U. S.
OFFICIAL GAZETTE
UNITED STATES
PATENT OFFICE
VOL. 907
FEBRUARY
1973

MICRO PHOTO DIVISION

BELL & HOWELL

S
W

OFFICIAL GAZETTE of the UNITED STATES PATENT OFFICE

February 6, 1973 Volume 907 Number 1

CONTENTS

Page

Patents and Trademark Notices

Board of Appeals Decisions Rendered in the Month of December 1972 . . 2
Patent Office—Organization and Functions 2
Patent Suits 4

Patent Notices

Certificates of Correction for the Week of February 6, 1973 6
Adverse Decisions in Interferences 6
Condition of Patent Applications 7
Reissue Patents Granted 8
Plant Patents Granted 12

Patents Granted

General and Mechanical 13
Chemical 151
Electrical 198
Design Patents Granted 283
Index of Patentees . . . . PI 1
Indices of Reissues, Plants, and Designs . . . . PI 32

Classification of

Patents (Including Reissues) . . . . PI 35
Designs and Plants . . . . PI 37

Geographical Index of Residence of Inventors

Patents (Including Reissues) . . . . PI 38
Designs and Plants . . . . PI 40

The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

THE OFFICIAL GAZETTE (PATENTS SECTION), issued weekly, subscription $89.00 per annum, foreign mailing $22.25 additional; single copies $2.00 each.

THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly, subscription $17.00 per annum, foreign mailing $4.25 additional; single copies 40 cents each.

CIRCULARS OF GENERAL INFORMATION concerning PATENTS or TRADEMARKS, price 15 cents each.

PRINTED COPIES OF PATENTS are furnished by the Patent Office at 50 cents each; PLANT PATENTS in color, $1.00 each; copies of TRADEMARKS and DESIGN PATENTS at 20 cents each. Address orders to the Commissioner of Patents, Washington, D.C., 20231.

Printing authorized by Section 11(a)3 of Title 35, U.S. Code P.O.

PATENT OFFICE NOTICES

Board of Appeals Decisions Rendered in the Month of December 1972

Examiner affirmed	91
Examiner affirmed in part	10
Examiner reversed	27
Total	128

Office of the Secretary

[Dept. Organization Order 30–3A]

PATENT OFFICE

ORGANIZATION AND FUNCTIONS

This order effective December 15, 1972, supersedes the material appearing at 27 FR 11469 of November 21, 1962.

SECTION 1. *Purpose.* This order delegates authority to the Commissioner of Patents and prescribes the functions of the Patent Office.

SEC. 2. *Status and line of authority.* .01 The Patent Office is hereby continued as a primary operating unit of the Department of Commerce. First established as an independent bureau under the direction of a Commissioner of Patents by the general revision of patent laws enacted by Congress July 4, 1836 (5 Stat. 117), it became a bureau of the Department of Commerce by Executive Order of April 1, 1925, in accordance with the authority contained in the act of February 14, 1903 (32 Stat. 830). When the patent laws were codified as Title 35, United States Code, effective January 1, 1953, the Patent Office was continued as an office in the Department of Commerce.

.02 The Commissioner of Patents (hereinafter called the Commissioner), who is appointed by the President by and with the advice and consent of the Senate shall be the head of the Patent Office. He shall be principally assisted by a Deputy Commissioner and four assistant commissioners, whose titles and status are specified below. The First Assistant Commissioner (Deputy Commissioner) and the first two assistant commissioners are provided for by 35 U.S.C. 3 and are appointed by the President by and with the advice and consent of the Senate.

a. The Deputy Commissioner (First Assistant Commissioner under 35 U.S.C. 3).

b. The Assistant Commissioner for Patents (an assistant commissioner under 35 U.S.C. 3).

c. The Assistant Commissioner for Trademarks (an assistant commissioner under 35 U.S.C. 3).

d. The Assistant Commissioner for Legal Affairs.

e. The Assistant Commissioner for Administration.

.03 The Deputy Commissioner or, in the event of a vacancy in that office, the assistant commissioner appointed under 35 U.S.C. 3 who is senior in date of appointment, shall act as Commissioner during a vacancy in that office until a Commissioner is appointed and takes office. In the absence of the Commissioner, the Deputy Commissioner shall act as Commissioner. If the Deputy Commissioner is likewise absent or that office is vacant, one of the assistant commissioners appointed under 35 U.S.C. 3 or the Assistant Commissioner for Legal Affairs or the Solicitor of the Patent Office shall act as Commissioner in an order of precedence prescribed by the Commissioner.

.04 The Commissioner shall report and be responsible to the Assistant Secretary for Science and Technology.

SEC. 3. *Delegation of authority.* .01 Pursuant to the authority vested in the Secretary of Commerce by 35 U.S.C. 3 and Reorganization Plan No. 5 of 1950, the functions of the Patent Office and its officers specified in Title 35 of the United States Code, as amended, are hereby vested in the Secretary of Commerce and redelegated to the Commissioner of Patents.

.02 Pursuant to the authority vested in the Secretary of Commerce by law, the Commissioner of Patents is hereby delegated authority to perform the following functions vested in the Secretary of Commerce.

a. The functions in Title 15, Chapter 22 of the United States Code, which pertain to trademarks.

b. The functions in Executive Order 10096 of January 23, 1950, and the Executive Order 10930 of March 24, 1961, which pertain to inventions made by Government employees.

c. The functions in 42 U.S.C. 2181 and 2182, which pertain to inventions relating to atomic weapons, and in 42 U.S.C. 2457, which pertain to property rights in inventions made in performance of work under contract for the National Aeronautics and Space Administration.

d. Such functions under other authorities of the Secretary of Commerce as are applicable to performing the functions assigned in this order.

.03 Exercise of the functions delegated in paragraphs .01 and .02 of this section shall be subject to such policies or directives as may be prescribed by the Secretary of Commerce or the Assistant Secretary for Science and Technology.

.04 The Commissioner of Patents may, except as precluded by law or regulation, redelegate his authority to employees of the Patent Office subject to such conditions in the exercise of the delegated authority as he may prescribe.

SEC. 4. *Functions.* The Patent Office shall perform the following functions:

.01 Examine applications for patent to determine if they meet the requirements of law for the issuance of patents and, upon such determination, granting patents.

.02 Administer special laws and regulations as to secrecy of certain inventions, licenses for foreign filing, and those relating to atomic energy and space technology.

.03 Decide the ownership of patents and the rights to inventions made by Government employees, as provided by Executive Orders 10096 and 10930.

.04 Provide for the publication, storage, dissemination, and exchange of patents and related documentation.

.05 Maintain systems and facilites providing appropriate access to United States and foreign patents and other technical literature for use of the examiners and the public.

.06 Examine applications for the registration of trademarks to determine their entitlement to registration under the law; give public notice of trademarks allowed for registration and publish registered trademarks; maintain the principal and supplemental registers of trademark registrations, and provide for public access to such registers and related trademark records.

.07 Issue patents and certificates of trademark registration.

.08 Reissue defective patents and issue certificates of correction of patents and trademark registrations.

.09 Maintain records as to proprietary interests in patents and trademarks and applications therefor.

.10 Carry on or authorize studies and programs, separately or in coordination with other United States, foreign, and international agencies, regarding domestic and international patent and trademark law.

.11 Perform other functions required, or which the Commissioner deems necessary and proper, in exercising the authority delegated herein.

Effective date: December 15, 1972.

GUY W. CHAMBERLIN, JR.,
Acting Assistant Secretary
for Administration.

[FR Doc. 73–320 Filed 1–5–73; 8:45 am]

[Dept. Organization Order 30–3B]

PATENT OFFICE

ORGANIZATION AND FUNCTIONS

This order effective December 15, 1972, supersedes the material appearing at 36 FR 9078 of May 19, 1971.

SECTION 1. *Purpose.* This order prescribes the organization and assignment of functions within the Patent Office. Department Organization Order 30–3A prescribes the scope of authority and functions.

SEC. 2. *Organization structure.* The principal organization structure and line of authority of the Patent Office shall be as depicted in the attached organization chart. A copy of the

organization chart is attached to the original document on file in the Office of the Federal Register.

SEC. 3. *Office of the Commissioner.* The Commissioner determines the policies and directs the programs of the Patent Office and is responsible for the conduct of all activities of the Patent Office. He is principally assisted by a Deputy Commissioner and four Assistant Commissioners who shall have the main duties as specified below:

a. The Deputy Commissioner (First Assistant Commissioner under 35 U.S.C. 3) shall assist the Commissioner in the direction of the Patent Office with immediate responsibility for the Office of Petitions and shall perform the duties of the Commissioner in the latter's absence.

b. The Assistant Commissioner for Patents (an assistant commissioner under 35 U.S.C. 3) shall provide administrative and policy direction for the patent examining and related operations which consist of the organizational elements enumerated in section 5 of this order. He is assisted by a Deputy Assistant Commissioner who shall, among other duties, have immediate responsibility for the patent examining groups and shall perform the duties of the Assistant Commissioner during the latter's absence.

c. The Assistant Commissioner for Trademarks (an assistant commissioner under 35 U.S.C. 3) shall provide administrative and policy direction to the trademark registration and related operations which consist of the organizational elements enumerated in section 6 of this order.

d. The Assistant Commissioner for Legal Affairs shall be the chief law officer of the Patent Office and as applicable shall provide administrative and policy direction to the organizational elements enumerated in section 7 of this order. Pursuant to Department Organization Order 10–6, he shall be subject to the overall authority of the Department's General Counsel with respect to legal and legislative matters involving the Patent Office, other than in connection with the issuance of patents or the registration of trademarks.

e. The Assistant Commissioner for Administration shall be the principal advisor to the Commissioner on the formulation and application of management policies and shall provide administrative, management, and operational support services to components of the Patent Office. In addition, he shall provide administrative and policy direction to a staff assigned to his office as well as to the organizational elements enumerated in section 8 of this order. He shall be assisted by a Deputy Assistant Commissioner who shall perform the duties of the Assistant Commissioner during the latter's absence.

SEC. 4. *Offices reporting to the Commissioner.* .01 The Offices of Petitions shall receive, docket, maintain records, and take other appropriate action with respect to petitions to the Commissioner submitted under applicable law and regulations; assign petitions to appropriate officials for decision or recommend and prepare decisions for review and approval by the Deputy Commissioner; and recommend changes in office policy, practices, and procedures, where the need for such appears evident from the records of the office.

.02 The Office of Government Inventions and Patents shall administer Executive Order 10096, as amended by Executive Order 10930 and related regulations, including the rendering of final decisions on the ownership of patents and the rights to inventions made by Government employees, and advise the Commissioner on matters involving the Committee on Government Patent Policy (of the Federal Council for Science and Technology). It shall also conduct research, liaison, and coordinate functions needed to carry out Executive Order 10096 and to advise the Commissioner on Committee matters; provided executive secretariat support to the Committee; and assist in the development and formulation, to the extent appropriate, of a uniform Government-wide policy.

.03 The Office of Advanced Systems Development shall apply analytical basic research techniques to the development of new machine-assisted experimental search, retrieval, and display systems; to the exploration and application of advanced technology for the betterment of operating systems; and to increasing the effectiveness of technical information dissemination and accessing measures. This work is directed primarily to providing solutions to hitherto unresolved problems and to the development of experimental or test applications, or simulations of original techniques or operations. It shall assist in the installation, pilot use, and evaluation of experimental systems in operating environments.

.04 The Office of Information Services shall advise and represent the Commissioner on information matters; conduct programs fostering public understanding of the American patent system and the functions, services and administrative publications of the Patent Office; develop publication policies; provide direction and assistance in developing new and revised publications; and assure conformity with policies, regulations, and standards concerning publications and publication practices.

SEC. 5. *Offices reporting to the Assistant Commissioner for Patents.* .01 The Office of Patent Program Control shall develop procedures for and establish quality, quantity, and other performance standards relating to the conduct of the patent examination and classification functions; establish program activity targets and continually evaluate status against program objectives; provide training to examiners in patent practices and procedures; and monitor compliance with examination and classification standards and procedures.

.02 The Office of Patent Classification shall develop, implement, and maintain subject matter classification systems for patent search files of prior art; evaluate and adapt experimental or other search systems developed elsewhere; determine requirements for and initiate procurement of foreign patent and literature abstracting services for use by examiners; and provide technical specifications, guidance, advice, and assistance to the contracting officer in such procurements; coordinate the classification of U.S. and foreign patent documents and nonpatent literature; and participate in developing and fostering harmonization of the United States and the International Patent Classification systems.

.03 The Examining Groups shall examine applications for patents to ascertain if the applicants are entitled to patents under the law and grant patents to those so entitled. Each examining group shall perform this function for patent applications falling within the generic category assigned to it. The number of examining groups and the coverage of the generic categories shall be determined by the Commissioner.

SEC. 6. *Offices reporting to the Assistant Commissioner for Trademarks.* .01 The Office of Trademark Program Contol shall develop guidelines governing trademark examining procedures; establish program activity targets and continually evaluate status against program objectives; and provide instruction in trademark practice and procedures and coordinate trademark administrative support activities.

.02 The Trademark Trial and Appeal Board shall be responsible for hearing and deciding adversary proceedings involving interfering applications, oppositions to registration, cancellations, and concurrent use proceedings; and for hearing and deciding appeals from final refusals of the trademark examiners to allow the registration of trademarks.

.03 The Trademark Examining Operation shall be responsible for the classification of trademark applications into classes of goods and services, the examination and processing of these applications, and the registration of trademarks, service marks, and certification marks; and maintain the principal and supplemental registers of trademarks.

SEC. 7. *Offices reporting to the Assistant Commissioner for Legal Affairs.* .01 The Office of the Solicitor shall handle all litigation to which the Commissioner is a party and provide other legal services, including advice and assistance on legislative matters, and maintenance of the law library.

.02 The Examiners-in-chief sitting as a Board of Patent Appeals shall be responsible for hearing and deciding appeals from adverse decisions of examiners upon applications for patents.

.03 The Board of Patent Interferences shall conduct patent interference proceedings and make final determinations in the Patent Office as to priority of invention. The Board shall also hear and decide questions concerning property rights in inventions in the atomic energy and space fields brought before it under the provisions of sections 2182 and 2456 (d) and (e) of title 42, U.S.C.

.04 The Office of Legislation shall develop recommendations and advise policy and action concerning matters which may require changes in the patent and trademark laws; review and prepare analysis of bills or drafts of legislation concerning patent or trademark matters received for technical appraisal; prepare legislative proposals and, after appropriate clearance, draft legislation and supporting documentation for clearance with the Department's Office of the General Counsel and the Office of Management and Budget, for consideration by the Congress; and maintain liaison with patent and trademark bar associations, industry, and others concerned with proposed and pending legislation.

.05 The Office of International Affairs shall coordinate the development of policy and program recommendations or positions respecting international patent and trademark affairs, including all proposed new or modified agreements under the Paris Union, Patent Cooperation Treaty, or like treaties; maintain liaison in such matters with the Office of the Secretary, the Department of State, and concerned elements of the public; and participate in negotiating patent and trademark matters in establishing international agreements and in the implementation of programs affecting Patent Office commitments or responsibilities in these areas.

SEC. 8. *Offices reporting to the Assistant Commissioner for Administration.* .01 Management Planning Organizations:

a. The Office of Budget shall formulate, interpret, and execute budgetary and fiscal policies; establish and maintain a comprehensive budget program collaborating with cost center officials in developing budget and fiscal plans; develop and present budget requests; allocate and maintain budgetary accountability of available funds; maintain external liaison in budgetary matters; and review and evaluate the fulfillment of budget-based program commitments.

b. The Office of Management and Organization shall plan and conduct studies designed to improve organization, methods, procedures, workflow, work measurement, managerial techniques, and resource utilization, or otherwise increase efficiency, effectiveness and economy of operations; develop and manage a system for the issuance of internal administrative orders and instructions; promote development of the Patent Office management improvement program and coordinate the collection, review and submission of reportable plans and accomplishments thereon; coordinate a program for the management and control of external reports; and make special studies as required.

c. The Office of Program Planning and Evaluation shall formulate plans for and coordinate the development of Patent Office-wide long and short range program objectives within the framework of budgetary constraints; define, project, and allocate the manpower and other resources required to achieve Patent Office-wide objectives; develop and monitor a management information system which prescribes code structures for and consolidates all administrative management systems into a single integrated data base to provide information designed to measure performance and achievement against planned objectives; and develop and issue a wide variety of timely internal analytical and interpretive reports to the managers of the Patent Office.

.02 Public service organizations:

a. The Office of Publications shall schedule and manage the processing and movement of allowed patent application files in procuring the creation of full patent text machine language data base and the composition and printing of weekly patent issues and related announcements in the OFFICIAL GAZETTE; provide requisition and scheduling services for trademark publications; monitor the quality or performance by contributing sources and maintain close liaison with U.S. Government Printing Office; and prepare and issue patent grants and periodic publications of patent indexes.

b. The Office of Patent and Trademark Services shall provide the materials and services offered directly to the public, many of which are provided on a fee basis. These shall include recording instruments that transfer property rights to patents and trademarks; furnishing copies of patents, trademarks registrations, and office records to examiners and others in the Office, as well as to the public; providing drafting services; and maintaining appropriate collections of pertinent technical and scientific information such as United States and foreign patents, periodicals, books, and other publications for use by the public. It shall also conduct an initial examination of patent applications for compliance with law and regulation as to form and certain matters of factual content; grant or deny a filing date based on such examination and forward to the Examining Groups those granted a filing date; acknowledge the acceptance or rejection of applications for examination; originate documentation of pending applications; initially assign accepted applications to units of the examining groups for examination; and maintain records on the status and location of all applications.

.03 Administrative service organizations:

a. The Office of Computer Services shall be responsible for providing data processing services to other elements of the Patent Office. This shall include the conduct of systems analysis and equipment evaluation studies directly related to the design and development of systems and programs for applications of computer techniques; preparation or procurement and testing of computer programs, and supplemental data processing services; operation of all general purpose ADP equipment including that which may be approved for use within another organization unit as an integral part of its operations; and maintenance of a comprehensive library of programs, including those developed or procured by other organization units.

b. The Office of Finance shall develop and maintain the financial accounting system of the Patent Office, perform accounting operations for the revenue, trust funds, and appropriation of the Patent Office, including maintenance of general accounts and related fiscal records, preparation of financial statements and reports, audit and certification of vouchers for payment, issuance of deposit account statements, initiation of action to collect amounts due the Patent Office, and administration of the payroll system and related employee accounts; and provide financial advice and opinions.

c. The Office of General Services shall plan and administer a broad Office-wide program of general services, including procurement control; property, space, and facilities management; communications, records, files, mail, and forms management; administrative printing; and clearance of all requirements involving contractual procurements, including liaison with the Department, in connection therewith.

d. The Office of Personnel shall administer activities relating to recruitment, placement, employee relations, equal employment opportunity programs for employees, training and career development, incentive awards, performance rating, position classification and wage administration, group-management relations, and various employee benefit programs.

.04 The Office of Technology Assessment and Forecast shall continually assess the status of technological activities in all countries; compare inventive activity in the United States relative to other nations; and forecast developments on a world-wide basis.

Effective date: December 15, 1972.

GUY W. CHAMBERLIN, Jr.,
Acting Assistant Secretary
for Administration.

[FR Doc. 73–321 Filed 1–5–73; 8:45 am]

Published in 38 F.R. 1068, Jan. 8, 1973

Patent Suits

Notices under 35 U.S.C. 290; Patent Act of 1952

2,741,416, G. W. Hileman, CONTAINER; **3,269,640,** E. L. Arneson, same; **3,411,692,** E. G. Mathews, same, **filed** May 4, 1972, D.C., N.D. Ill. (Chicago), Doc. 72c1117, *Federal Paper Bd. Co. Inc.* v. *Field Container Corp.*

2,947,104, Johnson and Johnson, WATER FOWL DECOY; **3,010,245,** F. R. Conibear, TRAPS, **filed** Oct. 26, 1967, D.C. Minn. (St. Paul), Doc. 2–67–297–C, *Woodstream Corporation* v. *Herter's Inc. and George L. Herter.* Judgment in favor of the defendants, the two patents being declared invalid. In the above action the U.S. Court of Appeals reversed the judgment with regard to the finding of invalidity of the Conibear patent, and affirmed the judgment in all other respects. This was done by mandate received here Sept. 27, 1971. On Aug. 4, 1972, Judge Devitt entered judgment that U.S. Letters Patent No. 3,010,245 is valid, enjoined defendants from making or selling the trap involved.

3,010,245. (See 2,947,104.)

3,046,056, Greene and Pulley, SEAT BELT PROTECTOR BOOTS; **3,126,228,** same, TWIN HOOK TYPE VEHICLE SAFETY BELT AND GUARD BOOT THEREFOR; **3,171,688,** A. S. Nicholas, RECEIVER FOR SEAT BELT RETRACTOR; **3,272,557,** A. S. Nicholas, same; **3,287,061,** same, HOLDER FOR SEAT BELTS; **3,287,063,** same, RETRACTOR HOUSING; **3,291,526,** same, GUARD FOR VEHICLE SAFETY BELTS; **3,305,266,** Nicholas and Fuerst, SEAT BELT TERMINAL JACKET; **3,313,574,** A. S. Nicholas, RECEIVER FOR BELT RETRACTORS; **3,318,634,** same, SEAT BELT UNIT; **3,401,980,** same, HOUSING WITH PLATE ANCHOR; **3,550,955,** Nicholas and Chamberlain, SEAT BELT TERMINAL JACKET; **3,455,603,** A. S. Nicholas, SEAT MOUNTED RETRACTOR HOUSING, **filed** May 10, 1972, D.C., E.D. Mich. (Detroit), Doc. 38286, *Gateway Industries, Inc.* v. *U.S. Industries, Inc.*

3,075,781, Atkinson, Cline and Cunningham, BEARING SEAL, **filed** Feb. 14, 1969, D.C., S.D. Tex. (Houston), Doc. 69–H–153, *Hughes Tool Company* v. *Reed Roller Bit Company (now G. W. Murphy Industries, Inc).* Judgment, patent is valid, defendant has infringed and is enjoined, Aug. 7, 1972.

3,089,212, Graham, Smith and Morriss, PIPE CLAMP, **filed** July 31, 1972, D.C., C.D. Calif. (Los Angeles), Doc. 72–1742–ALS. *Smith-Blair, Inc.* v. *R. H. Baker & Co.*

3,093,177, J. P. Villo, THREAD LOCK AND METHOD OF MAKING THE SAME, **filed** Aug. 7, 1972, D.C., N.D. Ohio (Cleveland), Doc. 72–825, *Standard Pressed Steel Co.* v. *Amerace Esna Corporation.*

3,095,309, Zeblisky, McCormack, Williamson and Schneble, ELECTROLESS COPPER PLATING, **filed** Apr. 21, 1971, D.C., C.D. Calif. (Los Angeles), Doc. 71–971–EC, *Kollmorgen Corporation* v. *Dynachem Corporation.* Consent judgment, plaintiff is exclusive licensee under at least one of the claims of said patent, have been infringed by Dynachem Corp., Aug. 8, 1972.

3,100,080, R. A. Flechter, RAILWAY RAIL JOINT; **3,139,364,** same, METHOD OF MAKING RAILWAY TRACK, **filed** July 6, 1972, D.C., W.D. Pa. (Pittsburgh), Doc. 72–558, *Allegheny Drop Forge Company* v. *Portec, Inc.*

3,115,647, W. M. Emery, CUSHIONS; **D. 197,397,** same, PILLOW, **filed** June 20, 1972, D.C., Md. (Baltimore), Doc. 72–634–HM, *Better Sleep, Inc.* v. *Triangle Manufacturing Co., Inc.*

3,126,228. (See 3,046,056.)

3,139,364. (See 3,100,080.)

3,171,688. (See 3,046,056.)

3,184,556, W. K. Larkin, MINIATURE HEADSET-MICROPHONE ADAPTED FOR USE WITH A MASK; **3,548,118,** K. J. Hutchings, SELF-SUPPORTING HEADSET; **D. 218,173,** same, COMBINED MICROPHONE AND RECEIVER INSTRUMENT, **filed** Apr. 20, 1972, D.C., S.D.N.Y., Doc. 72–C–1625, *Pacific Plantronics* v. *Roanwell Corporation.*

3,191,956, A. Rizzuto, WHEELED SHOPPING CART OR BASKET, **filed** Aug. 10, 1972, D.C., S.D.N.Y., Doc. 72–C–3399, *Bernard A. Guadano, Jr.* v. *Feneral Home Products Corporation and Laskey & Odette, Inc.*

3,239,145, A. D. Russo, DISPENSING CONTAINER FOR AIR TREATING GEL, **filed** July 31, 1972, D.C., C.D. Calif. (Los Angeles), Doc. 72–1748–AAH, *Blue Cross Laboratories* v. *Airwick Industries, Inc.*

3,269,640. (See 2,741,416.)

3,272,557. (See 3,046,056.)

3,287,061. (See 3,046,056.)

3,287,063. (See 3,046,056.)

3,291,526. (See 3,046,056.)

3,293,203, G. F. Paulus, THERMOSETTABLE RESIN COMPOSITIONS AND METHOD FOR FORMING LOW FRICTION SURFACE COATINGS, **filed** Aug. 9, 1972, D.C., C.D. Calif. (Los Angeles), Doc. 72–1836 WPG, *Acheson Industries, Inc.* v. *Drilube Company.*

3,305,266. (See 3,046,056.)

3,313,574. (See 3,046,056.)

3,318,634. (See 3,046,056.)

3,359,116, L. L. Little, METHOD OF PREPARING ACIDIFIED DAIRY PRODUCTS; **3,378,375,** same, PROCESS OF MAKING SOUR CREAM TYPE PRODUCTS AND CREAM CHEESE, **filed** Dec. 1, 1971, D.C. Del. (Wilmington), Doc. C–4285, *Diamond Shamrock Corp.* v. *The Battelle Development Corp.*

3,362,829, Landfried and Moneymaker, COATED DRY GLUTEN PRODUCTS AND PROCESS FOR PREPARING SAME, **filed** May 9, 1972, D.C. Conn. (New Haven), Doc. 15022, *Top-Scor Products, Inc.* v. *Maurice R. Haney, doing business as M. R. Haney Co.* Consent judgment, July 28, 1972. Plaintiff is owner, an injunction is granted, awarded and decreed to plaintiff against defendant.

3,375,227, D. D. Hicks, CARBOXY-HYDROXY-CONTAINING COPOLYMERS; **Re. 27,151,** same, **filed** Apr. 21, 1972, D.C. Md. (Baltimore), Doc. 72–409–B, *PPG Industries, Inc.* v. *Celanese Coatings Company.*

3,376,388, M. G. Reiffin, DIRECT-CURRENT-COUPLED TRANSISTOR POWER AMPLIFIERS; **3,495,181,** same, TRANSISTOR POWER AMPLIFIER WITH PROTECTIVE CIRCUITRY; **filed** July 24, 1972, D.C., N.D. Ill. (Chicago), Doc. 72c1812, *Martin G. Reiffin* v. *Heathkit Electronic Center, Heath Co. and Schlumberger Limited.*

3,378,375. (See 3,359,116.)

3,393,838, M. J. Syverson, STORAGE CONTAINER AND DISPENSER; **D. 215,259,** same, BEVERAGE DISPENSER, **filed** Feb. 28, 1972, D.C., S.D. Tex. (Houston), Doc. 72–H–258, *Fountain Industries, Inc.* v. *Consolidated Chemical Corp.*

3,401,980. (See 3,046,056.)

3,411,692. (See 2,741,416.)

3,455,603. (See 3,046,056.)

3,469,557, D. L. Wollard, CHANNEL STERN POWER BOAT; **3,518,604,** Beaver and Van Benthuysen, ELECTRICAL COMPONENT, **filed** May 19, 1972, D.C., S.D. Fla. (Miami), Doc. 71–5–C–WM, *Penn Yan Boats, Inc.* v. *Sea Lark Boats, Inc. et al.* Judgment, patent is valid, defendant is owner, plaintiff, Penn Yan Boats, Inc. has infringed, June 6, 1972.

3,495,181. (See 3,376,388.)

3,518,087. (See 3,469,557.)

3,538,389, Levesque and Harper, SUBELEMENT FOR ELECTRONIC CIRCUIT BOARD, **filed** May 4, 1971, D.C., C.D. Calif. (Los Angeles), Doc. 71–1086–CC, *Circuit Stik, Inc.* v. *International Rectifier Corp.* Judgment and ordered thereon that plaintiff's claim is dismissed that defendant's counterclaims are dismissed, July 26, 1972.

3,548,118. (See 3,184,556.)

3,550,955. (See 3,046,056.)

3,673,410, Waite and Nodine, METHOD OF EXAMINATION OF CELL SAMPLES USING A RADIOACTIVELY TAGGED DYE; **3,678,148,** L. Caiola, ANALYSIS OF RADIOACTIVE SLIDE SPECIMEN AND METHOD OF PREPARATION, **filed** Aug. 4, 1972, D.C.N.J. (Trenton), Doc. C–1341–72, *Isomedics, Incorporated and Information Utilization Corporation* v. *Bio-Digital Sciences, Inc.*

3,678,148. (See 3,673,410.)

Re. 27,151. (See 3,375,227.)

D. 197,397. (See 3,115,647.)

D. 214, J. A. Goodall, BATHTUB; **D. 219,874,** same, **filed** Aug. 10, 1972, D.C., S.D. Tex. (Houston), Doc. 72–H–1068, *Walker Marble Company, Inc.* v. *Kenneth Veach, doing business as KV Tile & Marble Company.*

D. 215,259. (See 3,393,838.)

D. 218,173. (See 3,184,556.)

D. 219,874. (See D. 214,902.)

Certificates of Correction for the Week of Feb. 6, 1973

D. 223,178
3,141,105
3,295,570
3,384,986
3,489,751
3,539,338
3,558,081
3,573,527
3,575,970
3,577,345
3,582,884
3,595,886
3,597,584
3,598,899
3,609,167
3,611,964
3,612,800
3,615,325
3,617,234
3,617,431
3,617,787
3,619,076
3,619,462
3,620,978
3,621,577
3,622,294
3,623,020
3,624,316
3,625,613
3,629,463
3,630,979
3,631,355
3,632,491
3,632,538
3,635,825
3,636,443
3,637,386
3,637,535
3,638,133
3,638,433
3,641,164
3,644,051
3,644,756
3,645,545
3,645,789
3,645,972
3,646,595
3,647,464
3,647,990
3,648,618
3,651,421
3,652,886
3,655,992
3,656,951
3,657,244
3,657,875
3,660,186
3,660,306
3,660,380
3,660,396
3,660,640
3,660,869
3,661,352
3,661,903
3,662,652
3,662,809
3,663,239
3,664,629
3,665,017
3,665,039
3,665,743
3,666,413
3,666,457
3,666,789
3,667,237
3,667,958
3,668,403
3,669,727
3,669,877
3,670,057
3,671,492
3,671,545
3,672,105
3,672,825
3,672,950
3,672,997
3,673,164
3,673,274
3,673,410
3,673,519
3,673,574
3,673,921
3,674,784
3,675,370
3,675,773
3,676,161
3,676,204
3,676,347
3,676,839
3,676,860
3,678,017
3,678,117
3,678,180
3,678,274
3,678,509
3,678,533
3,678,621
3,679,750
3,679,927
3,679,981
3,680,080
3,680,261
3,680,409
3,681,491
3,681,707
3,681,824
3,682,131
3,682,633
3,682,942
3,682,963
3,683,120
3,683,121
3,683,626
3,683,797
3,683,828
3,684,055
3,684,066
3,684,071
3,684,186
3,684,320
3,684,515
3,884,545
3,685,055
3,685,202
3,685,346
3,685,530
3,685,683
3,685,779
3,685,940
3,686,076
3,686,382
3,686,868
3,686,869
3,687,004
3,687,052
3,687,148
3,687,247
3,687,269
3,687,544
3,687,615
3,687,707
3,687,730
3,687,884
3,687,888
3,687,891
3,688,333
3,688,453
3,688,998
3,689,016
3,689,487
3,690,927
3,691,072
3,691,334
3,691,579
3,692,017
3,692,138
3,692,417
3,692,553
3,692,582
3,692,684
3,692,867
3,692,893
3,693,512
3,694,175
3,694,502
3,695,108
3,696,648
3,696,870
3,698,255

Adverse Decisions in Interferences

In the designated interferences involving the indicated claims of the following patents, final decisions have been rendered that the respective patentees were not the first inventors with respect to the claims listed.

Patent No. 3,402,205, George P. Gregory, POLYPEROXIDES, decided August 30, 1972, Interference No. 96,742, claim 2.

Patent No. 3,432,468, Rudolf Gabler, HEAT-RESISTANT POLYTHIOETHERS AND METHOD FOR THEIR PRODUCTION, decided February 15, 1972, Interference No. 97,704, claim 4.

Patent No. 3,446,915, Raymond C. Volge, CATHODE RAY TUBE BEAM BLANKING CIRCUIT, decided November 16, 1972, Interference No. 97,465, claims 1(m) and 5(m).

Patent No. 3,453,762, Robert D. Fremont, DISPOSABLE MAGAZINE HAVING A PROTECTIVE COVER AND FOLLOWER RETAINING MEANS, decided September 22, 1972, Interference No. 97,354, claim 9.

Patent No. 3,461,003, Don M. Jackson, Jr., METHOD OF FABRICATING A SEMICONDUCTOR STRUCTURE WITH AN ELECTRICALLY ISOLATED REGION OF SEMICONDUCTOR MATERIAL, decided August 24, 1972, Interference No. 97,433, claims 7 and 8.

Patent No. 3,472,944, P. H. Morton and A. C. Barber, ASSEMBLIES OF SUPERCONDUCTOR ELEMENTS, decided August 30, 1972, Interference No. 97,170, claims 1, 2, 4, 5, 7 and 8.

Patent No. 3,484,413, Marvin L. Kaufman, POLYURETHANES PREPARED FROM THE CYCLIZATION PRODUCT OF A POLYGLYCIDYL CARBAMATE, decided October 12, 1972, Interference No. 97,650, claims 1(m), 2(m), 3(P), 4(m), 5(m), 6(m), 7(m), 8(P), 9(P), and 10(P).

Patent No. 3,496,135, Stanley W. Caywood, Jr., CRUDE EPDM COPOLYMER STABILIZED WITH A LEWIS BASE, decided November 2, 1972, Interference No. 97,453, claims 1(P), 2(P), 4(P), 6(P), and 8(P).

Patent No. 3,565,846, H. Enders, W. Dantanello, G. Pusch and S. Adolph, AGENT FOR MAKING TEXTILES CREASE PROOF AND TEXTILES TREATED BY SUCH AGENT, decided November 8, 1972, Interference No. 97,974, claims 1, 2, 3, 4, 6, 7 and 10.

Patent No. 3,522,950, Robert C. Schenck, Jr., PISTON AND PTFE RING ASSEMBLY FOR INTERNAL COMBUSTION ENGINES, decided August 31, 1972, Interference No. 97,741, claims 1, 2, 3, 4, 5 and 6.

PATENT EXAMINING CORPS

R. A. WAHL, Assistant Commissioner
WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF JANUARY 23, 1973

PATENT EXAMINING GROUPS	Actual Filing Data of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—M, STERMAN, Director Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	10-19-71
GENERAL ORGANIC CHEMISTRY, GROUP 120—I. MARCUS, Director Heterocyclic; Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	12-10-71
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—L. J. BERCOVITZ, Director Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	8-12-71
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—A. P. KENT, Director Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	10-01-71
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—R. FRIEDMAN, Director Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	10-01-71
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—N. ANSHER, Director Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	5-31-72
SPECIAL LAWS ADMINISTRATION, GROUP 220—R. L. CAMPBELL, Director Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	1-21-72
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	4-03-72
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—L. FORMAN, Director Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	10-26-71
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—W. L. CARLSON, Director Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	12-27-71
DESIGNS, GROUP 290—R. L. CAMPBELL, Director Industrial Arts; Household, Personal and Fine Arts.	4-29-71
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—A. BERLIN, Director Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	3-01-72
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—D. J. STOCKING, Director Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus: Plastics Working Apparatus: Plastic Block and Earthenware Apparatus: Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	1-03-72
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—A. RUEGG, Director Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	2-01-72
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—M. M. NEWMAN, Director Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	3-06-72
MISCELLANEOUS CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—T. J. HICKEY, Director Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	10-18-71

Expiration of patents: The patents within the range of numbers indicated below expire during January 1973, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents	Numbers 2,733,439 to 2,736,897, inclusive
Plant Patents	Number 1,456

REISSUES

FEBRUARY 6, 1973

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

27,569

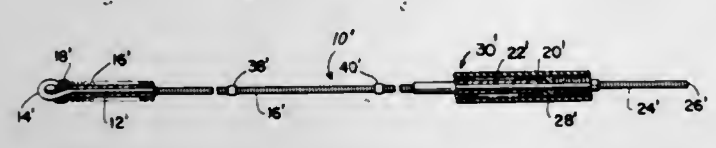
CARDIAC ELECTRODE CATHETER AND HEART STIMULATION METHOD

Bernard Ackerman, Metuchen, N.J., assignor to Electro-Catheter Corporation, Rahway, N.J.

Original No. 3,485,247, dated Dec. 23, 1969, Ser. No. 480,020, Aug. 16, 1965. Application for reissue Aug. 27, 1970, Ser. No. 67,406

Int. Cl. A61n *1/04*

U.S. Cl. 128—418 **14 Claims**



A bipolar catheter includes an outer conductor and an inner conductor located inside the outer conductor and insulated therefrom except at the outermost portion. The outer conductor is divided intermediate its length and the two portions from the terminals of the catheter. The catheter is inserted in the heart by puncturing the patient's chest wall and heart with a needle and threading the catheter therethrough, after which the needle is removed and the catheter is connected to a suitable electrical impulse generator.

27,570

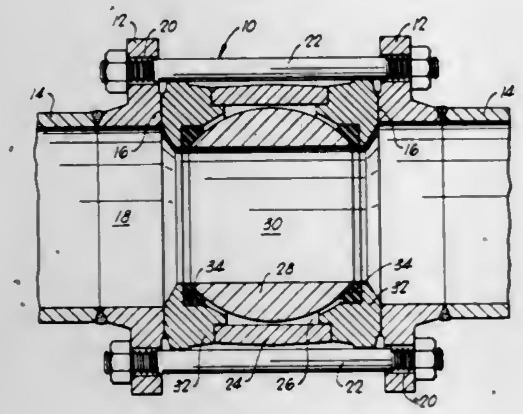
BALL VALVE FOR USE BETWEEN FLANGES

Domer Scaramucci, Oklahoma City, Okla., assignor to Balon Corporation, Oklahoma City, Okla.

Original No. 3,462,118, dated Aug. 19, 1969, Ser. No. 658,667, Aug. 7, 1967. Application for reissue Aug. 19, 1970, Ser. No. 65,205

Int. Cl. F16k *5/06, 51/00;* **F16l** *19/02*

U.S. Cl. 251—151 **11 Claims**



A ball valve for use between standard ASA flanges, wherein the body of the valve is shaped to accommodate the bolts connecting the flanges without interference, and is of the maximum internal diameter consistent with the provision of a seal no greater in diameter than the seating faces of the flanges, whereby the maximum size of valve ball can be used to maximize the flow capacity of the valve. The valve body is supported by retaining rings at each end which engage the flanges and transmit a compressive load from the flanges to the body, as well as for carrying upstream and downstream seals in positions to sealingly engage the valve ball.

27,571

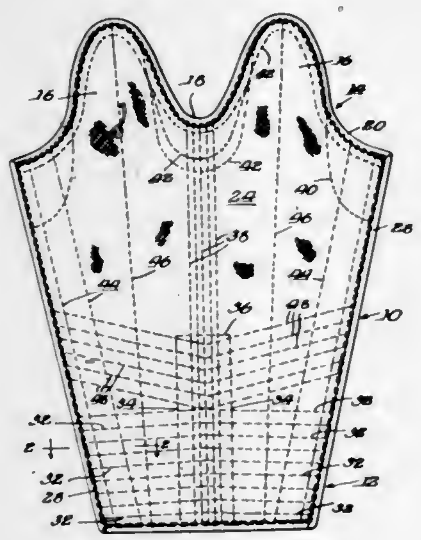
SURGICAL DRESSING

James F. Graham, 9760 S. Kedzee Ave., Evergreen Park, Ill. 60642

Original No. 3,521,632, dated July 28, 1970, Ser. No. 776,340, Nov. 18, 1968. Application for reissue July 1, 1971, Ser. No. 159,073

Int. Cl. A61l *15/00*

U.S. Cl. 128—156 **14 Claims**



A surgical dressing which is adjustable for size and shape. An inner lining of non-adhering fluid-permeable fabric is roughly shaped to conform to the human trunk. A congruent mass of fluid-absorbent material is superimposed on the inner lining, and covered with an outer lining of moisture-resistant fabric. All three layers are fastened together about their contiguous edges with a fabric tape. A plurality of spaced lines of stitching are provided through the outer lining and the mass of absorbent material. The stitching lines permit cutting of the dressing to size and shape without disturbing the structural integrity of the absorbent mass.

27,572

DIATOMACEOUS SILICA PIGMENTS AND THE LIKE

Clifford William Cain, Jr., Bound Brook, and Donald Earl Brody, Verona, N.J., assignors to Johns-Manville Corporation, New York, N.Y.

Original No. 3,499,778, dated Mar. 10, 1970, Ser. No. 596,119, Nov. 22, 1966. Application for reissue May 15, 1970, Ser. No. 37,942

Int. Cl. C09c *1/28*

U.S. Cl. 106—288 B **3 Claims**

A diatomaceous silica flatting agent capable of imparting both a high level of smoothness and a low level of 60 degree gloss and 85 degrees sheen to various paints, the flatting agent being characterized by not more than about 5 percent diatomaceous silica coarser than about 10 microns, by a least 80 percent between about 2 and about 10 microns, and not more than about 15 percent smaller than about 2 microns, the particle sizes being the equivalent Stokes diameters obtained by a sedimentation test using the conventional Klein hydrometer technique.

27,573

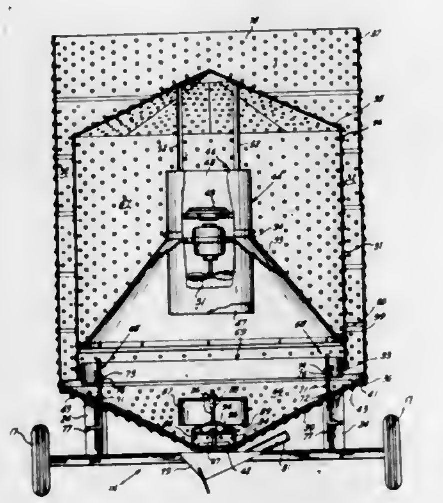
MACHINE AND METHOD FOR DRYING

Joseph B. Kucera, Traer, Iowa, assignor of a fractional part interest to Rudolph L. Lowell, Des Moines, Iowa

Original No. 3,524,264, dated Aug. 18, 1970, Ser. No. 785,651, Dec. 20, 1968. Application for reissue Nov. 8, 1971, Ser. No. 196,716

Int. Cl. F26b *7/00*

U.S. Cl. 34—20 **12 Claims**



The grain drier is adapted for continuous or batch drying and includes a portable frame that carries upright inner and outer grain receiving passage. Secured to the lower end of the outer wall is a downwardly converging perforated cooling wall having a centrally disposed dried grain outlet. The lower end of the inner wall is spaced upwardly from the lower end of the outer wall so as to form with the cooling wall a circular outlet for the grain passage. Drying air is drawn upwardly through the cooling wall and within the space defined by the inner wall, where it is heated and passed through the grain passage over the full length of such passage. The rate of flow of grain from the passage onto the cooling wall is controlled in accordance with predetermined drying requirements so tha tonly grain of substantially uniform moisture content is discharged through the dried grain outlet.

27,574

BLOWBACK SEAL FOR BUILDING PANELS

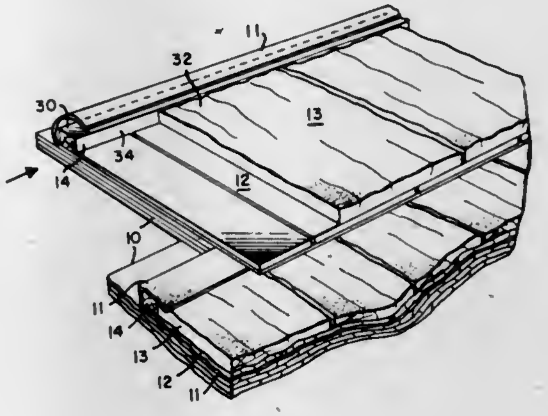
John K. Kough and Blair B. Kough, Morgan Hill, Calif., assignors to Ditz-Crane, San Francisco, Calif.

Original No. 3,509,676, dated May 5, 1970, Ser. No. 793,865, Jan. 24, 1969. Application for reissue July 15, 1970, Ser. No. 55,297

Int. Cl. E04d *1/26, 1/36*

U.S. Cl. 52—541 **9 Claims**

Disclosed is a panel a plurality of which may be used to surface the exteriors (roof and/or sides) of buildings. The panel is prefabricated and incorporates the sheathing, waterproofing, singling and shakes often found in building surfacing of high quality and is installed in abutting vertical courses each course containing as many adjacent panels as required by the roof dimensions. The panel is substantially modular so that only a small amount of on-site custom fitting is required as compared to conventional construction. In addition, the panel includes provision for inhibiting the seepage of water into the building attic even as a result of rain driven by intense wind.



27,575

WATER-INSOLUBLE BENZIMIDAZOLONE CONTAINING MONOAZO DYESTUFFS

Joachim Ribka, Offenbach am Main, and Wolfgang Pretzer, Fischbach, Tannus, Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany

No Drawing. Original No. 3,555,002, dated Jan. 12, 1971, Ser. No. 769,711, Oct. 22, 1968. Application for reissue Mar. 23, 1971, Ser. No. 127,353

Claims priority, application Germany, Aug. 2, 1968, P 17 95 052.6

Int. Cl. C09b *29/36*

U.S. Cl. 260—157 **7 Claims**

Water-insoluble monoazo-dyestuffs consisting of 5-amino-isophthalic-diamides as diazo component and 5-acetoacetylamino-benzimidazolones as coupling component and process for their preparation. Said pigments are especially suitable for dyeing and printing plastics, caoutchouc, resins of natural or synthetic origin, fibrous textile materials or paper. Moreover, the pigments can be used for the preparation of dispersion paints, lacquers and printing inks.

27,576

WATER-INSOLUBLE BENZIMIDAZOLONE CONTAINING MONOAZO DYESTUFFS

Joachim Ribka, Offenbach am Main, Germany, assignor to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany

No Drawing. Original No. 3,555,003, dated Jan. 12, 1971, Ser. No. 769,728, Oct. 22, 1968. Application for reissue Mar. 23, 1971, Ser. No. 127,389

Claims priority, application Germany, Oct. 27, 1967, P 16 44 231.2; Aug. 2, 1968, P 17 95 051.5

Int. Cl. C09b *29/36*

U.S. Cl. 260—157 **7 Claims**

Water-insoluble monoazo dyestuffs consisting of 5-amino-isophthalic-acid-dimethylester as diazo component and 5 - acetoacetylamino - benzimidazolones as coupling component and process for their preparation. Said pigments are especially suitable for dyeing and printing plastics, caoutchouc, resins of natural or synthetic origin, fibrous textile materials or paper. Moreover, the pigments can be used for the preparation of dispersion paints, lacquers and printing inks.

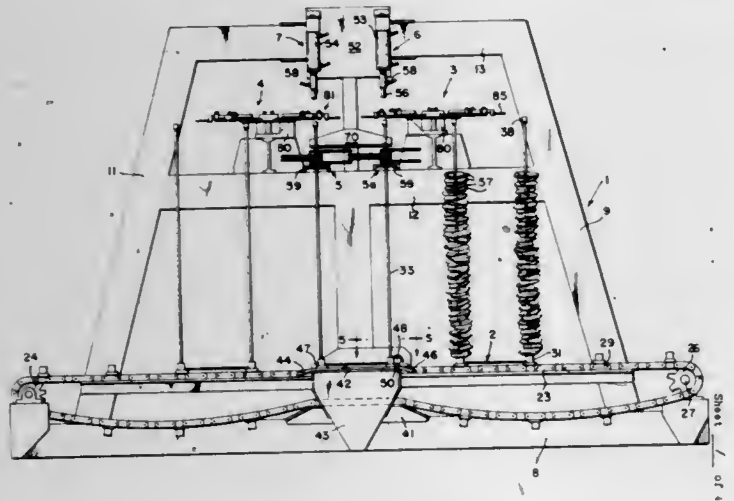
27,577
SHELL STRINGER APPARATUS

Richard F. Rawlings, 226 SW. 131st St., Seattle, Wash. 98146, and George E. Austin, Mercer Island, Wash.; said Austin assignor to said Rawlings

Original No. 3,431,803, dated Mar. 11, 1969, Ser. No. 576,635, Sept. 1, 1966. Application for reissue Feb. 12, 1971, Ser. No. 115,144

Int. Cl. B26d *7/06, 5/20*

U.S. Cl. 83—95 **6 Claims**



A shell stringing device for punching a hole in individual shells and stringing the shells onto a wire which is rigidly supported during the punching operation. The individual shells are automatically conveyed to the punching position over the wire, punched and strung onto the wire.

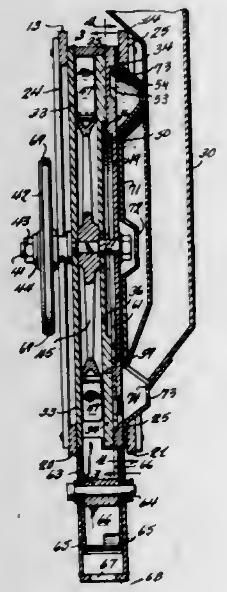
27,578
SEED PLANTER

Eugene G. Keeton, Rte. 2, Trenton, Ky. 42286

Original No. 3,308,774, dated Mar. 14, 1967, Ser. No. 550,569, May 16, 1966, which is a continuation of Ser. No. 338,927, Jan. 20, 1964. Application for reissue Jan. 29, 1968, Ser. No. 702,143

Int. Cl. A01c *9/00*

U.S. Cl. 221—219 **59 Claims**



A seed planter having a seed selector which passes through a supply of seeds, engages a seed and slides it along a surface, and discharges the seed through an aperture in the surface. The surface is provided with a step which causes extra seeds engaged by the selector to drop back to the seed supply prior to discharge. A seed conveyor having removable compartment dividers can be used in conjunction with the seed selector.

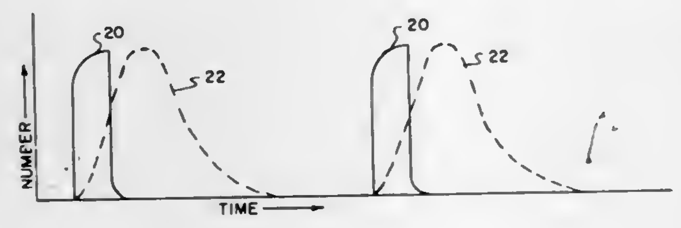
27,579
METHOD OF CORE ANALYSIS USING THERMAL NEUTRON CAPTURE CROSS SECTION

Arthur H. Youmans, Houston, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Original No. 3,426,203, dated Feb. 4, 1969, Ser. No. 423,037, Jan. 4, 1965. Application for reissue Nov. 19, 1970, Ser. No. 91,229

Int. Cl. G01t *3/00*

U.S. Cl. 250—83.1 **10 Claims**



A preselected volume of a preselected standard material is irradiated at the earth's surface with a burst of fast neutrons, after which the decline of the thermal neutron population is measured. A sample of the borehole formation is then mixed with the material of the earth's surface and further readings are made of the decline of the thermal neutron population in the mixture. The first measurements are then compared with the further measurements, the comparison forming a correction factor for measurements made of the decline of the thermal neutron population with the well bore per se.

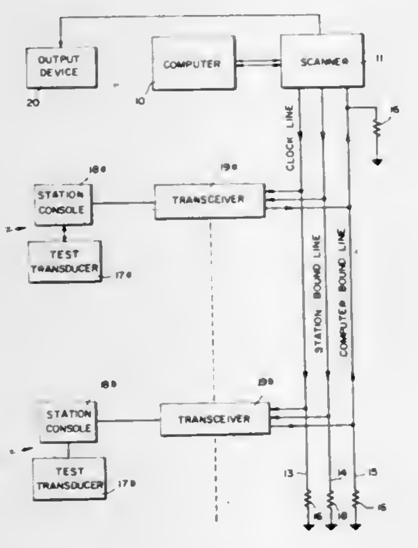
27,580
MULTIPHASIC MEDICAL SCREENING SYSTEM

Edward B. Rawson, Lincoln, Daniel B. Schwarzkopf, Stow, Joseph B. Ferguson, Harvard, and Jay H. Ball, Natick, Mass., assignors to Searle Medidata Inc.

Original No. 3,566,365, dated Feb. 23, 1971, Ser. No. 759,389, Sept. 12, 1968. Application for reissue Feb. 10, 1972, Ser. No. 225,344

Int. Cl. G06f *15/02, 15/42*

U.S. Cl. 340—172.5 **16 Claims**



A multiphasic medical screening system in which medical data concerning a patient is derived by suitable transducers and transmitted and processed in real time to produce a medical history and work-up of the patient. A plurality of testing stations are provided, each implemented to conduct a particular test or tests, and the stations are selectively polled by a central processor to communicate data to the stations and to receive data from the stations.

27,581
MONOFUNCTIONALLY SUBSTITUTED HYDROPHOBIC STARCH AND FILM-FORMING DISPERSIONS PREPARED THEREFROM

Erling T. Hjermstad, Cedar Rapids, Larry C. Martin, Albernett, and Kenneth W. Kirby, Cedar Rapids, Iowa, assignors to Penick & Ford, Limited, New York, N.Y.

No Drawing. Original No. 3,462,283, dated Aug. 19, 1969, Ser. No. 619,153, Feb. 28, 1967. Application for reissue Mar. 15, 1971, Ser. No. 124,560

Int. Cl. C09j *3/06;* **C09d** *3/20;* **C09k** *3/00*

U.S. Cl. 106—213 **15 Claims**

Hydrophobic starch dispersible in water as submicron sized particles to provide a film-forming dispersion is prepared by etherification of granule starch with a monofunctional etherifying agent providing the starch with ether-linked hydrophobic groups. The hydrophobic groups are alkyls of at least three carbons or aralkyls of at least seven carbons, and the starch is substituted to a level where it is essentially hydrophobic and does not gelatinize. The hydrophobic granule starch can be fragmented to subgranule particles of submicron size, which are dispersible in water to provide a film-forming dispersion.

27,582
METAL-CONTAINING DETERGENT-DISPERSANTS FOR LUBRICANTS

Donald J. Kahn, Metuchen, Max L. Robbins, South Orange, and Frieder S. Furer, Wayne, N.J., assignors to Esso Research and Engineering Company

No Drawing. Original No. 3,451,931, dated June 24, 1969, Ser. No. 575,971, Aug. 30, 1966, which is a continuation-in-part of Ser. No. 333,614, Dec. 26, 1963. Application for reissue June 21, 1971, Ser. No. 155,367

Int. Cl. C10m *1/32, 3/20, 5/20*

U.S. Cl. 252—32.7 E **20 Claims**

An overbased detergent-dispersant for an oil composition is prepared by reacting a metal base, such as barium hydroxide or calcium hydroxide, with an acidic gas such as CO_2, H_2S, or SO_2 in the presence of an amide, imide or ester derived from a high-molecular-weight monocarboxylic or polycarboxylic acid of from 40 to 250 carbon atoms and from an organic nitrogen-containing compound having at least one amino group or hydroxy group, including alkylene polyamines, hydroxyalkyl amines and N-hydroxy alkyl morpholinones. Useful compositions are prepared by blending these reaction products into fuels and lubricants.

PLANT PATENTS

GRANTED FEBRUARY 6, 1973

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

3,297
PLUM TREE

Roy Sumruld, 2957 E. Tulare Ave.,
Tulare, Calif. 93274
Filed July 27, 1971, Ser. No. 166,648
Claims priority, application Netherlands, Aug. 25, 1970, 7012597
Int. Cl. A01h *5/03*

U.S. Cl. Plt.—38 **1 Claim**

A plum tree which is generally similar to the unpatented Santa Rosa plum tree but which bears fruit which ripens approximately three months later than that of the Santa Rosa.

3,298
PEACH TREE

Grant Merrill, 416 N. Anderson Road,
Exeter, Calif. 93221
Filed Apr. 29, 1971, Ser. No. 138,723
Int. Cl. A01h *5/03*

U.S. Cl. Plt.—43 **1 Claim**

1. A new and distinct variety of peach tree substantially as illustrated and described and being characterized by a vigorous tree regularly bearing fruit which when mature remains firm and retains its full color on the tree, thus enabling it to be picked in one picking, having a brilliant red color over 50 to 75 percent of its skin surface upon an under color of bright yellow, and which most nearly resembles its parent plant, Franciscan (U.S. P.P. 2,239), but differs from and is an improvement on that variety by ripening about ten days later and holding its firmness longer, by its brighter yellow skin color and brighter red blush, and by being completely free from the stone when ripe.

3,299
CARNATION PLANT

William E. Duffett, Akron, Ohio, assignor to Yoder Brothers, Inc., Barberton, Ohio
Filed June 15, 1971, Ser. No. 153,458
Int. Cl. A01h *5/00*

U.S. Cl. Plt.—70 **1 Claim**

1. A new and distinct carnation cultivar characterized particularly as to uniqueness when compared to the cultivar White Elegance by its six to ten inches more vigor; stem length which averages two inches longer; two to four more flowers and buds per stem, which enables it to grade out 5–10% higher on the top two grades; approximately 7–10 days earlier flowering on the first crop; its well budded, open sprays during the winter months; two to five days longer keeping quality; its strong but pleasant fragrance; more fully petailed flowers, averaging approximately 50% more petals per flower; and its greater stem production per square foot for one-year crops planted after July 1 and into the winter months.

3,300
CHRYSANTHEMUM PLANT

Arthur Maton, Pana, Ill., and Walter H. Jessel, Jr., Doylestown, and William E. Duffett, Akron, Ohio, assignors to Webb Greenhouses, Inc., Pana, Ill.
Filed June 23, 1971, Ser. No. 156,140
Int. Cl. A01h *5/00*

U.S. Cl. Plt.—81 **1 Claim**

1. A new and distinct cultivar of chrysanthemum characterized particularly as to its uniqueness when compared to the parent cultivar Pink Champagne by its darker lavender flower color, approximately 20% more petals, more solid flower, flowers which reflex less at maturity, and its 2–3 days later response.

3,301
CARNATION PLANT

Ralph E. Hawes, 27 Highland Ave.,
Sudbury, Mass. 01776
Filed June 1, 1971, Ser. No. 149,089
Int. Cl. A01h *5/00*

U.S. Cl. Plt.—70 **1 Claim**

1. A new and distinct cultivar of carnation characterized particularly as to its uniqueness when compared to the cultivar White Elegance by its more fully petalled flower with a higher petal count of approximately 30 more per flower; a higher and fuller flower crown, with more symmetrically placed petals; flowers which never develop hollow centers; a more compact spray formation which becomes less terminal in winter under low light conditions; stronger, shorter pedicels supporting flowers; higher but count, averaging 1–2 more flowers and buds per stem; more ivory flower coloration; one to two days longer keeping quality under identical conditions; breaks on return crops clear lateral growth more rapidly and come into flower sooner under late winter and early spring conditions, thereby providing higher annual production per square foot per year on late season plantings.

PATENTS

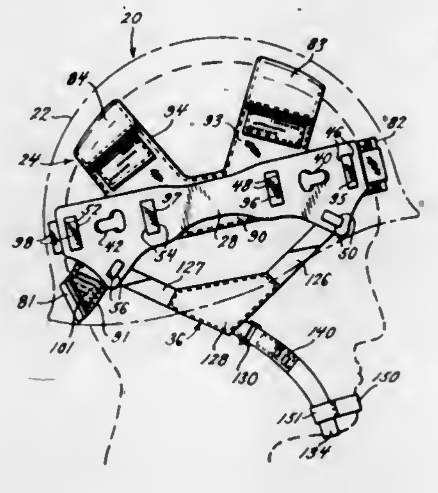
GRANTED FEBRUARY 6, 1973

GENERAL AND MECHANICAL

3,714,668
PROTECTIVE HELMET

Anthony C. Mirabella, Hartford, Conn., assignor to Angelica Corporation, St. Louis, Mo.
Filed Feb. 11, 1971, Ser. No. 114,538
Int. Cl. A42b *3/00*

U.S. Cl. 2—3 C **18 Claims**

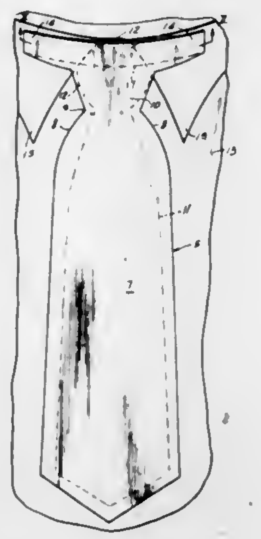


This invention relates to a new and improved helmet comprising an outer shell and an advanced helmet suspension system supported therein. Also provided are adjusting means for fitting the suspension system to the exact head size required, including separate adjustments for the forehead, nape, and top of the head as well as for correctly positioning the suspension system within the shell.

3,714,669
FOUR-IN-HAND TIE SHIELD

Roger C. Vorbau, 417 Dawn, Glen Ellyn, Ill. 60137
Filed Feb. 4, 1971, Ser. No. 112,578
Int. Cl. A41d *27/12*

U.S. Cl. 2—46 **11 Claims**

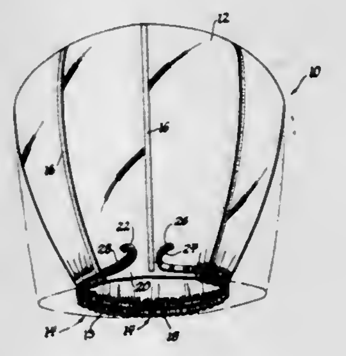


A one-piece panel in a form simulative of and preferably a little wider than the current widest style of four-in-hand ties provides a pendant shield having on its upper end attachment means in the form of lateral wing-like tabs carrying pressure-sensitive adhesive on the back whereby the device can be attached to the adjacent wing portions of the wearer's collar or to the knot of the tie with the shield protectively overlying the tie.

3,714,670
HAND SHAPABLE CAP WITH ADJUSTABLE HEADBAND

Shirley Pollack, 1830 Balmoral, Detroit, Mich., and Devora Finsilver, 7344 Deep Run Drive, Birmingham, Mich.
Filed Dec. 22, 1970, Ser. No. 100,746
Int. Cl. A42b *1/02*

U.S. Cl. 2—197 **1 Claim**



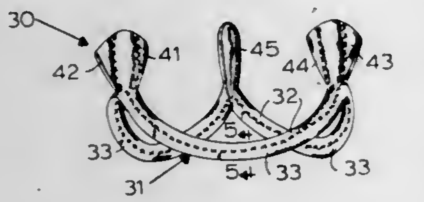
A hand shapable cap including a large bulbous body of flexible material for enclosing the hair of the wearer with a headband portion at the rim of the bulbous body for supporting the body on the head of the wearer, and a plurality of nonresilient, hand formable stiffening elements secured to the flexible material of the body permitting the body to be hand formed into a desired free shape according to the coiffure of the wearer so that the body can enclose the hair but at the same time remain substantially out of contact therewith when the cap is supported on the head of the wearer, the headband portion having elastic and nonelastic segments permitting the headband to be extended to its maximum circumference so as not to disturb the coiffure as the cap is placed on the head of the wearer, and adjustable means on the headband for selectively adjusting the length of the nonelastic segment and hence the tension of the elastic segment to secure the headband to the head of the wearer.

3,714,671
TISSUE-TYPE HEART VALVE WITH A GRAFT SUPPORT RING OR STENT

William Sterling Edwards, Albuquerque, N. Mex.; Paul Kahn, San Francisco, Calif., and Samuel H. Goodenough, Oakland, Calif., assignors to Cutter Laboratories, Inc., Berkeley, Calif.
Filed Nov. 30, 1970, Ser. No. 93,545
Int. Cl. A61f *1/22*

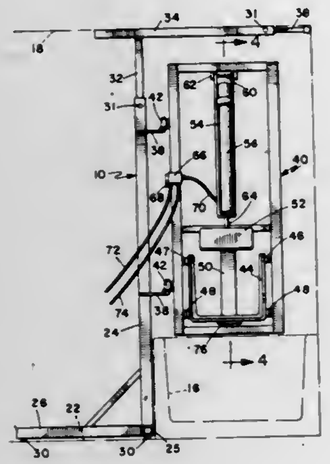
U.S. Cl. 3—1 **21 Claims**

A tricuspid valve and a graft support ring or stent therefor. The frame of the stent comprises three wire arcs, each formed along a circular or elliptical cylindrical surface. Each arc has an upstanding end portion that blends into a line parallel to the axis of the cylinder. Preferably, each arc is a separate wire, and, an elastomeric coating or a cloth pledget may lie over the meeting ends, which may be welded together. A fabric covering completely surrounds and encloses the frame, the coating or pledget preventing later strike-through of the fabric by the metal during use. The fabric covering preferably provides a pair of radial wings at each post, one extending inwardly and the other one outwardly, and it also provides a continuous projection along the length of the wires for stitching. To this graft support ring is sutured living tissue, preferably autologous or homologous, by stitches to the wings and the continuous projection. A plurality of such tissue members, e.g., fascia lata, is used, one for each wire arc, shaped to provide a cusp-type valve. The tissue covers essentially all the surfaces of the fabric on both the inner and outer faces, so that essentially nothing but tissue is in contact with the blood and body tissues after the valve is installed.



3,714,672
SEAT DEVICE FOR LIFTING, MOVING AND LOWERING AN INVALID

Gordon L. Condon, 7676 Torrem St., San Diego, Calif. 92041
Filed Oct. 12, 1970, Ser. No. 79,998
Int. Cl. A47k *3/12*
U.S. Cl. 4—185 L **5 Claims**

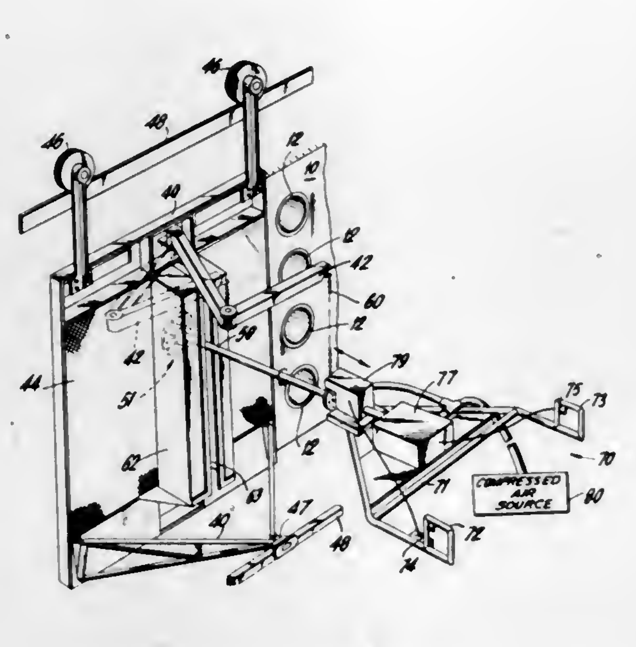


A device having a seat for supporting an invalid, which seat is supported on a movable frame and which frame raises and lowers the seat, whereby an invalid can position himself on the seat and then be moved over a bathtub and be lowered into the bathtub, and then be raised again and be moved back to his original position.

3,714,673
RETORT BUMPING MACHINE

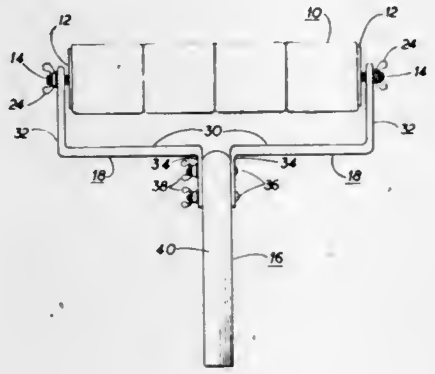
Laddie L. Brown, Blackwell, Okla., assignor to American Metal Climax, Inc., New York, N.Y.
Filed May 3, 1971, Ser. No. 139,383
Int. Cl. B08b *9/02*
U.S. Cl. 15—104.1 R **9 Claims**

Apparatus for dislodging (herein: "bumping") loam, zinc oxide and the like from a horizontal retort furnace employs a main frame mounted for horizontal translation about the retort orifice plane. A cleaning tool head portion is disposed on a rotating shaft which projects through a vertical slot in a heat shield secured to the apparatus frame. The tool head portion includes plural radially extending reaming and facing members for removing material retained within and about the front retort areas.



3,714,674
ROLLER PAINT APPLICATOR

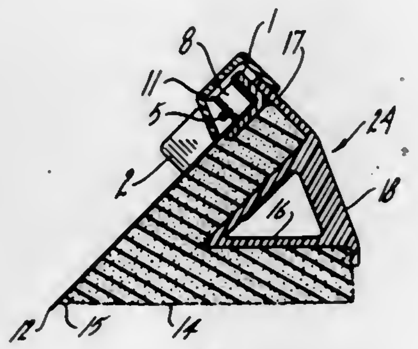
Otello M. Simoncioni, 6527 Wuerpel St., New Orleans, La. 70124
Filed May 12, 1971, Ser. No. 142,660
Int. Cl. B44d *3/28*
U.S. Cl. 15—230.11 **1 Claim**



A length of cylindrical flexible hose adapted to rotate longitudinally around shafts respectively mounted in line in the oppositely disposed ends of said hose, said shafts defining an axis of rotation and being rotatably engaged by respective flexible arms of a bifurcated handle. A roller cover, comprising a plurality of cylindrical sections which are adapted to snugly fit over said roller, extends sequentially between said oppositely disposed ends. The combination of said flexible roller, sectioned roller cover and flexible arms allow the paint applicator to conform to the shapes of angular and curved surfaces for roller painting thereof, as well as for flat surfaces.

3,714,675
LINE DRAWING PAINT APPLICATOR

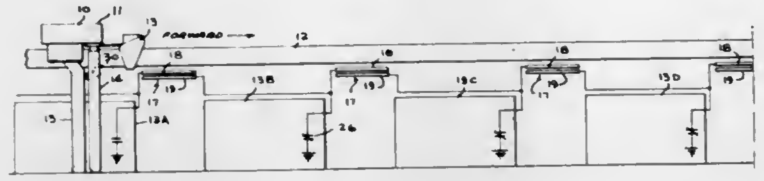
Leonid Koptelow, 619 County Trunk S, Oconomowoc, Wis. Continuation-in-part of Ser. No. 124,212, March 15, 1971, abandoned. This application July 16, 1971, Ser. No. 163,402
Int. Cl. A46b *17/00;* **B44d** *3/22*
U.S. Cl. 15—244 CH **8 Claims**



A paint applying device for edging or lining areas to be painted includes a member capable of receiving paint and discharging it on the areas. A movable line drawing blade is positioned on the member to assist in the application of the paint.

3,714,676
AUTOMATIC CONTROL SYSTEM FOR TRAVELING CLEANERS

Donald A. Sloan, Winston Salem, N.C., assignor to The Bahnson Company, Winston Salem, N.C.
Filed Oct. 14, 1971, Ser. No. 189,437
Int. Cl. A47l *5/38*
U.S. Cl. 15—312 R **10 Claims**

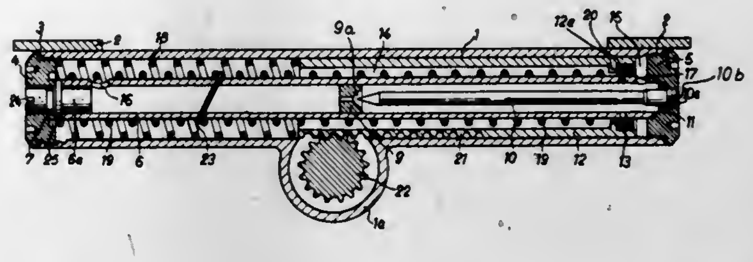


A control system for a traveling cleaner which travels in first and second directions on an overhead track centered above a row of textile machines, the control system comprising a switch for each textile machine for signifying when it is shut down, and a conductor bar assembly on the overhead track structure at a location between each pair of textile machines electrically connected to the switches of the textile machines located adjacent the conductor bar assembly in the first and second directions therefrom, and a contact arm carried by the traveling cleaner in a position to engage the conductor bar assemblies to activate a relay for stopping the cleaner when the textile machine being approached is shut down.

3,714,677
DOOR CLOSING MECHANISM WITH FLUID BRAKE

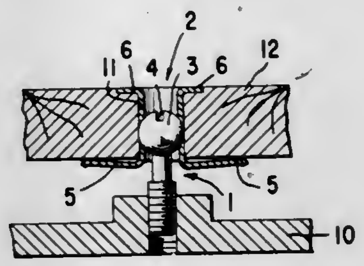
Jakob Schmid, Bernstrasse 1647, Aargau, Switzerland
Filed Feb. 24, 1971, Ser. No. 118,296
Claims priority, application Switzerland, Apr. 29, 1970, 6,441/70
Int. Cl. E05f *3/04, 3/14*
U.S. Cl. 16—62 **8 Claims**

There is disclosed a door closing mechanism of the type incorporating a fluid brake, and utilizing a piston member which is displaceable by means of at least one helical spring, a rotatable rod being located within such helical spring. Separate adjustment means are provided for the purpose of enabling the helical spring to be adjustably positioned along the rod. According to an important aspect of the invention the adjustment means comprises at least one support means, for instance in the form of a support pin, for the spring, this support pin extending between the windings of the helical spring.



3,714,678
BALL HINGES

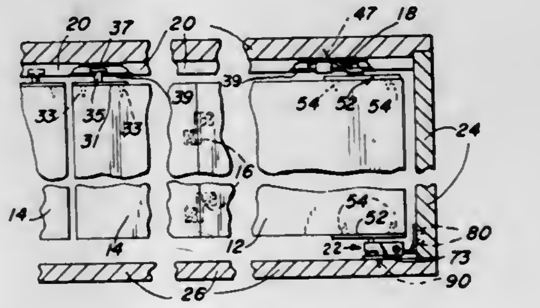
William Weisz, Rockaway, and William L. Herron, No. Caldwell, both of N.J., assignors to The Singer Company, New York, N.Y.
Filed Aug. 23, 1971, Ser. No. 173,765
Int. Cl. E05d *1/06*
U.S. Cl. 16—128 R **3 Claims**



A ball hinge device characterized by its economical construction in that a ball head screw is used in conjunction with a bracket which may be formed of sheet metal or of non-metallic resilient material which depends for its strength and support on the close fit between it and a slot machined into a supporting panel. A construction is taught in which the hinge may be attached to the supporting panel without the use of additional hardware.

3,714,679
BIFOLD DOOR HARDWARE

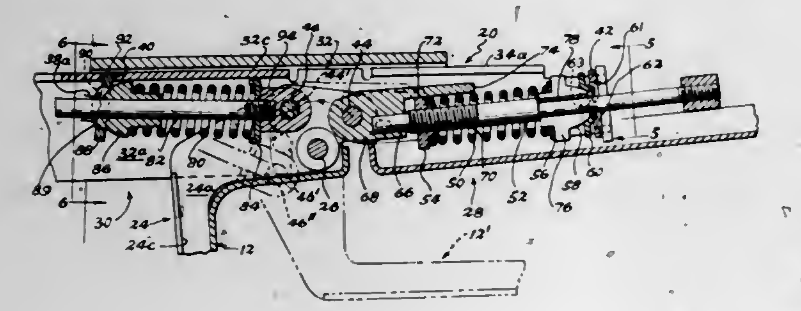
James A. Edeus, Rock Falls, Ill., assignor to National Manufacturing Co., Sterling, Ill.
Original application Mar. 2, 1970, Ser. No. 15,360. Divided and this application July 12, 1971, Ser. No. 161,973
Int. Cl. E05d *7/04*
U.S. Cl. 16—131 **8 Claims**



Bifold door hardware includes a socket member mounted on an overhead support structure for receiving an upstanding pivot pin on the top edge of the door, and a jamb bracket assembly mounted below the bottom edge of the door for receiving and supporting a depending pivot pin on the bottom edge of the door. The socket member includes a mounting base, a resilient clip extending from one side of the base and having in its distal end a pin-receiving socket hole, and a bumper tab extending from the opposite side of the base. The jamb bracket assembly includes a bracket adapted to be fastened to the support structure, a housing adjustably connected to the bracket for adjusting the horizontal position of the door relative to the support structure, and a helical cam rotatably mounted in the housing below a pivot-pin receiving hole in the top wall thereof for adjusting the vertical position of the door.

3,714,680
COUNTER-BALANCE SUPPORT

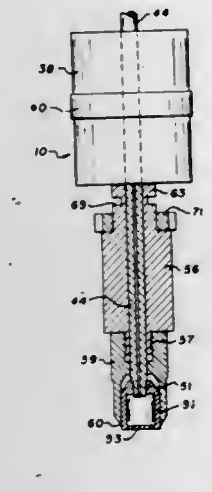
Carl H. Little, Jamestown, N.Y., assignor to Weber-Knapp Company, Jamestown, N.Y.
Filed Nov. 17, 1971, Ser. No. 199,584
Int. Cl. E05f *1/12*
U.S. Cl. 16—190 **7 Claims**



A counter-balance support for a suspended lid including a pair of compression springs acting alternatively together and in opposition for effectively counter-balancing the weight of the lid during vertical swinging movement thereof.

3,714,681
CUTTING APPARATUS FOR TISSUE-LIKE MATERIAL

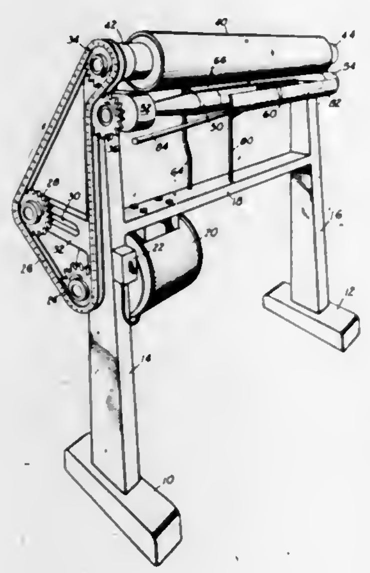
Anton P. M. Van Snellenberg, Vancouver, British Columbia, Canada, assignor to The Canadian Fishing Company Limited, Vancouver, Britich Columbia, Canada
Filed Aug. 10, 1970, Ser. No. 62,492
Int. Cl. A22c *25/00*
U.S. Cl. 17—1 R **16 Claims**



Apparatus for cutting tissue-like material from a soft or unsupported background material, such as cutting glands out of membranes in heads of fish. The tissue is drawn against a suction head, and a cutter sleeve surrounding the head cuts the background material around said tissue. The removed tissue is blown from the suction head.

3,714,682
METHOD AND APPARATUS FOR REMOVING OIL GLANDS FROM FOWL

Grover S. Harben, Jr., Gainesville, Ga., assignor to Gainesville Machine Company, Inc., Gainesville, Ga.
Filed Feb. 16, 1971, Ser. No. 115,318
Int. Cl. A22c *21/00*
U.S. Cl. 17—11 **9 Claims**



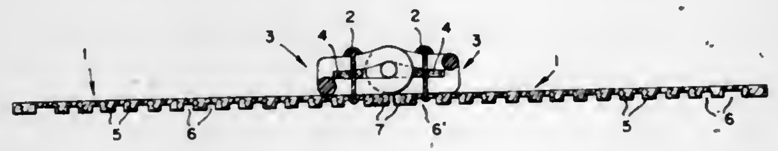
A bird is moved along a path and feed means including a pair of counterrotating rollers grips the opposite sides of the tail of the bird and moves the tail laterally of said path into engagement with the cutting edge of a fixed cutting means extending between said rollers. One of the rollers slopes upwardly toward the cutting means so as to pinch the oil gland of the bird between the cutting edge of the cutting means and said upwardly sloping member to cut off the oil Gland. Guide means is provided for preventing portions of the bird other than the tail from being carried laterally by the feed means.

ERRATUM

For Class 17—66 see:
Patent No. 3,715,229

3,714,683
SLIDE-FASTENER STRINGER WITH STITCHED-ON COUPLING ELEMENT

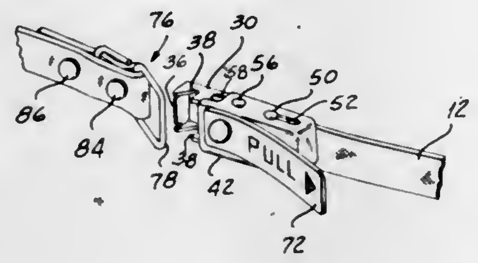
Alfons Frohlich; Marie-Luise Cappel, both of Essen, and Ernst Strubiger, Giessen, all of Germany, assignors to Opti-Holding AG, Glarus/Schweiz, Germany
Filed Oct. 20, 1970, Ser. No. 82,324
Claims priority, application Germany, April 4, 1972, P 20 16 146.0
Int. Cl. A44b *19/40*
U.S. Cl. 24—205.1 C **4 Claims**



A slide-fastener stringer has a pair of warp-knit support tapes with longitudinally running wales separated by valleys. A coupling element is stitched to each tape adjacent the edge thereof with rows of stitching passing through the tape only in the valley adjacent one of the edge wales thereof. In the case of a very fine knit, the stitching lies in the second valley in from the tape edge. The edge wale is reinforced for best holding action by knitting it with a relatively dense or bulky yarn.

3,714,684
SKI SAFETY STRAP LATCH

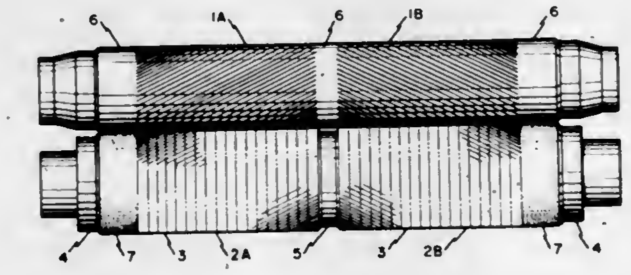
Paul R. Gley, Hillsdale, N.J., assignor to Rex Chainbelt, Inc., Milwaukee, Wis.
Filed June 12, 1969, Ser. No. 832,784
Int. Cl. A47b *19/00*
U.S. Cl. 24—230 AM **3 Claims**



A latch for a ski safety strap in which a base formed with a hook and secured to one end of the safety strap slidably supports a cover for movement between a first position at which it closes the hook to retain a ring carried by the other end of the strap within the hook and a second position at which the hook is open to permit the ring to fall away from the hook. A spring housed by the cover and base biases the cover to its hook closing position.

3,714,685
CRIMPING ROLLS FOR THERMOPLASTIC MATERIALS

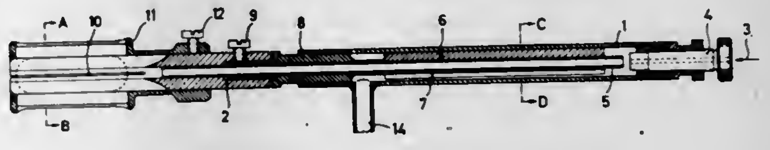
Harold Dean Yarber, Wallace, N.C., assignor to J. P. Stevens & Co., Inc., New York, N.Y.
Filed June 17, 1971, Ser. No. 154,109
Int. Cl. D02g *1/00, 1/14*
U.S. Cl. 28—1.2 **6 Claims**



Crimping rolls for crimping thermoplastic textile material are provided with inclined engravings on the customary heated roll, with the engravings inclined in one direction on part of the roll and the opposite direction on the other, forming inverted or upright V's. The embossed roll, which is embossed by running against the engraved roll, similarly has its embossing inclined in more than one direction. Preferably, the embossed roll may be provided with a central rigid spacer or several if the rolls are divided into four instead of two parts. The inclined engravings and mating embossings do not cause the surface of the embossed roll, which is usually a non-woven hard felt surface, to creep in a single direction, and wear is reduced and frequency of having to true-up the embossed roll is greatly reduced.

3,714,686
PROCESS AND APPARATUS FOR TEXTURING FILAMENTS

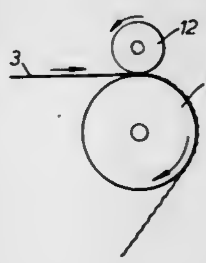
Hans Schmid, Ludwigshafen, Heinrich Feldhoff, Bad Durkheim, Wolfgang Martin, Ludwigshafen, Wolfgang Bauer, Heidelberg, and Dieter Herion, Frankenthal, Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany
Filed Feb. 8, 1971, Ser. No. 113,502
Claims priority, application Germany, Feb. 11, 1970, P 20 06 022.4
Int. Cl. D02g *1/16*
U.S. Cl. 28—1.4 **8 Claims**



Process and apparatus for texturing filaments by subjecting the filaments to a flowing heated gaseous medium. The filaments are exposed to a turbulently flowing medium in two zones, an exchange between the medium and the ambient air taking place in the second zone. By means of this process and apparatus filaments made of synthetic linear materials of high molecular weight may be textured at high filament speeds.

3,714,687
METHOD OF BIAXIALLY DEFORMING SHEET MATERIAL

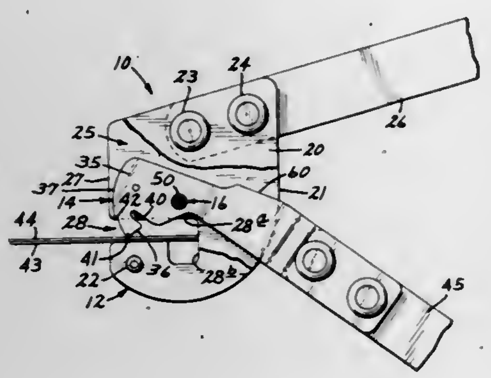
Jan van Tilburg, Alkmaar, Netherlands, assignor to American Can Company, Greenwich, Conn.
Filed Feb. 3, 1970, Ser. No. 8,342
Claims priority, application Great Britain, Feb. 17, 1969, 8,473/68; Feb. 11, 1969, 72,902/69; March 27, 1969, 16,181/69
Int. Cl. D02g *1/00, 1/14*
U.S. Cl. 28—72.1 **16 Claims**



Sheet material is deformed, for example crimped or bulked by feeding it to the surface of a rotating roll having a multiplicity of depressions in its surface and pressing the material against the roll surface, the material being fed to the roll at a rate exceeding the linear peripheral speed of the roll. Examples of materials which may be so deformed are filaments consisting of or containing thermoplastic polymers, woven and non-woven fabrics, thermoplastic sheets, paper and metal foils. Preferably, the roll surface consists of sintered particulate material, the depressions being the voids between adjacent particles.

3,714,688
PUNCH RIVETER FOR JOINING METALS

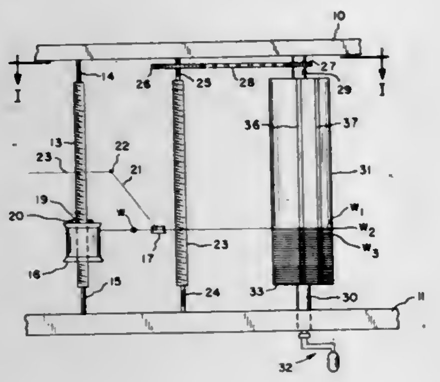
Glenn V. Olson, 2654 Keeler Pkwy., St. Paul, Minn.
Filed June 11, 1971, Ser. No. 152,043
Int. Cl. B23p *17/00*
U.S. Cl. 29—21.1 **6 Claims**



A punch riveter for joining metal studs and runners by piercing the overlying metals and then folding back and crimping the pierced metal. The opening punched in each of the metals is of a generally rectangular shape and the pierced metal is rolled back along the uncut edge thereof.

3,714,689
APPARATUS FOR MAKING SPARK CHAMBER WIRE ARRAYS

Albert Whetstone, Southport, Conn.; Samuel Fine, New City, N.Y., and Stanley Phillips, Trumbull, Conn., assignors to Science Accessories Corporation, Southport, Conn.
Filed Dec. 14, 1970, Ser. No. 97,581
Int. Cl. H01j *9/06, 9/48*
U.S. Cl. 29—25.2 **1 Claim**

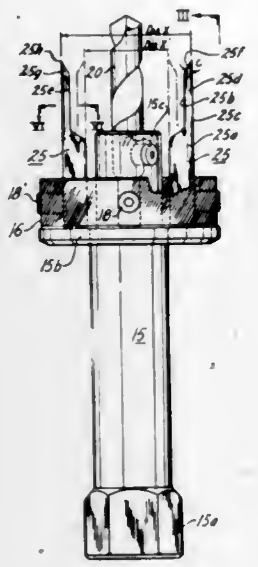


An apparatus for producing curved or flat wire arrays for use in wire spark chamber devices having a wire spool holding means and wire feeding device; tensioning means; wire winding and spacing device; and a device for stretching and shaping the array. The wire is fed over tensioning pulleys about a threaded rod onto a wire winding and spacing device which comprises a support cylinder. The wound wires are attached to lucite strips mounted on the cylinder and then cut and removed to form a loose wire array. The wire array is then clamped in the stretching and shaping device which stretches the wires and forms the surface to the desired curvature.

3,714,690
BELT HOLE CUTTER

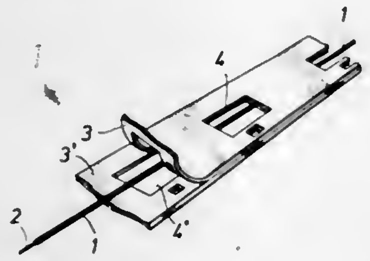
Joseph A. Parenti, Rte. 7, P.O. Box 330, Morgantown, W. Va. 26505
Original application Sept. 17, 1968, Ser. No. 760,176, now Patent No. 3,504,577. Divided and this application Sept. 30, 1969, Ser. No. 862,360
Int. Cl. B26d *1/12*
U.S. Cl. 29—105 A **5 Claims**

A rotative hole cutting device for a heavy, somewhat soft, resilient, fabric-like material in the nature of belting is provided with a forwardly-extending drill stem that first enters the material, and with a pair of opposed, especially-constructed and positioned key-like cutter elements that follow the drill stem and quickly and efficiently cut out a circular hole in the material. The drill stem serves to guide movement of the cutter elements and to retain the part or fragment being cut-out in position until the completion of the operation.



3,714,691
METHOD FOR PRODUCING SHEET SUPPORTED COILED CONDUCTORS

Masanobu Aizawa, Tokyo, and Kijuu Mori, Kawasaki-shi, Japan, assignors to Stanley Electric Co., Ltd., Tokyo, Japan
Filed Nov. 18, 1970, Ser. No. 90,602
Int. Cl. H01j *9/18, 9/36*
U.S. Cl. 29—25.15 **5 Claims**



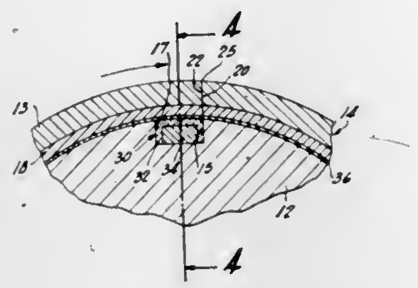
This disclosure relates to a method for producing sheet supported coiled conductors and also to various constructions of these sheet supported coiled conductors. In the method, the coiled conductors each wound around a core material are interposed between a required number of supporting sheets made of a material not soluble in a dissolving liquid for the core material and having a plurality of cutout portions therethrough so that a substantial part of the coiled conductors is exposed through the cutout portions, and the whole of the coiled conductors interposed between the supporting sheets is immersed into the dissolving liquid for the core material so that the core material is thereby dissolved and removed from the coiled conductors.

3,714,692
COATING MAT

Andrew M. Bray, Little Suamico, Wis., assignor to Magna-Graphics Corp., Dayton, Ohio
Filed June 28, 1971, Ser. No. 157,182
Int. Cl. B21b *31/08*
U.S. Cl. 29—129 **13 Claims**

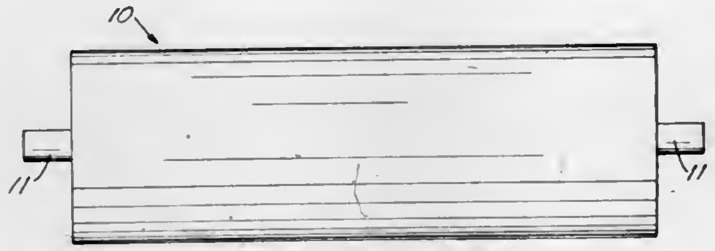
A coating mat formed from a sheet of resilient material which is adapted to be wrapped around the outer surface

of a rotary cylinder. The coating mat includes a magnetic backing or a magnetic member for securing the mat to the cylinder. The magnetic member is secured to at least the leading edge of said mat and is adapted to be positioned in a slot provided in the rotary cylinder. The magnetic member including a strip of magnetic material for magnetically holding the leading edge of the sheet of resilient material in tight engagement with the cylinder. Registration of the coating mat in the proper position on the surface of the rotary cylinder is provided by the slot for the magnetic member.



3,714,693
INKING COVER

Stanley G. Peterson, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed Sept. 30, 1971, Ser. No. 185,127
Int. Cl. B21b *31/08*
U.S. Cl. 29—132 **7 Claims**

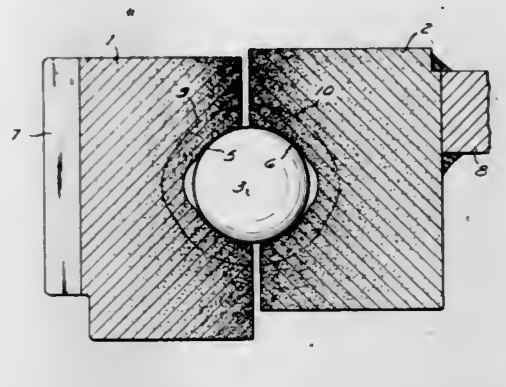


An inking cover which has at least a working surface comprised of filled crosslinked poly(epichlorohydrin/ethylene oxide) elastomer plasticized with monomeric ester plasticizer, e.g., tricresyl phosphate, to provide a hardness value of from about 40 to 50 Shore A durometer, contains an amount of microcrystalline wax sufficient to substantially prevent exudation of the plasticizer.

3,714,694
PROCESS OF MAKING A COMPOSITE BEARING RACE OR THE LIKE

John C. Dobson, Bay Village, Ohio, assignor to Formmet Corporation, Avon, Ohio
Filed June 9, 1971, Ser. No. 151,264
Int. Cl. B21h *1/12*; **B23p** *25/00*
U.S. Cl. 29—148.4 R **14 Claims**

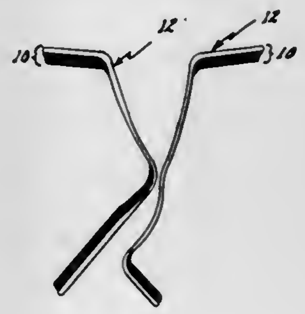
Disclosed are antifriction bearings, annular ring blanks for forming races of the bearings, and a process of making the annular blanks. The process involves centrifugally casting metals having different chemical compositions, such as steel having different amounts of carbon or other alloying elements, to form a tubular casting having at one periphery metal that has a different chemical or metallurgical composition and hardenability than the metal at the other periphery; annular rings are cut from this tubular casting, and these rings are hot worked by working including roll forging, under conditions that beneficially modify the structure of the metal. The resulting race may be machined into annular bearing races by the usual procedures to form bearing races. These races are hardened in a known manner and by known means, to provide hard metal



where the rolling antifriction elements, such as balls, contact the metal, while the metal at the opposite side of the race is substantially more ductile and tough, so that it may be machined to provide gear teeth, or may be machined or welded for other purposes as to provide fastening means for the bearing race.

3,714,695
METHOD FOR FORMING THRUST CHAMBERS

Phillip Beeson, Thousand Oaks, Calif., assignor to The United States of America as represented by the Secretary of the Air Force
Filed Sept. 17, 1970, Ser. No. 56,166
Int. Cl. B21d *53/00*
U.S. Cl. 29—157 C **3 Claims**

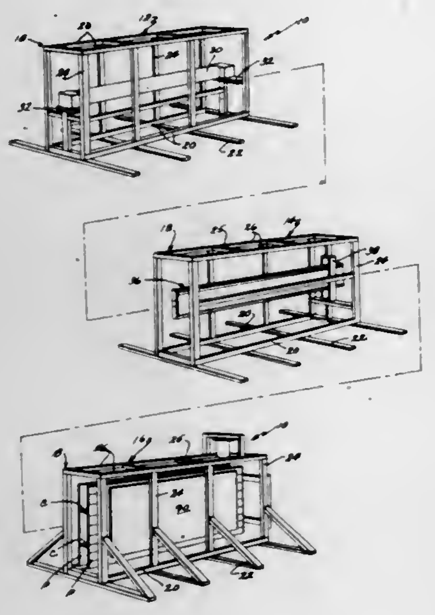


A method for forming thrust chambers in which a plurality of tubes are welded together in tube-to-tube alignment. These tubes form a "blanket" of tubes which can then be formed to any desired thrust chamber configuration.

3,714,696
BUILDING CONSTRUCTION ASSEMBLING AND POSITIONING APPARATUS

Charles Kay, 7056 Thornapple River Drive, S.E., Caledonia, Mich.
Filed March 18, 1971, Ser. No. 125,707
Int. Cl. B23p *19/00*
U.S. Cl. 29—200 P **10 Claims**

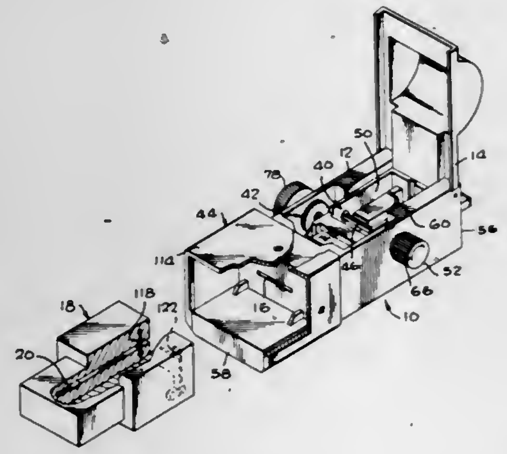
Apparatus for making structural building units from a pair of spaced panels and interconnecting elongated plates, employing plate insertion means cammed into plate gripping condition during powered advancement thereof between panel retention means for insertion of the plates into the panels. The plate insertion means has elongated clamp elements forced together on the plates.



The leading end of the plate insertion means preferably has broach means to cut slots into the panels ahead of the advancing plates.

3,714,697
FILM CHIP STRIPPER

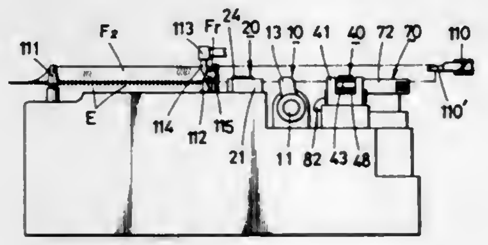
Gunter Schmidt, Malibu, Calif., assignor to Production, Inc., Los Angeles, Calif.
Division of Ser. No. 732,186, May 27, 1968, Pat. No. 3,559,554. This application Oct. 12, 1970, Ser. No. 80,083
Int. Cl. G03d *13/08, 17/00*
U.S. Cl. 29—239 **3 Claims**



Apparatus which can be used in a lighted room to strip the coverings from a film chip which is held in a protective package and insert the chip into a light-tight magazine. The stripping apparatus includes a hub that engages a tab on the film chip package to peel off an outer layer, and an assembly that holds another protective layer of the package away from the film chip while a roller moves the chip toward a slot that leads to the magazine.

3,714,698
METHOD AND MACHINE FOR ASSEMBLING SLIDE FASTENERS OF SEPARABLE TYPE

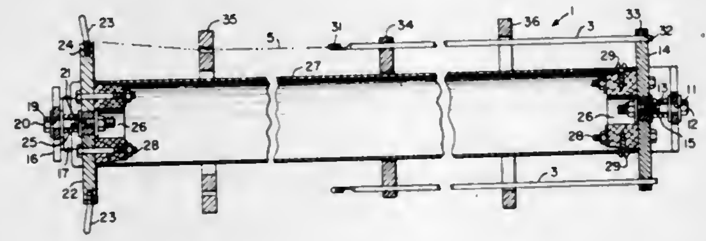
Takeo Fukuroi, Uozu, Japan, assignor to Yoshida Kogyo Kaîrishiki Kaisha, Tokyo, Japan
Filed March 2, 1971, Ser. No. 120,278
Claims priority, application Japan, March 14, 1970, 45/21219; March 14, 1970, 45/21220; March 14, 1970, 45/21221; March 14, 1970, 45/21222; March 14, 1970, 45/21223
Int. Cl. B23p *11/00, 19/04*
U.S. Cl. 29—408 **17 Claims**



A method and apparatus for assembling separable type slide fasteners whereby two separated fastener stringers are advanced by grippers along parallel paths and during such advancement, both stringers are cut by scissor devices, one stringer is threaded through a slider presented by a movable holder and receives a box and pin component applied by a clamping means, and the other stringer receives a pin component applied by a preclamping device and then secured and punched to finished form by another clamping device.

3,714,699
METHOD OF INSERTING FLEXIBLE STRAND MEMBERS THROUGH A PERFORATE FITTING

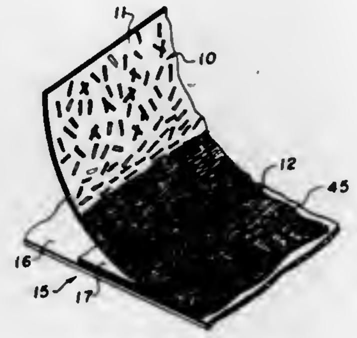
Robert W. Bucher, Glendale, Ariz., assignor to The Goodyear Tire & Rubber Company, Akron, Ohio
Filed July 19, 1971, Ser. No. 163,853
Int. Cl. B23p *19/04*
U.S. Cl. 29—241 **8 Claims**



A method and apparatus for inserting flexible cords or strands through holes in a perforate fitting for a high strength container such as a crash resistant fuel tank. A fixture is attached to one end of a plurality of elongated rods to support them parallel to each other in a position to match the hole pattern of the fitting to permit a plurality of the fittings to be slid onto the free end of the rods with each hole of each fitting having one of the rods passing therethrough. A plurality of cords or strands are looped around a hook on the free end of each rod and are fastened to a remote retaining member to position the strands in substantially axial alignment with the rods and provide an elongated extension of the rods so that each fitting may be slid from the rods onto the strands. The fittings are then spaced apart from each other on the strands and the strands are cut midway between each fitting leaving a group of strands through each hole of each fitting for attaching the fitting to a container wall.

3,714,700
APPARATUS FOR ORIENTING SLENDER PARTICLES

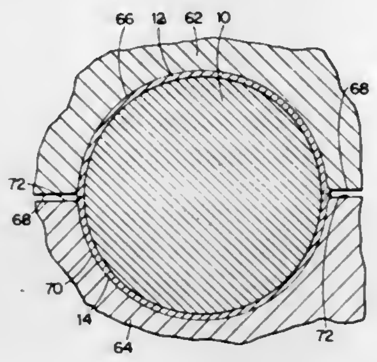
Hubert Ehrenfellner, Surrey, British Columbia, Canada, assignor to MacMillan Bloedel Limited, Vancouver, British Columbia, Canada
Filed Mar. 12, 1971, Ser. No. 123,545
Int. Cl. B23p *17/00*
U.S. Cl. 29—419 **10 Claims**



A method of and apparatus for orienting slender particles such as cellulosic splinters or flakes used in the manufacture of panels, cores for plywood panels and other boards, and in which the slender particles are oriented by a curved chute which directs them onto a mat of the particles.

3,714,701
MANUFACTURE OF CLAD METALS

Paul A. Dion, and Paul O. Hagarman, both of North Attleboro, Mass., assignors to Polymetallurgical, Corp., Attleboro, Mass.
Filed Jan. 4, 1971, Ser. No. 103,518
Int. Cl. B21d *39/04*
U.S. Cl. 29—474.1 **13 Claims**



A continuous process for cladding a metal core rod with a dissimilar metal sheath. Two thin, flat strips are pre-bent into facing semi-circular shapes and then are moved into convergence around a round core rod while the strips and rod are maintained contaminant free. The strips and rod are maintained at a substantially equal temperature and the assembly is solid-phase roll bonded to produce a clad rod suitable for subsequent drawing into wire without the need for subsequent sintering, metal removal or other finishing operations on the clad rod.

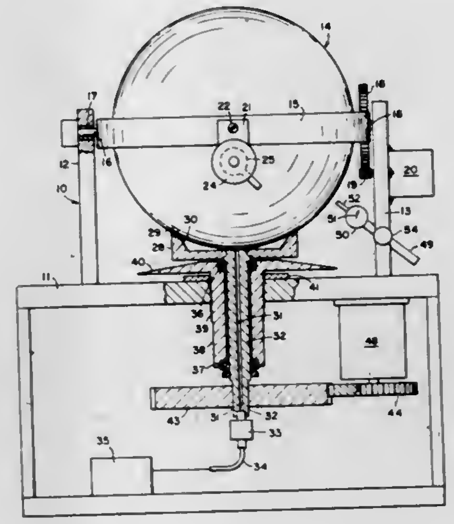
3,714,702
METHOD FOR DIFFUSION BONDING REFRACTORY METALS AND ALLOYS

Joseph P. Hammond, Knoxville, Tenn., assignor to The United States of America as represented by the United States Atomic Energy Commission
Filed Aug. 17, 1971, Ser. No. 172,533
Int. Cl. B23k *31/02, 35/38*
U.S. Cl. 29—494 **7 Claims**

An improvement in the method of diffusion-bonding articles comprised of refractory metals or alloy combinations thereof. The customary intermediate placed between the articles to promote bonding is modified by incorporating therein a dispersion of fine particles which at the bonding temperature are chemically and physically stable and substantially non-reactive and non-coherent with the intermediate. The dispersed particles are selected to be essentially mutually insoluble with the intermediate. The high-energy boundaries provided by the dispersed particles act as inexhaustible sinks for lattice vacancies in the matrix metal or alloy, thus suppressing the formation of Kirkendall voids in the interlayer between the articles.

3,714,703
BOWLING BALL REFINISHING MACHINE

Travis N. Maples, 1326 E. Country Club Road, Roswell, N. Mex.
Filed May 27, 1970, Ser. No. 40,855
Int. Cl. B24b *11/02*
U.S. Cl. 29—560 **8 Claims**

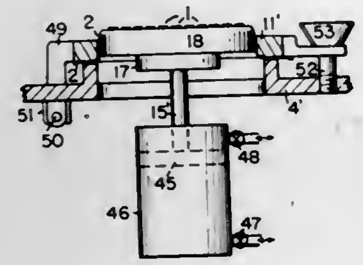


A machine for restoring the sphericity of used bowling balls in which a bowling ball is held in a vacuum chuck and rotated about a vertical axis passing through the center of the ball. A cutter is moved through an arcuate path in a vertical plane which includes the vertical axis of rotation, the cutter being moved in a circular path about a horizontal axis through the center of the ball. After the major upper portion of the ball has been cut, the ball is removed from the chuck, inverted and reseated in the chuck. The chuck is elevated and the remainder of the surface of the ball is cut as before.

3,714,704
WAFER SPREADER

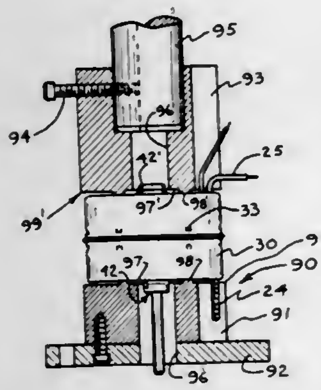
Arthur H. Moore, Campbell, Calif., assignor to Hugle Industries, Inc., Sunnyvale, Calif.
Filed Aug. 31, 1970, Ser. No. 68,287
Int. Cl. B01j *17/00*
U.S. Cl. 29—569 **8 Claims**

A method for separating pieces (dies) of a semiconductor wafer in which the wafer is attached to a vinyl film, scribed, broken, and the film stretched in all radial dimensions. A plunger-type device having a rounded chamfer in contact with the film and a Teflon or nylon surface is used to stretch the film radially by deforming it axially. The film is heated for attaching the wafer and for the stretching process. A vacuum step may be employed to enhance wafer-film adherence.



3,714,705
METHOD OF ASSEMBLING A DYNAMO-ELECTRIC MACHINE

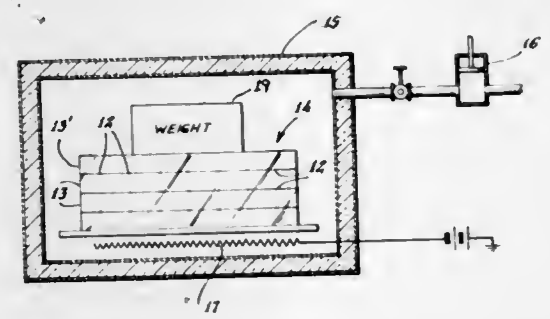
John G. Lewis, St. Louis, Mo., assignor to Emerson Electric Co., St. Louis, Mo.
Filed Sept. 9, 1971, Ser. No. 178,953
Int. Cl. H02k *15/00, 15/14, 15/16*
U.S. Cl. 29—596 **17 Claims**



An electric motor having a stator with a central bore, a rotor part rotatably mounted in the bore, formed sheet metal end shields secured to the stator, and bearing assemblies press fitted in the end shields for rotatably supporting the rotor shaft. Each end shield includes a central seat for supporting the bearing assembly. In one embodiment, the seat includes an axially inwardly extending cup integral with a formed sheet material end shield, and in another embodiment the seat is merely a lip defining a hole in the end shield, and a separate cup forms a part of the bearing assembly. The bearing assembly includes a spring supported by the cup for biasing the bearing against a seating surface in the bearing assembly. The motor is assembled by coating the stator with a varnish, allowing the varnish to air dry to a semi-cure state, placing the end shield on the stator in contact with the varnish, with the bearing in contact with a spacer on the rotor shaft, curing the varnish, deflecting a portion of the end shield around the seat inwardly, thereby shifting the bearing with respect to the seat, and releasing the end shield with the bearing maintained in its shifted position, thereby establishing a desired end play for the rotor.

3,714,706
ARRAY OF CONDUCTORS FIXED THROUGH DIELECTRIC PLATE

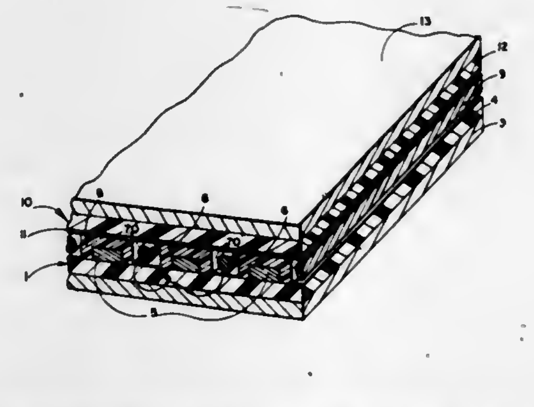
Fremont Reizman, Wilton, and Robert B. McGraw, Jr., Orange, Conn., assignors to The Perkin-Elmer Corporation, Norwalk, Conn.
Filed Aug. 21, 1970, Ser. No. 65,768
Int. Cl. H01b *13/00;* **H05k** *3/00*
U.S. Cl. 29—624 **1 Claim**



Arrays of conductors accurately fixed in position relative to each other are made by laying stripes of conductive material, such as thin stripes of chromium, gold or platinum group metals, on a surface of each of a number of plates of dielectric material, such as glass, that softens when heated and that fuses to similar material at the softening point. The plates are stacked, placed under compression normal to their conductor bearing surfaces in a partial vacuum and heated to the softening point. The vacuum is then relieved and the heat turned off. After the stack cools below the softening point, the fused stack is sliced at an angle to the lengths of the conductors to provide plates having conductor arrays therethrough.

3,714,707
METHOD OF MAKING INTERSTITIAL CONDUCTORS BETWEEN PLATED MEMORY WIRES

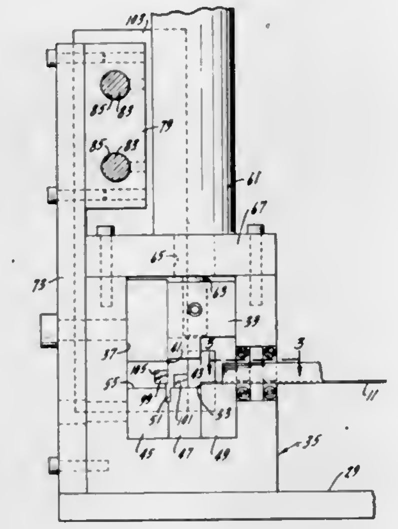
Joseph M. Shaheen, La Habra, and John Simone, Garden Grove, both of Calif., assignors to North American Rockwell Corporation
Division of Ser. No. 45,677, June 12, 1970, Pat. No. 3,641,520. This application Sept. 23, 1971, Ser. No. 182,973
Int. Cl. H01f *7/06*
U.S. Cl. 29—604 **6 Claims**



A copper layer on a dielectric substrate is etched into strips for forming interstitial conductors. Layers of resinous material are placed over the strips for forming channels therebetween. The exposed surface of a dielectric layer clad on one side by a metal layer is placed over the channels to form tunnels for plated memory wires. The outer metal layers of the structure are etched to form word straps orthogonal to the tunnels. The interstitial conductors between the tunnels are interconnected at a common point.

3,714,708
WIRE TERMINAL MAKING AND ASSEMBLING

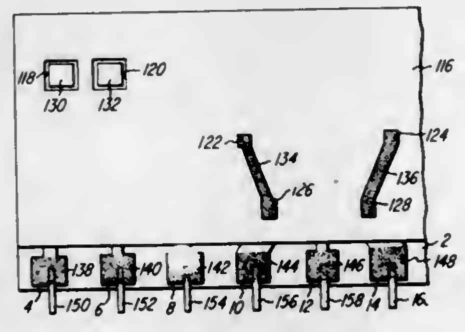
Maurice H. Brown, 12521 S. 68th Court, Palos Heights, Ill.
Filed Jan. 20, 1971, Ser. No. 108,065
Int. Cl. H01b *13/00;* **H05k** *3/00*
U.S. Cl. 29—624 **6 Claims**



A method of forming a wire terminal and attaching it to a thermoplastic support member for a coil form. The terminal is formed from a continuous piece of wire by bending one end of the wire into a modified U-shaped configuration having one leg of the U-bent intermediate its length to extend at right angles to the other leg and severing the wire configuration from the continuous piece of wire. The wire configuration or terminal is then transported in supporting contact with a pair of electrodes to a position adjacent a thermoplastic support member. The terminal is heated by means of electrical current passed through the electrodes. While hot, the terminal and the thermoplastic support member are brought into engagement with each other to embed the bight portion of the terminal in the thermoplastic material by fusion of the thermoplastic material due to the heat of the terminal. The electrodes are then removed from the terminal leaving the terminal embedded in the thermoplastic support member.

3,714,709
METHOD OF MANUFACTURING THICK-FILM HYBRID INTEGRATED CIRCUITS

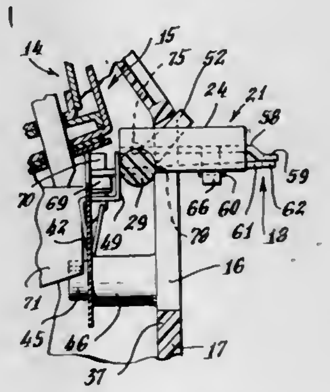
William Herman Liederbach, Carmel, Ind., assignor to RCA Corporation, New York, N.Y.
Filed July 6, 1970, Ser. No. 52,538
Int. Cl. B41m *3/08;* **H05k** *3/00*
U.S. Cl. 29—626 **6 Claims**



Method comprises: (1) screen printing on a ceramic substrate a pattern of conductors, resistors and sometimes capacitors and inductors; (2) firing to cure these components; (3) covering the fired components and substrate with a thin layer of a resin composition which is relatively pure, soft, elastic, and non-brittle, leaving openings in the layer where discrete active components are to be mounted and where jumper connections are to be made; (4) mounting the active components within some of these openings and making screen-printed jumper connections between other openings; and (5) encapsulating in an outer layer of a tough, good thermal conducting, moisture resistant, tightly adherent type resin composition.

3,714,710
AUXILIARY CUTTER MEANS FOR AN ELECTRIC DRY SHAVER

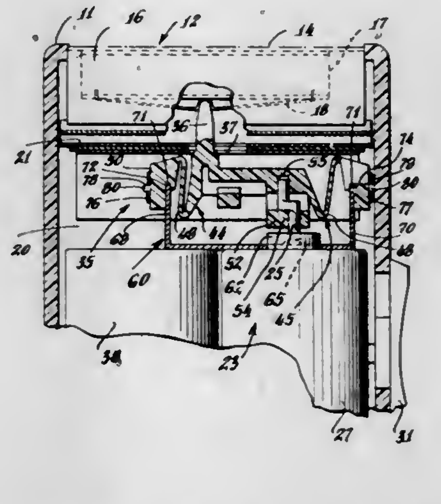
John F. Daniels, Bridgeport, and Antonio Pires, Trumbull, both of Conn., assignors to Sperry Rand Corporation, New York, N.Y.
Filed Dec. 30, 1970, Ser. No. 102,846
Int. Cl. B26b *19/38*
U.S. Cl. 30—34.1 **8 Claims**



An auxiliary trimmer unit for an electric dry shaver comprising a stationary cutter and a movable cutter carried by a guard member with the guard member having trunnion means for supporting the unit for manual rotation into and out of engagement with drive means. Means are provided on the guard member and on adjacent portions of the shaver casing for detenting the unit in operative and non-operative positions.

3,714,711
CUTTER DRIVE MEMBER MEANS FOR ELECTRIC DRY SHAVER

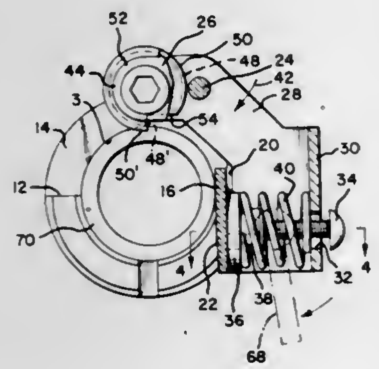
John F. Daniels, Bridgeport, Conn., assignor to Sperry Rand Corporation, New York, N.Y.
Filed Dec. 30, 1970, Ser. No. 102,639
Int. Cl. B26b *19/10*
U.S. Cl. 30—43.92 **3 Claims**



An electric dry shaver having a cutter head comprising a stationary and a movable cutter, a drive member for said movable cutter, and a motor for effecting operation of said drive member. Means are provided for mounting the drive member on the motor and which means include a plate member secured to the motor housing and detachable clamp means provided for detachably securing the drive member to the plate.

3,714,712
CUTTING OR GROOVING TOOL

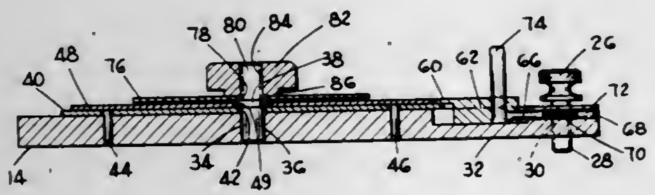
Joseph Willard Hoffman, Liverpool, Pa., assignor to AMP Incorporated, Harrisburg, Pa.
Filed Feb. 18, 1971, Ser. No. 116,431
Int. Cl. B23d *21/04*
U.S. Cl. 30—95 **13 Claims**



A tool provided with a plurality of cutting blades received in a carriage which is pivotally mounted to the tool for engaging and disengaging the cutting blades on a pipe. A compressed coil spring forcefully urges the cutting blades to penetrate into the pipe and a stop means is provided to limit penetration of the cutting blades. The tool is further provided with a removable cradle which adapts the tool for use with pipes of varying diameters.

3,714,713
DEVICE FOR CIRCULAR ENGRAVING

Henry C. Jadow, New York, N.Y., assignor to B. Jadow and Sons, Inc., New York, N.Y.
Filed Sept. 15, 1971, Ser. No. 180,574
Int. Cl. B43l *13/10*
U.S. Cl. 33—23 K **7 Claims**

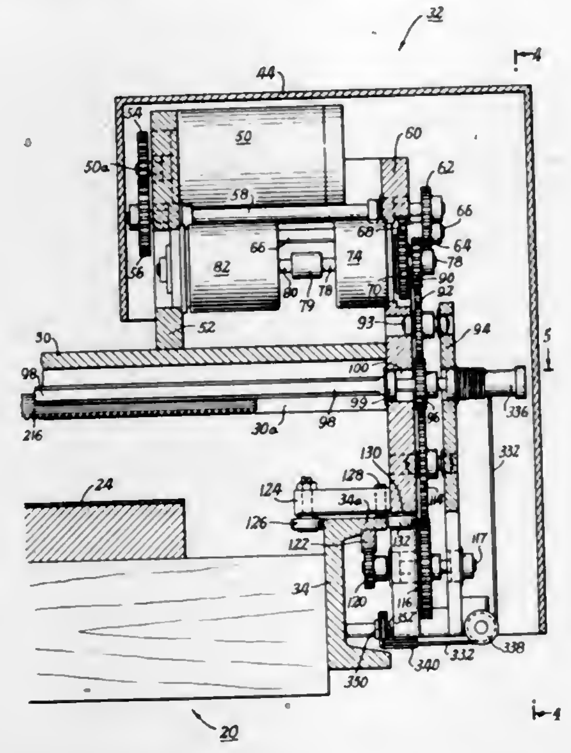


A device for circular engraving for use with a pantographic engraving apparatus or the like which employs a circular character disk mounted on a support member about an axis of rotation. The character disk has a plurality of spaced, circumferentially arranged tracing characters (the letters of the alphabet and/or numerals). A circular layout disk overlies the character disk and is mounted for rotation about the same axis as for the character disk. The layout disk has a diameter which does not exceed the diameter of the character disk. Means is provided for releasably securing the layout disk to the support member while permitting the character disk to be rotated with respect to the support member and the layout disk.

3,714,714
DRAFTING MACHINE

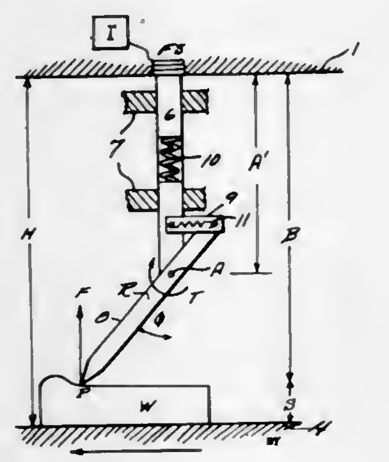
Edward P. Bullard, III, MTD Bldg., 171 Spring Hill Rd., Trumbull, Conn.
Filed Feb. 12, 1971, Ser. No. 114,832
Int. Cl. B43l *13/02*
U.S. Cl. 33—80 **12 Claims**

The disclosed drafting machine comprises a drafting head coupled to a main carriage supported on a main rail for movement parallel to a transverse axis. Parallel top and bottom rails support main rail carriages for movement parallel to a longitudinal axis of the main rail pursuant to positioning the drafting head to any point on the drafting surface. A drive train is incorporated for precise point to point positioning of the drafting head either under manual positioning control or automatic positioning control on the basis of numerical positioning data inputs.



3,714,715
GRINDING CONTROL SYSTEM

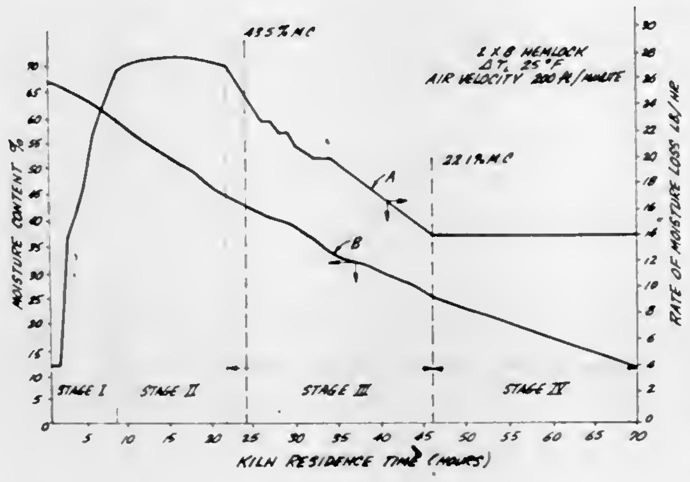
Loring Coes, Jr., Princeton, Mass., assignor to Norton Company, Worcester, Mass.
Filed May 25, 1971, Ser. No. 146,756
Int. Cl. G01b *7/28*
U.S. Cl. 33—174 R **9 Claims**



A method for determining and controlling the distance between a variable surface and a point on a device which contacts the variable surface, requiring measurement or control solely of quantities relating to the contacting device where a reference point A on the contacting device is constrained to move along a line A′ and a point of contact P from the contacting device is constrained to follow the variable surface and the angle ϕ between the line of constraint A′ and a radial line R between the points A and P has a non-zero value. The method requires the measurement of at least four of the following five quantities: the length of line A′ from a reference plane to point A, the length of the radial line R, the angle ϕ, the force F acting upon the reference point A due to the contact of the contacting device with the variable surface measured along the line of constraint A′, and the torque T due to the contact with the variable surface which acts around the point A. Once these quantities are measured, the distance B between the variable surface and the point A along the line of constraint A′ may be determined by using the equations $B=A'+R\cos\phi$ and $T=FR\sin\phi$. Control of the quantities shown in the above equations can, of course, control the distance B.

3,714,716
PROCESS FOR KILN DRYING LUMBER BY MEANS OF A PREDETERMINED DRYING RATE

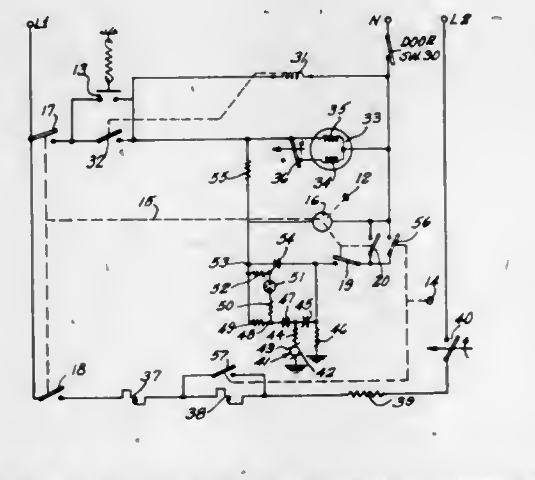
Dallas S. Dedrick, Longview, Wash., assignor to Weyerhaeuser Company, Tacoma, Wash.
Filed June 29, 1970, Ser. No. 50,561
Int. Cl. F26b *3/00*
U.S. Cl. 34—30 **47 Claims**



An improved process for kiln drying wood with a conditioned circulating fluid, such as heated air, is described. A desired rate of moisture loss is initially chosen. This rate is achieved and maintained by control of the rate of energy transfer from the fluid to the wood. In contrast to prior art methods, the rate of energy loss from the fluid to the wood is here held as an independent variable. This energy loss is sensed and the entering air is allowed to assume whatever temperature necessary to maintain the selected rate of moisture loss. The entering air dry bulb temperature thus becomes a dependent variable.

3,714,717
KNIT CYCLE FOR CLOTHES DRYER

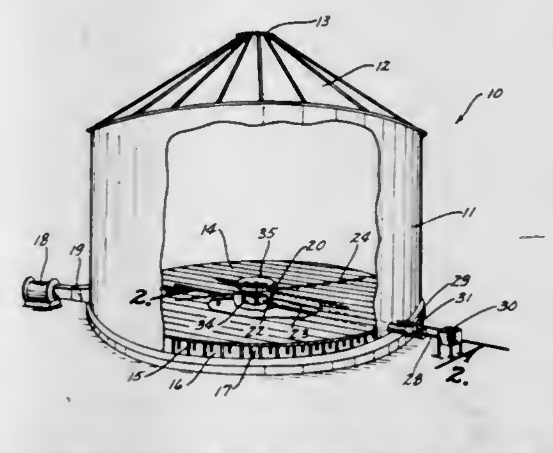
William L. Beard, Jr., Benton Harbor, and Ronald E. Hahn, St. Joseph, both of Mich., assignors to Whirlpool Corp., Benton Harbor, Mich.
Filed Dec. 11, 1970, Ser. No. 97,242
Int. Cl. F26b *13/10*
U.S. Cl. 34—45 **5 Claims**



A knit cycle is provided for clothes dryers to prevent shrinkage caused by excessive drying due to inadertent presetting of the dryer programmer to an excessively dry setting. During an automatic drying cycle, moisture sensing apparatus is employed to stall or interrupt operation of a cycle terminating timer motor. Selection of a knit cycle overrides an incorrect setting by limiting the ability of the moisture sensing apparatus to affect the operation of the timer motor.

3,714,718
CONTROL SYSTEM FOR GRAIN DRYING BIN

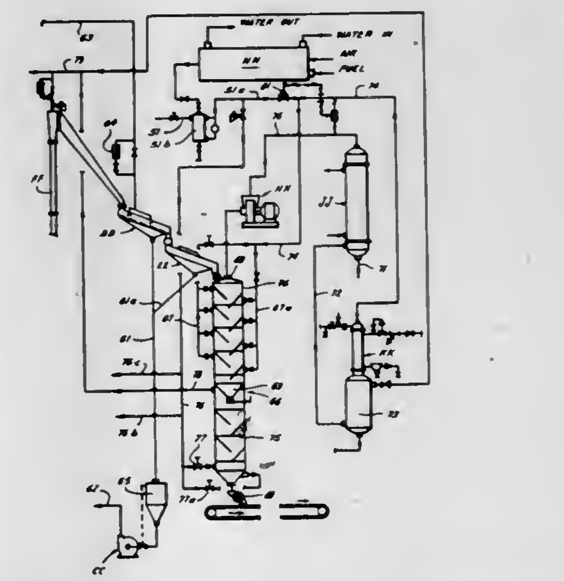
Eugene G. Sukup, Sheffield, Iowa
Filed March 18, 1971, Ser. No. 125,672
Int. Cl. F26b *13/12*
U.S. Cl. 34—56 **11 Claims**



A control system for grain drying bins of the type adapted to receive wet grain, remove moisture from the grain by the passage of heated air therethrough, and discharge dried grain. A portion of the heated air passing through the grain in the bin escapes through the grain discharge means, and the humidity of this escaping air is indicative of the moisture content of the grain being discharged. A humidity measuring device capable of controlling the on-off operation of the grain discharge means is located near the dried grain discharge outlet and is set to cause the discharge means to operate when the humidity of the air passing it is below a preselected level.

3,714,719
APPARATUS FOR DESOLVENTIZING SOLVENT EXTRACTED MILLED RICE AND RICE BRAN

Truman B. Wayne, c/o Truman B. Wayne & Assc., P.O. Box 13086, Houston, Tex.
Division of Ser. No. 695,632, Jan. 4, 1968, which is a continuation-in-part of Ser. No. 529,814, Feb. 24, 1966. This application Feb. 1, 1971, Ser. No. 111,632
Int. Cl. F26b *21/06*
U.S. Cl. 34—74 **4 Claims**



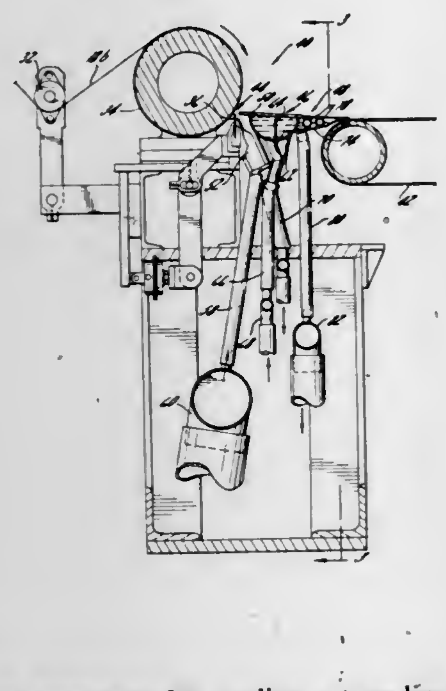
A method and apparatus of desolventizing previously solvent extracted milled rice and, in certain embodiments of the invention, desolventizing of the bran removed from the rice. The method and apparatus contemplates using a desolventizing gaseous medium comprising inert gas as the major component thereof wherein the gaseous medium is contacted with the rice when at a temperature in the range from about 100° F. to about 150° F., whereby the solvent is vaporized from the rice at a relatively low temperature, thereby preserving the quality of the rice. The gaseous medium with the vaporized solvent entrained therein is subsequently condensed to remove the solvent therefrom and the medium is subsequently heated and recycled.

3,714,720
APPARATUS FOR COOLING A TRAVELING WEB OF MATERIAL

Adrian D. Drost, Balfour, N.C., and Ronald P. Glanz, Covington, Va., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed Aug. 10, 1971, Ser. No. 170,559
Int. Cl. F26b *19/00*

U.S. Cl. 34—120 **12 Claims**



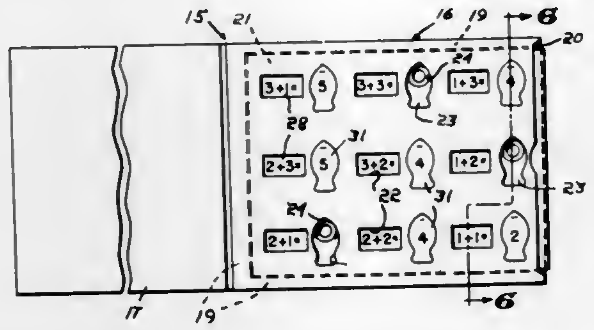
A cooling apparatus for cooling a traveling web of fabric having adhesive which must be rapidly set. The apparatus includes a heat conductive bed surface having a transverse upstream edge where the fabric is received. An upwardly directed air jet cools as well as partially supports the web as it passes onto the bed surface. Immediately downstream of the air jet are two liquid cooling mechanisms that have the bed surface as an upper wall thereof. A cooling liquid is pumped through the mechanisms to cool the underside of the bed surface and therefore the fabric traveling over the surface. The elevation of the bed surface is adjustable to suit the desired running conditions and is also capable of being raised to permit access to the equipment below the surface.

3,714,721
EDUCATIONAL AND AMUSEMENT DEVICES

Charles L. Tilley, 41 Elm St., Saugus, Mass. 01906
Filed Dec. 9, 1971, Ser. No. 206,261
Int. Cl. G09b *3/02*

U.S. Cl. 35—9 R **13 Claims**

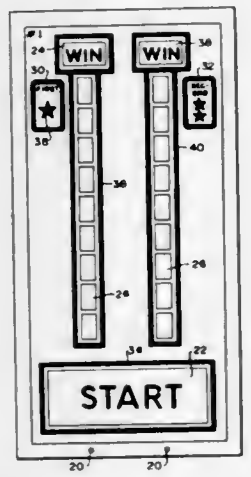
An educational and amusement device is disclosed that has a board adapted for use with work sheets having on their front faces a series of indicia, the board having openings exposing the indicia. A second series of indicia is provided by a group of members on the front face of whice indicia is printed and the board has means enabling any member to be associated with the indicia exposed in any of the openings. Both the back face of the work sheet and the back of the member have code means exposed at the back of the board enabling the correctness of the relationship of the members to the exposed indicia to be determined thereby. The device may be provided with a shield covering the code means but movable to expose them.



3,714,722
CHILDREN'S GAME APPARATUS

Nancy L. Sonnabend, 24 Greenhill Road, Brookline, Mass. 02146
Original application Feb. 23, 1968, Ser. No. 707,681. Divided and this application Mar. 1, 1971, Ser. No. 119,674
The portion of the term of the patent subsequent to Mar. 2, 1988, has been disclaimed
Int. Cl. G09b *1/00*

U.S. Cl. 35—8 **8 Claims**



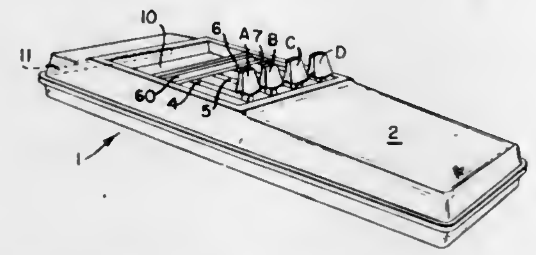
This invention relates to apparatus for playing an instructional series of games. The apparatus is constructed and arranged to enable a very young child to learn, by playing the games in sequence, the necessary abstract concepts required to play conventional board games. The preferred embodiment of the invention includes a game board having printed thereon three different playing surfaces, two sets of counters, each of a different color and a container therefor, cards to provide random counts for the players and to determine the order of play, a card holder, counters for counting the number of times a path has been traversed and a holder therefor. By learning to play each of the three games in sequence a young chlid will readily learn to play conventional board games.

3,714,723
HAND HELD TEACHING MACHINE

David A. Horine, and Carl J. Clement, Santa Clara County, Calif., assignors to Richard B. Ball, Palo Alto, Calif.
Filed Dec. 21, 1970, Ser. No. 100,313
Int. Cl. G09b *3/06*

U.S. Cl. 35—9 A **10 Claims**

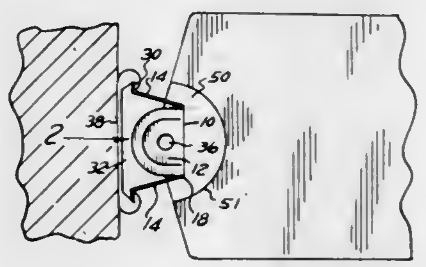
A hand held manually operable teaching machine is disclosed herein comprising a replaceable cartridge containing a web, typically an endless or Z-folded web and a plurality of manually operated slideable web-advancing means. The web is used for displaying frames of material to which a response is intended. Each frame of material on the web is provided with a web advancing hole at a predetermined location on a line transverse to the web in associated with an appropriate one of several possible responses displayed with the material. The advancement of a pre-determined one of the web-advancing means will engage the hole associated with a correct response and advance the web for presenting another frame of material, thus indicating a correct response had been made by the operator.



3,714,724
DISPLAY MARKER CLIP

Robert J. Slavsky, Detroit, Mich., assignor to Shaw & Slavsky, Inc., Detroit, Mich.
Filed July 16, 1971, Ser. No. 163,387
Int. Cl. G09f *3/18*

U.S. Cl. 40—11 **3 Claims**

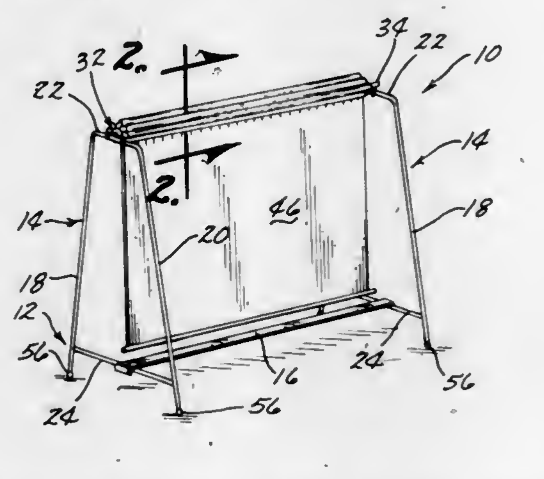


A spring clip is provided with retaining means for holding an associated attention directing card and is also provided with side wall flanges for snapping into grooves of a conventional C-shaped price tag molding with which the clip is used.

3,714,725
DEVICE FOR DISPLAYING SHEET MEMBERS HAVING INDICIA THEREON

Gary R. Banks, Rte. 2, Westfield, Iowa 51062
Filed May 27, 1971, Ser. No. 147,393
Int. Cl. G09f *11/08*

U.S. Cl. 40—84 **8 Claims**

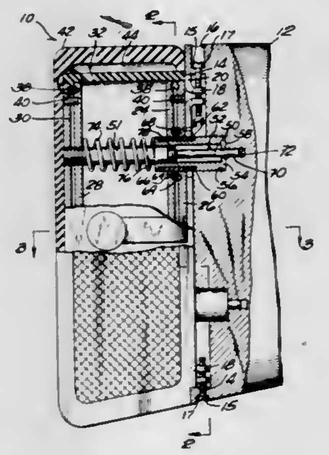


A device for displaying sheet members having indicia thereon is comprised of a support frame and an elongated spindle rotatably mounted in the support frame for rotation about a horizontal axis. A plurality of sheet members having indicia thereon are rolled into cylinders and are detachably mounted to the spindle. Complementary brackets are provided on the spindle and on each cylinder for detachably holding the cylinders to the spindle.

3,714,726
RECOIL STOCK

Paul E. Braun, 8325 S.W. 72nd, Miami, Fla.
Filed Nov. 25, 1970, Ser. No. 92,559
Int. Cl. F41c *23/00*

U.S. Cl. 42—74 **11 Claims**

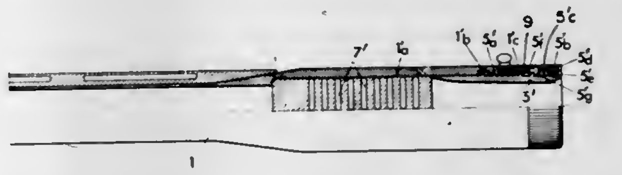


A rubber membrane is sealed between a pair of front and back plates forming a fluid filled chamber secured to the butt end of a gun stock. The shock caused by the firing of the gun is translated to the fluid chamber causing the rubber membrane to expand radially with respect to the gun axis resulting in relative movement of the front and back plates toward each other to absorb and relieve the user of the shock impact. A pair of spring loaded pistons longitudinally positioned between the front and back plates provide proper realignment of the recoil pad after firing. A U-shaped spring clamp prestresses the fluid chamber to provide immediate shock absorbing expansion of the membrane when the gun is fired.

3,714,727
GUN BARREL

Hideo Iino, Mito, Japan, assignor to SKB Arms Company, Tokyo, Japan
Filed Aug. 25, 1970, Ser. No. 66,692
Claims priority, application Japan, Aug. 28, 1969, 44/81175; Aug. 28, 1969, 44/81176
Int. Cl. F41c *21/00*

U.S. Cl. 42—79 **2 Claims**



A gun barrel which comprises a relatively large-diametered portion formed integrally with a barrel body in the forward end thereof and adapted to incorporate an exchangeable choke inside the muzzle of said relatively large-diametered portion, said relatively large-diametered portion being formed coaxially with the gun barrel body; a means for securely holding said choke therein; and/or gas vents formed in the substantially upper part of said relatively large-diametered portion to release gas jets therefrom, thereby preventing an undesirable bounce of the gun barrel at firing.

In the gun barrel of the present invention, the total length of the barrel can always be constant and the replacement of chokes is easily made without causing a change in the balance of said barrel.

Moreover, an undesirable bounce of the gun barrel is effectively prevented by forming the gas vents in only the upper part of the barrel.

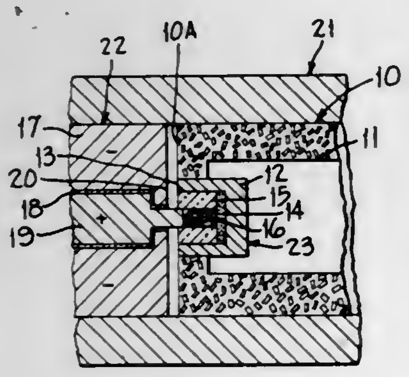
3,714,728
COMPRESSIBLE PRIMER CONTACT AND FIXED FIRING PIN ASSEMBLY

William E. Perkins, Runnemede, N.J.; Allen F. Schlack, Churchville, and Thomas Q. Ciccone, Langhorne, both of Pa., assignors to the United States of America as represented by the Secretary of the Army

Filed Dec. 22, 1970, Ser. No. 100,742

Int. Cl. F41b *5/18*

U.S. Cl. 42—84 **6 Claims**



A compressible primer contact plug and fixed firing pin assembly combination for use in small caliber electrically actuated caseless ammunition and small arms weapons. The primer contact is operationally interposed between a priming mixture and a firing pin or center electrode which is an integral part of a small arms weapon bolt assembly and is affixed thereto. Undesirable propellant gas leakage is obviated in the firing pin area by the fixed firing pin bolt assembly which acts as an obturator during the ballistic cycle. The primer contact plug is located slightly below flush with respect to the rear surface of the caseless cartridge and from that position, tolerates longitudinal compression to assure good electrical conduction to the sensitive priming mixture while compensating for variations in the seating depth of the primer assembly.

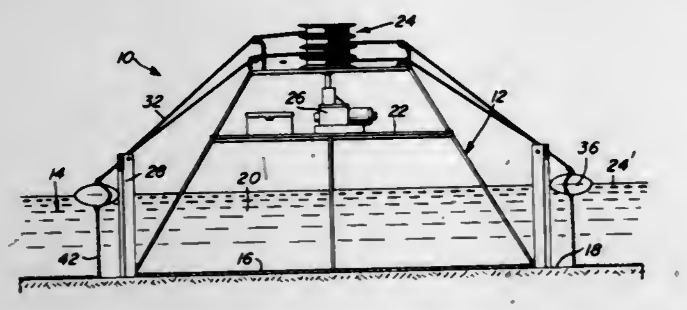
3,714,729
FISH HARVESTING METHOD AND APPARATUS

John R. Moise, 115 Central Avenue, Houma, La.

Filed Feb. 9, 1971, Ser. No. 113,871

Int. Cl. A01k *79/00*

U.S. Cl. 43—4.5 **7 Claims**



Fish and other marine life are harvested by establishing electric field barriers in a body of water enclosing a relatively large volume that is contracted toward a central collection zone with which the fish are concentrated. The electric fields are formed between flexible electrodes suspended from floats that are moved toward the collection zone by cables extending from a frame mounted at the collection zone.

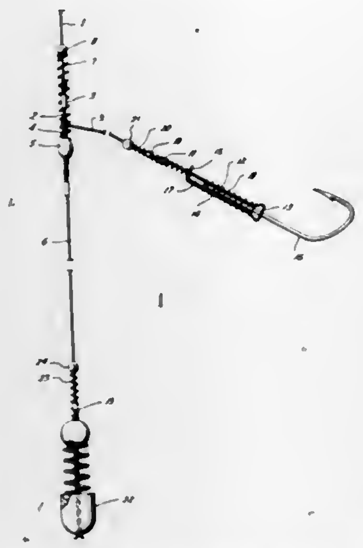
3,714,730
FISHING LEAD

Kenneth R. Lloyd, 66 Chaparell Ranch Road, Cleveland, Tex.

Filed Dec. 8, 1970, Ser. No. 96,026

Int. Cl. A01k *97/00*

U.S. Cl. 43—17.2 **3 Claims**



A fishing lead having a yieldably mounted connection to a fishing line, fish hooks having other leads thereon being yieldably connected laterally to the fishing lead, and a sinker connected by yieldable means to the lower end of the fishing lead. When tension is placed on one of the yieldable means, as when one of the members becomes stuck, and upon release of the tension, the member will be released by the force of the yieldable means returning to its original position.

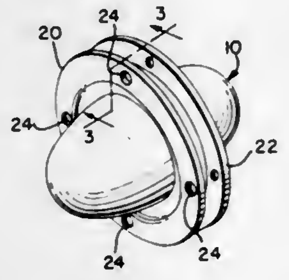
3,714,731
FISHING DEVICE

Richard J. Benson, P.O. Box 256, Rockaway, N.J.

Filed Nov. 23, 1970, Ser. No. 91,852

Int. Cl. A01k *93/00*

U.S. Cl. 43—43.11 **19 Claims**



A fishing bobber wherein an elongated buoy portion is shaped to float in the water in a position wherein its longitudinal axis is parallel to the water surface. A circular rim portion extends around the buoy portion in a plane perpendicular to the longitudinal axis and is adapted to receive fishing line wound therearound so that, when cast into the water, the bobber will rotate to permit the line to unwind into a fishing position. The rim portion includes a spring loaded clamp in order to retain the line relative to the bobber, yet permit its release upon a predetermined line tension.

3,714,732
APPARATUS FOR DISENGAGING A FISHHOOK

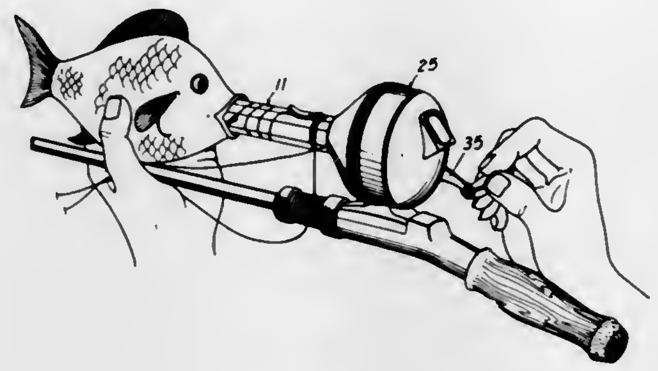
**Samuel Woodrow Little, P.O. Box 404,
Milledgeville, Ga. 31061**

Filed Dec. 17, 1970, Ser. No. 99,026

Int. Cl. A01k *97/00*

U.S. Cl. 43—53.5 **11 Claims**

An apparatus for removing a fishhook lodged in the flesh of a fish including means for rotating a lodged fishhook with control means operatively associated with the rotating means for effecting a rotation of said rotating means so as to disengage the fishhook from its engaged placement and to retrieve the fishhook from the fish. The apparatus provides a novel method for automatically disengaging a fishhook from the flesh of a fish including the steps of wrapping the fishline attached to the hook around a fishhook rotating means and rotating the rotating means, thereby dislodging the fishhook from the fish. Another method disclosed for automatically disengageng a fishhook from the flesh of a fish includes the steps of wrapping the fishing line attached to the hook around a fishhook rotating means, engaging the fishhook with the rotating means, and rotating the rotating means whereby the fishhook will be disengaged from the flesh of the fish.



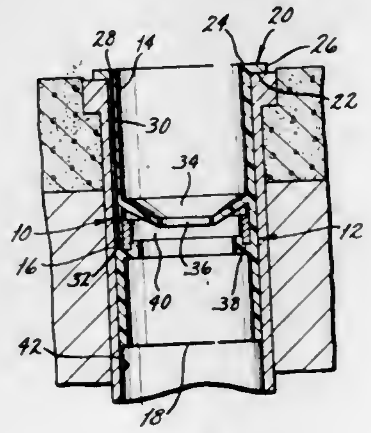
3,714,733
INSECT GUARD FOR SEWER AND DRAIN OPENINGS

**Michael A. Madonna, 1900 Thunderbird Ave.,
Florissant, Mo. 63033**

Filed Nov. 2, 1970, Ser. No. 86,133

Int. Cl. A01m *1/20*

U.S. Cl. 43—121 **5 Claims**



A cylindrical shaped tube is made of a low coefficient of friction material and has a flange at its upper end so that it can be inserted into sewer or drain openings. Centrall disposed on the inside of the cylindrical shaped tube are means for preventing insects from crawling upwardly therethrough. The disclosure shows three distinct embodiments of such centrally disposed means, among which are two mechanical means which completely close up the sewer or drain openings and another means which presents a physical obstacle to insects along with means for poisoning the insects as they attempt to crawl upwardly through the tube.

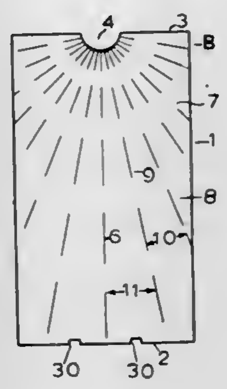
3,714,734
TOY AIRCRAFT

**John Edwin Livingston, 502 Camp St.,
New Albany, Ind. 47150**

Filed Mar. 1, 1972, Ser. No. 230,647

Int. Cl. A63h *27/00*

U.S. Cl. 46—76 R **8 Claims**



Discloses a toy aircraft formed by folding a blank of stiff sheet material into a configuration having a vertically disposed keel and horizontally disposed and tapered wing portions. An elongated clamping and stabilizing member consisting of a bar having an elongated slot and fitted over the walls of the keel portion clamp same together and maintain the keel in vertical disposition while in flight. In one embodiment, two folded members are produced from two blanks of stiff sheet material and these are clamped into abutting and congruent relationship so as to produce a finned missile. This is accomplished through the use again of an elongated clamping and stabilizing member.

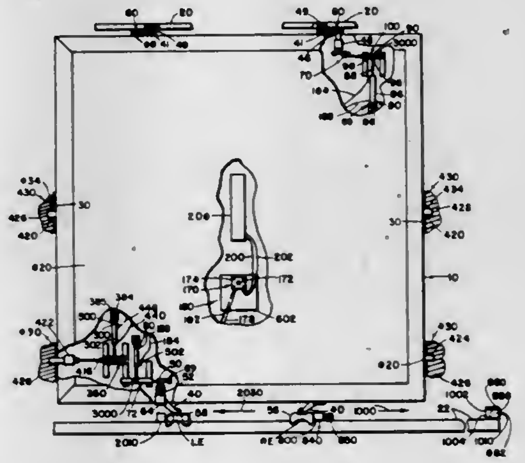
3,714,735
HYDRAULICALLY OPERATED RAILROAD CAR DOOR

**Robert E. Owen, 10908 Walling Circle,
Omaha, Nebr. 68144**

Filed June 7, 1971, Ser. No. 150,706

Int. Cl. E05d *15/10;* **E05f** *15/06*

U.S. Cl. 49—220 **12 Claims**

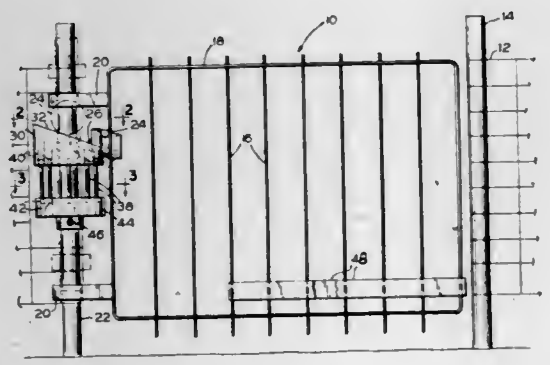


An actuating mechanism for laterally moving a sliding door of the plug type into and out of the door opening utilizing four independent crank arms, each rotatably journaled at opposite end portions to the sliding door and the supporting door track, respectively. The journaling being by vertical shafts each forming a crank arm and shaft assembly with the respective arm, hydraulic cylinder door opening and closing actuation means connected to said assemblies, and manually controllable hydraulic pressure supply means operating said hydraulic cylinders for opening and closing said door. Latching assemblies at the sides of said door and controlled by hydraulic cylinder means which latter is operably correlated with said manually controllable hydraulic pressure supply means and unlatching said door before it opens and latching said door after it closes.

3,714,736

GATE STRUCTURE

George D. Weaver, Weaver Road, Myrtle Creek, Oreg.
Filed May 26, 1971, Ser. No. 146,919
Int. Cl. E05f *1/04*
U.S. Cl. 49—237 **6 Claims**

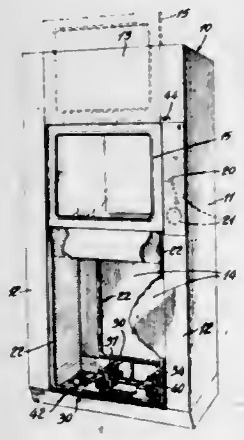


A gate slidable along and pivotal on a stanchion carries a roller engaging a cam surface on a cam block to close the gate and stop the gate in a closed position. The block is rotatable on the stanchion and is connected by torsion rods to a collar fixed to the stanchion.

3,714,737

OPERATING MECHANISM FOR VERTICALLY SLIDING DOOR

Paul-Henri Fillion, Ste-Foy, Quebec, and Viateur Guay, Charlesbourg, Quebec, both of Canada, assignors to Hoplab Inc., Quebec, Canada
Filed Feb. 8, 1971, Ser. No. 113,488
Int. Cl. E05f *15/08*
U.S. Cl. 49—360 **7 Claims**

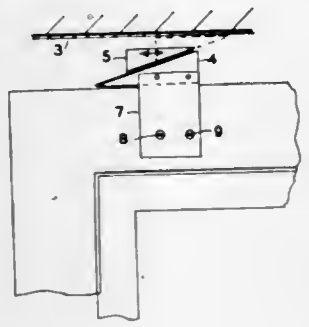


The invention relates to operating mechanism for a vertically sliding door of a washing machine for laboratory equipment in which the door is raised to the open position by hydraulic pressure and is lowered to the closed position by gradually releasing the hydraulic pressure in such a way that during the downward run of the door the same is only under the influence of its own weight, so as to avoid accidental injury to the operator or damage to the equipment being washed.

3,714,738

SLIDING GLASS DOOR RETAINER MEANS

Sidney Koslow, 6845 N.W. 9th St., Margate, Fla., and James P. Malone, 1 Odell Court, Syosset, N.Y.
Continuation-in-part of Ser. No. 848,032, Aug. 6, 1969, abandoned. This application June 11, 1971, Ser. No. 152,169
Int. Cl. E05d *13/00*
U.S. Cl. 49—404 **3 Claims**

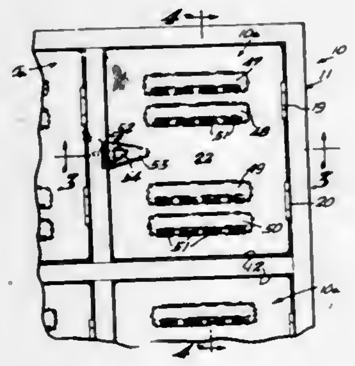


One or more adjustable retainers are mounted on top of a sliding glass door at the corners, or suitably spaced, to fill in the space between the sliding glass door and the inside of the upper track so that the sliding glass door cannot be lifted vertically from the outside by unauthorized persons. The fastener comprises two adjustable wedge members which are secured to the door or the track.

3,714,739

DOOR FOR BOX LOCKERS AND THE LIKE

Daniel D. Dolan, 2610 SW. 28th Lane, Miami, Fla. 33145
Filed Dec. 3, 1971, Ser. No. 204,600
Int. Cl. E06b *3/00*
U.S. Cl. 49—501 **10 Claims**



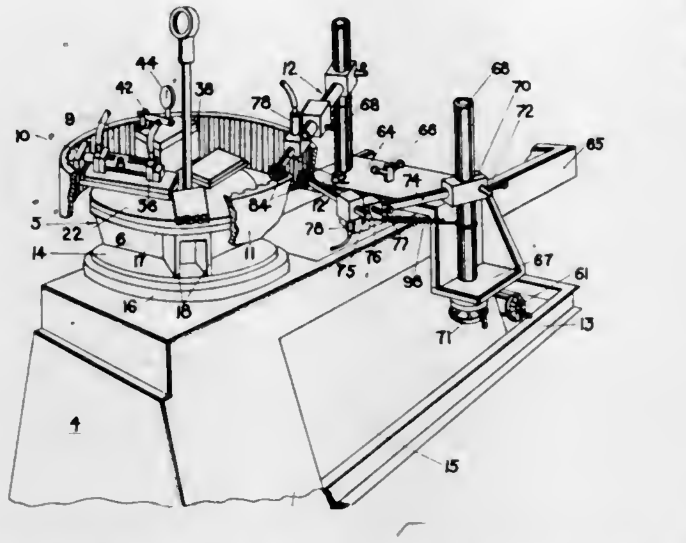
An integrally molded box locker door is described, for use either in substitution for steel doors in ordinary lock box construction, or for use in the original construction of lock boxes of synthetic plastic materials. A rectangular door face panel formed with a peripheral skirt defining a vertically-extending hinge side portion having a wall section of divergently increasing thickness, with respect to which hinge leaves are adapted to secured for hinging for the door to a lock box opening, is described, whereby, due to the resilience of the skirt hinge side with respect to the face panel, spring action operative to prevent door slamming is effected.

3,714,740

GEAR DEBURRING DEVICE

Frank J. Steinhardt, 2208 E. 9th St. S., Salt Lake City, Utah 84108
Filed Aug. 24, 1970, Ser. No. 66,373
Int. Cl. B24b *9/00*
U.S. Cl. 51—33 **6 Claims**

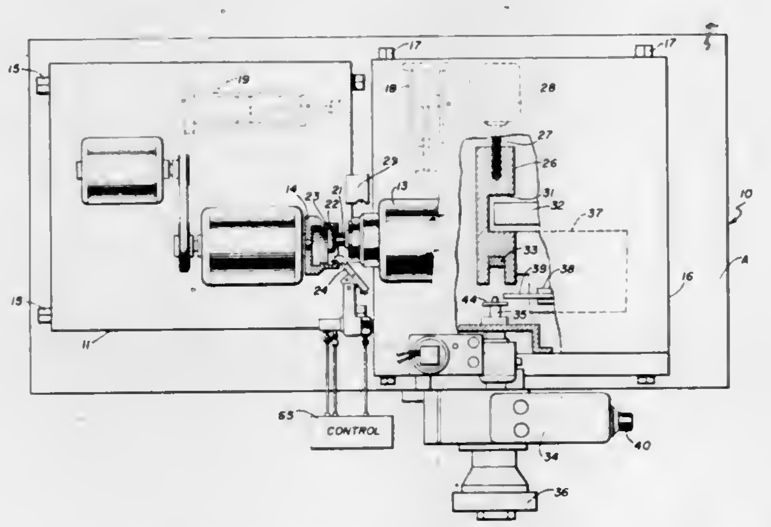
A device for simultaneously deburring both faces of a centerless gear. The deburring device includes a centerless gear holding means having a plurality of extendable arms radially mounted to a rotatable table. Each of the arms has a resilient member at its outer end which when extended radially by hydraulic means, contacts and exerts a force on the inner walls of the centerless gear. The amount of hydraulic force exerted is sufficient to hold the gear suspended in a "floating" relationship above a support surface. A pair of abrasive spindles are carried on the gear holding means for gear deburring.



3,714,741

GRINDING MACHINE WITH SIZE CONTROLLED DRESSING MEANS

Herbert R. Uhtenwoldt, Worcester, and Diran Deranian, Holden, both of Mass., assignors to Cincinnati Milacron-Heald, Worcester, Mass.
Filed Feb. 24, 1971, Ser. No. 118,317
Int. Cl. B24b *51/00*
U.S. Cl. 51—165.91 **10 Claims**



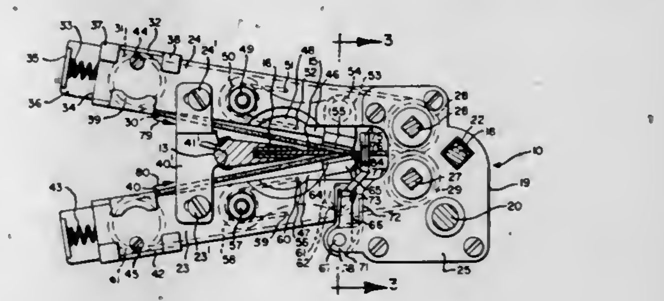
A grinding machine having a feed means for producing a controlled force between the abrasive wheel and the workpiece and having means for changing the limits of rapid infeed, if dressing takes place during a grinding cycle.

3,714,742

KNIFE SHARPENING MECHANISM

Frederick G. Clark, Buffalo, N.Y., assignor to Eastman Machine Company, Buffalo, N.Y.
Filed July 15, 1971, Ser. No. 162,922
Int. Cl. B24b *19/00, 2/00*
U.S. Cl. 51—246 **8 Claims**

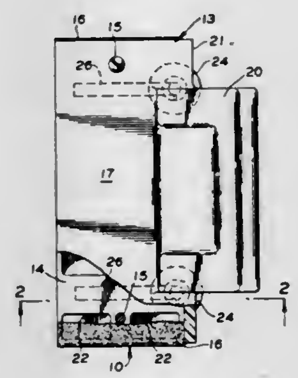
A knife sharpening mechanism for a cutting machine having an elongated knife comprising a grinder carriage having an upper leg and a lower leg, an upper endless abrasive belt mounted on the upper leg, a lower endless abrasive belt mounted on the lower leg, drive means for driving said belts, an upper belt guiding shoe for holding said upper belt in engagement with said knife, a lower belt guiding shoe for holding said lower belt in engagement with said knife, biasing means for urging said lower shoe in a direction toward said knife, detent means for holding said lower shoe against movement toward said knife as said carriage moves longitudinally of said knife while permitting said shoe to move away from said knife when the pressure between said knife and said shoe exceeds the pressure of said biasing means urging said shoe toward said knife, said detent means comprising a finger attached to said lower shoe for engagement with a plurality of serrations on a pivotal arm on said carriage, said serrations being of a configuration to permit said finger and said lower shoe to move away from said knife but preventing said lower shoe from moving toward said knife while said finger is in engagement with said serrations, and cam means for periodically resetting said lower shoe in a direction toward said knife.



3,714,743

SQUARE EDGE SANDING TOOL

Ronald B. Hall, P.O. Box 365, Alliance, Ohio 44601
Filed Nov. 11, 1971, Ser. No. 197,706
Int. Cl. B24d *15/02*
U.S. Cl. 51—392 **6 Claims**



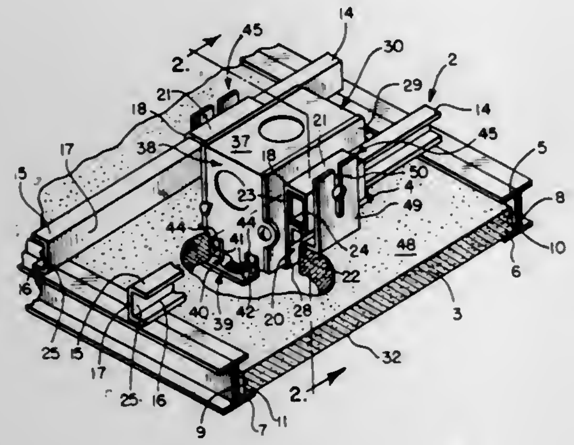
A sanding tool for smoothing one surface of a board or similar article at right angles to an adjoining surface. The tool has a block and abrasive paper or cloth is held taut over a flat surface on one side of the block, and a handle extends angularly from the other side. Rollers journaled on the block extend at right angles from the flat surface for bearing on the adjoining surface of the article being sanded.

3,714,744

ELECTRICAL FIXTURE HANGER

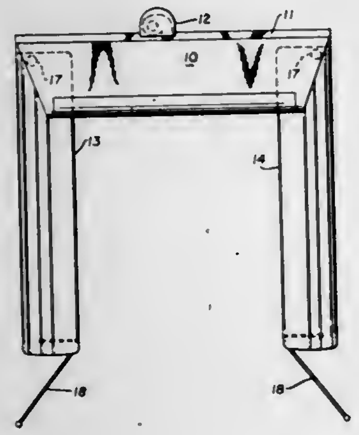
Joseph J. Koziarz, 5830 W. Leland Ave., Chicago, Ill.
Filed Oct. 12, 1971, Ser. No. 188,364
Int. Cl. E04g *17/18*
U.S. Cl. 52—28 **10 Claims**

A support for an electrical fixture from a ceiling tile or ceiling wall structure of low tensile strength, comprising a junction box fitted between load spreading beams positioned to overlie the structure. A pair of bendable hanger straps are hooked over the beams and flank the box which is held with its lower edge flush with the ceiling surface. The straps are bent at their lower ends upwardly into the box under its lower edge, and thus hold the box with its lower edge aligned with the ceiling surface. A clamping foot is mounted on each hanger and presses against the top of the tile, and the box has big extensions which bear against the bottom of the tile.



3,714,745
INFLATABLE DOCK SEAL

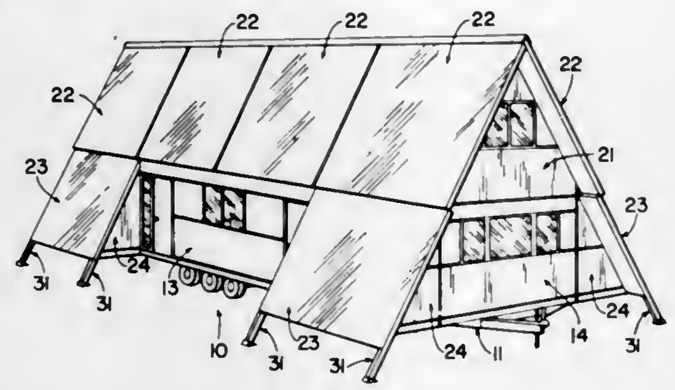
Larry O'Neal, 4953 Timbercrest Drive, Canfield, Ohio 44406
Filed Nov. 8, 1971, Ser. No. 196,471
Int. Cl. E06b *7/22*
U.S. Cl. 52—2 **6 Claims**



An inflatable dock seal for closing an opening such as a loading dock with respect to a truck or trailer includes an upper horizontal inflatable member movable downwardly against the top of the truck or trailer and a pair of vertical inflatable members movable outwardly in curving configurations to engage the sides of the truck or trailer. The horizontal and vertical inflatable members are closed with respect to one another at their junctions and the vertical inflatable members are arcuate in inflated configuration so as to move outwardly and toward one another restricting the opening in which the truck or trailer is positioned. The inflatable members are formed of waterproof fabric and means for inflating the same is provided and means for resiliently retracting the members when non inflated are also provided.

3,714,746
EXPANDABLE A-FRAME TYPE TRAILABLE BUILDING STRUCTURE

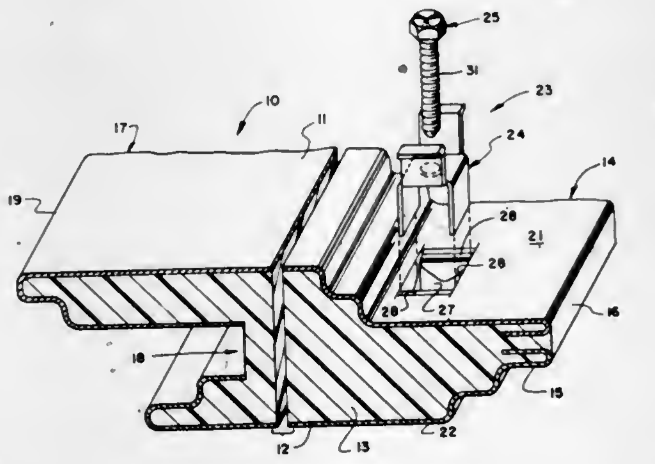
Richard A. Barlow, 2008 Dundee Road, Rockville, Md. 20850
Filed Nov. 5, 1970, Ser. No. 87,071
Int. Cl. E04b *1/343*
U.S. Cl. 52—69 **2 Claims**



A mobile home having wall members hingedly mounted to the structure for allowing the members to assume an outwardly extending angularly oriented position. Floor extensions are moved for connection with wall members to form additional living space. Telescoping braces are connected to the lower wall members and engage the ground thereby stabilizing the structure.

3,714,747
FASTENING MEANS FOR DOUBLE-SKIN FOAM CORE BUILDING PANEL

Bernard E. Curran, Sewickley, Pa., assignor to H. H. Robertson Company, Pittsburgh, Pa.
Filed Aug. 23, 1971, Ser. No. 174,105
Int. Cl. E04c *1/10, 2/20*
U.S. Cl. 52—309 **6 Claims**

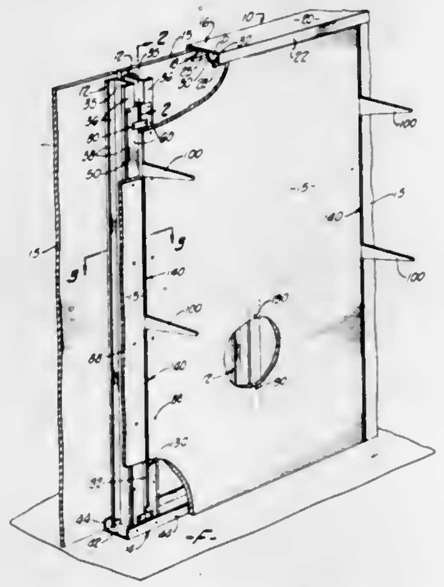


A double-skin foam core building panel presenting an inboard side segment along one side and an outboard side segment along its opposite side—the side segments being adapted to be assembled in lapped interfitted relation without externally visible fasteners. Hidden fastening means in the form of a clip and fastener is provided for securing the inboard side segment of the panel to the subgirt of a structural framework.

3,714,748
SUPPORT STRUCTURE FOR SHELVING

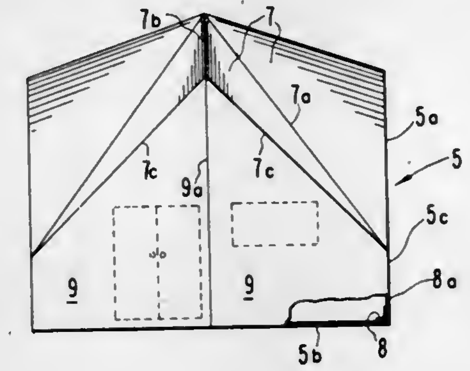
Peter Costruba, Pico Rivera, Calif., assignor to Angeles Metal Trim Co., Los Angeles, Calif.
Filed Jan. 2, 1970, Ser. No. 48
Int. Cl. A47g *29/02*
U.S. Cl. 52—36 **3 Claims**

A pair of upstanding channeled studs are positioned vertically between an overlying horizontal cap and a horizontal floor track positioned beneath and parallel to the cap. The studs have main webs spaced apart to receive a pair of elongated upstanding substantially T-shaped interlock members which are secured in opposed substantially parallel relationship between the webs of the studs. Each interlock member has reversely folded portions to provide shallow spaced channels for adjustably receiving a vertical slotted bar and the inner ends of shelf brackets and clips. Each interlock member has a vertical inward passage behind the spaced channels for the reception of the inner ends of shelf brackets. An elongated slotted bar having a vertical row of slots is disposed in the vertical channels. Elongated stabilizing flanges extend outwardly from each slotted bar along each side of the row of slots to stabilize shelf brackets when positioned in the slots. T-shaped clips are inserted into slots near the upper and lower ends of the slotted bar and are secured to the interlock member so that the slotted bar is adjustably anchored in the interlock member. The inner ends of the shelf brackets are inserted between the stabilizing flanges through the slots, and into the vertical passages in the respective interlock members. T-shaped concealing members are inserted vertically between the stabilizing flanges and between adjacent shelf brackets in order to conceal from view the recess that exists between the stabilizing flanges and the junction between the stabilizing flanges and adjacent sheets of wallboard.



3,714,749
PORTABLE BUILDING CONSTRUCTION

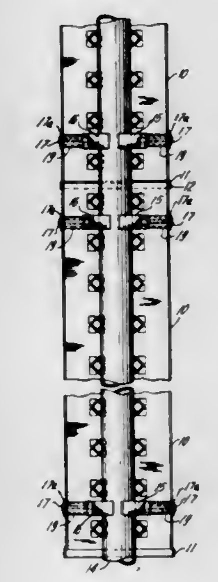
James B. Aitken, El Cerrito, Calif., assignor to Instant Structures, Inc., Albany, N.Y.
Continuation of Ser. No. 747,215, July 24, 1968, abandoned. This application Sept. 2, 1971, Ser. No. 177,480
Int. Cl. E04b *1/344*
U.S. Cl. 52—70 **18 Claims**



A building construction having a collapsible roof and a collapsible floor coupled to the roof, whereby the floor and roof form a unit which can be alternately expanded and collapsed. The roof unit has a number of hingedly interconnected sections and the floor unit has a plurality of hingedly interconnected panels with the sections and panels being disposed to permit the same to be substantially parallel with each other when the roof and floor are collapsed. When expanded, the roof forms side openings which can be at least partially covered by sidewall panels hingedly connected to the adjacent roof sections.

3,714,750
COVERING FOR RISER OR THE LIKE

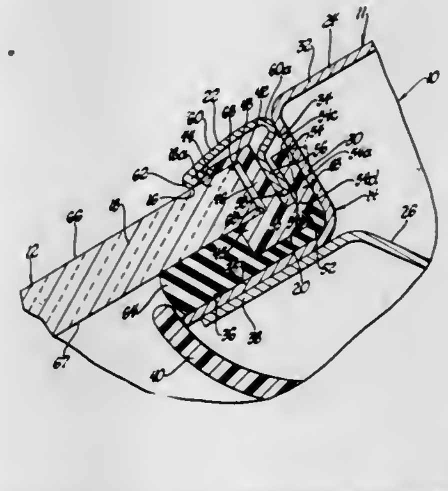
Nicholas Pallotto, 1865 55th St., Brooklyn, N.Y.
Filed April 27, 1970, Ser. No. 32,221
Int. Cl. E04f *19/00*
U.S. Cl. 52—728 **4 Claims**



Covering or casing for unprotected risers adjacent interior walls, which consist of vertical supply or return pipes for steam, water, gas, sewer and the like, further to be used for covering of support posts for ceiling beams, horizontal pipe lines such as sprinkler pipes. The covering has adjustable spring clips for attaching the same on pipes of various sizes.

3,714,751
WINDOW ASSEMBLY

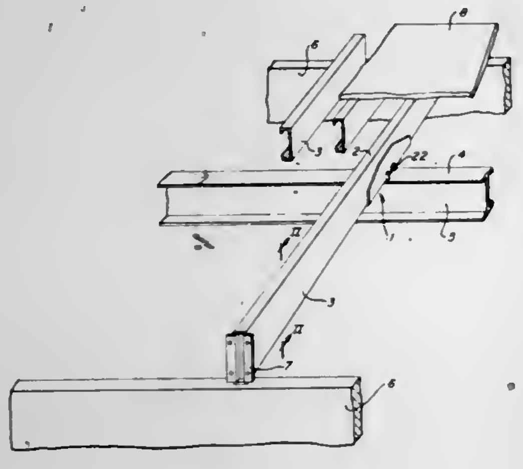
Ronald H. Lackey, Sterling Heights, Mich., assignor to General Motors Corporation, Detroit, Mich.
Filed Aug. 20, 1971, Ser. No. 173,363
Int. Cl. E06b *1/36, 3/62*
U.S. Cl. 52—400 **2 Claims**



In a preferred form, this disclosure relates to a window assembly having a support structure within which a glass panel is maintained by a resilient retaining strip. The resilient retaining strip has a channel portion for slidably engaging the edge of the glass panel to form an oversize sub-assembly. The retaining strip also has a cam surface which is engaged by the support structure to cause the retaining strip to slide inwardly upon the glass panel as the sub-assembly is received within the support structure. The retaining strip further includes a deflectable locking flange means spaced from said channel portion and defining an elongated slot therebetween and which engages the support structure to maintain the assembly therein. The window assembly also includes a reveal molding means which has a flange portion for covering between the structural frame means and the edge of the glass panel. The locking flange also clamps a depending flange portion on the molding means against the channel portion of the resilient strip to hold the molding means in place.

3,714,752
REINFORCING AND SUPPORTING SADDLE FOR C-SHAPED SHEET-METAL BEAMS

George D. Ratliff, Jr., Churchill Borough, Pa., assignor to United States Steel Corporation, Pittsburgh, Pa.
Filed Sept. 25, 1970, Ser. No. 75,393
Int. Cl. F16b *1/00;* **E04c** *3/04*
U.S. Cl. 52—665 **5 Claims**

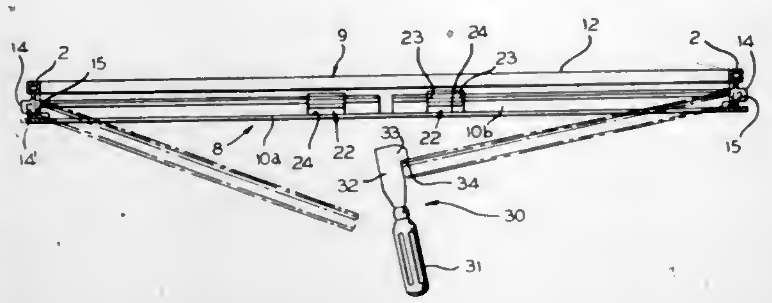


A saddle for supporting and reinforcing the central portion of a C-shaped sheet-metal beam on a transversely extending I-beam or other supporting structure in a building is disclosed. The saddle has a channel shape with a horizontal base or web and flanges extending upwardly from opposite edges thereof, the web providing a support for the bottom flange of the C-shaped beam on the upper surface of the I-beam or supporting wall, and the flanges being effective to reinforce the C-shaped beam against bending. One of the saddle flanges engages the web of the C-shaped beam to reinforce it against bending, and the other of the saddle flanges is employed to hold the bottom flange of the beam against movement out of supporting engagement with the web of the saddle.

3,714,753
CONCEALED GRID SYSTEM

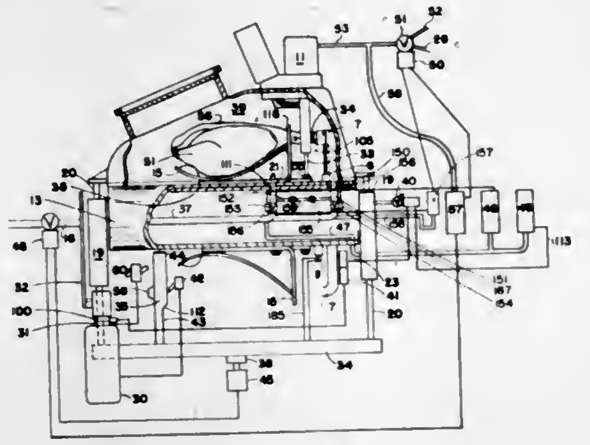
Reinbardt H. Jahn, Riverside, Ill., assignor to Chicago Metallic Corporation, Chicago, Ill.
Filed May 3, 1971, Ser. No. 139,377
Int. Cl. E04b *5/52*
U.S. Cl. 52—484 **22 Claims**

A suspended ceiling grid structure for use in a concealed type of grid system, in which the grid structure may include a pair of main runners between which a plurality of ceiling tiles are to be supported, two spaced runner means extending between the main runners for supporting such ceiling tiles therefrom, with at least one of said runner means including downwardly movable means for supporting the associated ceiling tile, with such tile being removable from the grid structure following downward movement of said movable means.



3,714,754
VACUUMIZING SYSTEM

Edward L. Holcombe, Taylor, and Orville M. Calvert, Spartanburg, S.C., and William M. Kessel, Wernersville, Pa., assignors to W. R. Grace & Co., Duncan, S.C.
Filed Dec. 14, 1970, Ser. No. 97,703
Int. Cl. B65b *31/02*
U.S. Cl. 53—22 B **9 Claims**

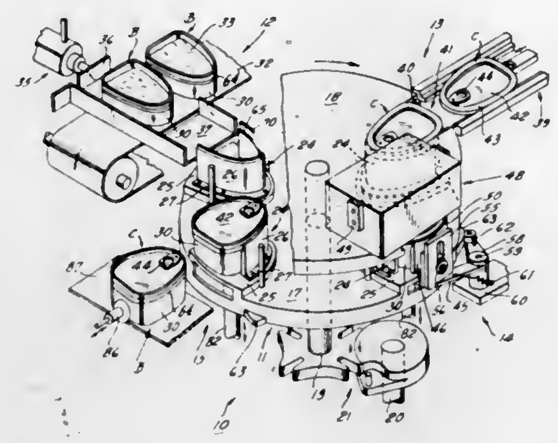


Disclosed is an apparatus and method for vacuum packaging products in containers such as bags. The vacuumizing apparatus includes a vacuum chamber and a vacuum extractor operating independently on the container within the vacuum chamber. In preferred embodiments, the apparatus includes a conveyor for transporting the bagged products and a hood member which, when contacting the conveyor, forms a vacuumizing chamber therewith and the hood member contains means for closing the bag after vacuumizing.

3,714,755
METHOD AND APPARATUS FOR SUPPORTING FLEXIBLE CONTAINER BODIES IN A CLOSING MACHINE

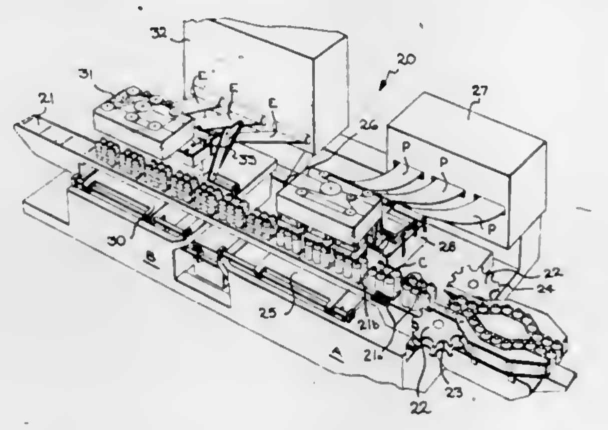
Thomas Lawrence Phalin, Cary, and William Stephen Birkholz, Zion, both of Ill., assignors to American Can Company, Greenwich, Conn.
Filed May 17, 1971, Ser. No. 143,936
Int. Cl. B65b *7/28*
U.S. Cl. 53—42 **10 Claims**

A method and apparatus for supporting flexible open-ended container bodies, such as formed of plastic, in a closing machine are provided in which the body is moved laterally into an open-ended partial supporting mold, an end closure member is positioned in aligned relation with the open end of the body, a second partial supporting mold is moved against the side wall of the body at the open end of the open-ended partial mold, and both of the partial molds with the body therebetween are moved into a seaming mechanism whereby the side walls and open end of the body are supported by the partial molds during attachment of the end closure to the body.



3,714,756
MACHINE FOR ASSEMBLING GROUPS OF CONTAINERS

John M. MacInnes, Millis, and Robert W. Saumsiegle, Needham, both of Mass., assignors to Owens-Illinois, Inc., Toledo, Ohio
Filed Dec. 21, 1970, Ser. No. 100,034
Int. Cl. B65b *21/00, 27/04*
U.S. Cl. 53—48 **12 Claims**

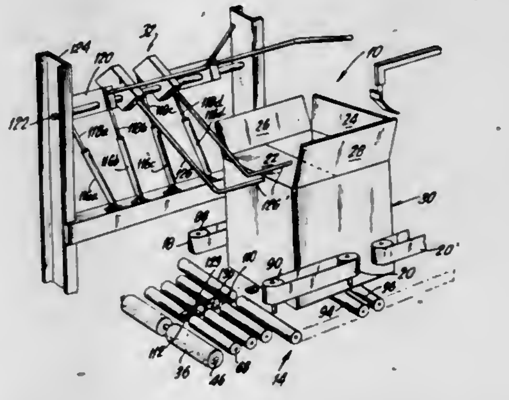


A method and apparatus for forming packages of containers which have a body portion and a relatively smaller neck portion with abutment means adjacent the upper end of the neck portion. The containers are moved continuously in a predetermined path, segregated into groups or clusters, and an endless band is expanded, moved along in registry with each cluster and finally telescoped and released onto each cluster. At a subsequent position along the path of each cluster a carrier is moved along in registry with each cluster and forced downwardly over the ends of the containers to complete the package.

3,714,757
DEVICE FOR FEEDING AND FOLDING THE TRAILING TOP FLAP OF A CONTAINER FOR CLOSING THE CONTAINER

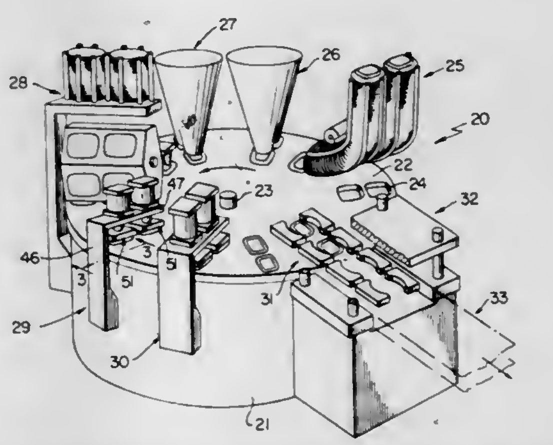
Harold J. Feigel, Teaneck, N.J., Harry S. Reizenstein, Bayside, N.Y., and Gilbert Bloch, Woodcliff Lake, N.J., assignors to FMC Corporation, Horsham, Pa.
Filed Sept. 21, 1971, Ser. No. 182,317
Int. Cl. B65b *7/20*
U.S. Cl. 53—75 **16 Claims**

A device for feeding and closing a top trailing end flap of a container comprises a roller conveyor over which the container is adapted to be passed. The roller conveyor includes an inclined section leading to a top flap closure station which extends substantially horizontally. At the beginning of the horizontal section, there is a rotatable driven roller which engages and feeds the container only after a stop member is moved out of the way to permit passage of the container through the closing section. The stop member is moved downwardly out of the way only after a container, which has been previously closed, is moved to the end of the folding section. The stop returns upwardly to block the next container until the one being folded is completed. The device includes means for straightening the container and feeding it by engaging both sides thereof while the top flaps are folded. An apparatus for folding the trailing or rear end flap includes a plurality of rod members which are carried on blocks on a common support rod. Each block is connected to a fluid pressure piston-and-cylinder combination which is actuated in accordance with the position of the container to move the folding rod member downwardly to engage the trailing top end flap. As the container is moved over the conveyor, electric eye control means are connected to the respective fluid pressure cylinders for each rod member to cause the rod members to move downwardly in succession to engage and successively depress the rear flap until it is fully closed and to hold it downwardly until other means are operable to close the side flaps and other end flap.



3,714,758
METHOD AND APPARATUS FOR FORMING A DEPRESSION IN A COVER MEMBER OF A CONTAINER CONSTRUCTION

George B. Vogeleer, Richmond, Va., assignor to Reynolds Metals Company, Richmond, Va.
Filed March 26, 1971, Ser. No. 128,349
Int. Cl. B65b *7/28, 51/14*
U.S. Cl. 53—39 **19 Claims**



Method and apparatus for forming a depression in a cover member assembled against and closing the open end of a product filled container body comprising a frame carrying a support that is adapted to receive and hold the assembled cover member and container body. A die is movably carried by the frame and is adapted to cooperate with the support for engaging against the cover member and form a depression therein inboard of the open end of the container. Means are operatively interconnected to the frame for moving the assembled cover member and container body off of the support by at least a load relieving amount before the die forms a depression in the cover member to relieve the support from substantially any loading during the cover member depression forming operation.

3,714,759

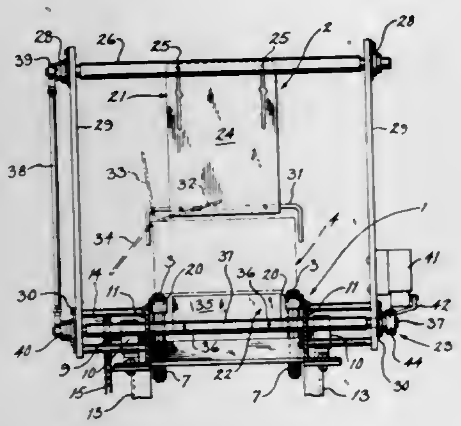
OPEN FLAP DETECTOR FOR FILLED CARTONS

William G. Pagdin, Milwaukee, and Robert F. Risley, Wauwatosa, both of Wis., assignors to Jos. Schlitz Brewing Company, Milwaukee, Wis.

Filed Jan. 4, 1971, Ser. No. 103,474

Int. Cl. B65b *57/04*

U.S. Cl. 53—78 **10 Claims**



Pivotal feelers are disposed above and below the cartons as they are transferred in succession from a flap sealing zone to a palletizing zone to trip a switch adapted to stop the transfer in the event one of the top flaps on a carton comes loose and engages the upper feeler or in the event the bottom sags or a bottom flap drops into engagement with the lower feeler.

The feelers are mechanically connected to a cam or abutment trip for a switch in the control circuit of a drive motor for the conveyor transferring the cartons from one zone to the other.

3,714,760

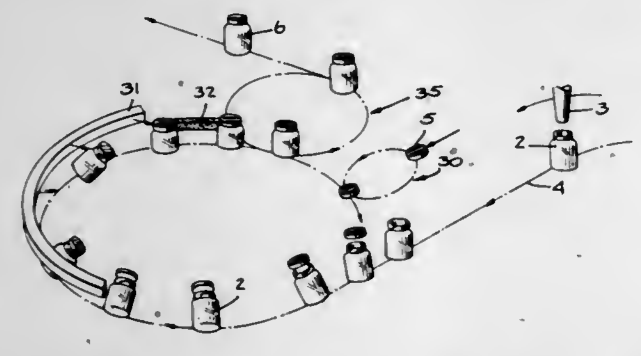
HIGH SPEED ROTARY CONTAINER SEALING MACHINE WITH INCLINED SEALING HEADS

Cecil P. Roberts and Charles S. Ochs, Lancaster, Ohio, assignors to Anchor Hocking Corporation, Lancaster, Ohio

Filed Mar. 10, 1971, Ser. No. 122,906

Int. Cl. B65b *7/28, 31/00*

U.S. Cl. 53—112 R **22 Claims**



A sealing machine is disclosed for sealing glass or other containers with closure caps. The sealing machine is of the rotary type having a number of sealing heads mounted on a rotating turret for picking up caps at a cap feeding station and for thereafter applying the caps to containers carried in spaced relation beneath the heads by the rotating turret. The sealing machine operates at extremely high speed and in order to counteract spillage from centrifugal forces on products in the containers has inclined container support means which tilts each of the containers inwardly before and during the sealing operation as the containers move along with the rotating turret. Each of the sealing heads are mounted with their axes having a corresponding inward and upward tilt to align the sealing heads and the closure caps positioned thereon with the inclined rims of the containers.

3,714,761

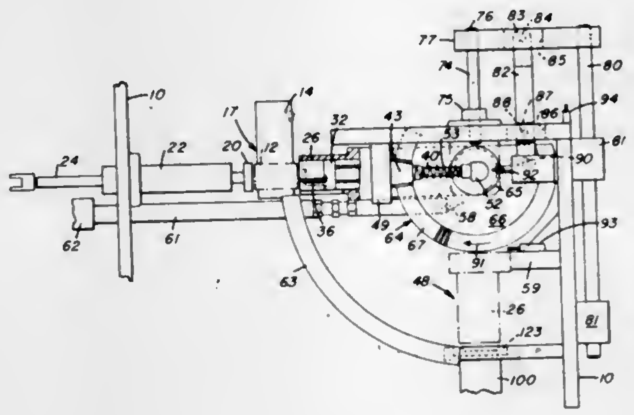
APPARATUS FOR CANNING FILM MAGAZINES

John Herford; Richard R. Mosman; Thomas L. Vieira, and Robert G. Wallace, all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed March 5, 1971, Ser. No. 121,329

Int. Cl. B65b *63/04*

U.S. Cl. 53—118 **13 Claims**



A film magazine having a leader extending therefrom is taken from an automatic film spooler and inserted into a cylindrical transfer housing with the leader extending outwardly through a slot in the wall of the transfer housing. The magazine is pushed against a piston having a finger extending from the face thereof and located between the wall of the transfer housing and the magazine. The transfer housing and the magazine are moved to a canning station and during movement the piston and finger are rotated to rotate the magazine within the transfer housing and thereby wrap the film leader about the magazine. At the canning station the piston pushes the magazine out of the transfer housing and into a storage can which is then placed on a conveyor and fed to a capping machine.

3,714,762

ELECTROFILTER INSULATOR WITHOUT DAMAGING DUST DEPOSITS

Friedrich Fillies, Winz-Niederwenigern, and Günter Urban, Essen-Bredeney, Germany, assignors to Fried. Krupp Gesellschaft mit beschrankter Haftung, Essen, Germany

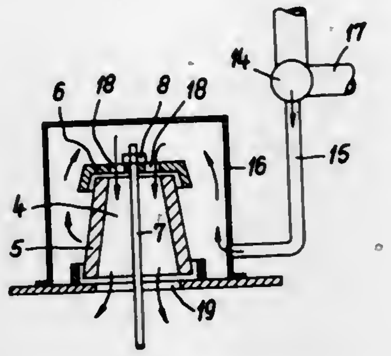
Filed Aug. 28, 1970, Ser. No. 67,932

Claims priority, application Germany, Aug. 29, 1969, P 19 43 916.8

Int. Cl. B03c *3/34*

U.S. Cl. 55—5 **5 Claims**

Hot oxidizing gas is passed over electrofilter insulators to reduce the amount of FeO deposited thereon and to convert any such FeO to Fe_2O_3. The electrofilter is one primarily used to remove pyrophoric dusts, particularly those from carbon-monoxide-containing converter waste gases, in a reducing atmosphere.



3,714,763

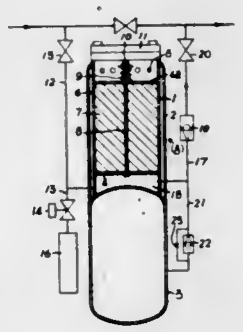
DEHUMIDIFYING DEVICE FOR AN AIR BRAKE

Kenichiro Suzuki, 41, 2-chome Negishi-machi, Kanagawa-ken, Yokohama, Japan

Filed Dec. 30, 1970, Ser. No. 102,637

Int. Cl. B01t *53/04*

U.S. Cl. 55—163 **5 Claims**



A dehumidifying method and device for an air brake by which air passed through a moisture adsorbent material is accumulated in the air brake reservoir for use. A portion of the dehumidified air is retained and passed back through the adsorbent material to the atmosphere, thereby reactivating the adsorbent material for subsequent use.

3,714,764

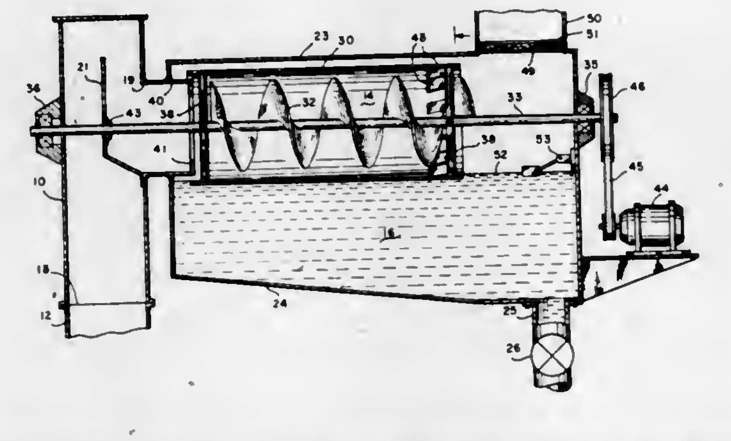
BOILER FLUE GAS SCRUBBER

Frank Gething, Milwaukee, Wis., assignor to Aqua-Chem, Inc., Milwaukee, Ill.

Filed Aug. 14, 1970, Ser. No. 63,685

Int. Cl. B01d *47/10*

U.S. Cl. 55—235 **16 Claims**



Pollution control method and apparatus wherein discharge gas containing pollutants is caused to flow between a revolving helical auger-like member and a simultaneously revolving surrounding drum having a film of pollutant absorbing liquid disposed on its surface and caused to flow counter to the gas and into and out of a sump by means of pump vanes carried by the drum.

3,714,765

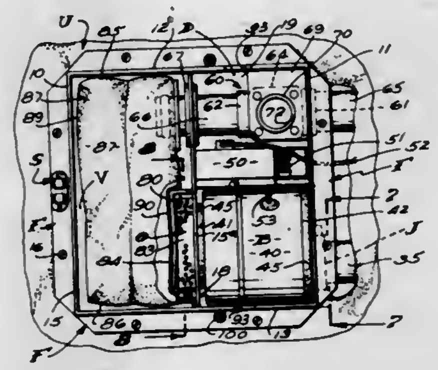
WALL-MOUNTED VACUUM CLEANER

Carl L. Simonelli, Glendora, Calif., assignor to Central Vac International, Inc., Los Angeles, Calif.

Filed Oct. 19, 1970, Ser. No. 81,647

Int. Cl. B01d *46/00*

U.S. Cl. 55—472 **7 Claims**



A central power and collector unit for a wall-mounted, built-in vacuum cleaner comprising a case to be engaged in an opening in a wall structure and defining a power chamber and a collector chamber, said case having a mounting flange about its perimeter to engage and to be fixed to the front surface of the wall structure about said opening therein, said case having inlet and outlet ports in its sides to connect with inlet and exhaust ducts within the wall structure and spaced a distance not less than ¾" or greater than 4⅜" rearward of the flange, said unit having an air inlet tube extending from the power chamber into the collector chamber and an outlet port communicating between the collector chamber and a power driven blower in the power chamber, a filter bag in the collector chamber and having an opening receiving the inlet tube, an air conducting orienting pad in the collector chamber overlying the outlet port and having an air conducting inner surface engaging the bag to hold said bag centrally in its related chamber in spaced relationship from the sides of the chamber and having air conducting sides communicating with the space between the sides of the chamber and bag.

3,714,766

MACHINE FOR COMBINING HAY WINDROWS

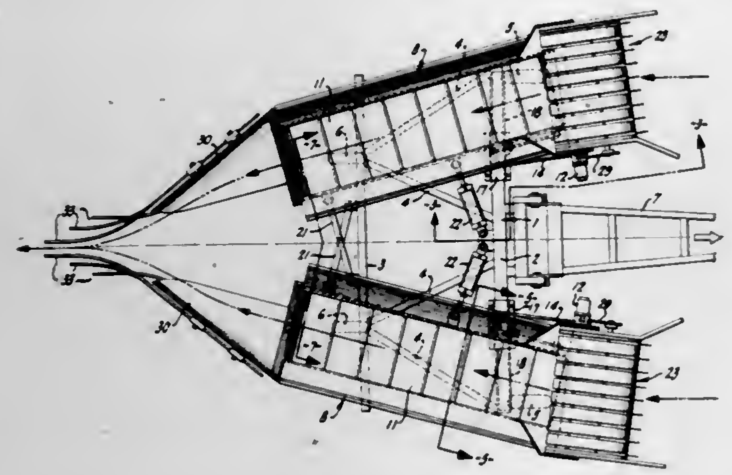
Herman R. Ender, 29516 S. Bird Rd., Tracy, and Neal H. Collins, 40 W. Highway 50, Lathrop, both of Calif.

Filed March 5, 1970, Ser. No. 16,857

Int. Cl. A01d *57/28*

U.S. Cl. 56—364 **2 Claims**

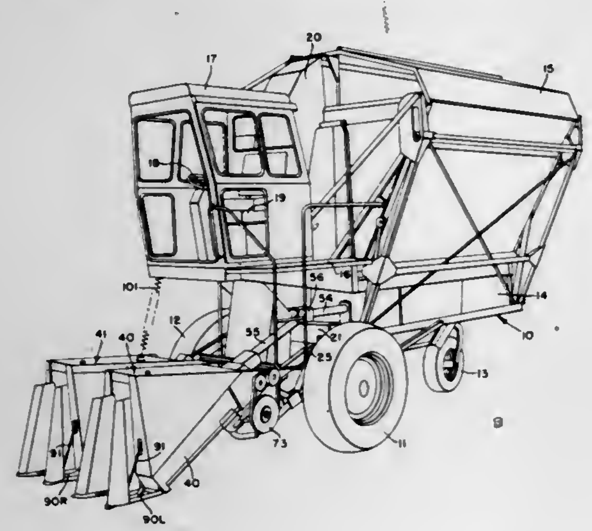
A machine, for combining hay windrows, comprising a low level mobile frame adapted for movement along a field between individual, longitudinally extending, laterally spaced, pre-formed windrows, a pair of driven, laterally spaced, longitudinal conveyors on the frame, and a driven pick-up reel at the front end of each conveyor operative to sweep the corresponding individual pre-formed windrow upwardly and to deposit said windrow on the related conveyor; the conveyors moving such individual windrows in a rearward direction, converging rearwardly, and having their rear ends in relatively closely adjacent relation whereby the individual windrows are discharged from the rear ends of the conveyors onto the ground in a composite, longitudinally extending, double-size, central windrow. Additionally, the conveyors are provided at their rear ends with deflectors which cause an inversion of the individual windrows as the latter discharge from the conveyors to form said composite central windrow.



3,714,767
CROP HARVESTER

Arthur Lowell Hubbard, and Leon Franklin Sanderson, both of Des Moines, Iowa, assignors to Deere & Company, Moline, Ill.

Filed June 9, 1971, Ser. No. 151,424
Int. Cl. A01d *67/00*
U.S. Cl. 56—208 **7 Claims**



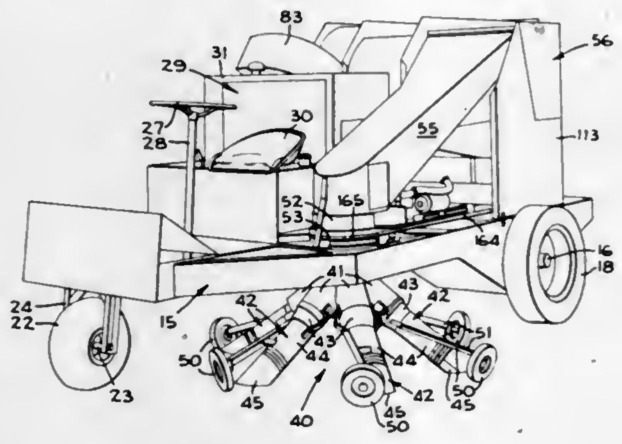
A hydraulically-operated vertical positioning mechanism for a crop harvester that is pivotally mounted on a frame for vertical swinging movement comprising a pair of rigidly-joined and axially-aligned pistons and cylinders that extend between the frame and unit, a ground feeler on the unit operates a valve for one of the pistons and cylinders and a linkage connected to the piston and cylinder and responsive to adjustment of the latter operates a control valve for the other piston and cylinder.

3,714,768
PICKUP AND SEPARATING MACHINE

Joseph M. Patterson, Winter Park, Fla., assignor to FMC Corporation, San Jose, Calif.

Division of Ser. No. 871,316, Nov. 10, 1969, Pat. No. 3,633,738, which is a division of Ser. No. 652,506, July 11, 1967, Pat. No. 3,520,123. This application Aug. 19, 1971, Ser. No. 173,189
Int. Cl. A01d *51/00*
U.S. Cl. 56—328 R **5 Claims**

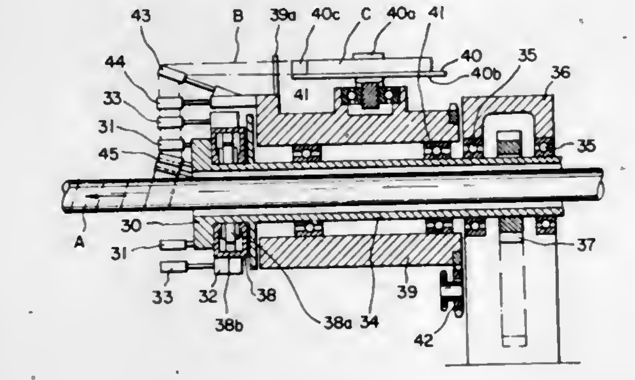
A pickup and separating machine, which moves along the ground, has a rotor with a plurality of suction tubes extending downwardly and outwardly therefrom. The tubes are vertically movable, and the ends thereof, which move in orbital paths, are maintained closely spaced from the ground by gage wheels. A centrifugal blower draws articles and debris through the suction tubes, rotor, and a suction duct. A centrifugal chamber and a vortex chamber between the duct and the blower separates the light debris from the articles and heavy debris, which fall through a rotary vacuum sealing valve to a conveyor. The conveyor has an upper run which moves larger debris in one direction and has a lower run which moves the nuts and small debris on a grate in the opposite direction. The grate passes the small debris, and the nuts are carried from the grate by an elevator to a receptacle.



3,714,769
METHOD AND APPARATUS FOR CONTINUOUSLY WINDING TAPE ONTO ELONGATED BODY

Seiji Tsuchiya, Kyushu, and Minoru Yabuki and Yoshinori Takada, Yokohama, Japan, assignors to The Furukawa Electric Company Limited, Tokyo, Japan

Filed Apr. 23, 1971, Ser. No. 136,915
Claims priority, application Japan, Apr. 25, 1970, 45/35,638
Int. Cl. B65h *81/08;* **H01b** *7/26*
U.S. Cl. 57—3 **9 Claims**

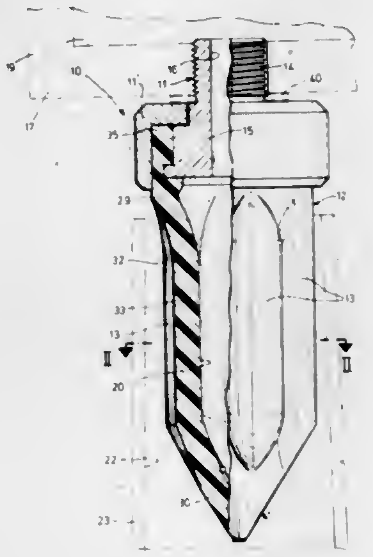


A tape is fed from a tape pad inserted in a tape pad holder through concentrically arranged outer and inner guide discs onto an elongated body. Normally, all of the tape pad holder and outer and inner guide discs are rotated at the same speed to wind the tape onto the elongated body. In case of replacing the tape pad with a new one, a relative speed between the outer and inner guide discs is changed to accumulate the tape onto the outer and inner guide discs and then the tape pad holder only is stopped to replace the tape pad with a new one and connect the front end of the tape from the new pad to the rear end of the tape accumulated around the outer guide disc while continuously rotating the outer and inner guide discs and delivering the accumulated tape onto the elongated body.

3,714,770
INFLATABLE GRIPPER FOR HANDLING SPOOLS OF TEXTILE MACHINES

Ernst Rothke, Schorndorf, Germany, assignor to Zinser-Textilmaschinen Gesellschaft mit beschrankter Haftung, Ebersbach, Germany

Filed Nov. 9, 1970, Ser. No. 87,873
Claims priority, application Germany, Nov. 7, 1969, P 19 56 035.1
Int. Cl. D01h *9/00;* **B66c** *1/46*
U.S. Cl. 57—52 **9 Claims**

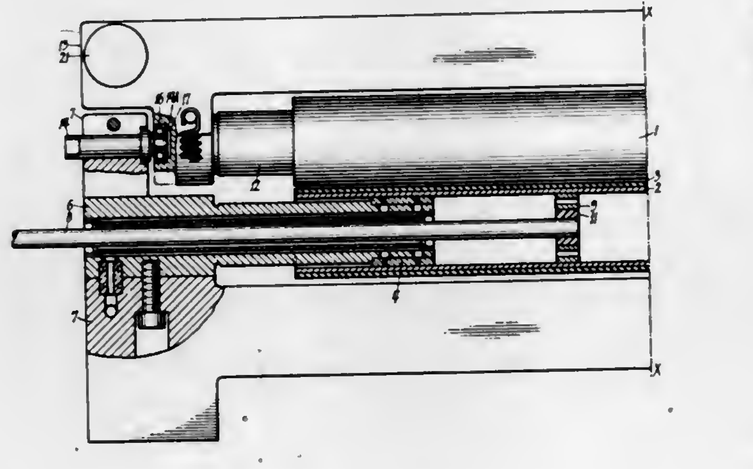


In a mandrel-like gripper assembly for firmly engaging the inner wall of a hollow spool, the inflatable hollow gripper body is formed of an expandable, resilient wall having, in cross section, an undulating, closed configuration.

3,714,771
ROLLER TWISTING APPARATUS

David Ernest Henshaw, Belmont; Werner Emil Otto Knothe, Highton, and Lionel Stern, Kew, all of Victoria, Australia, assignors to Commonwealth Scientific and Industrial Research Organization, Campbell, Australia

Filed Feb. 9, 1971, Ser. No. 114,014
Int. Cl. D01h *7/92;* **D02g** *1/08*
U.S. Cl. 57—77.42 **10 Claims**



Strand twisting apparatus comprising a pair of rollers arranged to form a nip between them and roller drive means to rotate the rollers so as to feed a strand through the nip and to reciprocate the rollers in opposite phase transversely of the strand feed direction. One of said rollers is mounted in a yoke pivotally mounted on the machine frame for movement toward and away from the other roller and biasing means is provided to bias said one roller toward said other roller with a predetermined biasing force.

3,714,772
POLYAMIDE IN COMBINATION WITH POLYCARBONATE, METAL COMPLEX, POLYISOCYANATING AGENT FOR POLYESTER MODIFICATION AND RUBBER TIRE STRUCTURES MADE THEREFROM

Roop S. Bhakuni, Copley, and Joseph L. Cormany, Jr., Akron, both of Ohio, assignors to Goodyear Tire & Rubber Company, Akron, Ohio

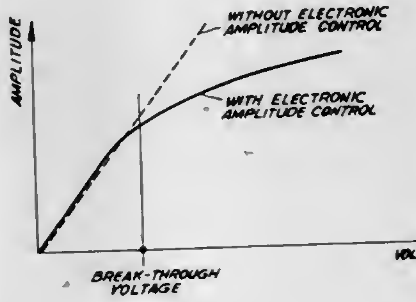
Filed March 22, 1971, Ser. No. 126,964
Int. Cl. B32b *25/08, 27/02, 27/36*
U.S. Cl. 57—153 **8 Claims**

Relates to an improved rubber structure reinforced with an improved polyethylene terephthalate reinforcing fiber modified with a polyamide in combination with a metal complex or this two-component combination in combination with a polycarbonate, or the polyamide in combination with a polycarbonate and a polyisocyanating agent, the modifier being present with the polyester prior to fiber formation.

3,714,773
AMPLITUDE CONTROL MEANS FOR BALANCE WHEEL OSCILLATOR

Gunther Rudolph Diersbock, Waterbury, Conn., assignor to Timex Corporation, Waterbury, Conn.

Filed Nov. 1, 1971, Ser. No. 194,392
Int. Cl. G04c *3/04;* **H02k** *33/02*
U.S. Cl. 58—28 B **5 Claims**



A means for controlling the amplitude of balance wheel oscillators used in timepieces which comprises predetermined semiconductor devices connected in parallel across the driving coil of an oscillator. The semiconductor device which may, for example, comprise a diode is mounted on a coil-carrying balance wheel in a simple and expeditious manner. This arrangement when employed in a timepiece having mechanical contacts also minimizes contact wear.

ERRATUM

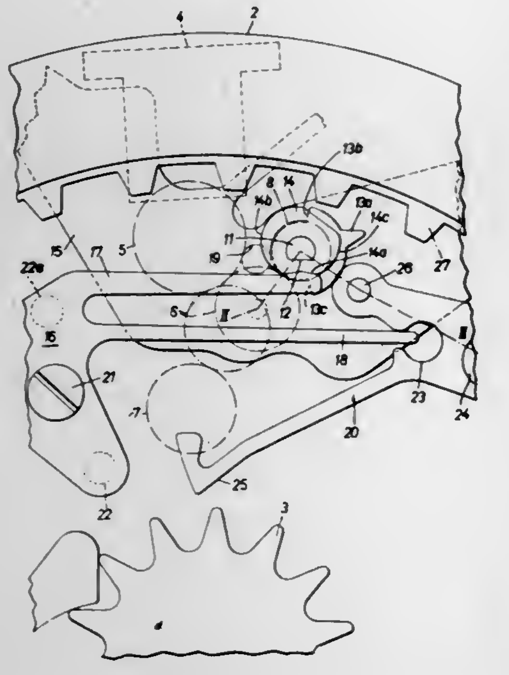
For Class 58—50 R see:
Patent No. 3,714,867

3,714,774
CORRECTION MECHANISM FOR CALENDAR WATCHES

Roland Zaugg, Grenchen, Werner Glanzmann, Bettlach, and Josef Fluck, Grenchen, Switzerland, assignors to A. Schild S.A., Grenchen (Canton of Sollure), Switzerland

Filed Dec. 13, 1971, Ser. No. 207,222
Claims priority, application Switzerland, Dec. 14, 1970, 18,490/70
Int. Cl. G04b *19/24*
U.S. Cl. 58—58 **9 Claims**

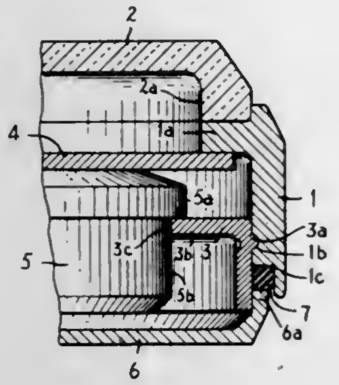
Apparatus is provided for manually correcting the date shown on a calendar watch by an indicating member exposed in an opening in the dial of the watch, the apparatus comprising a correction member having a single rigid radial finger which when pivoted between two positions strikes a tooth of the indicating member and moves it one unit but upon the return pivot to the original position does not move the indicating member.



3,714,775

WATERPROOF WATCH WITH INTERLOCKING CRYSTAL SUPPORT RING AND MOVEMENT SUPPORT RING

Masayoshi Aoki, 8-4, 5-chome, Nishi-Koiwa, Edogawa-ku, Tokyo, Japan
Filed May 25, 1972, Ser. No. 256,686
Claims priority, application Japan, May 27, 1971, 46/43509
Int. Cl. G04b *37/08*
U.S. Cl. 58—90 R **5 Claims**

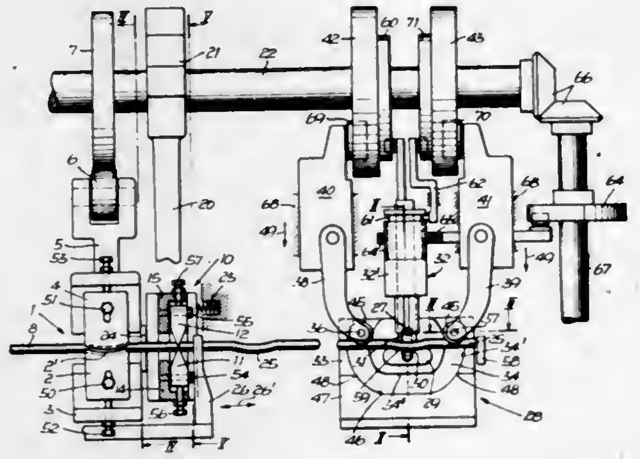


A watch and watch case construction which is dust-proof and moisture-proof. The watch case has an outer ring and an inner ring releasably joined together coaxially. The outer ring has an inner annular flange defining a seat on which the watch crystal rim is seated and a shoulder around this seat to hold the crystal from radial movement. The inner ring has an inner rim on which the watch movement is supported and fixed radially and axially of the inner ring. The two rings jointly define a groove, rectangular in cross section, into which a rim on the back cover extends and compresses a ring gasket, of circular cross section, to effect a moisture-proof and dust-proof seal.

3,714,776

APPARATUS FOR PRODUCING CHAIN LINKS

Gerhard Lange, Reutlingen, Germany, assignor to Wafios Maschinenfabrik Wagner, Ficker & Schmid G.m.b.H., Reutlingen, Germany
Filed May 28, 1971, Ser. No. 147,982
Claims priority, application Germany, June 9, 1970, P 20 28 266.0
Int. Cl. B21l *1/02*
U.S. Cl. 59—23 **12 Claims**

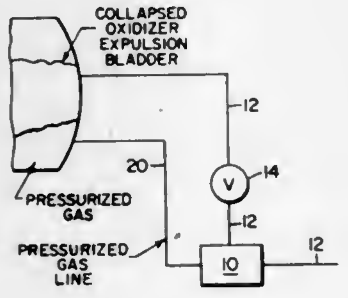


An apparatus for producing one-piece chain links in only two stations. The first of these stations contains a mechanism for severing a pin of a predetermined length from a rod or wire by means of two notching blades which reciprocate in opposite directions to each other within the same plane extending transverse to the axis of the rod. The first station further contains a press closely adjacent to and preceding the severing mechanism for clamping the rod in a fixed position during the severing operation and for bending at the same time the central part of the pin before being severed to provide the link when subsequently bent with a curved back. The second station contains a single bending unit in which the previously severed pin is bent in one continuous operation to its final shape by two bending rollers which roll the pin about a bending mandrel and are connected to guide rollers which roll along guideways so that the bending rollers themselves are indirectly guided and only have to engage with the pin during the bending operation. After a pin has been severed in the first station, it is passed by conveying tongs from this station to the bending unit and into the proper position therein for the bending operation.

3,714,777

PRESSURE DIFFERENTIAL LIMITER

De Lacy F. Ferris, Van Nuys, Calif., assignor to the United States of America as represented by the Secretary of the Navy
Filed July 6, 1970, Ser. No. 56,021
Int. Cl. F02c *3/12*
U.S. Cl. 60—39.48 **4 Claims**



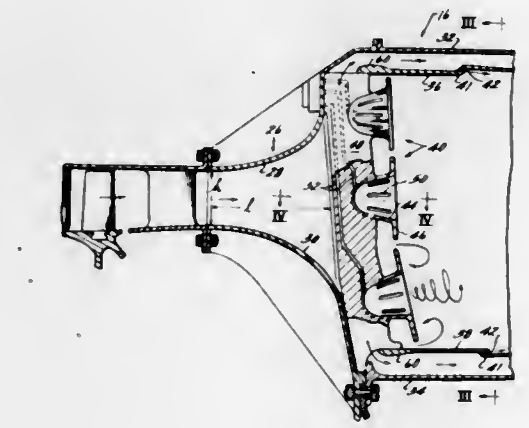
A normally open pressure differential actuated oxidizer flow control valve is located in a liquid propellant system

using a storage tank which employs a pressurized bladder to expell the oxident. This valve has an actuating piston responding to the increased expulsion gas-oxident pressure differential which occurs near completion of a missile firing. It is located in the oxidizer line and responds to such differential pressure increase to sever a shear disc and initially admit expulsion gas pressure to one side of the valve actuating piston. The other side is exposed to oxidizer pressure and, upon creation of sufficient pressure differential across the piston the valve closes to stop oxidizer flow.

3,714,778

ANNULAR COMBUSTOR SYSTEMS

Werner E. Howald, Cincinnati, Ohio, assignor to Angelica Corporation, St. Louis, Mo.
Filed Jan. 2, 1970, Ser. No. 353
Int. Cl. F02g *1/00*
U.S. Cl. 60—39.74 R **6 Claims**



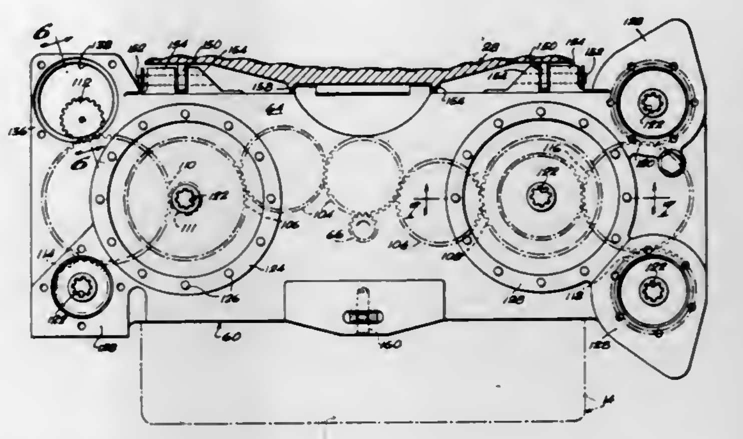
An annular combustor system is illustrated in a gas turbine engine environment. Compressor discharge air is diffused in a short length diffuser into a closely spaced plenum formed by a bluff bodied, annular array of fuel injectors and the upstream ends of liners which define, in part, an annular combustion zone. The compressor discharge air is evenly distributed in the plenum and then passes through and around the fuel injectors to break up the fuel and support its combustion in a short flame front having a uniform temperature distribution. Plenums surround the liners. Air from the diffuser pressurizes these plenums and is then metered by holes in the liners to provide cooling films on the inner surfaces thereof.

3,714,779

GAS TURBINE ENGINE HAVING A HORIZONTAL ACCESSORY GEAR BOX

Wolfgang J. Stein, Milford, Richard Ainsworth, Huntington, and Horst D. Berkner, Stratford, Conn., assignors to Avco Corporation, Stratford, Conn.
Filed Sept. 28, 1970, Ser. No. 76,014
Int. Cl. F02c *7/20*
U.S. Cl. 60—39.31 **12 Claims**

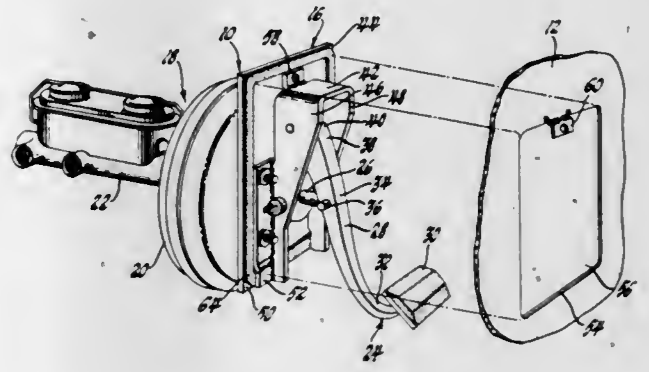
The disclosure illustrates a gas turbine engine providing a high degree of vertical accessibility to the engine and its important components. This accessibility is provided by employing a horiozntally positioned accessory gear box supported underneath the engine and having the accessories mounted on its upper surface. The gear box is supported from the engine housing so that the two components are free to thermally expand relative to one another. Vertically directed intake, exhaust and tangential single can combustor also contribute to the accessibility.



3,714,780

VEHICLE BRAKE CONTROL MODULE AND MOUNTING MEANS

Ronald L. Shellhause, Vandalia, Ohio, assignor to General Motors Corporation, Detroit, Mich.
Filed June 30, 1971, Ser. No. 158,476
Int. Cl. F15b *7/00*
U.S. Cl. 60—54.6 R **5 Claims**



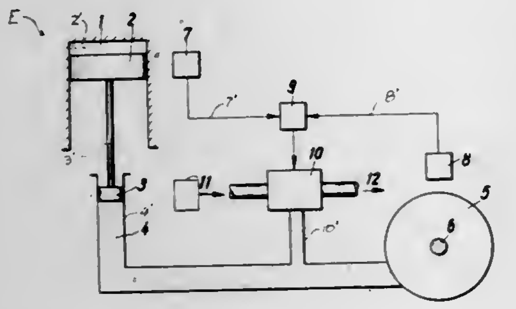
A vehicle brake control module comprising a bracket to which the brake booster and master cylinder are mounted on one side and the brake pedal lever is pivotally mounted on the other side, the pedal lever being connected to operate the booster and master cylinder when the pedal is depressed. The module is adapted to be easily installed through an aperture in a suitable vehicle panel such as the firewall, the bracket closing and sealing the aperture.

3,714,781

DEVICE FOR EXAMINING THE PISTON RINGS IN FREE-FLOATING PISTON ENGINES

Wolfgang Raetiger, Buchkenhofen, Germany, assignor to Grundig, Furth/Bay, Germany
Filed Dec. 8, 1971, Ser. No. 205,905
Claims priority, application Germany, Feb. 4, 1971, P 21 05 114.9
Int. Cl. F15b *7/00*
U.S. Cl. 60—54.5 R **7 Claims**

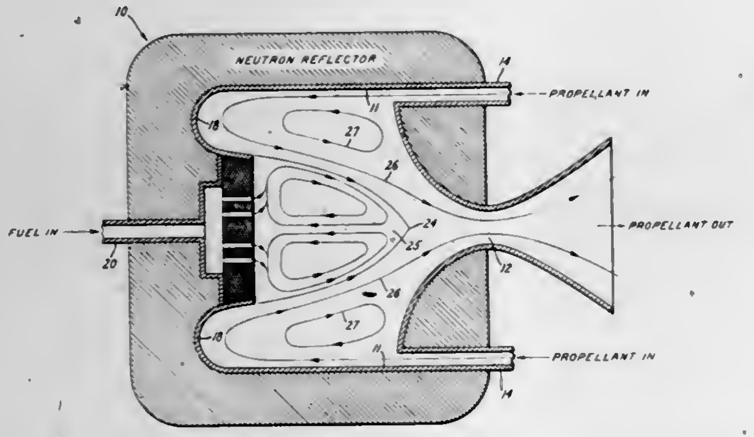
A device is provided for use in examining the piston rings of free-floating piston engines wherein power from the pistons is transmitted to the engine's power output shaft through a hydrostatic motion converter system. The device includes piston detector means associated with each of the pistons in the engine for respectively producing a continuous output signal corresponding to the momentary or instantaneous position of their associated piston. A shaft detector is located adjacent the engine's output shaft and is adapted to produce an output signal corresponding to the momentary or instantaneous angular position of the shaft. Independent comparator means are operatively connected between each of the piston detectors and the shaft detector for comparing the signals produced thereby and generating separate synchronization error signals for each of the pistons. Fluid control means is operatively connected to the comparator means for selectively adding liquid to or removing liquid from the hydrostatic converter system in response to the synchronizing signal so that the synchronization error between the pistons and the shaft is reduced. An adjustable signal generator for selectively producing output signals corresponding to predetermined output shaft positions, is selectively connected to the comparator means by a switch so that when the signal generator is connected to the comparators, the latter generate predetermined synchronization error signals to operate the fluid control means and thereby move the pistons to predetermined positions independently of the actual position of the engine's output shaft.



3,714,782

GASEOUS NUCLEAR ROCKET ENGINE

Sheldon Weinbaum, New York, N.Y., and Robert T. Liner, Jr., Devon, Pa., assignors to General Electric Company
Filed April 15, 1969, Ser. No. 816,269
Int. Cl. G21d *5/02*
U.S. Cl. 60—203 **1 Claim**

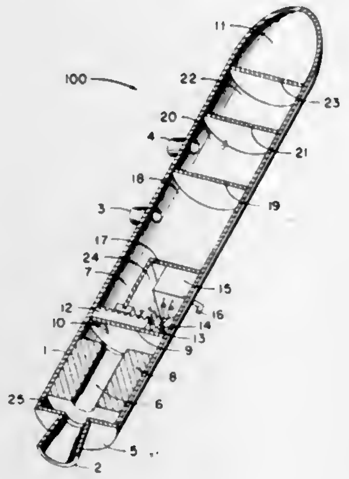


A gaseous nuclear propulsion engine wherein cool propellant gas is introduced around the nozzle at the aft end of the chamber and caused to flow along the chamber's outer wall to the chamber's fore end where it is deflected into a converging annular stream flowing toward the nozzle at the center of the chamber's aft end. Fissionable fuel gas is injected at the center of the fore end and is trapped in a closed space surrounded by the converging annularly flowing propellant gas. The fuel gas is maintained at a very high temperature by nuclear fission. Thermal radiation from the hot fuel gas is absorbed in the propellant gas as it flows toward the nozzle, thus heating the propellant to a high temperature before it exits through the nozzle.

3,714,783

PROPULSION METHOD IN AN INVERSE HYBRID ROCKET MOTOR

Donald Perry Bennet, Jr., Arapahoe, Colo., assignor of a fractional part interest to Martin E. Gerry, Orange County, Calif.
Continuation-in-part of application Ser. No. 787,789, Dec. 30, 1968. This application Nov. 9, 1970, Ser. No. 87,958
Int. Cl. C06d *5/10*
U.S. Cl. 60—207 **9 Claims**

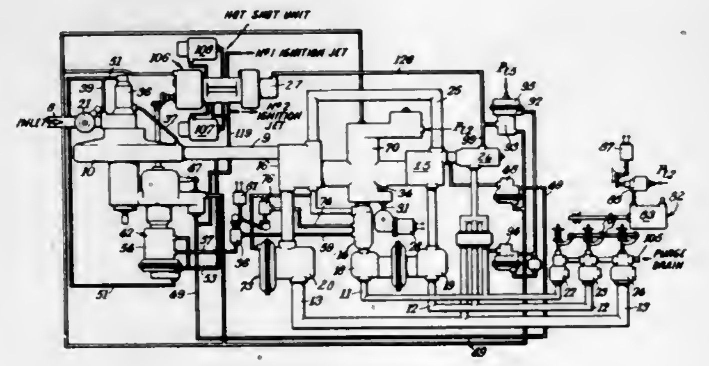


An inverse hybrid rocket motor where a fluid fuel reacts hypergolically in a combustion chamber with a nonfluid oxidizer to produce energy in the form of high temperature gases as reaction products, and means through which the reaction products are ejected to provide power to the rocket. Several unique oxidizers of the permanganate group and chromium trioxide are included. Fuels including hydrazenes and their derivatives, the carbonyl group, the ether group and such fuels as gasoline, diesel fuel and other petroleums and paraffin hydrocarbon derivatives are usable with these oxidizers to produce power.

3,714,784

FUEL SUPPLY SYSTEMS FOR JET AIRCRAFT ENGINES

Stanley G. Glaze, Kingswinford, and Donald Craven, Wolverhampton, both of England, assignors to H. M. Hobson Limited, London, England
Filed Feb. 18, 1971, Ser. No. 116,413
Int. Cl. F02k *3/10;* **F02c** *9/04*
U.S. Cl. 60—241 **9 Claims**

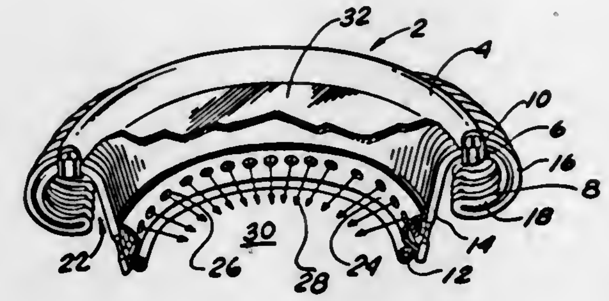


A reheat fuel control system for a jet aircraft engine, which comprises an engine-driven pump arranged to deliver fuel to primary, gutter and collander manifolds through individual primary,gutter and collander flow control valves, a three dimensional cam which is in joint control of the three control valves so as to maintain flows in the three manifolds which are desired functions of engine conditions, and means for controlling the metering pressure across the primary flow control valve as a function of engine speed.

3,714,785

ROCKET ENGINE NOZZLE WITH GAS SPIKE

Sam F. Iacobellis, Woodland Hills, Calif., assignor to North American Rockwell Corporation
Filed Feb. 11, 1966, Ser. No. 526,913
Int. Cl. F02k *9/02*
U.S. Cl. 60—258 **6 Claims**

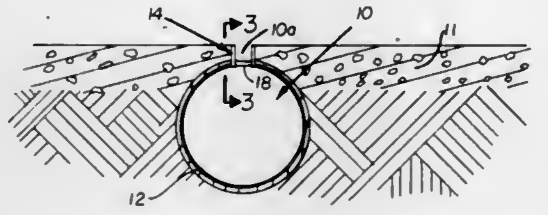


1. In a rocket engine having an annular combustion chamber, an injector and an annular throat, that improvement which comprises;
   an annular nozzle portion, said nozzle portion extending downstream from said throat adjacent the interior portion thereof and converging toward the interior of said rocket engine, said nozzle portion having openings therein,
   whereby gases exiting from said throat will impinge on said nozzle portion with a portion of said gases passing through said openings to the interior of said nozzle portion to increase base pressure on said engine.

3,714,786

DRAINAGE CULVERT

Ralph E. Evans, Middletown, Ohio, and Howard E. Blower, Lafayette, Calif., assignors to Armco Steel Corporation, Middletown, Ohio
Filed Aug. 3, 1970, Ser. No. 60,516
Int. Cl. E02b *11/00*
U.S. Cl. 61—11 **10 Claims**

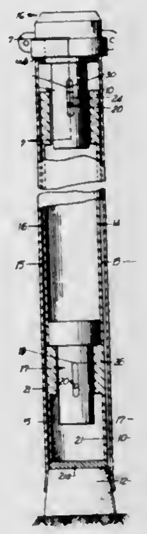


An open slot culvert for positioning in a drainage area with the open slot at the top so that any surface drainage water will flow through the slot and directly into the culvert, including a method and apparatus for its manufacture. The improved open slot culvert comprises a metallic, pipe section, split longitudinally along its upper side to form a narrow slot, and grate means, including two spaced, vertical bearing members joined by spacer means, secured in the slot. The method of making the improved open slot culvert includes the steps of providing two elongated, parallel, vertical members in spaced relation having a plurality of spacer means therebetween, longitudinally splitting the upper side of a metallic pipe section to form a narrow slot, and properly positioning the grate means within the narrow slot. The apparatus for making the improved open slot culvert generally comprises an entry pipe station, a pipe clamp, saw and tack welding station, and a finish welding and exit station.

3,714,787

ENERGY ABSORBING DEVICE FOR THE CONNECTIONS OF A SEGMENTED DRIVE CORE

William C. Clements and William Bootz, Middletown, Ohio, assignors to Armco Steel Corporation, Middletown, Ohio
Filed May 3, 1971, Ser. No. 139,365
Int. Cl. E02d *7/30, 5/34*
U.S. Cl. 61—53.7 **10 Claims**

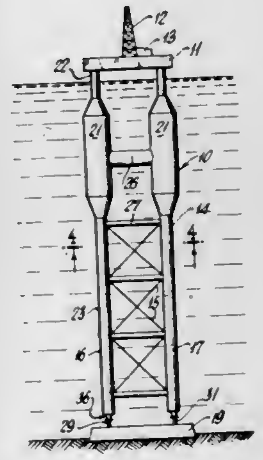


An energy absorbing device for the connections of a segmented drive core to decelerate each lower segment by absorbing the drive core inertia and downward momentum of such lower segments.

3,714,788

PLATFORM BUOYANT UNDERSTRUCTURE

George E. Mott, Metairie, La., assignor to Texaco Inc., New York, N.Y.
Filed April 30, 1970, Ser. No. 33,407
Int. Cl. B63b *21/50;* **E02b** *17/00*
U.S. Cl. 61—46.5 **1 Claim**



The invention relates to a floatable understructure for a marine platform or deck located in an offshore body of water. The understructure includes an elongated rigid column unit incorporating buoyancy means so disposed to permit the attitude of the structure to be controlled. In the operating position, one end of the understructure is operably connected to an anchor resting on the ocean floor. The structure other end is buoyed up such that the unit assumes a generally upright disposition in the body of water with a portion protruding beyond the water's surface to support the working deck or platform.

3,714,789

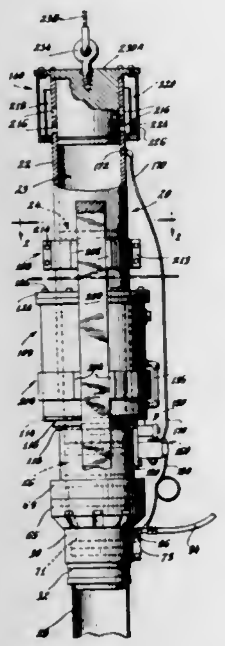
AUTOMATICALLY SELF-REGULATING VARIABLE-STROKE, VARIABLE-RATE AND QUIET-OPERATING PILE DRIVER METHOD AND SYSTEM

Stephen V. Chelminski, West Redding, Conn., assignor to Bolt Associates, Inc., Norwalk, Conn.

Filed Dec. 29, 1970, Ser. No. 102,325

Int. Cl. E02d *7/02*

U.S. Cl. 61—53.5 **17 Claims**



Automatically self-regulating variable-stroke, variable-rate and quiet-operating pile driver method and system are disclosed in which a massive piston weight is bounced upon a cushion of pressure fluid, the pile driver advantageously being adapted for operation in four different modes: (1) only double-acting, (2) single-acting automatically converting to double-acting at maximum stroke travel, (3) only single-acting, (4) pre-stressing plus impacting plus thrusting mode, and (5) pile extraction mode. The prolonged downward push resulting from the pressurized fluid-cushioned bouncing action is more effective than the conventional sharp hammer-type blow resulting from impact of one solid mass against another. When the pile being driven encounters softer strata in the earth, in the single-acting mode, the stroke of the piston weight automatically shortens while the number of bounces per minute automatically increase thus increasing the rate of the quiet powerful bounce thrusts for driving the pile faster, and when harder strata are encountered, the piston weight automatically bounces higher providing a longer stroke with fewer bounces per minute, thus increasing the force of each quiet powerful thrust for overcoming the increased impedance being encountered. In the double-acting mode, when harder strata are encountered, the velocity and stroke length of the piston weight increase automatically to deliver more powerful thrusts. A relatively large number of driving thrusts per minute can be provided in the double-acting mode by changing the head plug mass to shorten the maximum stroke length to increase the frequency of thrusts per minute. By virtue of the pressure fluid bouncing action imparted to the massive piston weight, the noise of metal-to-metal contact blows can be avoided, and in addition a muffler housing surrounding the ports through which the expanded pressure fluid is released muffles the sound of the flow of the fluid, such as air or steam; this muffler also serving to separate lubricating oil from the released fluid. A cylinder bottom assembly below the bounce chamber is coupled to the pile being driven to transmit the quiet powerful bounce thrusts to the pile, moving in accordance with the pile motion, and a driving fluid storage chamber and valve mechanism associated with this assembly control the flow of the pressure fluid in an automatically self-regulating manner to seek the most effective driving action from moment-to-moment as the pile encounters different strata. If desired, the bouncing action of the cushion of pressure fluid can be altered to permit the piston weight to strike bottom slightly to provide the driving mode (4) above. A self-contained lubrication system may be actuated by the pressure impulses in the bounce chamber.

3,714,790

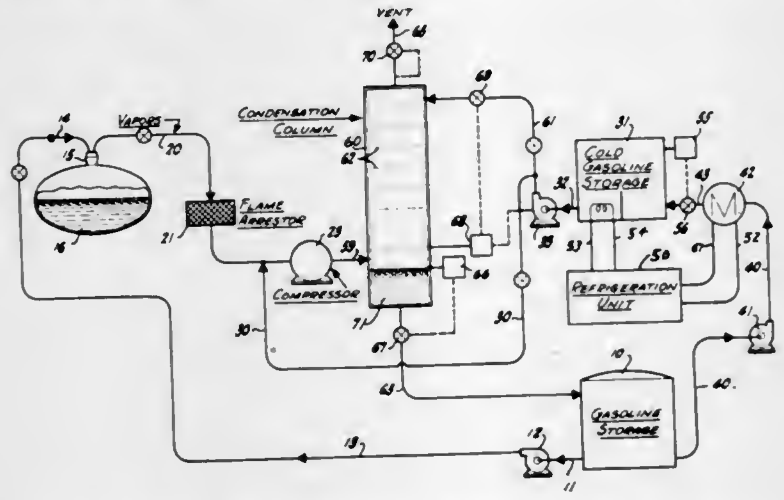
APPARATUS AND METHOD FOR HANDLING VOLATILE LIQUIDS

Robert F. Battey, Upland, Calif., assignor to FMC Corporation, San Jose, Calif.

Filed April 13, 1971, Ser. No. 133,638

Int. Cl. F17c *13/00*

U.S. Cl. 62—54 **7 Claims**



Hydrocarbon vapors normally released to the atmosphere during the filling of tanks with a relatively volatile liquid are condensed out and recovered as liquid by simultaneously compressing the vapors and saturating the same with vapors of the liquid, followed by a step wherein the compressor effluent is contacted under elevated pressures in a condensation column with a refrigerated stream of the volatile liquid. Said stream is supplied from a relatively small holding tank which is refrigerated and maintained at a relatively constant volume by addition of fresh quantities of the liquid as required.

3,714,791

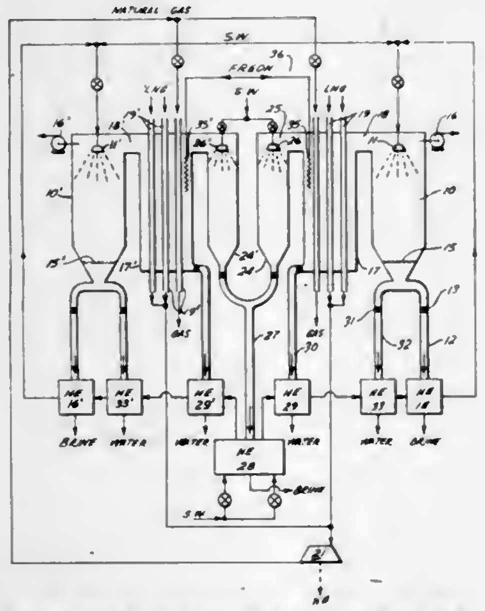
VAPOR FREEZING TYPE DESALINATION METHOD AND APPARATUS

Ralph E. Peck, Chicago, Ill., assignor to Pacific Lighting Service Company, Los Angeles, Calif.

Filed Feb. 25, 1971, Ser. No. 118,669

Int. Cl. B01d *9/04*

U.S. Cl. 62—58 **13 Claims**



A batch evaporative desalination method and apparatus having a pair of similar systems for substantially continuous output is described. Each system has three evacuated chambers in vapor communication with each other. In the first chamber, precooled seawater is sprayed for partial vaporization and consequent formation of ice crystals as latent heat is removed from the seawater. Ice crystals are permitted to accumulate in the first chamber and water vapor flows to a second chamber in which refrigeration coils, preferably cooled by cold natural gas, are maintained at a temperature below the triple point so that ice condenses thereon. After a selected interval, spraying of precooled seawater into the first chamber and refrigeration in the second chamber are stopped. Warmer seawater is then sprayed into a third chamber also maintained at low pressure so that a portion of the water vaporizes but without formation of ice in the brine. The water vapor flows to the first and second chambers and condenses on the ice therein to transfer latent heat for melting the ice. Fresh water is withdrawn from the second chamber. Fresh water in the first chamber percolates through the ice crystals for washing and when residual brine is removed, fresh water is withdrawn from this chamber also. In a preferred embodiment, natural gas refrigerant is expanded through a turbine for producing shaft horsepower for pumping seawater. The apparatus is arranged with hydraulic legs beneath the first and third chambers at a height at least equal to the head of water at one atmosphere pressure for maintaining low pressure in the three chambers. In a preferred arrangement, a reversible refrigeration loop may be provided between a pair of second chambers for reversibly transferring heat therebetween.

3,714,792

FREEZING AND MELTING TREATMENT OF RED MUD SLURRIES TO AID SOLID SEPARATION

James M. Murphy, Oakland, and Perce W. Bolmer, Danville, both of Calif., assignors to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.

Filed Aug. 19, 1971, Ser. No. 173,226

Int. Cl. B01j *13/00;* **B01d** *9/02*

U.S. Cl. 62—58 **10 Claims**

Red mud slurries, resulting from the alkaline digestion of bauxite and consisting of finely divided red mud particles dispersed in an aqueous medium, are subjected to a freeze-thaw treatment to enhance the settling properties and the filterability of the dispersed particles. Lowering the temperature of the slurry to a temperature required to freeze at least a portion of the aqueous medium, followed by thawing, was found to impart significantly accelerated settling and filtration rates.

3,714,793

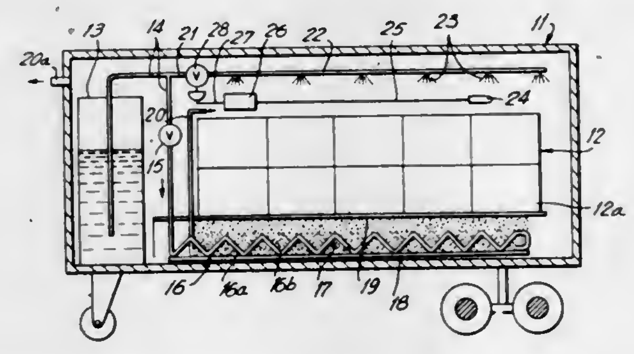
INTRANSIT LIQUEFIED GAS REFRIGERATION SYSTEM

Lester Hurt Eigenbrod, Grand Island, N.Y., assignor to Union Carbide Corporation, New York, N.Y.

Continuation of Ser. No. 777,643, Nov. 21, 1968, abandoned. This application Jan. 18, 1971, Ser. No. 107,541

Int. Cl. B60h *3/04;* **F25b** *19/00;* **F17c** *7/02*

U.S. Cl. 62—62 **16 Claims**



A liquefied gas vaporizer is provided in the bottom portion of the freeze-sensitive product storage chamber with thermal insulation around the liquid vaporizing conduit and thermally conductive metal floor means contiguously associated with and in heat transfer relation to the thermal insulation.

3,714,794

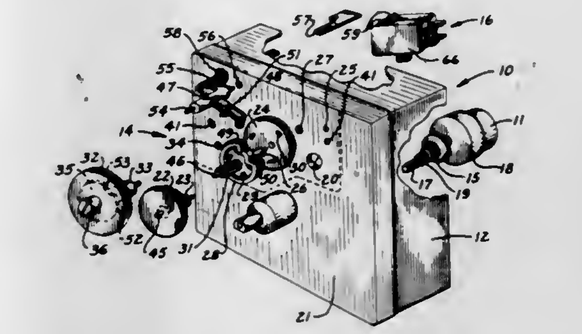
DRIVE MOTOR-DEFROST TIMER FOR REFRIGERATOR

William J. Linstromberg and Duane C. Nichols, Evansville, Ind., assignors to Whirlpool Corporation

Continuation of abandoned application Ser. No. 46,921, June 17, 1970. This application Feb. 4, 1972, Ser. No. 223,716

Int. Cl. F25c *1/10*

U.S. Cl. 62—137 **14 Claims**



A timer for controlling the defrost operation of a refrigeration apparatus. The refrigeration apparatus includes an ice body maker having a drive motor. The ice maker drive motor is utilized also to drive the defrost timer. The control permits the ice maker motor to operate continuously while discontinuing ice body production such as when the ice harvesting container is full.

3,714,795

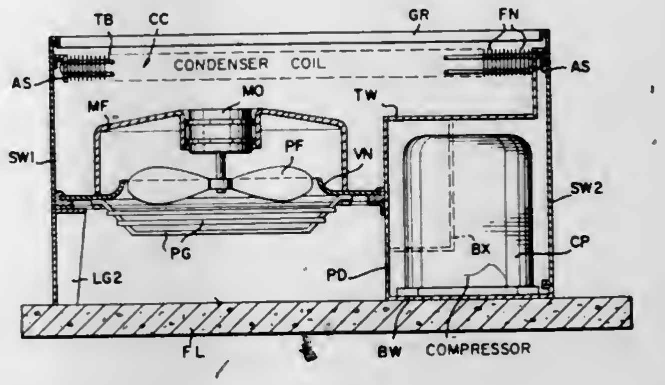
OUTDOOR REFRIGERANT APPARATUS

Andrew J. Fowell, Martinsville, N.J., and George R. Knebusch, North Olmsted, Ohio, assignors to The Tappan Company, Mansfield, Ohio

Filed March 31, 1970, Ser. No. 24,245

Int. Cl. F25b *39/04*

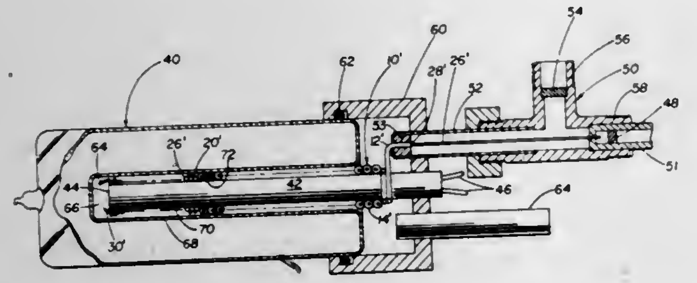
U.S. Cl. 62—508 **15 Claims**



Covers an outdoor refrigerant condenser-compressor unit operating at a low noise level. The unit consists of an upright housing in which a motor-driven fan having its blades in a relatively horizontal position transmits air under pressure directed upwardly, and a tubular condenser coil is mounted above the blades of the fan so that the air delivered by the fan will flow through the coil and cool and condense the hot refrigerant vapor supplied by the compressor as part of a cooling system. The compressor may be physically positioned adjacent to the fan within the same general housing, but the compressor may occupy a separate ventilated space adjacent to the fan structure. The condenser coil is arranged to substantially occupy the whole top space of the housing unit, or most of that space, in any case positioned well above the blades of the fan. The fan is thus concealed and inaccessible to fingers, pebbles and other impediments. The fan is operated at increased efficiency because relatively cool air is delivered thereto from the ground level.

3,714,796
CRYOGENIC REFRIGERATION SYSTEM WITH DUAL CIRCUIT HEAT EXCHANGER

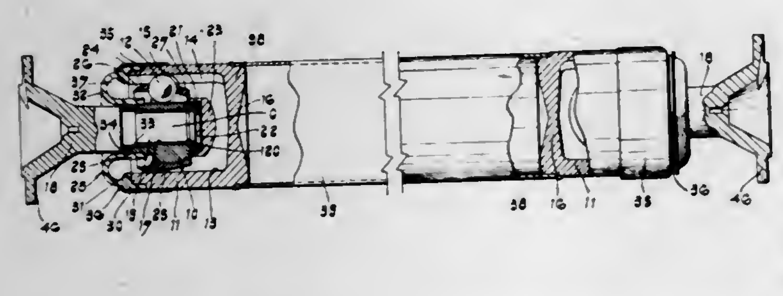
Ralph C. Longsworth, Allentown, Pa., assignor to Air Products and Chemicals, Inc., Allentown, Pa.
Filed July 30, 1970, Ser. No. 59,478
Int. Cl. F25b *19/00*
U.S. Cl. 62—514 **3 Claims**



Disclosed is a miniature cryogenic refrigeration system employing a dual circuit heat exchanger to effect rapid cooldown of the system. The heat exchanger is characterized in that the cooldown circuit is disposed within the run or steady state circuit with both circuits employing the same high pressure gas as the refrigerant.

3,714,797
UNIVERSAL JOINTS

Leslie George Fisher, Birmingham, England, assignor to GKN Birfield Transmissions Limited, Birmingham, England
Filed Dec. 11, 1970, Ser. No. 97,381
Claims priority, application Great Britain, Dec. 11, 1969, 60,435/69, 60,436/69
Int. Cl. F16d *3/16*
U.S. Cl. 64—8 **11 Claims**

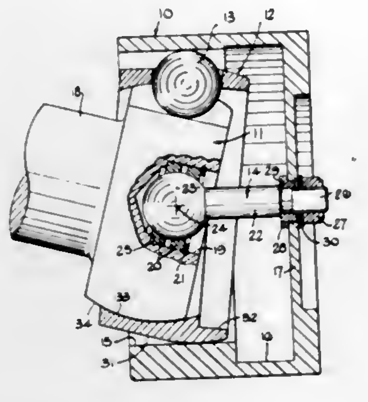


A plunging constant velocity universal joint includes an inner member and an outer member with torque-transmitting balls therebetween and sealing means acts between the inner and outer members of the joint such that a lubricant-tight enclosure is defined around the balls and the sealing means includes a part which acts as a stop to limit plunging movement in one direction.

3,714,798
CONSTANT VELOCITY UNIVERSAL JOINTS

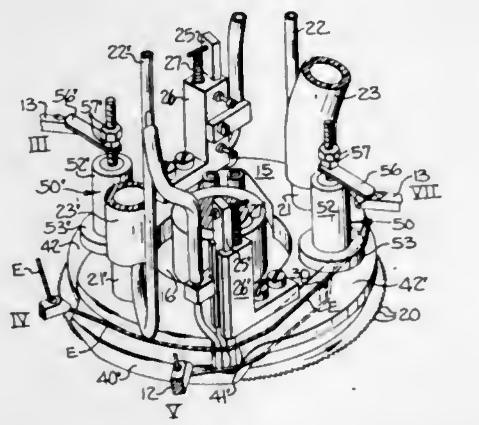
Jerzy Witold Macielinski, Warwick, England, assignor to GKN Birfield Transmissions Limited, Birmingham, England
Filed Feb. 17, 1971, Ser. No. 115,980
Claims priority, application Great Britain, Feb. 28, 1970, 9,763/70
Int. Cl. F16d *3/30*
U.S. Cl. 64—21 **5 Claims**

A constant velocity universal joint includes a restraining means in the form of a ball and socket connection between the inner member and the outer member of the joint. The inner member of the joint is free to move angularly relative to the outer member but is fixed against relative axial movement by said ball and socket connection.



3,714,799
YARN CONTROL APPARATUS AND METHOD FOR CIRCULAR HOSIERY KNITTING MACHINES

Clarence W. Minton, Nashville, Tenn., assignor to Americal Corporation, Henderson, N.C.
Filed Dec. 28, 1970, Ser. No. 101,484
Int. Cl. D04b *15/61*
U.S. Cl. 66—140 S **4 Claims**

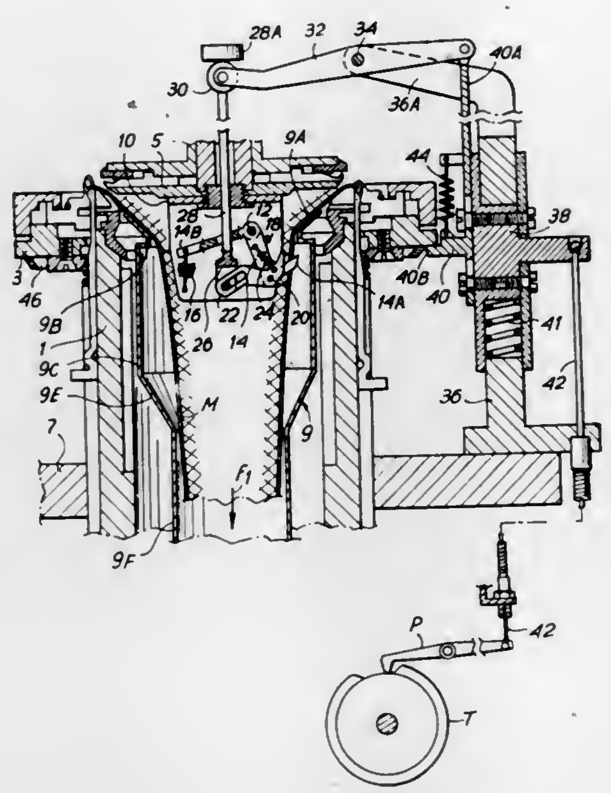


The present yarn control apparatus is adapted for use with circular multi-feed hosiery knitting machines of the type having a pair of diametrically opposed yarn cutters and pneumatic yarn holding means associated with each cutter. The control apparatus acts on a yarn withdrawn from active position at a yarn feeding station in advance of one of the cutters for preventing engagement of this yarn with this cutter and for directing the yarn into engagement with the next cutter so that the free leading end of the yarn severed by the second cutter has sufficient length that it will be reliably held by the pneumatic yarn holding means. Mechanical clamping means is also provided for holding a severed elastic yarn until it has been drawn into the pneumatic yarn holding means.

3,714,800
SHEARING DEVICE FOR CIRCULAR KNITTING MACHINES

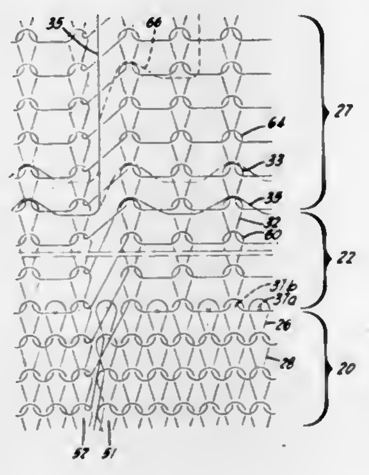
Aramis Mazzi, Florence, Italy, assignor to Solis S.r.l., Tavarmuzze, Florence, Italy
Filed Aug. 5, 1969, Ser. No. 847,615
Claims priority, application Italy, Aug. 14, 1968, 841,972/68
Int. Cl. D04b *35/00*
U.S. Cl. 66—147 **6 Claims**

To produce a longitudinal cut in knit fabric during the knitting thereof on a circular knitting machine, a shearing device in the form of scissors or an electrical resistance is disposed within the needle cylinder of the machine. The shearing device is movable between an operative position in which the fabric is cut and an inoperative position.



3,714,801
STOCKING AND METHOD OF MAKING SAME

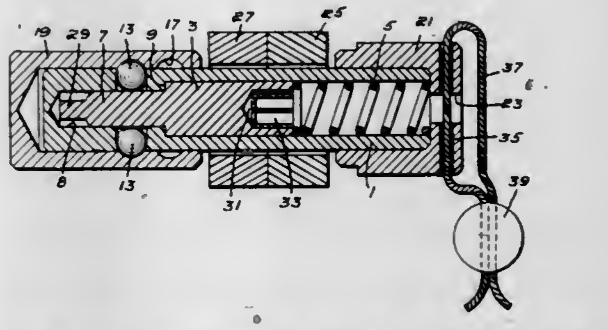
Richard M. Janda, Crestwood, Pa., assignor to North American Rockwell Corporation, Pittsburgh, Pa.
Filed Nov. 29, 1968, Ser. No. 779,733
Int. Cl. D04b *9/56*
U.S. Cl. 66—170 **8 Claims**



Knitted tubular stocking and methods of fabricating the same, said stocking having welt, leg and foot portions and a tubular double ply toe portion with a draw yarn interlaced with the stitches of courses defining the outer end of the double ply toe portion, the draw yarn acting when partially withdrawn from the courses to gather the stitches thereof into a tight bunch to close the outer end of the toe.

3,714,802
LOCKING BOLTS FOR SHUT-OFF VALVES AND SWITCHES

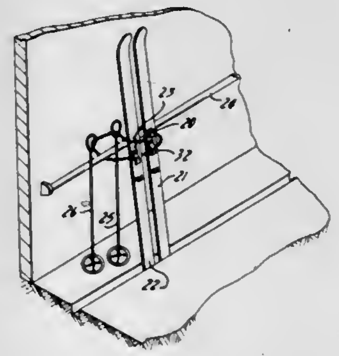
Lynn H. Morse, P.O. Box 1505, Venice, Fla. 33595, and Anker J. Nielsen, Jr., 410 Bailey Road, Holden, Mass. 01520
Filed May 12, 1971, Ser. No. 142,462
Int. Cl. E05b *67/36*
U.S. Cl. 70—34 **7 Claims**



In a locking bolt for shut-off valves, switches, meters, and other supply-controlling devices, such bolt being actuated by an inner spring-biased plunger having an axial recess and accessible only through an aperture in the bolt smaller than the diameter of the recess, the novel provision of a slidable sleeve or liner in such recess which must be expanded into tight frictional engagement with the walls of the recess in order to retract the plunger to unlock the bolt. Sealing means preventing access to the interior of the locking bolt without rupture is provided. The lock is also adapted to fix a cover on a meter casing or other enclosure, to prevent unauthorized access thereto; or to prevent removal of the meter itself.

3,714,803
SKI LOCK

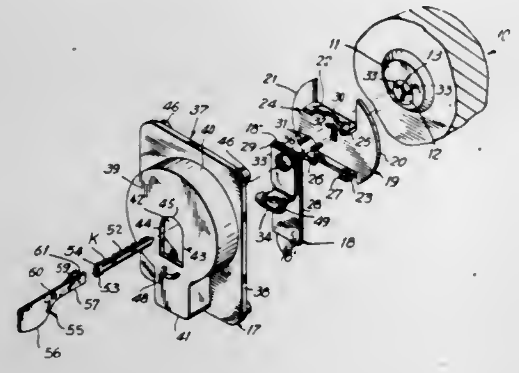
Norman Chenenko, 3911 Greentree Drive, Oceanside, N.Y.
Filed Nov. 27, 1970, Ser. No. 93,220
Int. Cl. E05b *73/00*
U.S. Cl. 70—58 **1 Claim**



A ski lock adapted to be mounted on one of a pair of skis and being normally in the unlocked position and adapted to be altered to a locked condition whereby the pair of skis is affixed to a support. Retractable means are mounted in a housing and are adapted to be partially extended through an opening in the housing. A two-piece fastener is provided with one part of the fastener on the exterior of the housing and the other part of the fastener connected to the retractable means. There are means in the housing to facilitate the extension and retraction of the retractable means which is attachable to the support and the other ski with the two-part fastener in locked engagement thereby locking the skis to the support to minimize the danger of the skis being stolen until it is desirable to utilize the skis whereupon the parts of the fastener are unlocked and disengaged.

3,714,804
SHUTTER STRUCTURE

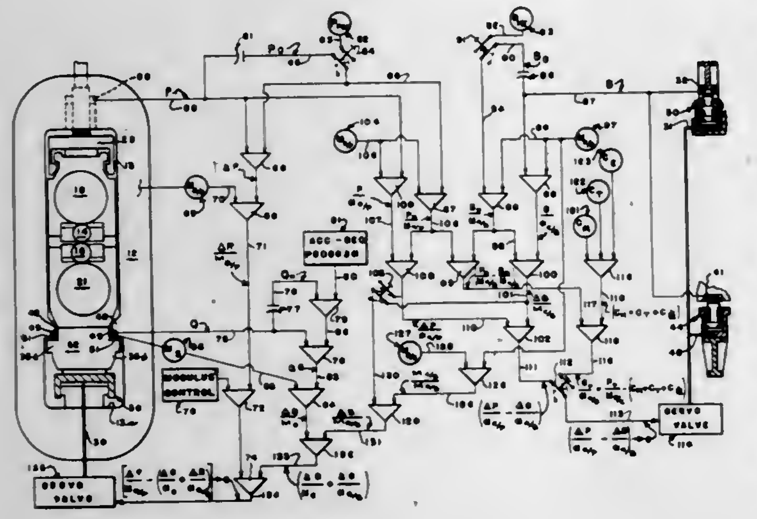
Walter K. French, Montrose, N.Y., assignor to Richard William Cameron, New York, N.Y.
Filed Nov. 4, 1971, Ser. No. 195,606
Int. Cl. E05b *17/14, 19/00*
U.S. Cl. 70—419 **9 Claims**



Apparatus for increasing the security of existing door lock installations by rendering the same impervious to picking. The apparatus includes an armored cover plate and shutter mechanism adapted to prevent the effective application of picking torques to the lock plug, and includes novel key means and an operator thereon, and an auxiliary locking provision which bars operation of the lock even by persons having a properly fitting key.

3,714,805
CONTROL SYSTEM AND METHOD FOR CONCURRENT AUTOMATIC GAGE AND CROWN CONTROL OF A ROLLING MILL

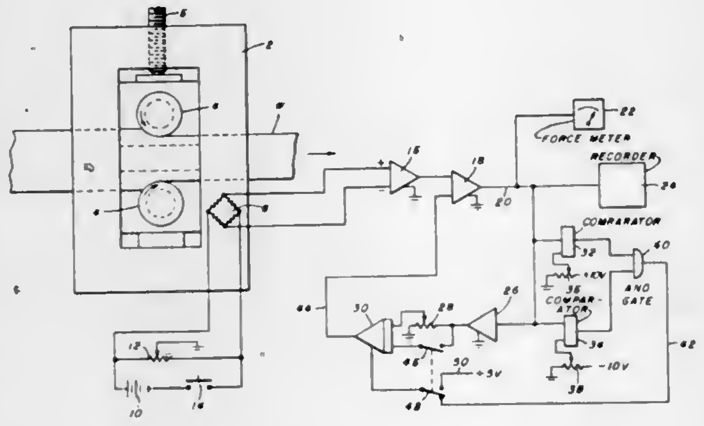
Morris Denor Stone, Pittsburgh, Pa., assignor to Wean United, Inc., Pittsburgh, Pa.
Filed Nov. 11, 1971, Ser. No. 197,715
Int. Cl. B21b *37/08*
U.S. Cl. 72—8 **20 Claims**



A control system and method for concurrently controlling the delivery gage and crown of a workpiece while it is being processed in a rolling mill, preferably in the form of a 4-high rolling mill including a piston and cylinder assembly type of force applicator for adjusting the gap formed between the working rolls under the rolling load. The rolling mill further includes roll bending apparatus whereby bending forces are applied to extended journals of the backup rolls for changing the effective roll crown at the roll gap. The control system provides an automatic control designed to concurrently maintain a relationship between signals generated on the basis of rolling mill measurements to control the force applicator and the roll bending device. This concurrent relationship of signals equates a position change of the force applicator with the algebraic sum of signals representing roll gap changes due to a change in the rolling load and due to a change in the roll bending force, while concurrently the change in roll crown due to a change in roll bending force is equated to a rolling load change. The control system includes additional circuitry for an alternate form of concurrent gage and crown control.

3,714,806
DRIFT CORRECTOR FOR TRANSDUCERS

Earl R. Berkey, Franklin Twsp., Westmoreland County, and Everett L. Keener, Monroeville Borough, both of Pa., assignors to United States Steel Corporation
Filed Aug. 20, 1971, Ser. No. 173,436
Int. Cl. B21b *37/08*
U.S. Cl. 72—19 **14 Claims**

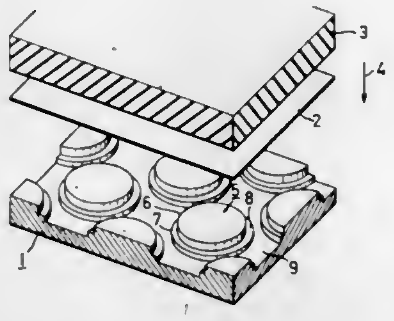


Apparatus for measuring the roll separating force produced by a workpiece includes a strain gage bridge, and an amplifier having a first input connected to the output of the bridge, a second input and an output. A first circuit including a polarity reversal means and an integrator connected in series is arranged between the output and second input of the amplifier. The integrator has an input connected to the output of the amplifier, an output connected to the second input of the amplifier, and a control connection. A second circuit between the control connection and the first circuit on the input side of the integrator includes switch means operable when there is no workpiece in the mill to provide a signal to the control connection to cause the integrator to be in its operative mode and operable when there is a workpiece in the mill to provide a signal to the control connection to cause the integrator to be in its hold mode. This provides a signal to the amplifier from the integrator which is equal and opposite to the voltage from the bridge when there is no workpiece in the mill which voltage remains constant when the workpiece is in the mill. Thus, a true reading of the roll separation force is obtained regardless of the amount of drift present.

3,714,807
PROCESS OF MAKING A CUTTER FOIL FOR DRY SHAVING APPARATUS

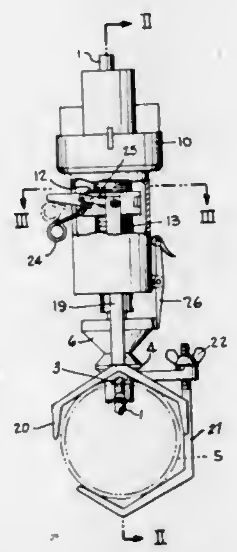
Sigrot Gronberger, Klagenfurt, Austria, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Sept. 23, 1970, Ser. No. 74,632
Claims priority, application Austria, Sept. 25, 1969, A 9,089/69
Int. Cl. B21d *28/18*
U.S. Cl. 72—55 **8 Claims**

A process of making a cutter foil for dry shaving apparatus, using a rubber cushion, and a die having raised parts each of which decreases in cross section from a base to a free end, and consists of two superimposed portions between which is a step-like offset, the end portion having a height at least equal to the thickness of the foil; the process comprising a single operation of pressing the die and the cushion together with the foil between them, which causes the end portion of each raised part to punch a hole in the foil, as a first step, and directly thereafter causes the base portion to turn over the edge of the hole, as a second step; followed by removing part only of the turned-over material by grinding in a plane parallel to the surface of the foil.



3,714,808
MEANS FOR FORMING A HOLE IN A TUBE OR PIPE WALL AND DEFORMING THE EDGE OF THE HOLE INTO AN UPSTANDING FLANGE

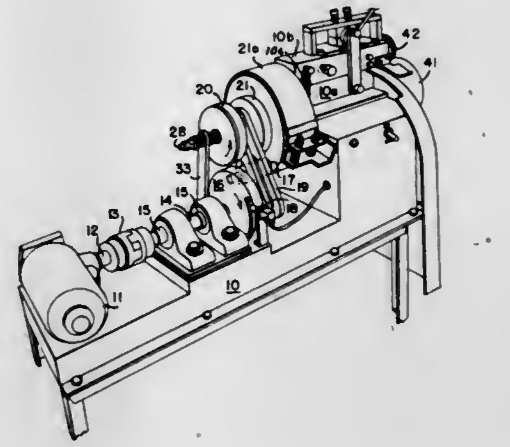
Leo Larikka, IV Linja 17–19 B 3, Helsinki, Finland
Continuation-in-part of application Ser. No. 744,087, July 11, 1968, now Patent No. 3,592,038. This application Mar. 17, 1971, Ser. No. 125,035
Int. Cl. B21d *31/02, 53/00*
U.S. Cl. 72—325 **5 Claims**



A tool for forming a hole and a surrounding upstanding flange for the wall of a tube into which flange a branch pipe is adapted to be attached in which a drill is provided with at least two components which, after drilling of the hole, can be extended under the edge of the hole whereby, upon withdrawal of the drill, the components form a projecting flange at the edge of the hole. For forming the flange and particularly for returning the drill, means are employed to obtain an appropriate number of revolutions and return feeding as well as a support for the work piece or the tube.

3,714,809
ROTARY STAMPING MACHINE

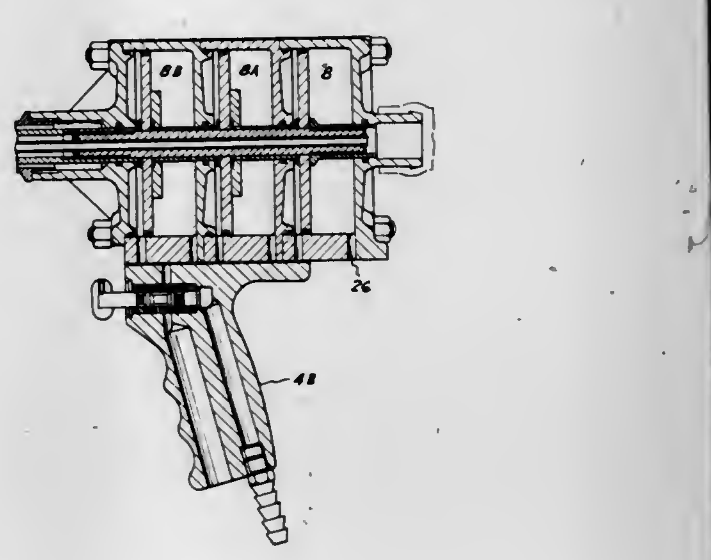
Tony E. Lewis, Campbell, Calif., and George Rodriguez, 1292 McBair Ave., Campbell, Calif. 95008; said Lewis assignor to said Rodriguez
Filed Jan. 14, 1971, Ser. No. 106,447
Int. Cl. B21d *31/02;* **B21j** *13/10*
U.S. Cl. 72—326 **5 Claims**



A rotary stamping machine for cutting tongues in sheet metal and bending the tongues to extend at an angle to the sheet metal body. The sheet metal is clamped between rotatable driving means and is advanced step by step, after the sheet metal is advanced a step it is stationary during the tongue cutting interval. After the tongue is cut and bent the cutting means is shifted to clear the sheet metal and the sheet metal is advanced another step. Thereafter the cutting and bending operations are repeated.

3,714,810
BLIND RIVET PULLING TOOL

Clive Reginald Boyd, Artarmon, New South Wales, Australia, assignor to Spurway's Industries Pty. Limited, Alexandria, New South Wales, Australia
Filed Dec. 3, 1970, Ser. No. 94,796
Claims priority, application Australia, Dec. 23, 1969, 65680
Int. Cl. B21j *15/20*
U.S. Cl. 72—391 **1 Claim**

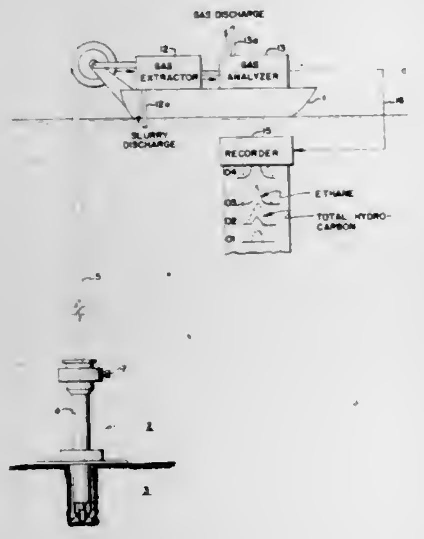


An improved fluid operated rivet pulling tool for forming a head on the far side of the work. The tool is adaptable to use on a variety of rivet sizes with minor addition or interchange of parts such as an additional piston and associated cylinder block with ports.

3,714,811
MARINE MUD HYDROCARBON SURVEYING

Edwin E. Daigle; Robert R. Luke; James B. Turner, and Harold L. Wise, all of Houston, Tex., assignors to Shell Oil Company, New York, N.Y.

Filed June 22, 1970, Ser. No. 48,366
Int. Cl. G01n *7/00*
U.S. Cl. 73—19 **8 Claims**

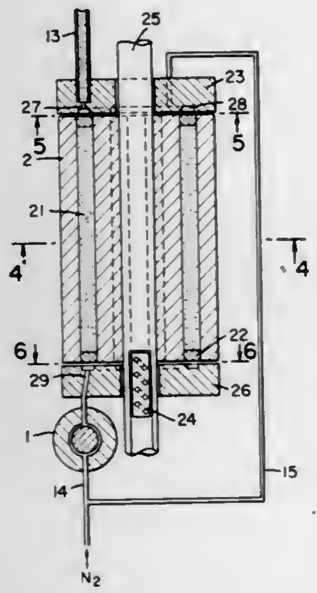


A process for exploring a water-covered region is improved by jetting water into soft bottom sediments, forming a slurry of the sediments in water, extracting gas from the slurry and measuring the concentration with location of a mobile reservoir fluid that was entrapped within the bottom sediments.

3,714,812
ELECTRON CAPTURE IDENTIFICATION APPARATUS

John W. Drinkwater, Chester, and Albert Evans, Wirral, both of England, assignors to Shell Oil Company, New York, N.Y.

Filed May 22, 1970, Ser. No. 39,602
Claims priority, application Great Britain, May 22, 1969, 26,209/69
Int. Cl. G01n *31/08*
U.S. Cl. 73—23.1 **3 Claims**

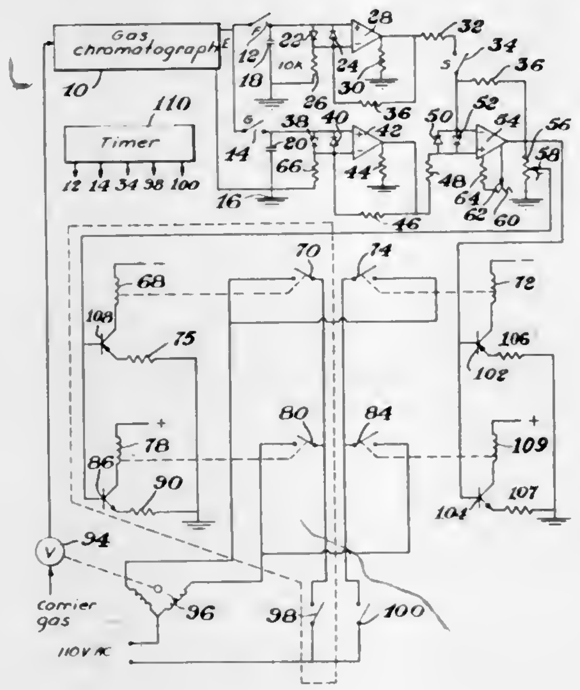


An electron capture identification apparatus for identifying labelling additives which comprises a revolving gas/liquid chromatographic tube magazine for receiving samples from the sampling mechanism and an electron capture detector for detecting a labelling additive separated in the magazine. The eluents of the individual tubes of the magazine are mixed in an after-column whose eluent is supplied to the detector so as to provide a constant background indication and to compensate for minor variations between individual tubes of the magazine.

3,714,813
APPARATUS FOR STABILIZING COMPONENT ELUTION TIMES IN GAS CHROMATOGRAPHS

Fred D. Martin, Angleton, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed Jan. 12, 1971, Ser. No. 105,893
Int. Cl. G01n *31/08*
U.S. Cl. 73—23.1 **3 Claims**



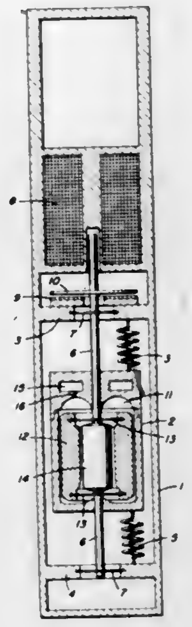
A peak stabilizer in accordance with this invention controls the peak retention time during an analysis, by gas chromatograph, for example, so that this time will be the same for all determinations. This allows a peak to be gated or picked for process control or read-out without the undesirable possibility that it would drift beyond the time limits of the gate. If a peak in the chromatogram, for example, is sampled on the leading and trailing slopes at predetermined times, a comparison of these voltages will indicate if the peak is early, late or at its right time. The carrier gas flow or other rate control parameter may be automatically changed to bring the peak back to the proper retention time.

3,714,814
TIGHT VISCOSIMETER WORKING IN AGGRESSIVE MEDIA

Albert M. Schneiders, Angera; Peter Schiller, Gavirate; Gustave L. Hollebeck, Ispra, and Friedhelm Diletti, Gemonio, all of Italy, assignors to European Atomic Energy Community (Euratom), Kirchberg, Luxembourg

Filed April 23, 1970, Ser. No. 31,346
Claims priority, application Luxembourg, April 29, 1969, 58532
Int. Cl. G01n *11/16*
U.S. Cl. 73—54 **11 Claims**

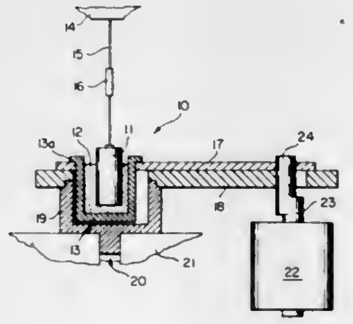
A viscosimeter for measuring the viscosity of fluids or suspensions especially those which may be inherently dangerous such as radioactive fluids. The fluid is placed in a sealed casing with a cylindrical body inside. The casing is resiliently suspended for axial oscillation in a sheath which can be evacuated. Means such as a solenoid are provided to oscillate the casing. Means outside the sealed area to measure the damping of the oscillations of the cylindrical body are also provided.



3,714,815
MEANS FOR SIMULATING THE NATURAL FLOW OF BLOOD

Hellmut Hartert, Kaiserslautern, Germany, assignor to Fritz Hellige & Co. G.m.b.H., Freiburg im Breisgau, Germany

Filed Apr. 15, 1971, Ser. No. 134,143
Claims priority, application Germany, Apr. 22, 1970, P 20 19 341.3
Int. Cl. G01n *11/10, 33/16*
U.S. Cl. 73—64.1 **4 Claims**

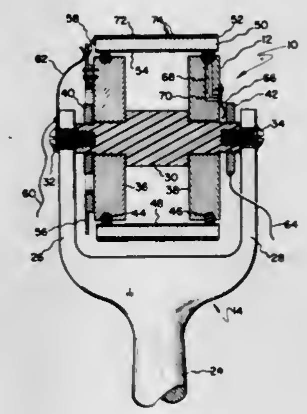


Mechanical means for simulating the natural flow of blood, including motor means having an eccentrically located cam on its drive shaft for providing motion to a crank lever having a movable pivot point. A vessel containing a blood sample under analysis is retained on the crank lever to receive the motion established by the mechanical means. The vessel containing the blood sample is orbited around a detector element at a relatively high speed to establish shearing effects and resulting electro-kinetic surface effects between the inner wall of the vessel and the surface of the detector element corresponding to the shearing and electro-kinetic surface forces present in the veins and arteries of an individual. The detector element is part of a conventional blood analysis device which may provide either visual or recorded indicia representative of the coagulation characteristics of the blood sample.

3,714,816
TUBULAR TRANSDUCER AND DRY COUPLANT THEREFOR

Darrow L. Miller, Los Angeles, Calif., assignor to North American Rockwell Corporation

Division of Ser. No. 832,568, June 12, 1969, Pat. No. 3,678,737. This application April 30, 1971, Ser. No. 139,116
Int. Cl. G01n *29/00*
U.S. Cl. 73—71.5 **5 Claims**

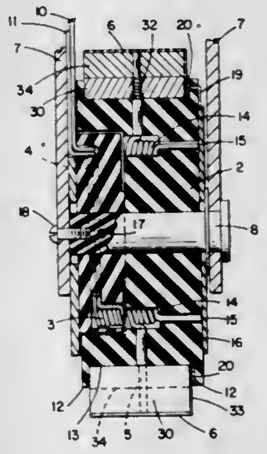


A probe for nondestructive testing to identify internal structural defects comprises a tubular piezoelectric element adapted for low frequency vibration while moving in rolling contact over a workpiece surface. A dry adhesive couplant forms a mechanical bond between the piezoelectric element and the workpiece surface, and is also useful with disc-type probes known to the prior art, especially when the adhesive is coated with a layer of minute glass beads.

3,714,817
ACOUSTICAL TRANSDUCER WITH ROTARY PULSE COUPLER

Darrow L. Miller, Los Angeles, Calif., assignor to North American Rockwell Corporation

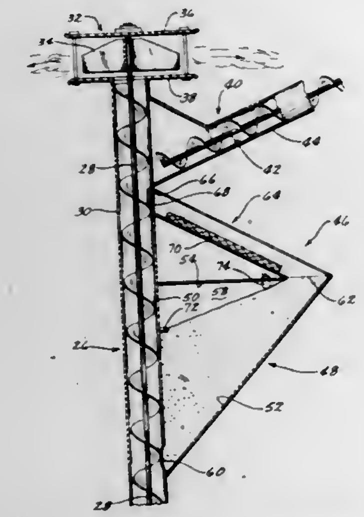
Filed Sept. 28, 1970, Ser. No. 75,997
Int. Cl. G01n *29/00*
U.S. Cl. 73—71.5 **2 Claims**



A manual probe for ultrasonic inspection of metallic workpieces has a rotatable wheel with a plurality of separate transducer crystals affixed thereon concentric about the rotation axis. The crystals are individually connected to separate secondary transformer coils mounted within the wheel. A stationary primary coil is mounted adjacent the rotatable wheel and adapted to excite each secondary coil in succession as the crystal connected to such coil contacts the workpiece surface during wheel rotation, whereby only one crystal is excited at any given instant.

3,714,818
METHOD AND MEANS OF MEASURING THE MOISTURE CONTENT OF GRAIN

Warren L. Relph, Cambria, Iowa
Filed March 10, 1971, Ser. No. 122,743
Int. Cl. G01n *33/02*
U.S. Cl. 73—73 **12 Claims**

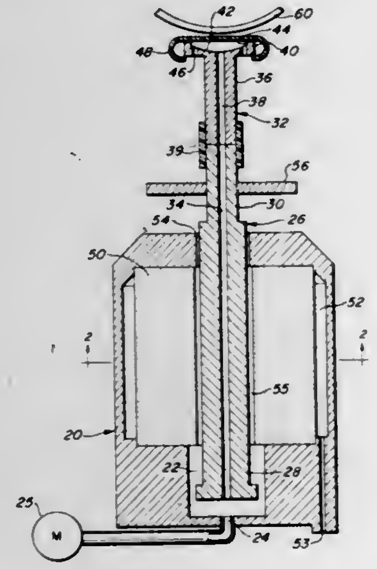


A method for determining the moisture content of grain is comprised of the steps of depositing a quantity of grain to be tested at a fixed point above a supporting surface so that the grain will, through gravity, form a uniformly inclined surface extending outwardly and downwardly from the point of deposit, and measuring the magnitude of the angle created between the surface of the grain and a horizontal plane.

The means for measuring the moisture content of grain includes a triangular box having an opening at its upper end and an opening at its lower end. The moisture content of the grain is determined by measuring the slope of the pile of grain which accumulates in the box as the grain is poured into the box.

3,714,819
APPLANATION TONOMETER COMPRISING POROUS AIR BEARING SUPPORT FOR APPLANATING PISTON

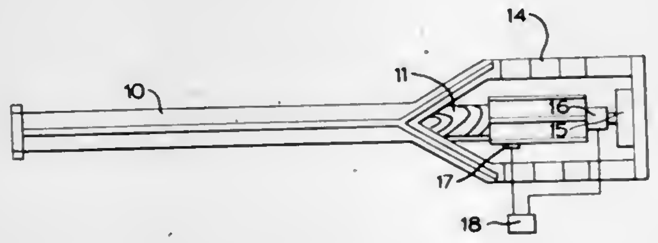
Robert H. Webb, Lexington, Mass., assignor to Block Engineering, Inc., Cambridge, Mass.
Filed Nov. 19, 1970, Ser. No. 90,893
Int. Cl. A61b *3/16, 5/02*
U.S. Cl. 73—80 **2 Claims**



An applanation tonometer using a pneumatically driven piston having a sensing tip operated by the gas driving the piston, in which a porous gas bearing serves both as a bearing for the piston and a throttling barrier for gas introduced to drive the piston.

3,714,820
COMBINED TENSILE E MEASUREMENT AND PROOF LOADING OF LUMBER

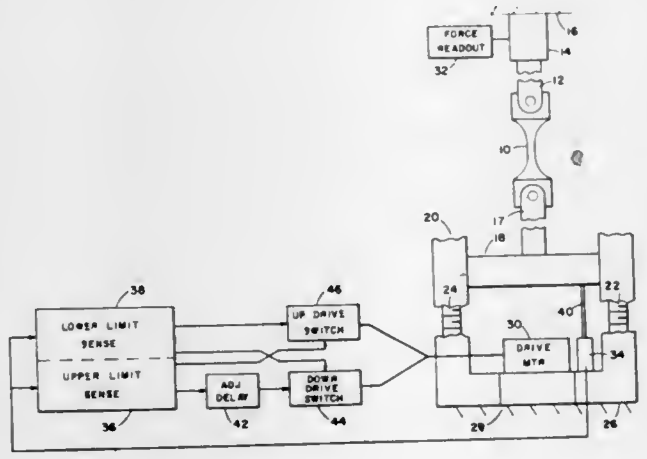
Melvin D. Strickler, and Roy F. Pellerin, both of Pullman, Wash., assignors to Washington State University Research Foundation, Pullman, Wash.
Filed Oct. 1, 1971, Ser. No. 185,537
Int. Cl. G01n *3/08*
U.S. Cl. 73—89 **17 Claims**



A method and apparatus for stress grading structural wood members in a non-destructive test by which each member is proof loaded in tension parallel to the grain at a stress level approaching the predicted rupture strength of the particular member. The modulus of elasticity of each member is measured at low stress during the early stages of the loading cycle. The proof load level for each member is determined in relation to its measured modulus of elasticity.

3,714,821
MATERIAL FATIGUE TESTING SYSTEM

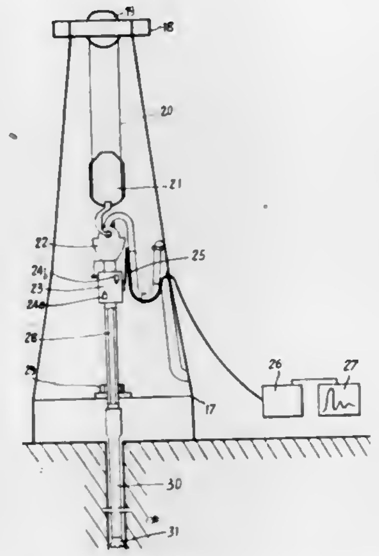
Paul J. Gilley, Decatur, Ala., assignor to The United States of America as represented by the Administrator of the National Aeronautics Space Administration
Filed Dec. 1, 1970, Ser. No. 94,049
Int. Cl. G01n *3/32*
U.S. Cl. 73—90 **1 Claim**



A system for cyclicly applying a varying load to a material under test. It includes a load sensor which senses the magnitude of load being applied to a material, and, upon sensing a selected magnitude of loading, causes the load to be maintained for a pre-determined time and then causes the system to resume cyclical loading.

3,714,822
PROCESS FOR MEASURING WEAR ON A DRILLING TOOL

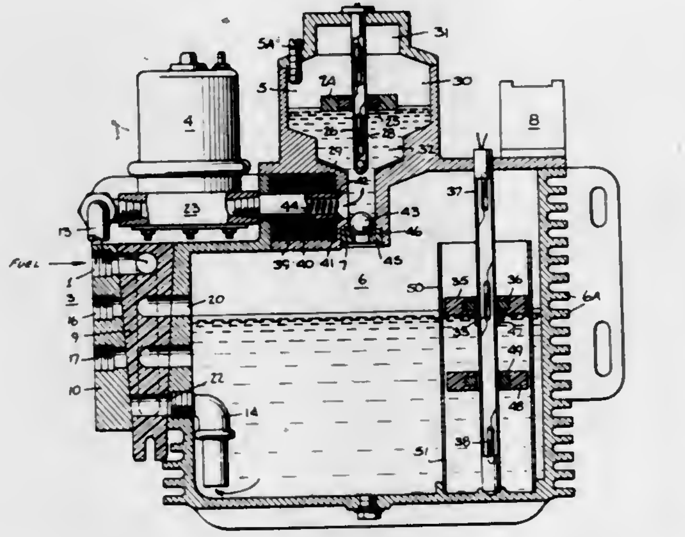
Jean Lutz, Pau, France, assignor to Societe Nationale des Petroles d'Aquitaine, Paris, France
Filed Nov. 9, 1970, Ser. No. 87,700
Claims priority, application France, Nov. 12, 1969, 6938645
Int. Cl. G01n *29/00*
U.S. Cl. 73—104 **9 Claims**



The wear on a drilling tool is measured by picking up certain vibrations produced by rotating said tool, which vibrations have a component indicative of the extent to which the tool has worn. The indicative component may be at least partially isolated so as to produce a more exact result.

3,714,823
FUEL CONSUMPTION METER

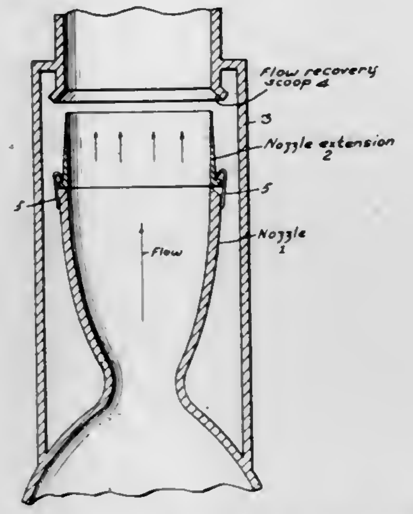
Henry W. Wilkens, and Daniel D. Sabatino, both of Little Ferry, N.J., assignors to Flowtron Industries Inc., Little Ferry, N.J.
Filed Sept. 11, 1970, Ser. No. 71,289
Int. Cl. G01f *3/36*
U.S. Cl. 73—113 **12 Claims**



A fuel meter for trucks having a fuel measuring chamber for measuring by float sensed levels a quantity of fuel and emptying that quantity into a reservoir from which the truck engine draws its fuel, the emptying occurring whenever the fuel level in the reservoir is low. A counter counts the number of times the measuring chamber thus empties in order to compute overall fuel consumption. The meter can be by-passed when out of order.

3,714,824
APPARATUS FOR MEASURING SKIN FRICTION

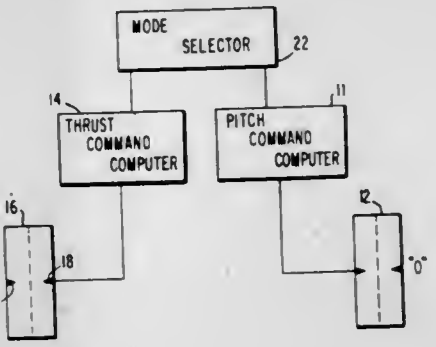
Clarence C. Bush, Bel Air, Md., assignor to The United States of America as represented by the Secretary of the Army
Filed Dec. 21, 1970, Ser. No. 100,018
Int. Cl. G01m *17/00*
U.S. Cl. 73—117.4 **6 Claims**



A ring shaped element is placed in the path of flowing fluid. Gravity holds the element down until skin frictional forces of the flowing fluid lift it off its seat. At the point of lift-off the precise degree of skin friction is known.

3,714,825
INSTRUMENT FLIGHT SYSTEM

William W. Melvin, 8424 Greenstone Drive, Dallas, Tex.
Division of Ser. No. 813,500, April 4, 1969, Pat. No. 3,586,268. This application Dec. 29, 1970, Ser. No. 102,298
Int. Cl. G01c *21/00*
U.S. Cl. 73—178 T **2 Claims**



An aircraft control system particularly useful during approach operations. In the approach mode, a pitch command computer produces a pitch command signal for controlling an aircraft's pitch to maintain a desired angle of attack, and hence a desired airspeed; and a thrust command computer produces a thrust command signal for controlling the flight path angle to maintain an aircraft on a desired glide path for landing. The command signals control either instrument indicators which visually display the appropriate information to the pilot for manual operation or alternatively control an autopilot and autothrottle for automatic operation of the aircraft. If the aircraft is below the desired glide path but at the desired airspeed, a thrust command computer indicates the direction necessary to change the thrust to increase the aircraft's flight path angle so that the aircraft returns to the glide path. As the thrust level is varied according to the thrust command signal, an angle of attack sensor senses the changes in the angle of attack of the aircraft and a pitch command computer produces a pitch command signal to maintain the angle of attack at a desired level determined from the desired airspeed. In addition to the approach mode, the control system offers advantages in the take off, climb, hold, maximum range, severe turbulence, and descent modes of an aircraft's operation. The cruise mode operates similar to prior art systems.

3,714,826
INDUCTION LIQUID FLOW METER AND METHOD OF ELECTRO-MAGNETICALLY DETERMINING FLOW RATE OF LIQUID

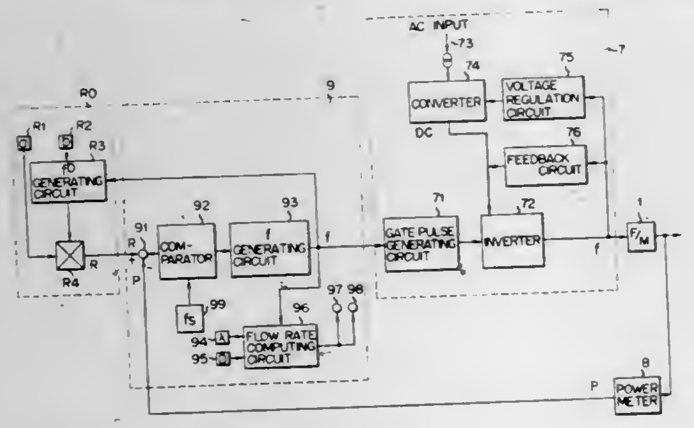
Yorio Tsunoda, Kawasaki, and Shigeyuki Takamatu, Totsuka-ku, Yokohama, both of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan

Filed March 5, 1971, Ser. No. 121,435

Claims priority, application Japan, March 10, 1970, 45/19691

Int. Cl. G01f *1/00*; G01p *5/08*

U.S. Cl. 73—194 EM **6 Claims**



An induction liquid flow meter wherein a device for generating a magnetic field shifting along a liquid passage is energized from a power source of fixed frequency. The power P supplied to the magnetic field generating device is measured and the slip *s* is determined from the measured power P. The flow rate V of the liquid through the liquid passage is then determined from the measured value of slip *s* in accordance with a predetermined relationship between slip *s* and flow rate V.

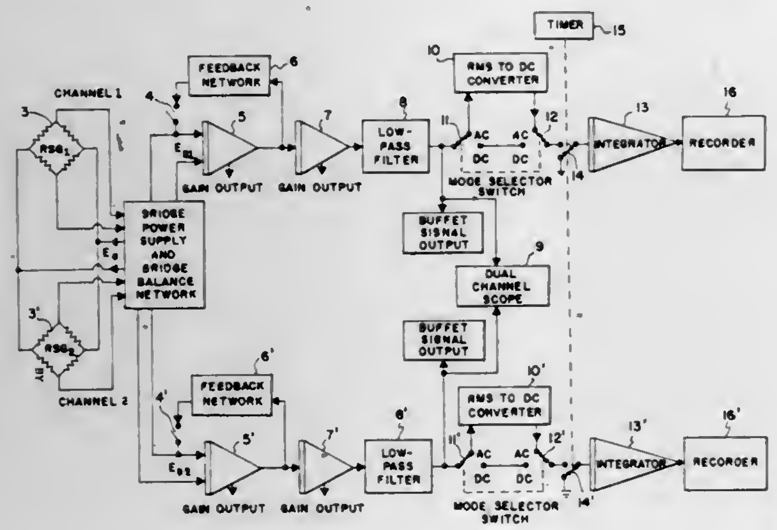
3,714,827
VARIABLE TIME BASE INTEGRATOR CIRCUIT FOR BUFFET SIGNAL MEASUREMENTS

Colossie N. Batts, 17 Berkeley Place,
Newport News, Va. 23602

Filed Nov. 12, 1971, Ser. No. 198,222

Int. Cl. G01m *9/00*

U.S. Cl. 73—147 **10 Claims**



A measurement circuit to obtain buffet data from wind tunnel models wherein a signal proportional to the average RMS value of buffet data is produced for subsequent recording. Feedback means are employed to suppress the D.C. portion of signals developed by the strain gages during dynamic testing. Automatic recording of gain settings of amplifiers employed in the circuit is also provided.

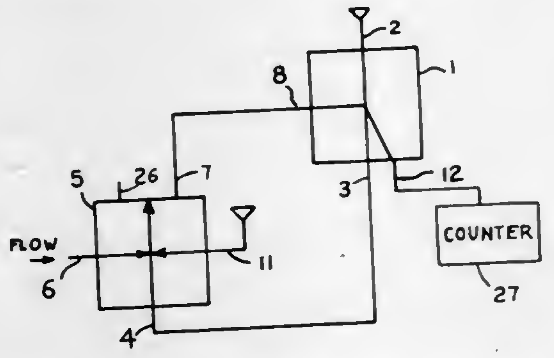
3,714,828
FLUIDIC DIGITAL PNEUMOTACHOMETER

Gerald Durkan, 6 Emerson Street, Uniontown, Pa.

Filed Oct. 26, 1970, Ser. No. 83,885

Int. Cl. G01f *1/00*

U.S. Cl. 73—194 R **8 Claims**



A device for measuring fluid flow comprises a fluid oscillator including a feedback path whose RC time constant may be varied in response to the flow being measured, such that the frequency of oscillation is proportional to the rate of flow. A proportional fluid amplifier has a power stream input and one output connected in the feedback path of a NOR-type oscillator, and the flow being measured is applied as a control input signal to the amplifier to effectively vary the RC time constant of the feedback path. The oscillator produces fluid output pulses at a rate proportional to the flow being measured, and these pulses are counted to provide a digital indication of the flow rate.

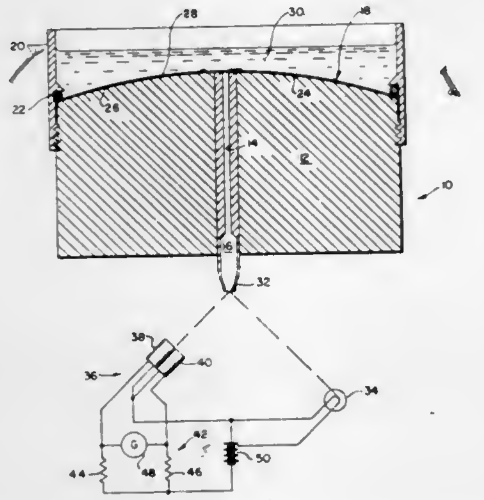
3,714,829
PRESSURE MEASURING SYSTEM

Paul T. Gilbert, Los Altos Hills, Calif., assignor to Beckman Instruments, Inc.

Filed June 29, 1970, Ser. No. 50,463

Int. Cl. G01l *9/00*

U.S. Cl. 73—398 R **27 Claims**



A pressure measuring system including a light source and a pressure sensitive membrane illuminated by the light source and adapted to reflect the light in a manner dependent upon the pressure being sensed. A sensor is illuminated by the reflected light and includes a photosensitive detector connected in a Wheatstone bridge circuit lacking diagonal bilateral symmetry.

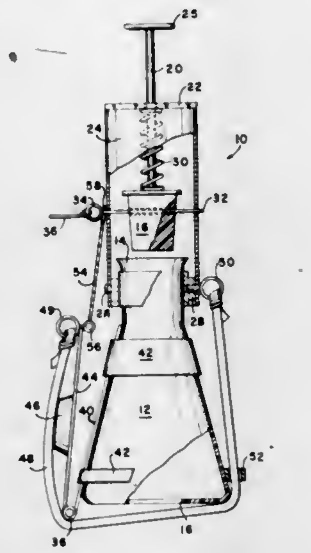
3,714,830
WATER SAMPLING DEVICE

Robin S. Keir, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy

Filed March 26, 1971, Ser. No. 128,395

Int. Cl. G01n *1/10*

U.S. Cl. 73—425.4 R **2 Claims**



A water sampling device capable of carrying a conventional laboratory-type flask container having a neck opening and a bottom opening with means for closing each of said openings to capture a water sample therein at a preselected water depth whereby the contamination problems of transferring the water sample to another container for laboratory analysis are avoided.

3,714,831
DEVICE FOR SUSPENDING MEASURING INSTRUMENTS INSIDE DRILLING ASSEMBLY

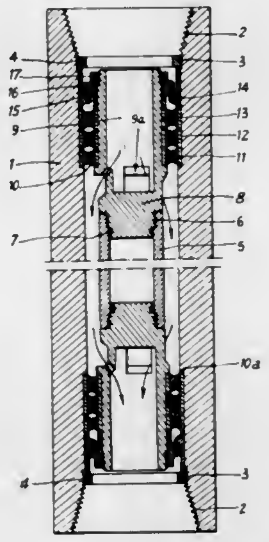
Claude Quichaud, Billere; Jean-Pierre Le Peuvedic, and Jacques Tinchon, both of Pau, all of France, assignors to Societe Nationale des Petroles d'Aquitaine, Paris, France

Filed Sept. 3, 1970, Ser. No. 69,235

Claims priority, application France, Sept. 5, 1969, 6930325

Int. Cl. G01d *11/10*; G01l *19/14*

U.S. Cl. 73—431 **10 Claims**



A device for suspending a measuring instrument in a drilling assembly comprising: a drill-collar designed to receive the measuring instrument; at least one connecting member attached to the measuring instrument and provided with a shoulder; a number of suspension rings consisting of three sections integrated by vulcanization i.e., a first frame, a second frame having the same center line and an annular elastomeric body between said frame, said suspension rings bearing by one of their frames on said shoulder; a first permanent seat on the connecting member through which said rings are attached to the connecting member; a second permanent seat on the drill-collar bearing on the other frame of said suspension rings and an annular part supported between said seats and made of an elastomer having a greater rigidity than that of the elastomer used to make the suspension rings.

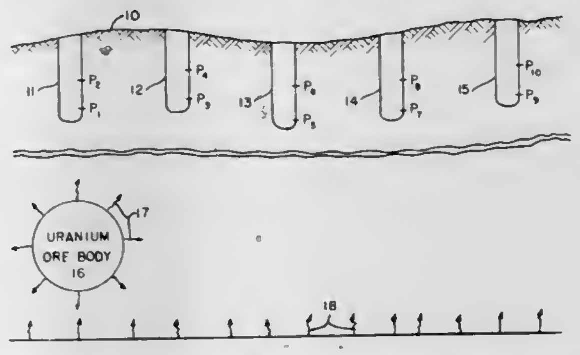
3,714,832
GEOTHERMAL EXPLORATION

Eddie P. Howell, Plano; Jack E. Hardison, Garland, and William M. Campbell, Irving, both of Tex., assignors to Atlantic Richfield Company, New York, N.Y.

Filed Aug. 24, 1970, Ser. No. 66,285

Int. Cl. G01v *9/00*

U.S. Cl. 73—432 R **3 Claims**



A uranium prospecting system based on the determination of temperature anomalies in the earth's crust. The earth heat flux is measured at preselected points in shallow boreholes in order to detect heat given off as a result of radioactive decay. Localized anomalies are indicative of concentrations of radioactive materials.

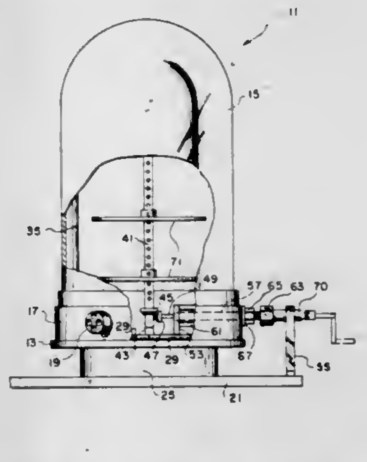
3,714,833
TEST STAND SYSTEM FOR VACUUM CHAMBERS

Dewey F. Newman, Huntsville, Ala., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration

Filed Dec. 23, 1971, Ser. No. 211,411

Int. Cl. G01d *21/00*

U.S. Cl. 73—432 SD **4 Claims**

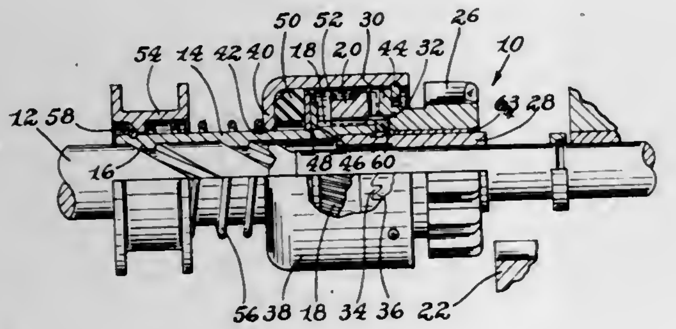


A test stand system for supporting test items within a vacuum chamber comprising a frame adapted to conform to the inside of the vacuum chamber and supporting a central vertical shaft which shaft is rotatable on bearings located at each end thereof. The shaft is rotated through a drive that is manually actuated externally of the vacuum chamber. A plurality of vertically spaced plates are adjustable fixed to the vertical shaft for supporting various test "setups" as required. The test items may be rotated during a test without disturbing the vacuum.

3,714,834
ENGINE STARTING GEARING

James J. Digby, Elmira, N.Y., assignor to The Bendix Corporation

Filed March 12, 1971, Ser. No. 123,498
Int. Cl. F02n *15/06*
U.S. Cl. 74—6 **6 Claims**

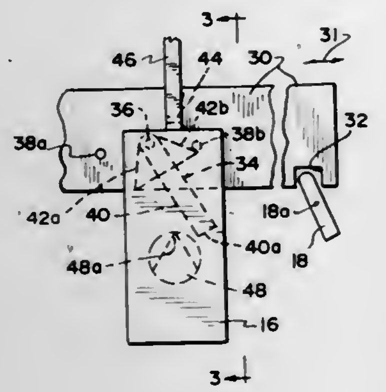


Starter gearing of the positive shift dentil type overrunning clutch is shown herein. In order to provide maximum service life with a minimum of wear the drive is provided with means forming a low friction substantially axially solid connection between the pinion and the starter gearing sleeve which interconnects the starter gearing with the rotary power shaft.

3,714,835
TUNER PUSHBUTTON SYSTEM WITH AUTOMATIC BAND MEMORY

Jack C. Fiore, Chicago, Ill., assignor to Motorola, Inc., Franklin Park, Ill.

Filed April 21, 1971, Ser. No. 135,912
Int. Cl. F16h *35/18*
U.S. Cl. 74—10.33 **3 Claims**

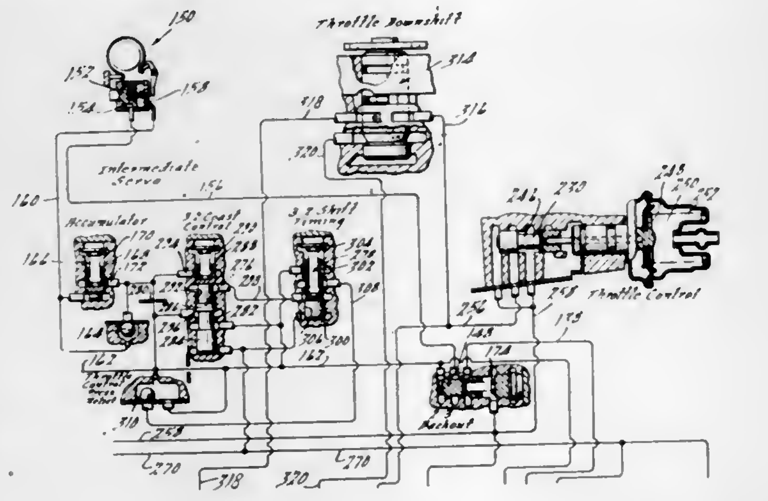


A pushbutton tuner is provided with a plurality of memory tabs pivotally secured to a slide plate which is located adjacent the pushbuttons. The slide plate is fastened to a band selector switch which is shiftable between one or the other of the two band positions upon movement of the slide plate between its two extreme positions. A depending finger on each of the pushbuttons sets the mode or band of the associated memory tab depending on the position of the slide plate when a particular radio station is set on the memory pushbutton mechanism. Once the radio station is set, the pushbutton mechanism will automatically return to the tuned station setting as well as the proper band setting regardless of the band setting then in effect.

3,714,836
AUTOMATIC TRANSMISSION CONTROLS FOR AN AUTOMOTIVE VEHICLE DRIVELINE

Stanley L. Pierce, Jr., Birmingham, and William C. Winn, Inkster, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Feb. 16, 1971, Ser. No. 115,454
Int. Cl. F16h *3/74*; **B60k** *21/00*
U.S. Cl. 74—752 C **14 Claims**

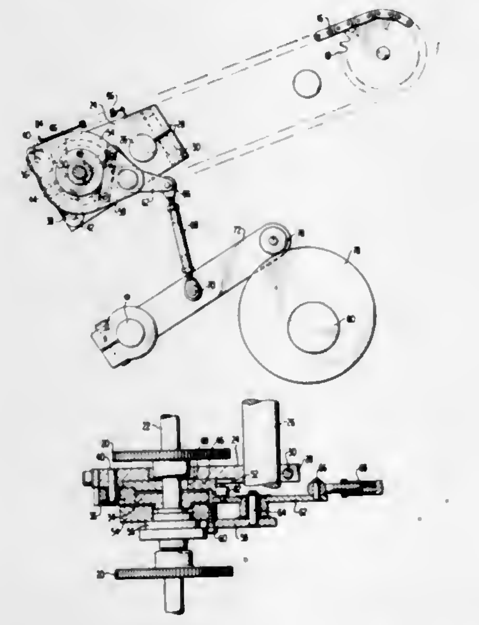


An automatic control valve circuit for controlling the application and release of fluid pressure operated servos in an automatic power transmission mechanism for an automotive vehicle driveline including pressure booster valve means for augmenting the servo pressure during coast braking of the vehicle at high speeds and limiting that pressure to a predetermined maximum value, and valve means for cushioning the application of a reaction brake during a ratio change to an underdrive condition whereby harshness in the ratio shifts to the underdrive ratio is reduced and excessive load on the hydraulic pump for the circuit is avoided.

3,714,837
INDEXIBLE CLUTCH MECHANISM

Ole R. Jensen, 126 Nottingham, Montvale, N.J., and Preben W. Jensen, 21 Southside Avenue, Somerville, N.J.

Filed June 23, 1970, Ser. No. 48,965
Int. Cl. F16d *27/01*
U.S. Cl. 74—125.5 **8 Claims**

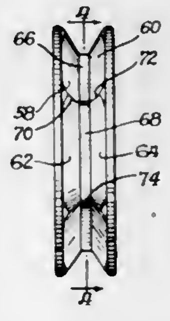


An incremental, angular, intermittent input motion is provided by means of a cam and follower arrangement to a double acting clutch mechanism. The angular input motion will be imparted to an output member through a portion of the one-way clutch mechanism and any attempt to overrun the predetermined indexing angle will be prevented by the other portion of the double acting one-way clutch mechanism. Any retrograde motion of the output member will be resisted by the binding of the input linkage connected intermediate the double acting one-way clutch mechanism and the cam follower to thereby provide positive control of the output member at all times. A modified arrangement provides for converting a constantly rotating input motion to a variable intermittent output motion utilizing a double acting one-way clutch mechanism operable under the control of a pair of pawls which control the clutch locking and unlocking member.

3,714,838
SHEAVE FOR RATCHET BLOCK

Robert E. Gilson, 4 North Franklin Avenue, Madison, Wis.

Filed Sept. 11, 1970, Ser. No. 71,568
Int. Cl. F16h *55/36*
U.S. Cl. 74—230.24 **11 Claims**

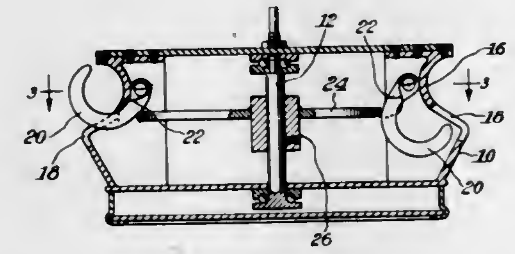


The line-receiving groove of the sheave includes a plurality of opposed inwardly converging shoulders on the sides of the groove and a coplanar corner in the innermost portion of the groove. The configuration is especially adaptable to ratchet blocks in that little effort is required to hold the line against a strong pull, and the line may be easily released in the direction of pull without binding or undue wear.

3,714,839
PULLEY WITH BELT CLAMPING MEANS

Timothy Watson, 1149 Tiffany St., Bronx, N.Y. 10459

Filed Mar. 30, 1971, Ser. No. 129,440
Int. Cl. F16h *55/36*
U.S. Cl. 74—230.24 **2 Claims**

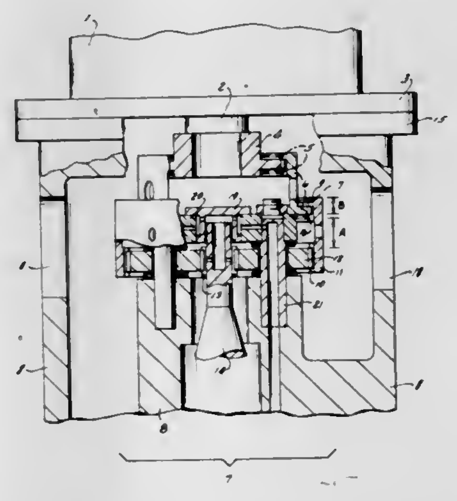


A horizontal wheel having a peripheral circular groove is rotatable about a vertical axis. A plurality of hooks having released open positions and taut closed positions are disposed about the groove to cooperate with a flexible line engaging the groove. Cam means cooperate with the hooks control the open or closed positions of same in a manner at which rotation of the wheel causes the hooks to individually open and close in predetermined manner.

3,714,840
DRIVE SHAFT

Walter K. Jekat, Munich, Germany, assignor to Klein Schanzlin & Becker Aktiengesellschaft, Frankenthal, Pfalz, Germany

Filed Sept. 29, 1971, Ser. No. 184,833
Claims priority, application Germany, Oct. 3, 1970, P 20 48 681.1
Int. Cl. F16h *1/06, 1/20*
U.S. Cl. 74—421 A **5 Claims**

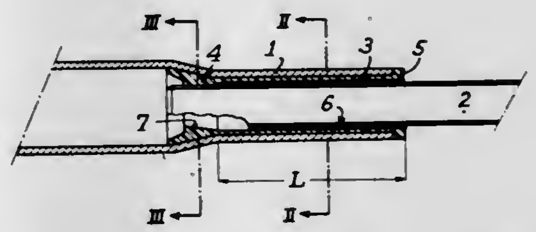


A rotary shaft carries for rotation an externally toothed coupling gear, and axially spaced therefrom is a planetary drive having a sun gear and planetary gears which mesh with the sun gear and all of which are rotatable about axis paralleling that of the coupling gear. An internally toothed ring gear surrounds the primary gears and coupling gear and is movable axially between a first and a second position in which it is respectively in and out of mesh with the teeth of the coupling gear. It may be continuously in mesh with the planetary gears or it may be out of mesh with them when in the second position. A removable detent prevents the ring gear from moving out of its first to its second position, and another detent prevents the ring gear—when data has been moved from first to second position after removal of the first detent—for moving beyond the second position.

3,714,841
TELESCOPIC DEVICE FOR TRANSMITTING ROTARY MOVEMENT

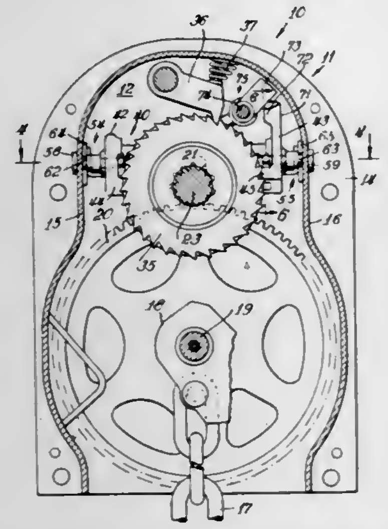
Albert Grosseau, Chaville, France, assignor to Societe Anonyme Automobiles Citroen, Paris, France

Filed April 1, 1971, Ser. No. 130,256
Claims priority, application France, April 3, 1970, 7012204
Int. Cl. B62d *1/18*
U.S. Cl. 74—492 **5 Claims**



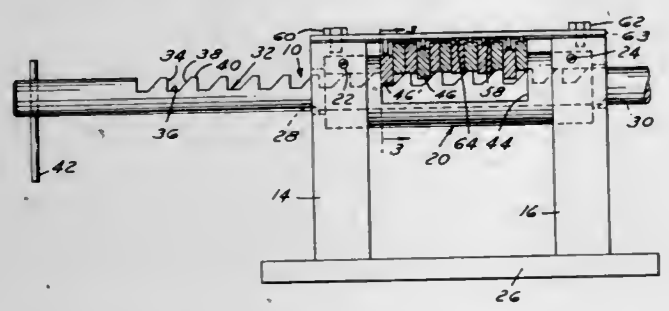
This invention relates to a telescopic device for transmitting rotary movement, utilizable in particular for the steering column of a vehicle, comprising a sleeve, a shaft inside the sleeve and sliding with respect to this latter and a lining made of deformable material disposed between the sleeve and the shaft and fixed to one of these two elements, a sufficient clearance being provided between the zones opposite the sliding members in order to avoid requirement for their adjustment, wherein the clearance is eliminated over a portion of the zones opposite the lining and the element sliding with respect thereto, this ensuring a localized assembly with locking due to a deformation upon assembly of the lining.

3,714,842
PIVOT MOUNTING FOR TRIP BAR OF HAND BRAKE MECHANISM
William F. Koehler, Chicago, Ill., assignor to Cleveland Hardware & Forging Company, Cleveland, Ohio
Filed June 23, 1971, Ser. No. 155,915
Int. Cl. G05g *1/08*
U.S. Cl. 74—505 **2 Claims**



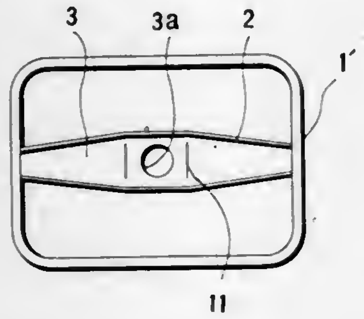
The trip bar of a hand brake mechanism comprises a tie bar having a lever at each end for releasing the driving connection between a ratchet wheel and a gear wheel rotatable with a chain winding drum, each lever having a pivot aperture for receiving a pivot pin extending inwardly from the side wall of the brake mechanism housing. Each pivot pin has an annular groove for receiving a U-shaped slot in a plate like pin keeper juxtaposed to the respective side wall of the housing to hold the pivot pin in operative position. A cylindrical spring guide is secured to each pin keeper to receive a coil compression spring arranged to bias the respective lever to maintain the driving connection.

3,714,843
ADJUSTABLE LATCHING MECHANISM
Robert A. Bracey, 4628 Johnathan, Dearborn, Mich.
Filed June 15, 1971, Ser. No. 153,242
Int. Cl. G05g *5/06*
U.S. Cl. 74—527 **17 Claims**



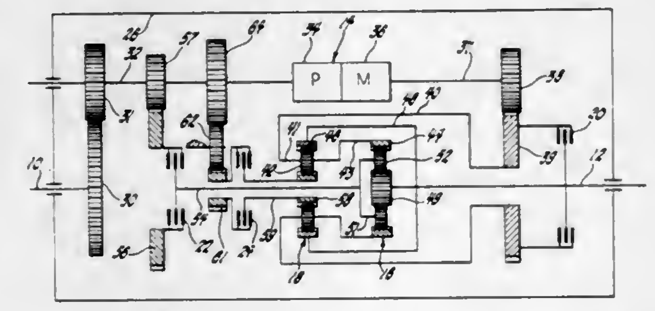
The adjustable latching mechanism functions on the vernier principle. In the preferred embodiment, a row of pivotally mounted side-by-side detent elements corresponds to a vernier scale. A latching element having a plurality of recesses corresponds to the regular measuring scale. The latching element is movable with respect to the detent elements. The detent elements are biased towards engagement with the recesses. At any given relative position of the detent elements and latching element, one of the detent elements will always be close to or in alignment with one of the recesses in accordance with the vernier principle for pivotal movement thereinto to result in locking engagement.

3,714,844
STEERING WHEEL CONSISTING OF A LIGHT FRAME INTEGRALLY MOULDING, PROCESSED FROM A FLAT PLATE
Jo Tsuda, Aichi-ken, Japan, assignor to Masakazu Inagaki, Aichi-ken, Japan
Filed Jan. 22, 1971, Ser. No. 108,935
Claims priority, application Japan, Jan. 27, 1970, 45/7488; Aug. 31, 1970, 45/76577; Aug. 31, 1970, 45/76578; Aug. 31, 1970, 45/76579; Aug. 31, 1970, 45/76580; Aug. 31, 1970, 45/76581
Int. Cl. B62d *1/04*
U.S. Cl. 74—552 **2 Claims**



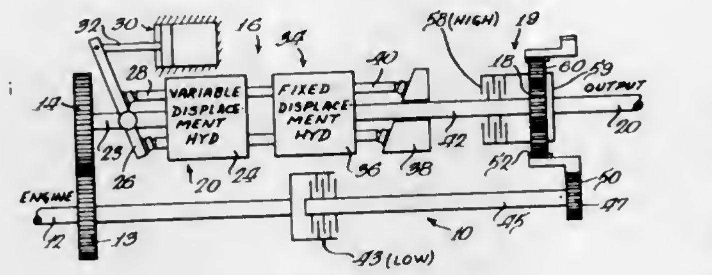
A steering wheel for a motor vehicle having a frame with ring, spoke and boss portions. The spoke portion has cuts to absorb mechanical shocks. The ring, spoke and boss portions define a space to enclose required driving instruments and at least a part of the ring portion is coated with covering material. The ring portion is noncircular and the steering wheel spokes enclose an air bag therein.

3,714,845
HYDROMECHANICAL TRANSMISSION
James J. Mooney, Jr., Indianapolis, Ind., assignor to General Motors Corporation, Detroit, Mich.
Filed Aug. 24, 1971, Ser. No. 174,317
Int. Cl. F16h *47/04*
U.S. Cl. 74—687 **4 Claims**



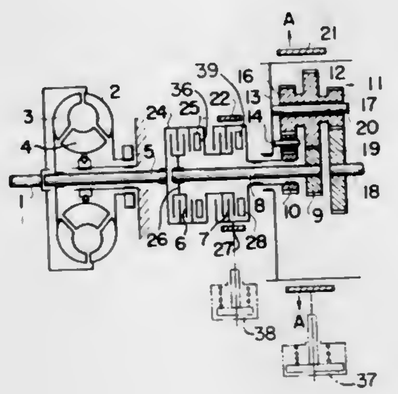
A hydromechanical transmission having a variable ratio hydrostatic drive unit, two planetary gear sets and three friction drive establishing devices combined to provide an all-hydrostatic drive in a low speed range in both forward and reverse and split power or hydromechanical drives into higher speed ranges in forward.

3,714,846
HYDROSTATIC-DIFFERENTIAL TRANSMISSION
Joseph E. Louis, Rockford, and George A. Schauer, Belvidere, both of Ill., assignors to Sundstrand Corporation
Filed Feb. 23, 1971, Ser. No. 117,948
Int. Cl. F16h *47/04, 47/00*
U.S. Cl. 74—687 **25 Claims**



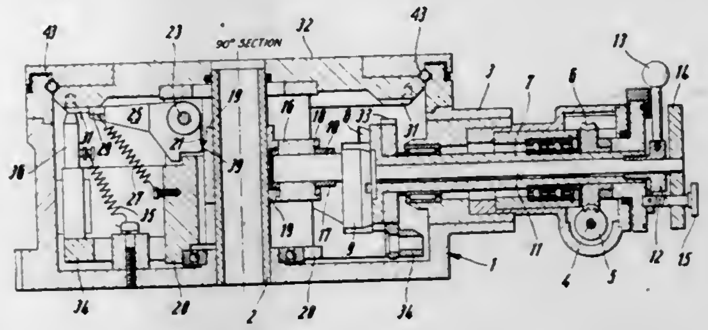
A hydromechanical transmission having plural power paths, one being a mechanical path and the other being a hydraulic path with an output differential for combining the torque of the two paths and providing an output for the transmission, there being provided a low speed plural path mode effected by clutching one of the differential elements to the input shaft, and a high speed straight hydraulic mode effected by locking the differential elements together for rotation as a unit. Both the low and high speed modes have forward and reverse speeds. A transmission ratio and mode control is provided that compensates for the difference in hydraulic displacement in the two modes so that the transmission may be easily shifted from zero output in the low speed mode to zero output in the high speed mode and vice versa.

3,714,847
HYDRAULIC CONTROL SYSTEM FOR AUTOMATIC TRANSMISSIONS
Fmihiro Ushijima, Toyota, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota-cho, Aichi-ken, Japan
Filed Feb. 10, 1971, Ser. No. 114,178
Claims priority, application Japan, Feb. 13, 1970, 45/12,896
Int. Cl. F16h *3/44*
U.S. Cl. 74—753 **10 Claims**



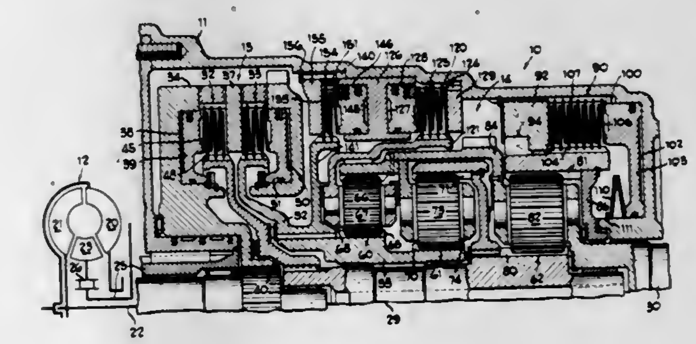
A hydraulic control system for automatic transmissions is applied to a multistage change gear mechanism including hydraulically actuated friction elements including clutches and brakes, selectively cooperable with components of the mechanism to establish the input-output gear ratio, and includes an accumulator which lessens the shock, resulting from the pressure changes during shifting, by controlling the transient pressure change of the hydraulic fluid supplied to hydraulic servos actuating the friction elements. Shift valves, operable in accordance with engine output and vehicle speed, control the supply and exhaust of hydraulic fluid relative to the servos. A reciprocable piston divides the accumulator into first and second chambers, with the first chamber controlling the pressure change to the hydraulic servos during shifting and the second chamber controlling operation of the accumulator. A return valve exhausts the second chamber of the accumulator in connection with operation of the shift valve upon shifting. The accumulator piston returns to its initial position after completion of shifting.

3,714,848
STEP-BY-STEP TRANSMISSION
Detlef Hofmann, 7531 Kieselbronn, Germany
Filed Dec. 21, 1970, Ser. No. 100,139
Claims priority, application Germany, Dec. 22, 1969, P 19 64 263.8
Int. Cl. B23b *29/32*
U.S. Cl. 74—822 **13 Claims**



A step-by-step transmission, or indexing mechanism, or dividing head, in which a part is provided which is adapted to be indexed, for instance in rotation. For indexing the part, a crank shaft is provided adapted for being driven in rotation and having a crank pin thereon which is adjustable in the radial direction of the crank shaft. As the shaft and crank pin rotate, a first member is driven in reciprocation and oscillation by the crank pin while a second member is driven in oscillation. The second member carries a follower which engages the part to be indexed in one direction of oscillation of the second member, the said engaging being under the control of the first member, while in the other direction of oscillation of the second member, a locking arrangement locks the part against movement.

3,714,849
AUTOMOTIVE TRANSMISSION
James G. Smith, Muncie, Ind., assignor to Borg-Warner Corporation, Chicago, Ill.
Filed Dec. 21, 1970, Ser. No. 99,803
Int. Cl. B60k *21/00;* **F16h** *57/10*
U.S. Cl. 74—869 **16 Claims**



A hydraulic control system for an automatic transmission having a hydraulic converter, fluid pressure operated friction engaging devices to provide a plurality of speed ratio drive trains upon serial automatic actuation of shift valves to upshifted positions by vehicle speed-responsive governor pressure and downshiftable by throttle-responsive pressure, a fluid-operated friction brake for low speed ratio, and a control valve for the brake and a manual valve to provide fluid pressure to the brake only in the downshifted position of the shift valves; an accumulator to control engaging fluid pressure of the engaging devices; and a stall control valve functioning to change the effective regulated output pressure from a regulator valve and to provide increased actuating fluid pressure during torque multiplication of the torque converter.

ERRATUM

For Class 74—15.4 see:
Patent No. 3,715,704

3,714,850
METHOD OF MANUFACTURING OF KNIVES

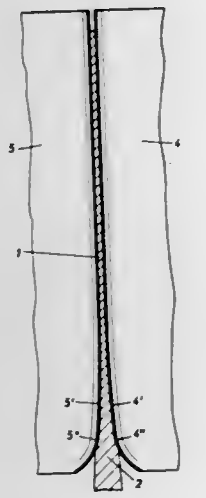
Hans Peters, Solingen, Germany, assignor to Firma J. A. Henckels Zwillangswerk

Filed June 15, 1971, Ser. No. 153,206

Claims priority, application Germany, June 16, 1970, P 20 29 621.3

Int. Cl. B21k *11/00*

U.S. Cl. 76—104 **2 Claims**



A method of producing of knives with a blade compacted by cold working which comprises the steps of compacting the blade of the knives after precision forging of a sling and of a haft by cold-rolling crosswise to its longitudinal axis with a roll pressure leading nearly to the yield point, and thereafter cutting the same to its outline shape.

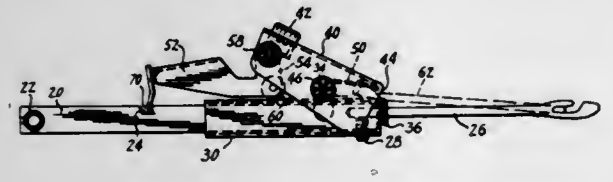
3,714,851
PLUG INSERTION TOOL

Harvey E. Orser, 123 Mark Street, Pontiac, Mich.

Filed March 23, 1971, Ser. No. 127,249

Int. Cl. B60c *25/16*

U.S. Cl. 81—15.7 **3 Claims**



A needle, a jaw slidably mounted adjacent the needle, and a handle for pivoting the jaw to secure and stretch a plug connected between the jaw and the needle.

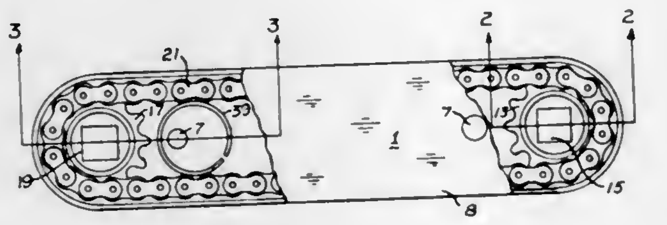
3,714,852
POWER TRANSFER DEVICE

Joseph A. Giangrasso, 11221 Elvessa St., Oakland, Calif. 94605

Filed June 3, 1971, Ser. No. 149,612

Int. Cl. B25f *17/00*

U.S. Cl. 81—57.3 **2 Claims**



A power transfer device for transferring the power of a hand tool to work located in an otherwise hard to reach location, and comprising a narrow elongated housing with a sprocket at each end and coupled by a chain drive. The one sprocket has an axial polygonal opening for engagement with a hand tool, while the other sprocket is provided with an axial extension of polygonal section to accommodate a socket.

3,714,853
AUTOMATIC LATHES

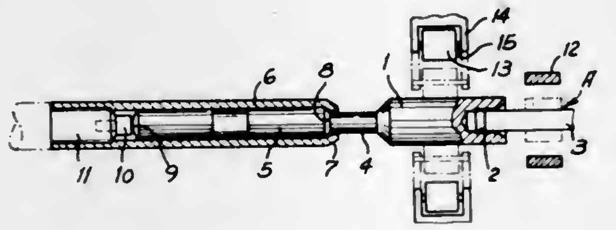
Andre Lechot, Orvin, Switzerland

Filed Dec. 18, 1970, Ser. No. 99,498

Claims priority, application Switzerland, Dec. 23, 1969, 19191/69

Int. Cl. B23b *13/02*

U.S. Cl. 82—2.5 **2 Claims**



An automatic lathe having a movable push rod for engaging the rear end of a bar to be machined is fitted with a member rotatably connected to one end of the push rod. This member has a threaded hole for gripping the rear end of a bar to be machined, the internal diameter of the threads of the hole being smaller than the diameter of the bar so that when the end of the bar is introduced by relative rotation of the bar and the member into the hole, the threads grip the end of the bar.

3,714,854
MACHINE FOR PERFORMING AN OPERATION ON ARTICLES

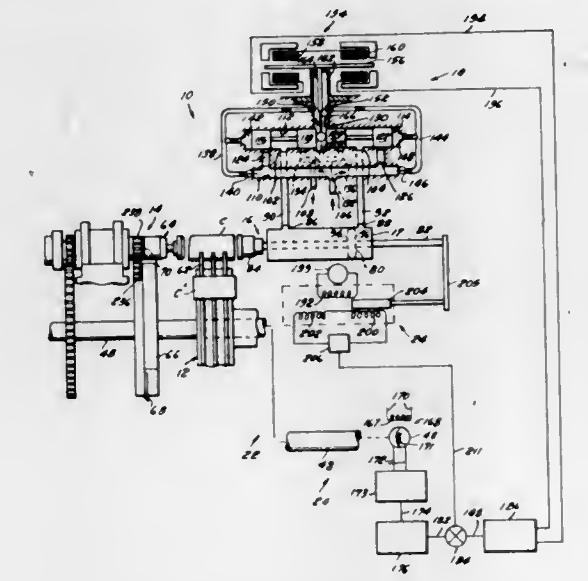
Edward Frank Kubacki, Arlington Heights, Ill., assignor to American Can Company, Greenwich, Conn.

Filed July 2, 1971, Ser. No. 159,401

Int. Cl. B23b *3/04*

U.S. Cl. 82—101 R **29 Claims**

A high speed mechanical-electric-hydraulic system for synchronizing the indexing and dwell of a multi-pocketed article aligning turret and the operation of an operating station with the forward and reverse strokes of a hydraulically actuated reciprocable feed slide which transfers successive articles into and out of the operating station from and to the turret, wherein during separate angular portions of a single rotational cycle of a rotating drive means of the system, a primary electrical command signal is generated by the mechanical-electrical components of the system to control the metering of fluid in the hydraulic component to initiate each forward and reverse stroke of the slide, the motion of the slide thereby generating a secondary electrical signal which is impressed on the primary electrical signal to produce a modified electrical signal which controls the metering of hydraulic fluid to the slide to control the slide during the balance of each stroke, and during other separate angular portions of the single rotational cycle of the rotating drive means, the turret is indexed and the station is operated by the drive means.



3,714,855
PROCESS AND APPARATUS FOR SETTING A FLEXIBLE ELONGATE BODY IN A PARTICULAR FORM

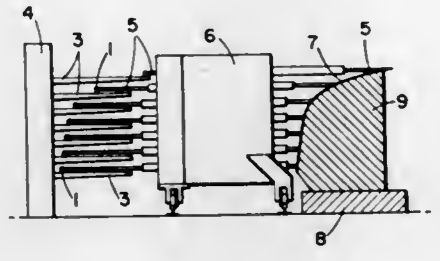
Pieter Klaas Noordenbos, Stokhorstpad 1, Enschede, Netherlands

Filed Feb. 18, 1971, Ser. No. 116,399

Claims priority, application Netherlands, Feb. 20, 1970, 7002474

Int. Cl. B26d *3/00*

U.S. Cl. 83—1 **11 Claims**



A process for setting a flexible elongate body, e.g. a wire-shaped body, supported by a number of bearings in a particular flowing form in which the bearings are placed in such relative positions as to cause the body to assume a desired shape, and while the body and the bearings are being positioned relative to each other, they are rotated about their relative geometrical axes. Also an apparatus for carrying out this process is disclosed.

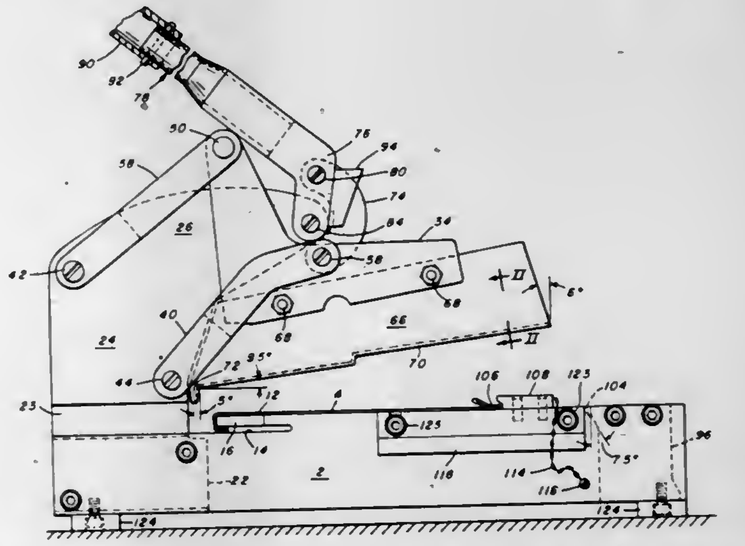
3,714,856
SIDING CUTTER

Marchand B. Hall, Olympia Fields; Irving Handler, Calumet City, both of Ill., and Calvin E. Kelly, Franklin Township, Allegheny County, Pa., assignors to United States Steel Corporation

Filed Feb. 2, 1971, Ser. No. 111,964

Int. Cl. B26d *7/16*

U.S. Cl. 83—453 **10 Claims**



The cutter consists essentially of an upright supporting frame having a pair of fixed shear blades attached one to each side of the bottom of the frame and extending horizontally therefrom in spaced parallel relation in a plane below the upper portion of the frame which upper portion curves outwardly and horizontally. A pair of supporting plates mounted loosely one on each side of the frame support carry an upper shear blade for coaction with the fixed blades. A linkage means pivotally connects the supporting plates to the support frame and to an actuating handle in such a manner that the upper shear blade moves in a path in a plane from the upper portion of the support frame to a point between the fixed shear blades at a constant angle relative to the surface of the siding when the handle is manipulated. The upper surfaces of the fixed shear blades are formed with fixed stop members. Interchangeable auxiliary fixed blades and stop members are provided to hold and shear a length of siding. The portion of the upstanding frame immediately adjacent to and immediately above the ends of the fixed shear blades attached to the frame is formed with a thickness less than the distance between the fixed shear blades so that the cutter is, in effect, a throatless cutter for the purpose of facilitating making long cuts in siding.

3,714,857
PUNCH

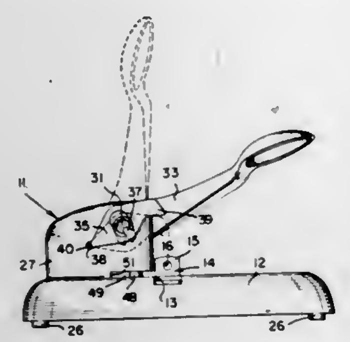
William D. Stuertz, Glen View, and Sam Martorano, Des Plaines, both of Ill., assignors to Swingline Inc., New York, N.Y.

Filed Sept. 9, 1970, Ser. No. 70,837

Int. Cl. B26d *7/02*

U.S. Cl. 83—468 **7 Claims**

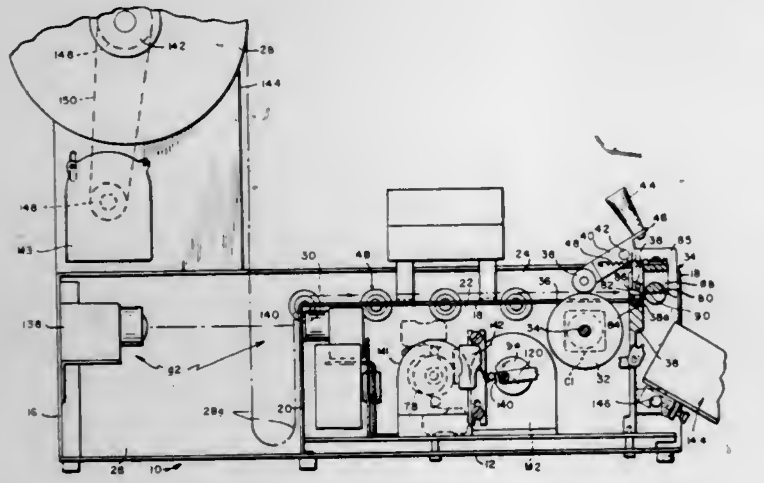
A punch is shown having a body, a punch element pivotally connected to the body, and a guide member slidably movable within the body. The guide member has indicia thereupon which are selectively viewable through an opening within the body. A latch structure is provided to selectively retain the guide member in various positions. Holding means are also provided to selectively retain the punch element in depressed position.



3,714,858

STRIP CUTTER

Richard G. Lee, Weston, Mass., assignor to Alves Photo Service, Inc., Braintree, Mass.
Filed Aug. 17, 1970, Ser. No. 64,410
Int. Cl. B26d *5/32, 5/34*
U.S. Cl. 83—211 **13 Claims**



A rotatable feed roll, mechanism including a one-way clutch for effecting intermittent non-linear rotation of the feed roll through a predetermined angle of rotation to advance strip material to an oscillatable cutter supported beyond the feed roll in the direction of movement of the strip, a detector comprising a lamp and photocell supported adjacent the strip in a position to detect indicia thereon when the strip has slowed to near stop at the end of an interval of non-linear rotation of the feed roll, and means operable by the detector in response to the indicia to effect oscillation of the cutter.

ERRATUM

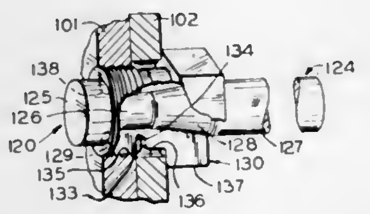
For Class 83—831 see:
Patent No. 3,714,974

3,714,859

ENERGY ABSORBING STRUCTURES

Myron D. Tupper, Portland, Oreg., assignor to Omark Industries, Inc., Portland, Oreg.
Filed Sept. 18, 1970, Ser. No. 73,548
Int. Cl. F16b *31/02;* **F16d** *19/00, 63/00*
U.S. Cl. 85—1 R **2 Claims**

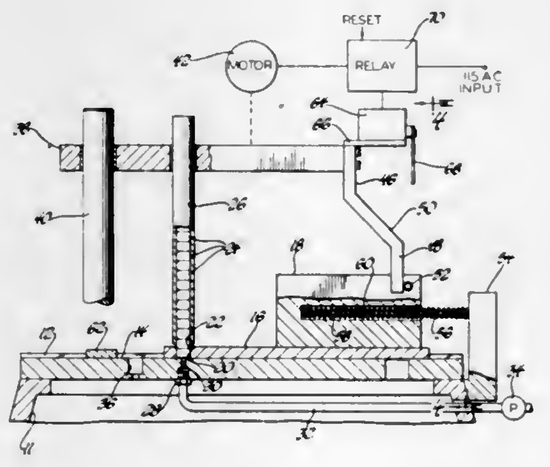
Fastener units (FIGS. 1 and 2) include drawable rods having drawable portions and heads of the same diameter and wedging units tensioning the rods. Another fastener unit (FIG. 3) has a die, a threaded head and a nut. A further fastener unit (FIG. 4) has a combined die and threaded plug connected by a frangible portion. Further fastener units (FIGS. 5 to 12) include capscrew-like drawable rods. Another fastener unit (FIGS. 13 and 14) has a drawable rectangular bar. A further fastener unit (FIGS. 15 and 16) has a die holder into which a drawing die strip is inserted from one side. Another fastener unit (FIGS. 17 and 18) includes a drawable spacer sleeve. Other fastener units (FIGS. 19 to 24) include splittable spacer sleeves. Another fastener structure (FIGS. 25 to 28) has extrudable tubes mounting a bumper on a vehicle frame. Another fastener unit (FIGS. 29 and 30) includes a drawing die and a rod bender for absorbing energy. A further fastener unit (FIGS. 31 to 33) has a drawable rod with two tapered drawable portions.



3,714,860

PRIMER METERING APPARATUS FOR AMMUNITION LOADING MACHINES

Robert A. Leich, Southfield, Mich., assignor to Camdex Inc., Detroit, Mich.
Filed May 13, 1971, Ser. No. 142,955
Int. Cl. F42b *33/04*
U.S. Cl. 86—23 **12 Claims**

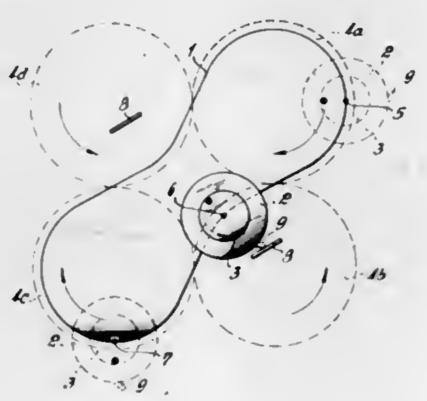


An automatic loading apparatus for small arms ammunition including a horizontally and cyclically displaceable transport member for metering primers from a gravity-feed vertical supply stack to a work station wherein the drive means for the transport member includes a spring for resiliently biasing the transport member into engagement with a programming cam during movement toward the work station, which cam positively drives the transport member back to the supply. Apparatus for vacuum cleansing the metering area is provided. An automatic power interruption feature is provided whereby the drive motor power is interrupted in the event the transport member fails to move out of the path of a switch carried by an upper platen assembly which forms part of the drive means.

3,714,861

APPARATUS FOR REVERSING THE BOBBINS IN A BRAIDING MACHINE

Reiner Strangfeld, Bundesrepublic Deutschland, Germany, assignor to August Herzog Maschinenfabrik, Bundesrepublic Deutschland, Germany
Filed Feb. 10, 1971, Ser. No. 114,280
Claims priority, application Germany, Feb. 10, 1971, P 20 06 792.9
Int. Cl. D04c *3/06*
U.S. Cl. 87—51 **4 Claims**

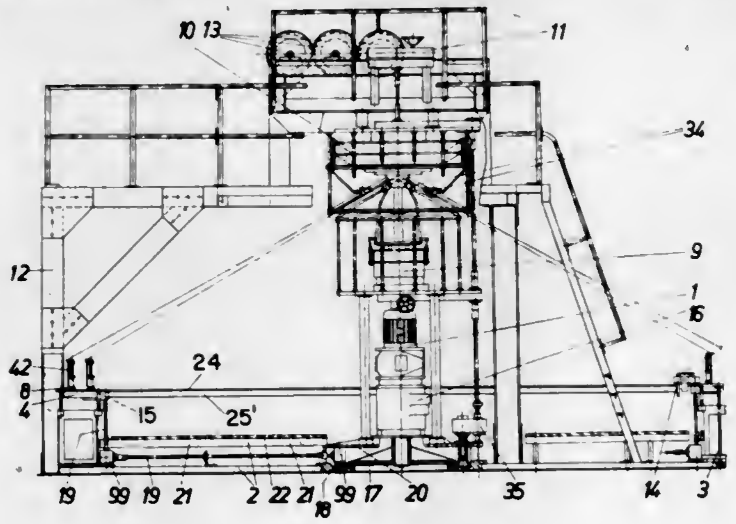


An apparatus for reversing the position of the bobbin of braiding machines wherein each bobbin is rotatably coupled to a bobbin base which includes a bobbin locking mechanism for releasably coupling the bobbin base to the bobbin so that after the bobbin is accelerated in the direction of reversal caused by the tracking kinematics, the locking mechanism is released during the counter-rotation of the bobbin base so that inertia of the bobbin rotator allow the causes it to rotate through the required angle relative to the bobbin base.

3,714,862

BRAIDING MACHINE FOR BRAIDING KNOTLESS NETTING

Heinz Berger, Oldenburg, Germany, assignor to August Herzog Machinenfabrik, Oldenburg, Germany
Filed Oct. 2, 1970, Ser. No. 77,509
Claims priority, application Germany, Oct. 3, 1969, P 19 49 893.2
Int. Cl. D04c *1/00, 3/00, 3/02*
U.S. Cl. 87—8 **19 Claims**

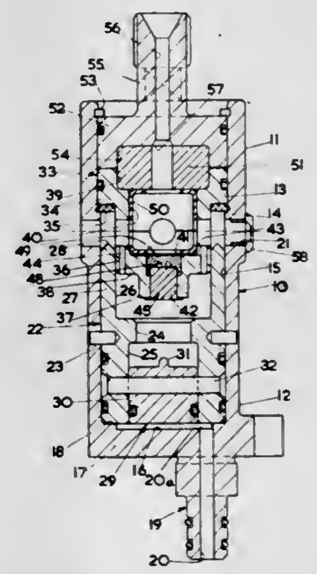


Lace braiding machine for braiding knotless netting. A mechanized braiding assembly is circularly arranged, in horizontal orientation, wherein two rows of wing wheels are provided, with means for carrying and interchanging net lacing needles, provision being made for tracks and track switches for the guidance of these needles. Braid elements formed in this assembly are transported to the upper central region of the machine, where braid lifter means, synchronized with the mechanism of the braiding assembly, complete the loops of the netting and provide for progressive transfer thereof to an overlying take-off unit.

3,714,863

GAS PRESSURE ACTUATORS

John Henry Sindall, Worcester, England, assignor to Imperial Metal Industries (Kynoch) Limited, Warwichshire, England
Filed Aug. 16, 1971, Ser. No. 172,115
Claims priority, application Great Britain, Aug. 18, 1970, 39,733/70
Int. Cl. F42c *15/00*
U.S. Cl. 89—1 R **4 Claims**

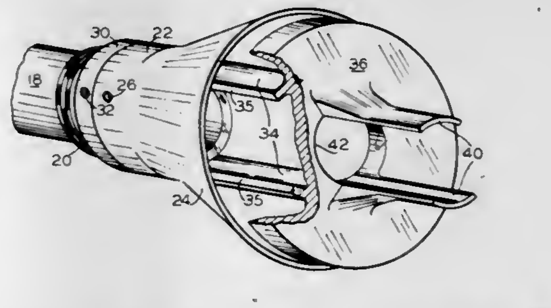


A pressure actuator for a missile system comprising a slide valve member slidable within a bore under combustion chamber gas pressure to close safety vents and operate a percussion priming device to fire an ignition charge, the latter producing gas to actuate the missile system.

3,714,864

MUZZLE ATTACHMENT FOR REDUCING THE RECOIL AND BLAST EFFECT OF GUNS

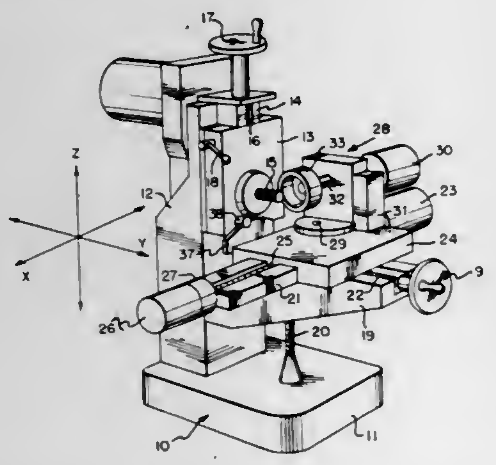
Robert J. Thierry, Averill Park, N.Y., assignor to The United States of America as represented by the Secretary of the Army
Filed March 3, 1971, Ser. No. 120,389
Int. Cl. F41f *17/12*
U.S. Cl. 89—14 C **7 Claims**



In order to reduce the relatively high blast effect customarily encountered by personnel in the vicinity of the breech end of a large caliber gun equipped with a muzzle brake having a forwardly expanding conical nozzle for directing the discharge gases against a baffle plate spaced therefrom to the extent required to promote maximum braking efficiency, the portion of the brake between the muzzle end of the gun tube and the baffle plate is formed by forwardly extending diametrically spaced longitudinal bars which provide a minimum of interference with the shock waves produced by the passage of the discharge gases through the muzzle brake. The distance between the nozzle and the baffle plate can be adjusted without the necessity for removing the muzzle brake from the gun tube.

3,714,865
APPARATUS FOR MILLING CAMS AND THE LIKE, AS FOR SWISS-TYPE SCREW MACHINE CAMS

John A. Villano, c/o CAM-APT 17 Brown Street, Waterbury, Conn.
Filed Jan. 7, 1971, Ser. No. 104,662
Int. Cl. B23c *1/18*
U.S. Cl. 90—13 C **5 Claims**



The invention is directed to a novel apparatus for milling Swiss-type screw machine cams. The invention provides a highly simplified and economical numerically controlled system enabling Swiss-type screw machine cams and similar articles to be milled with an ease and precision heretofore unattainable otherwise than with highly sophisticated and costly equipment. In its most typical application, the invention is utilized in the retro-fitting of an existing milling machine apparatus of otherwise conventional construction. Alternatively, the invention can be applied in the first instance, in connection with the manufacture of modified milling machines incorporating the new control system.

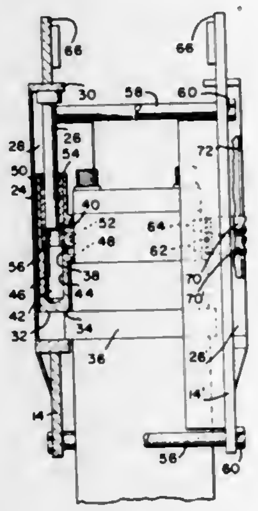
The system of the invention utilizes a conventional three axis milling machine, which is fitted out with a rotary table. Numerically controlled stepping motors are provided for the "X" and "Y" axes of the milling machine, as well as for the rotary table. An otherwise conventional linear interpolator system, which is substantially self contained and commercially available, is connected between one of the linear axis stepping motors and the rotary table stepping motor. By appropriate control of the linear and rotary stepping motors through the linear interpolator, precise, continuous path cutting of involute cam curves is made possible. Such curves are widely utilized in cams for controlling the operation of Swiss-type screw machines, for effecting cutting tool movement at a constant linear speed.

For some Swiss-type screw machines, where the desired cam contour departs slightly from the true involute to accommodate the geometry of the tool supporting arms, the system of the invention provides for programming of the linear and rotary axes to move in the nominal involute relationship, and the "Z" axis of the machine is actuated by a simple mechanical device to introduce the necessary minor geometrical corrections.

The system of the invention provides a highly simplified and economical system for performing a complex milling operation in the production of precision control cams for Swiss-type screw machines.

3,714,866
TOOL FIXTURE

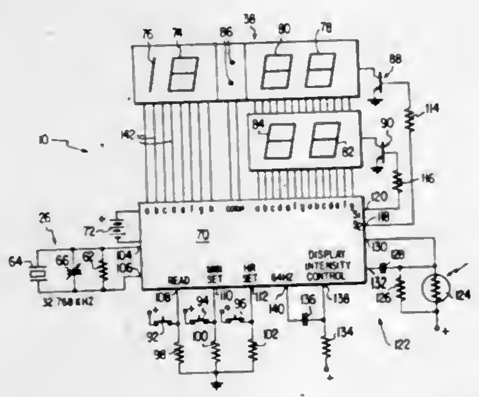
Jack B. Ottestad, 1442 Muirlands Drive, La Jolla, Calif.
Filed Oct. 9, 1970, Ser. No. 79,596
Int. Cl. F01b *15/00;* **F15b** *15/22*
U.S. Cl. 91—216 R **17 Claims**



An opened-ended, four-sided structure for slidably retaining the tool therewithin, with a pilot dowel pin fixed to an end of the structure and extending therefrom into the structure. The pin is slidably received by a cylinder. The cylinder has pressured fluid inlet and vent ports in the wall thereof, and an external terminal end of the cylinder abuts a surface of the tool. The pin cooperates with an annular sleeve disposed about a portion of the inner cylinder wall to seal off the vent port until the cylinder, under pressured-fluid force, travels a predetermined distance to effect a tool movement stroke. Toward the end of the stroke, the vent port is uncovered and evacuates fluid from the cylinder.

3,714,867
SOLID STATE WATCH INCORPORATING LARGE-SCALE INTEGRATED CIRCUITS

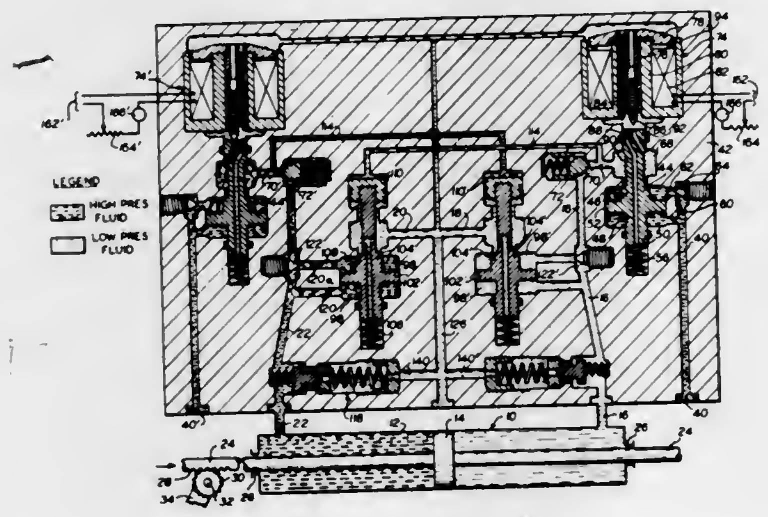
Bruno M. Dargent, Lancaster, Pa., assignor to Hamilton Watch Company, Lancaster, Pa.
Filed Apr. 29, 1971, Ser. No. 138,547
Int. Cl. G04c *3/00;* **G04b** *19/30*
U.S. Cl. 58—50 R **20 Claims**



Disclosed is a solid state wristwatch having no moving parts. A crystal oscillator supplies a timing signal through a binary divider and display actuator to an electro-optical display in the form of a digital array of light-emitting diodes. The vast majority of the electrical components of the watch are incorporated in one or more large-scale integrated circuits.

3,714,868
VALVE SYSTEM FOR PROPORTIONAL FLOW CONTROL FOR FLUID-OPERATED MOTOR

Slawomir Kowalski, Rockaway, and Donald A. Worden, Pompton Plains, both of N.J., assignors to Marotta Scientific Controls Inc., Boonton, N.J.
Filed Sept. 23, 1970, Ser. No. 74,612
Int. Cl. F15b *11/08, 13/04*
U.S. Cl. 91—420 **8 Claims**

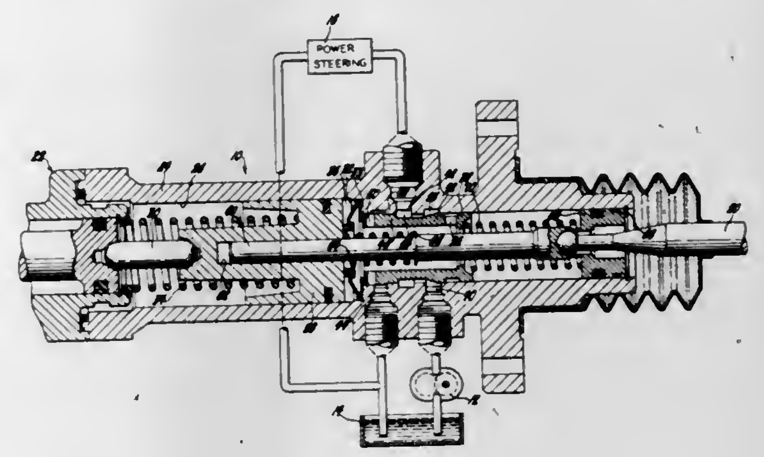


This system for controlling the flow of working fluid to and from a motor includes valves that regulate the working fluid flow so that it is proportional to the force applied to move the valves into open position regardless of changes in pressure in the system. The motor is double-acting and its movement is sometimes against the load and sometimes in a direction in which the load assists the movement of the motor. In the latter case it is important that the exhaust from the motor be regulated to control the speed since the supply of working fluid to the other end of the motor may produce excessive speed. Both the rate of inlet and exhaust of the working fluid, therefore, are determined by proportional flow control valves having their flow dependent upon the force applied to solenoids or other actuators for the valves.

3,714,869
HYDRAULIC POWER BRAKE UNIT

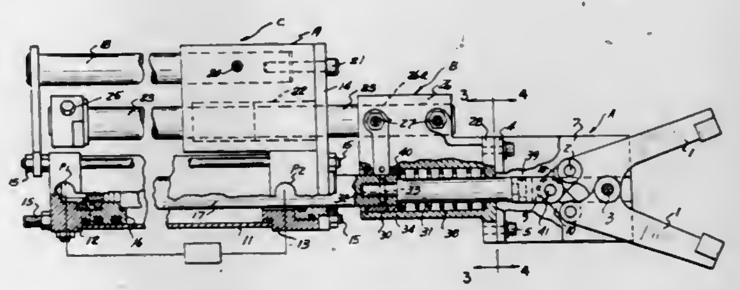
Donald M. Flory, Arcanum; Elton S. Moyer, Centerville, and Thomas D. Naismith, Dayton, all of Ohio, assignors to General Motors Corporation, Detroit, Mich.
Filed March 26, 1971, Ser. No. 128,357
Int. Cl. F15b *13/14, 13/10*
U.S. Cl. 91—434 **3 Claims**

A hydraulic power brake unit including a power piston operatively engaging a conventional master cylinder and an annular valve spool having differential end areas communicating with the power chamber formed by the power piston and being normally positioned in the housing to communicate hydraulic fluid from a pressure source to the power steering unit and communicate the power chamber to the power source reservoir. When the brake pedal is actuated, an actuating spring acting between the valve spool and a reaction piston attached to the pedal pushrod is compressed and the valve spool is moved to restrict fluid communication from the pressure source to the power steering unit and divert the flow to the power chamber while simultaneously blocking communication of the power chamber to the reservoir so that the power chamber is pressurized and the power piston fluidly displaced to actuate the master cylinder. The power chamber pressure acts on the differential area of the valve spool to resist its movement by the actuating spring and causes it to function as a regulating valve which continuously provides a power chamber pressure proportional to the force of the actuating spring. Upon a malfunction caused loss of hydraulic pressure the reaction piston moves into abutting engagement with the power piston to provide a rigid force transmitting link between the pushrod and the master cylinder whereby the brakes are actuated independently of the hydraulic boost.



3,714,870
DUAL GRIP ACTUATING UNIT WITH TRAVEL CYLINDER ASSEMBLY

Leland F. Blatt, 24121 Mound Road, Grosse Pointe Woods, Mich.
Continuation-in-part of Ser. No. 815,658, April 14, 1969. This application Dec. 14, 1970, Ser. No. 97,599
Int. Cl. F01b *9/00*
U.S. Cl. 92—140 **1 Claim**

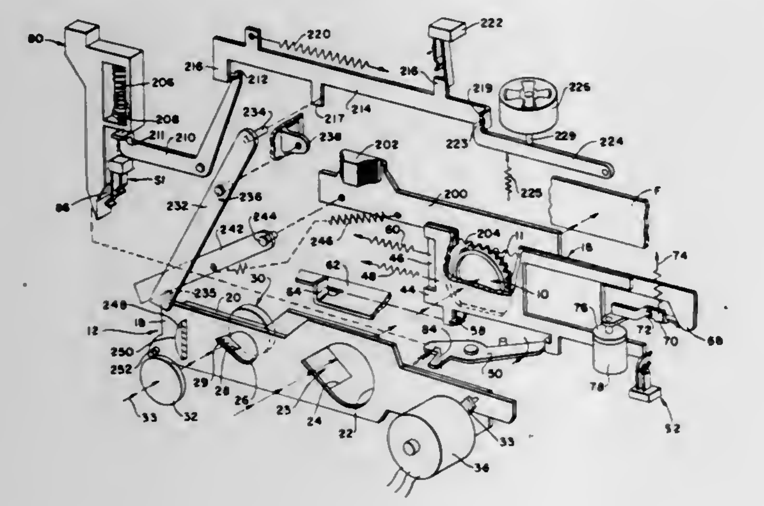


For use with a work gripping assembly such as is shown in U.S. Pat. No. 3,371,953, the combination of a travel means and an actuating assembly which are separate components, with the travel means carrying the actuating assembly, and with mechanical movement provisions in the actuating assembly to enable it to be moved as a whole towards and away from the travel assembly, but with a quick action on the gripping assembly during movement of the actuating assembly towards the travel assembly.

3,714,871
CAMERA APPARATUS ADAPTED FOR OPERATION WITH AUXILIARY LIGHT SOURCE

Richard J. Bresson, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
Filed Sept. 13, 1971, Ser. No. 179,710
Int. Cl. G03b *7/10*
U.S. Cl. 95—10 C **2 Claims**

An exposure control system for use in photographic apparatus which is adapted for operation with an auxiliary source of illumination such as a flash lamp. In particular, the exposure control system includes a radiation sensitive element disposed to receive illumination from a scene and a mechanism coupled to the radiation sensitive element for varying the size of the exposure aperture as a function of the scene radiation directed onto the radiation sensitive element. In a second mode of operation wherein an auxiliary source such as a flash lamp is used, a coupling mechanism is rendered operative for coupling a focusing mechanism associated with the camera lens to the aperture adjusting mechanism so that in the flash mode of operation, the shutter mechanism is set as a function of the focus distance. More specifically, the aperture adjusting mechanism tends to be driven by a motor until it engages the coupling mechanism which is set as a function of the focal distance.



3,714,872
PHOTOGRAPHIC FLASH EXPOSURE CONTROL SYSTEM

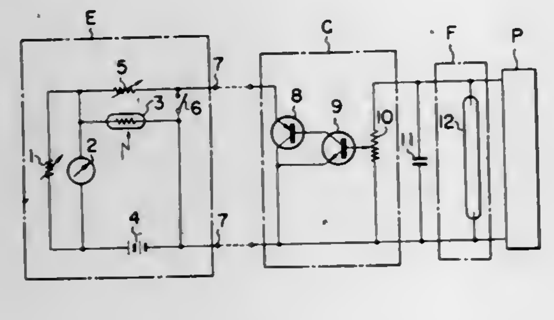
Yukio Mashimo, Meguro-ku, Tokyo; Seiichiro Mizui, Naka-ku, Yokohama-shi, Kanagawa-ken, and Yoshiyuki Takishima, Kawasaki-shi, Kanagawa-ken, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed April 13, 1970, Ser. No. 27,699

Claims priority, application Japan, April 18, 1969, 44/30113; June 20, 1969, 44/48735; June 20, 1969, 44/48736; June 6, 1969, 44/53050

Int. Cl. G03b *15/05*; **H05b** *41/02*

U.S. Cl. 95—10 CE **15 Claims**



A camera system comprises a flash device cooperative with a auto-flash mechanism in a camera. The flash device comprises a capacitor, a power supply circuit for charging the capacitor and a discharge lamp circuit including a discharge lamp. The flash device is further provided with a control circuit connected between the capacitor and the auto-flash mechanism for detecting the charge stored in the capacitor and providing output signal to control the auto-flash mechanism in the camera to obtain the optimum exposure.

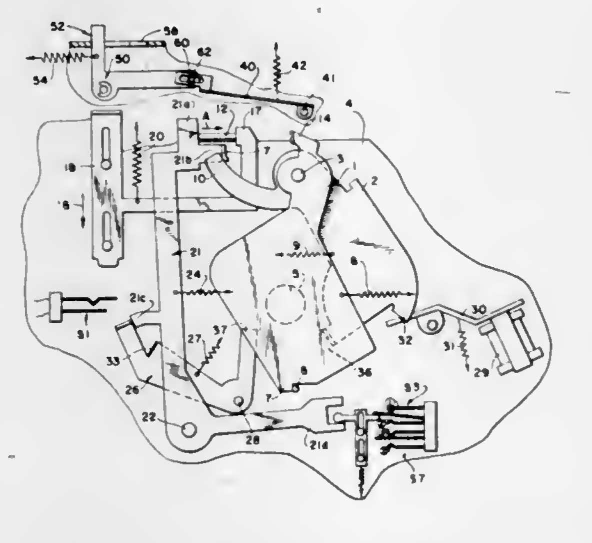
3,714,873
SHUTTER CONTROL APPARATUS FOR PHOTOGRAPHIC CAMERAS

Paul J. Ernisse, and Robert L. Reynolds, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 127,475, March 24, 1971. This application Jan. 24, 1972, Ser. No. 220,395

Int. Cl. 95 *60*; **G03b** *7/08, 9/62*

U.S. Cl. 95—10 CT **18 Claims**



In a camera having a photoelectric timing circuit for determining shutter speed in accordance with the level of scene illumination, a shutter mechanism including a mechanical override control is provided for establishing a maximum predetermined shutter speed for flash exposures. The shutter mechanism includes an opening blade actuatable to initiate an exposure interval and a closing blade actuatable under the control of the timing circuit to terminate the exposure interval, and the override control includes a member actuatable to permit the opening shutter blade to close after a predetermined time. The override control member is adapted for actuation in response to insertion of a flashlamp unit into a recepticle on the camera and/or in response to actuation of a member accessible from the exterior of the camera.

3,714,874
PHOTOGRAPHIC APPARATUS FOR USE WITH LIGHT GENERATING DEVICES WHICH ARE RESPONSIVE TO MECHANICAL IMPULSES

Dieter Engelsmann, 8025 Unterhaching; Hubert Hackenberg, Munchen 21, and Horst Karl, Munchen 13, all of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed June 30, 1971, Ser. No. 158,256

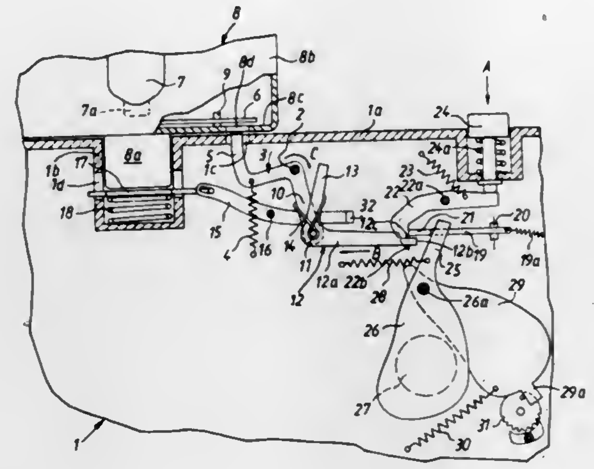
Claims priority, application Germany, July 3, 1970, P 20 33 150.4

Int. Cl. G03b *15/04*

U.S. Cl. 95—11.5 R **19 Claims**

A still camera for use with detachable flashcubes having lamps which are are associated with cartridges responsive to mechanical impulses to fire the associated lamps. The body of the camera supports a horizontal pivot pin for a first two-armed lever one arm of which carries the pivot pin for a second two-armed lever. The second lever can be pivoted with reference to the first lever during the first part of a first stage of movement of an actuating lever from a first to a second position, and the second lever pivots with the first lever during the next-following part of the first stage of movement of the actuating lever whereby the first lever causes an impeller in the flashcube to transmit an impulse to one of the cartridges for firing of a lamp at the exact moment when the actuating member opens the shutter during a second stage of its movement. During such second stage, the actuating lever is disengaged from the second lever so that a spring can retract the

first lever to its starting position. A blocking lever in the camera body can disengage the second lever from the actuating lever in response to detachment of the flashcube from the body so that the actuating lever can open the shutter while the first and second levers remain idle.



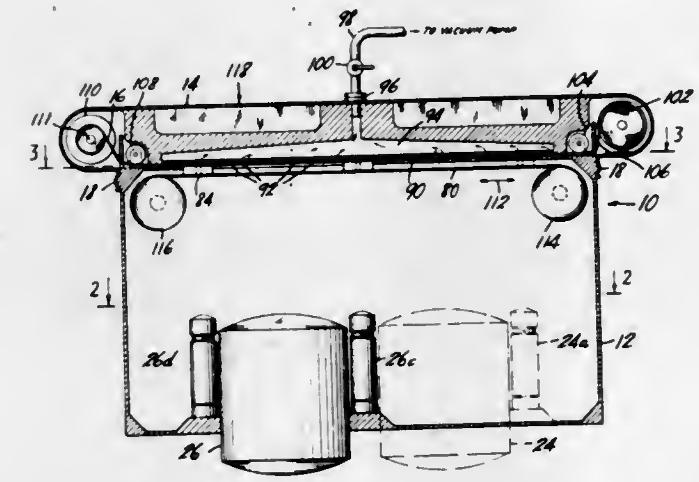
3,714,875
METHOD OF MULTISPECTRAL PHOTOGRAPHY AND PROTECTOR

Edward J. Yost, Jr., Northport, N.Y., assignor to Spectral Data Corp., Hicksville, N.Y.

Filed July 16, 1969, Ser. No. 842,133

Int. Cl. G03b *33/04*

U.S. Cl. 95—12.2 **4 Claims**



A multispectral camera simultaneously forms four black-and-white pictures of the same subject on a strip of photographic film. A different region of the electromagnetic spectrum is primarily employed in forming each picture. Simultaneously with the forming of the pictures, penlights mounted in the camera form on the film a number of fiducial marks associated with each picture. In projecting the pictures for viewing after they are developed, an additive color viewer is used having a separate projection lens for each picture, the lenses being movable with three degrees of freedom so that the projected images of the fiducial marks can be made to coincide. In this way, the projected images of the four pictures are accurately superimposed to produce a composite image in true or false color. The brightness, saturation, and hue of the projected images of the four pictures are then manipulated in order to extract a wide variety of data regarding the subject.

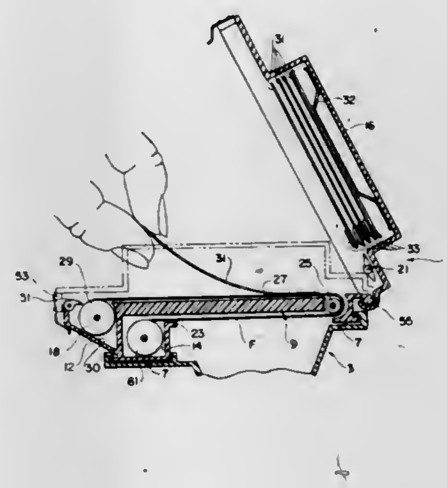
3,714,876
PHOTOGRAPHIC CARTRIDGE

Hubert Nerwin, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed May 1, 1970, Ser. No. 33,676

Int. Cl. G03b *17/52*

U.S. Cl. 95—13 **6 Claims**



A cartridge of self-processing photographic film includes first and second supply chambers, one each for film and second or process elements, and a take-up chamber for collecting and storing processing waste material disposable with the cartridge. In a preferred form, film is supplied in the cartridge from a single roll and is advanced therefrom to a first position for exposure, then to a second position for processing, and finally to a take-up mechanism for winding the film back into a roll. Individual second elements are supplied as sheets in stacked relation in a second chamber, behind the film processing chamber, and are superposed or registered one at a time with the film for processing. After processing, the second sheet, with the image received thereon, is stripped from the film automatically and transported to the cartridge exterior at the same time the film is wound into the take-up chamber. Alternatively, the cartridge back may be opened for manual stripping of the finished print.

3,714,877
PHOTOGRAPHIC STILL CAMERA

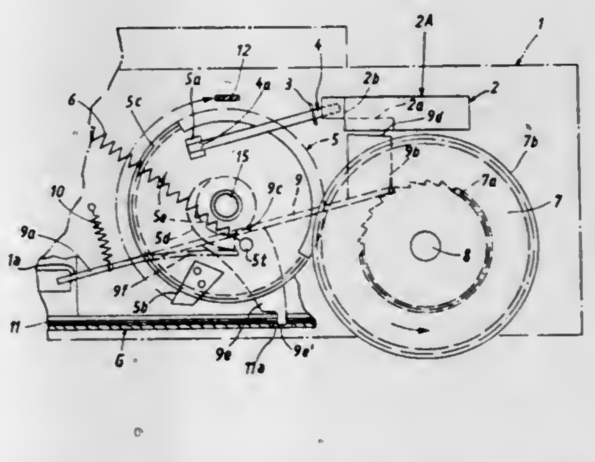
Rolf Schröder, Baldham-Kolonie, Germany, assignor to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed May 23, 1972, Ser. No. 256,096

Claims priority, application Germany, May 27, 1971, P 21 26 279.3; Dec. 17, 1971, P 21 62 705.4

Int. Cl. G03b *1/62, 15/04, 17/42*

U.S. Cl. 95—31 FM **26 Claims**



A still camera for use with roll film having a perforation for each film frame employs a film transporting member which is held against rotation by an arresting device in response to completed transport of film by the length of a frame. The arresting device is rigid with a tracking member which is normally biased against the film by a driver wheel to enter an oncoming perforation upon completed transport of the film by the length of a frame whereby the tracking member actuated the arresting device. The latter carries a projection which maintains the camera release in its starting position when the transporting member is free to advance the film. The driver wheel is biased by a first spring against a blocking pawl which can be disengaged in response to movement of camera release from its starting position whereby the spring propels the driven wheel to a position in which a second spring is free to withdraw the tracking member from the adjacent perforation and a gear segment of the driver wheel mesbes with a gear on the transporting member so that the latter can rotate the driver wheel back into engagement with the blocking pawl during transport of the film with attendant stressing of the first spring. The driver wheel further serves to open the shutter, to index a socket for a flashcube and/or to actuate an impeller which fires a flash lamp of the flashcube in open position of the shutter.

3,714,878

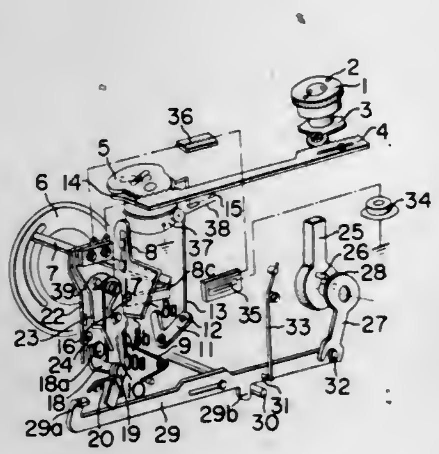
SINGLE-LENS REFLEX CAMERA HAVING INTERCHANGEABLE LENSES

Goro Hasegawa, Fuchu-shi, Tokyo, and Yukio Iura, Kawasaki-shi, Kanagawa-ken, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 30, 1970, Ser. No. 93,787

Int. Cl. G03b *19/12*

U.S. Cl. 95—42 **5 Claims**



A single lens reflex camera having interchangeable lenses, an exposure meter capable of carrying out photometering of the light through a phototaking lens according to the system of the lens attached. A sliding cam plate is movable to a position corresponding to a preset value of a diaphragm aperture by the engagement of an interchangeable lens with a preset pin. A rocking lever is engageable with the sliding cam plate for positioning at a predetermined location in accordance with the location of the preset pin for adjusting the exposure meter to open aperture photometry, and a sliding member is operatively engageable with an aperture setting pin of the lens. A setting lever is connected to the sliding member for setting the aperture to a preset value, a portion of the setting member being engageable with the rocking lever when the setting lever is actuated to set the exposure, thereby to pivot the rocking lever for adjusting the exposure meter to open aperture photometry. A warning member in operative association with the rocking lever is movable between a warning range and a photometry range.

3,714,879

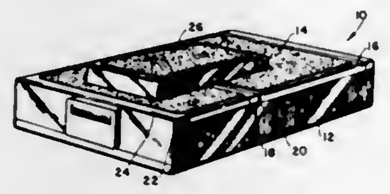
REFLEX CAMERA

Edwin H. Land, Cambridge; Igor Blinow, Millis, and Vaito K. Eloranta, Needham, all of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed April 16, 1971, Ser. No. 134,733

Int. Cl. G03b *19/12*

U.S. Cl. 95—42 **44 Claims**



A fully automatic single-lens reflex camera configured to be foldable into a thin, compact shape suited for convenient carrying in the pocket of a garment. Thinness is achieved through a placement of a motor source adjacent one side of a rectangular film cassette within the housing of the camera and a roll-type processing station adjacent an opposite side of the cassette. A gear train having two branch circuits is coupled within the camera housing between the motor and the processing station along a third side of the film cassette. Reflex operation of the camera is carried out in response to movement of a kinematic linkage including a ram extending along the length of the elongate gear train. Through selective dual energization of the motor, this reflex operator assembly is moved by the kinematic linkage between viewing and exposure positions.

3,714,880

ELECTRIC SHUTTER OPERATING MECHANISM

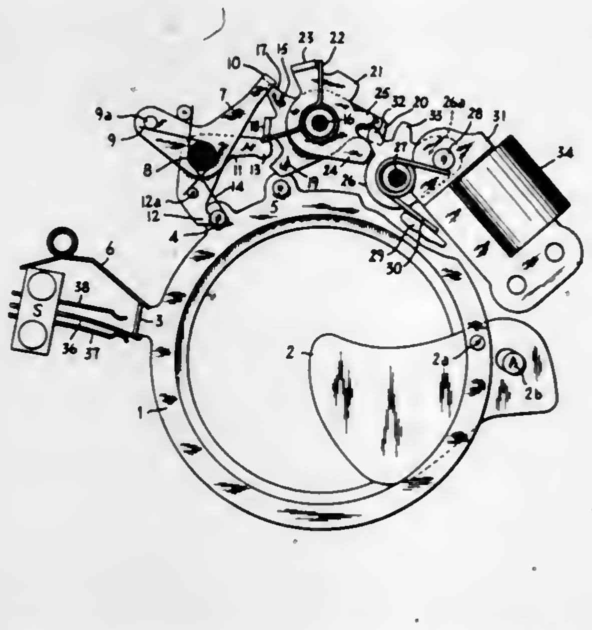
Kiyoshi Kitai, 54 Tomihisa-cho, Tokyo, Japan

Filed Sept. 24, 1971, Ser. No. 183,478

Claims priority, application Japan, Sept. 25, 1970, 45/83,484

Int. Cl. G03b *9/22*

U.S. Cl. 95—63 **9 Claims**



A shutter operating mechanism comprises three rotary driving members. The first and second driving members are coaxial and are coupled by a first driving spring. The first driving member opens the shutter by movement in one direction from a cocked position and closes the shutter by further movement in the same direction. The third driving member is biased in a direction to close the shutter by a second driving spring and is held against such bias by the armature of an electromagnet when energized. The second and third driving members are coupled by modified gear teeth so that, in cocked condition the second driving member biased by the first driving spring acts on the third driving member to hold the armature against the unenergized electromagnet. At the end of the opening movement, the residue force of first driving member is dissipated by being directed from the second driving member to the third driving member in an approximately radial direction by the gear teeth. Upon release of the third driving member by the electromagnet, rotation of the third driving member by the second driving spring is transmitted through the gear teeth to the second driving member and hence to the spring-coupled first driving member to close the shutter.

3,714,881

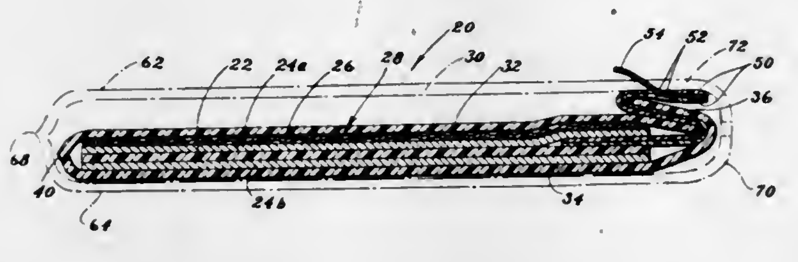
SINGLE USE FILM DEVELOPER AND RUPTURABLE SEAL THEREFOR

James F. G. Bowlby, 124 Demarest Road, Bloomingdale, N.J.

Filed Oct. 5, 1970, Ser. No. 77,778

Int. Cl. G03d *3/00*

U.S. Cl. 95—89 R **18 Claims**



Light-sealed holder means are disclosed for releasably packaging a length of film. The light seal of the film holder which is readily rupturable is made by heat sealing a folded over corner of the plastic that forms the holder.

3,714,882

APPARATUS FOR DEVELOPING EXPOSED LIGHT-SENSITIVE SHEETS

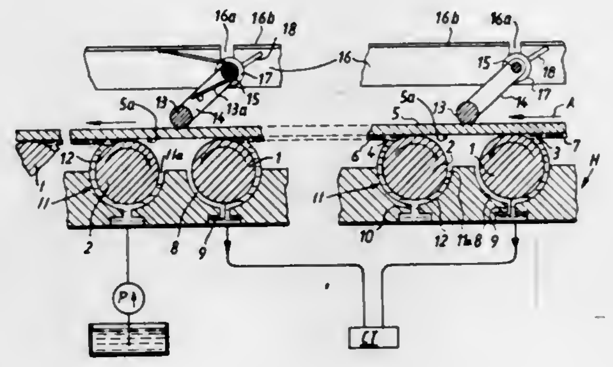
Karl-Wilhelm Schranz, Opladen; Wolfgang Hunicke, Leverkusen, and Josef Busch, Bensberg, all of Germany, assignors to Agfa Gevaert Aktiengellschaft, Leverkusen, Germany

Filed June 25, 1971, Ser. No. 156,840

Claims priority, application Germany, June 26, 1970, P 20 31 648.7

Int. Cl. G03d *5/06*

U.S. Cl. 95—89 R **19 Claims**



A developing apparatus for light sensitive emulsions at the undersides of sheets which are transported in a horizontal plane has alternating liquid applying and liquid removing rollers which respectively coat the undersides of sheets with layers of a liquid developer and remove such layers from the sheets. The sheets are biased against the rollers by idler rollers which rest by gravity on the upper sides of the sheets. The liquid applying and liquid removing rollers rotate in opposite directions at peripheral speeds which exceed the forward speed of the sheets by at least 10 percent.

3,714,883

MACHINE FOR WET TREATMENT OF ELONGATED STRIP-SHAPED CARRIERS FOR LIGHT SENSITIVE MATERIAL

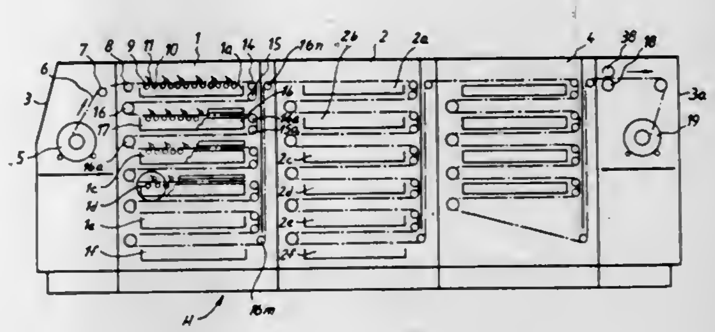
Wolfgang Hunicke; Rolf Spohr, both of Leverkusen; Karl-Wilhelm Schranz, Opladen; Josef Busch, Bensberg; Erwin Schon, Leverkusen, and Hans-Dieter Frick, Munich, all of Germany, assignors to AGFA-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed June 28, 1971, Ser. No. 157,572

Claims priority, application Germany, June 26, 1970, P 20 31 649.8

Int. Cl. G03d *3/12, 5/06*

U.S. Cl. 95—94 R **13 Claims**



A machine for repeated wet treatment of exposed film strips or the like with one or more liquids has one or more stacks of superimposed treating sections wherein the film strips advance in horizontal planes so that their emulsion-coated sides face downwardly. Each section contains liquid applying rollers which dip into supplies of liquid treating agents and contact the undersides of the travelling film strips. The liquid applying rollers alternate with liquid removing rollers which remove the layers of liquid applied by the preceding liquid applying rollers and direct the thus removed liquid into channels for evacuation from the machine. The film strips are pulled by advancing rolls which are mounted downstream of the last treating section, and the liquid applying and liquid removing rollers are driven in opposite directions to respectively brake and accelerate the adjoining portions of the strips. This insures that the tension of film strips cannot increase to a value at which the strips would be likely to tear or to slip off their guide rollers.

3,714,884

DEVICE FOR VENTILATION SYSTEMS IN SPACES

Tore Christiansen, Bandhagen, Sweden, assignor to Carl George Munters, Stocksund, Sweden

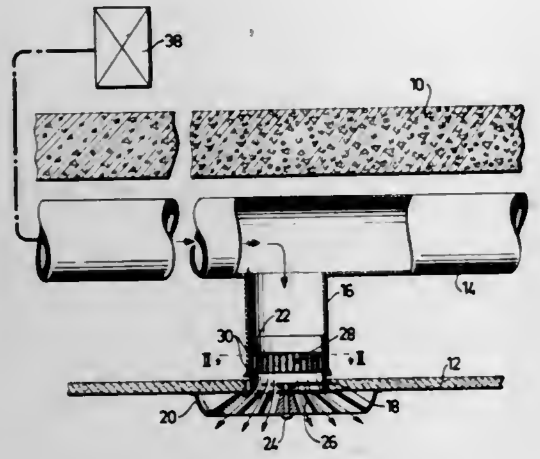
Filed July 1, 1970, Ser. No. 51,620

Claims priority, application Sweden, July 11, 1969, 9910/69

Int. Cl. F24f *13/06*

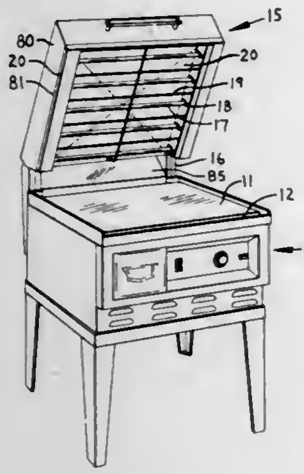
U.S. Cl. 98—40 D **7 Claims**

A device in a ventilation system for spaces and comprising a channel for admitted air opening into said spaces and housing a throttling member occupying at least almost the entire cross-sectional area of the channel and composed of mutually parallel thin layers subdividing said throttling member into a great



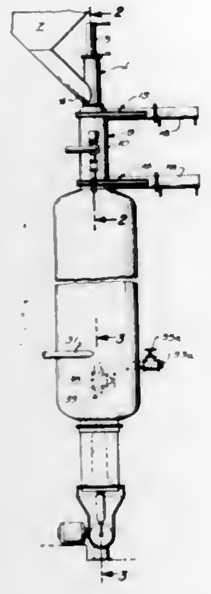
number of tubular straight passages with a so small diameter as effectively to counteract occurrance of disturbing noise.

3,714,885
BROILER-GRILL COOKING APPLIANCE
Donald J. Wertheimer, Milwaukie, Oreg.; Richard D. Fish, Bellevue, Wash., and Ralph A. Holmes, Portland, Oreg., assignors to F. S. Manufacturing Company
Filed Oct. 15, 1971, Ser. No. 189,548
Int. Cl. A47j *37/06*
U.S. Cl. 99—425 **14 Claims**



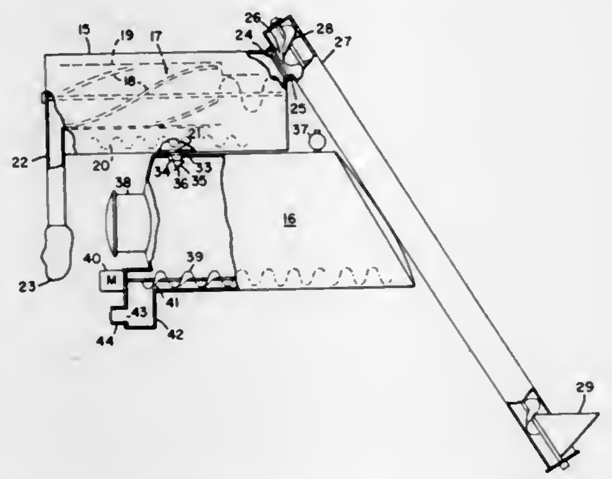
A griddle unit forms a base for a hinged hood containing a broiler unit whereby meat, fish and other products may be cooked very rapidly and efficiently by grilling them on the bottom and simultaneously broiling them on the top. The source of heat for the broiler is a plurality of tungsten filament quartz tube lamps mounted beneath a reflector plate. Counterbalancing springs in supporting hollow stanchions assist in raising the hood and a spring catch positioner holds the hood open at a 60° angle for normal use or in vertical position for use of the griddle without the broiler. The broiler is energized only when it is brought down into horizontal broiling position above the griddle. A grease trough along the front of the griddle discharges into a grease pan in the base which is enclosed in a slide housing to prevent overflow into the base of the appliance. An accordion-folded spring plate presses electric heating elements into good heat conducting relation with the under side of the griddle plate for efficient heating of the griddle.

3,714,886
MEANS AND METHOD OF PRODUCING AN EXPANDED CEREAL PRODUCT
William W. Worden, P.O. Box 98, Thermal, Calif.
Filed March 15, 1971, Ser. No. 123,999
Int. Cl. A23l *1/18*
U.S. Cl. 99—467 **7 Claims**



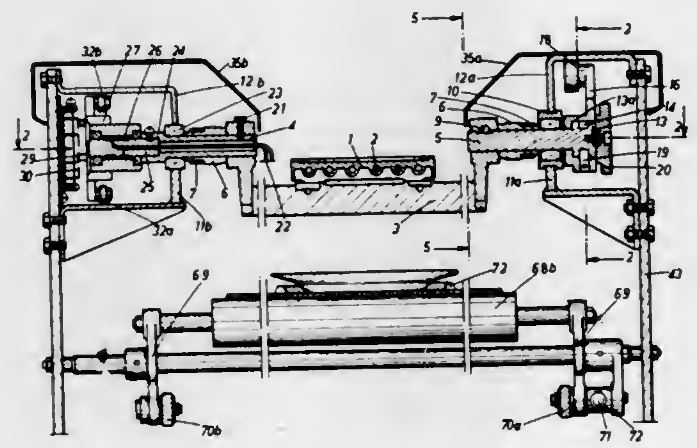
A means and method whereby bulk cereal is fed intermittently into an entrance chamber, steam pressurized and gravity fed into an elongated vertical superheated and pressurized steam chamber where the individual grains separate as they fall by gravity for intimate contact by super-heated steam to effect localized condensation of the steam and moisture impregnation. The grains being collected at the bottom of the steam chamber and subjected to continuous agitation and continuous extrusion to atmospheric pressure with attendant expansion in the course of discharge.

3,714,887
APPARATUS FOR CRUSHING FRUIT IN AN INERT GAS
Wallace J. S. Johnson, Berkeley, Calif., assignor to Up-Right, Inc., Berkeley, Calif.
Continuation-in-part of Ser. No. 65,576, Aug. 20, 1970, abandoned. This application Nov. 18, 1971, Ser. No. 107,176
Int. Cl. A23l *1/02*
U.S. Cl. 99—239 **12 Claims**



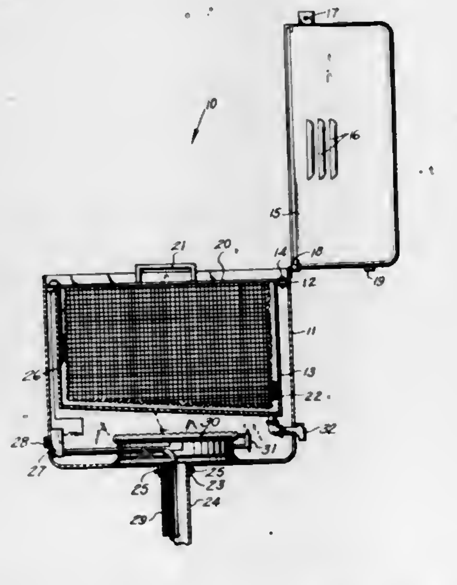
An enclosed fruit-crusher, discharging into an enclosed tank filled with an inert gas, which, as it is filled with crushed fruit, displaces the inert gas from the tank through the crusher and out the crusher inlet, thereby preventing entry of oxidizing air into the crusher or tank at all times during filling and crushing. Inert gas under pressure is introduced into the tank as crushed fruit is discharged therefrom, thereby refilling the tank with inert gas and preventing contact of the crushed fruit with oxidizing air during emptying.

3,714,888
MACHINE FOR COOKING EGGS AND MINCED MEATS
Pierre Tanguy, 19 rue de France, 95 S'Ouen P'Aumoue; Pierre Carre, 58 rue Y. Tonnjuene, P. 78 Bongival, and Jean Le Boulbouech, 6 rue Blangin, Lorlent, all of France
Continuation-in-part of Ser. No. 764,825, Oct. 3, 1968, abandoned. This application March 19, 1971, Ser. No. 125,997
Claims priority, application France, March 25, 1968, 68145315
Int. Cl. A47j *27/14*
U.S. Cl. 99—355 **7 Claims**



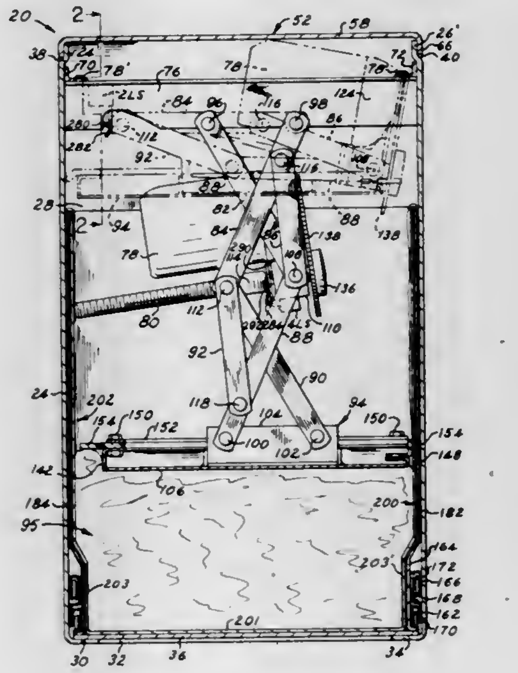
An automatic cooking machine for restaurants, canteens, etc., comprises a line of cooking slabs movable in a closed vertical circuit and carrying the food to be cooked. Each of the slabs is pivotable about a horizontal axis transverse to the direction of movement of the slabs and displaced from the center of the slab in the direction of movement of the slab so that by turning a slab over, food can be transferred to an adjacent slab. Means is provided for applying heat to cook the food on the slabs and for delivering the cooked food onto service plates at another point of the circuit.

3,714,889
OUTDOOR DEEP FRYER
Russell E. Mazzola, 1702 18th Street, Phenix City, Ala., and Nicola J. Fucci, 3934 Commander Drive, Columbus, Ga.
Filed March 4, 1971, Ser. No. 120,937
Int. Cl. A47j *37/12*
U.S. Cl. 99—411 **5 Claims**



An apparatus for outdoor frying of foods. This device includes a pipe stand with a casing attached to it, containing a pot member with a removable wire basket. The apparatus also includes heat control means for the gas or electric heating arrangement.

3,714,890
REFUSE COMPACTOR
Jerry W. Moon, 2735 Alveston, Bloomfield Hills, Mich.
Filed June 1, 1971, Ser. No. 148,879
Int. Cl. B30b *15/06*
U.S. Cl. 100—229 A **26 Claims**



A refuse compactor including a receptacle removably contained within a cabinet wherein refuse is compacted by a ram to a fraction of its normal volume. The refuse is compacted within a specially constructed bag supported by the receptacle and cabinet, permitting the compacted refuse to be removed as a wrapped package for convenient and tidy disposal. The ram includes a refuse-compressing platen actuated through a toggle linkage to which force is applied by a single screw driven by an electric motor coupled to the screw through a reduction drive. The screw and its motor drive train are carried as a unit by the toggle linkage and move bodily therewith to provide a very compact and high ratio force multiplication system of reliable and inexpensive construction. Additional features relating to control circuitry, a safety lock, and bag, receptacle and drawer construction are also disclosed.

3,714,891
PROCESS OF USING MULTI-PURPOSE LITHOGRAPHIC SOLUTION
Charles H. Van Dusen, Jr., Willoughby, and Paul Brown, Cleveland, both, Ohio, assignors to Addressograph-Multigraph Corporation, Cleveland, Ohio
Filed Dec. 8, 1970, Ser. No. 96,274
Int. Cl. B41m *1/00, 5/00;* **B41n** *3/00*
U.S. Cl. 101—451 **2 Claims**

A multi-purpose lithographic solution is provided adapted for use in concentrated form and in different ratios of aqueous dilution as conversion, start-up, fountain solution, or the like for a plurality of different types of planographic printing masters, such as electrostatic, direct-image, and photographic planographic masters, both projection speed and conventional. The solution preferably comprises glycerin, monosodium phosphate, potassium ferrocyanide, and water as solvent. The amounts of the dissolved components in the concentrated form must be present within fairly narrow ranges. Similarly, when the concentrated solution is diluted for use, for example as a fountain solution, the dilution with water must be carried out in definite ratios of concentrated solution to water.

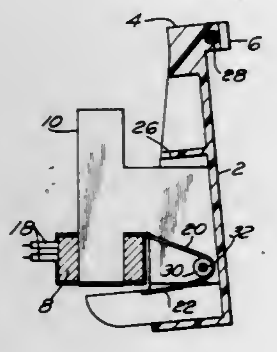
3,714,892
IMPACT HAMMER FOR LINER PRINTER

Richard Anthony Perry, Attleboro, Mass., assignor to Odec Computer Systems, Inc., East Providence, R.I.

Filed Oct. 20, 1970, Ser. No. 82,355

Int. Cl. B41j *9/38*

U.S. Cl. 101—93 C **3 Claims**



A plastic injection molded hammer for line printers is disclosed. The hammer comprises a tapered body and a hammer head projecting at approximately a right angle from the longitudinal dimension of the hammer body. The hammer body is hollow with an opening in the back of the body. The coil and core of an electromagnet are seated in the hollow portion of the body through the opening in the back of the body and an armature is embedded in the base of the body directly below the coil and core. In operation, the armature is attracted to the coil and the core, when the coil is energized, with such great force that the face of the hammer is whipped against the print anvil.

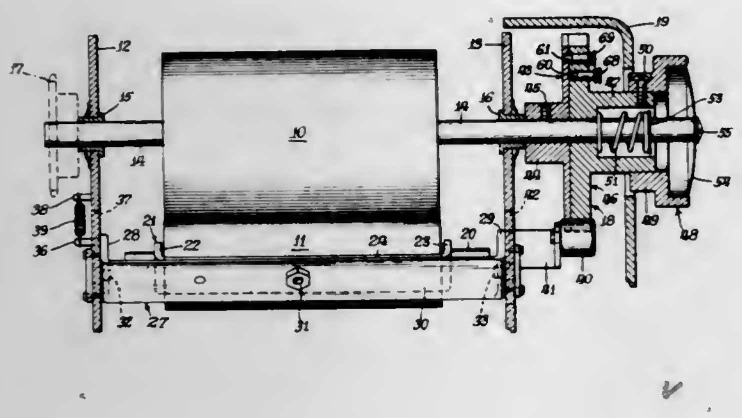
3,714,893
ROTARY LABEL PRINTING MACHINE WITH ADJUSTABLE ROTOR CAM FOR SEPARATING THE PRINTING COUPLE

Jean R. Cole, Des Plaines, Ill., assignor to Weber Marking Systems, Inc., Arlington Heights, Ill.

Filed March 15, 1972, Ser. No. 234,850

Int. Cl. B41f *13/34*

U.S. Cl. 101—228 **4 Claims**



A label printer having a printing roller and a cooperative platen roller which together act to print a label and feed label stock through the printer. An adjustable cam having plural discs is associated with the printing roller to move the platen roller away from its cooperative engagement with the printing roller during selected portions of the roller circumference to cause an intermittent feeding of label stock. One disc of the adjustable cam includes two arcuate concentric rows of spaced apart apertures with the apertures of one row regularly intercalated with the apertures of the adjacent row. Fine cam adjustment is accomplished by relative rotation of the plural discs of the cam and a pin locking of the discs in their adjusted position.

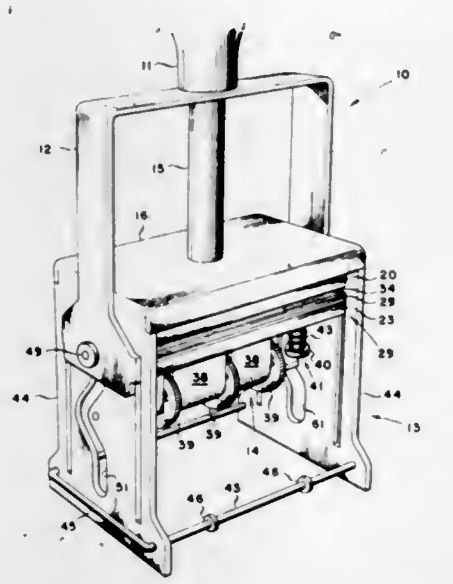
3,714,894
RECIPROCATING HANDSTAMP WITH MAGNETIC PLATE HOLDING MEANS FOR REMOVING THE PLATE

Gerald P. Robinson, 1940 North Atlanta Rd., Apt. 13B, Smyrna, Ga.

Filed Dec. 3, 1970, Ser. No. 94,916

Int. Cl. B41f *27/02;* **B41k** *1/06*

U.S. Cl. 101—382 MV **4 Claims**



A stamping machine having a removable resilient indicia bearing member adapted to imprint indicia upon desired receiving locations. The indicia bearing member is affixed to a saddle which is removably attached to the machine type carrying bed by means of magnetic attraction. A release plunger mounted on the type carrying bed detaches the saddle at predetermined times. Alignment and registry of the stamping machine with the item to be stamped is done by aligning integral indexing devices with index points on the indicia bearing member and desired points on the item to be imprinted. Two methods for proper alignment and registry are shown.

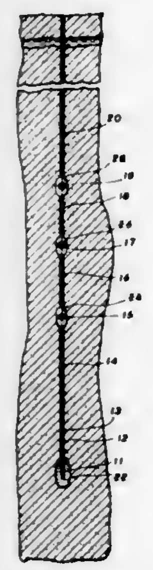
3,714,895
METHOD FOR EXCAVATING BY EXPLOSIONS

Donald E. Rawson, Del Mar, Calif., assignor to Gulf Oil Corporation

Filed Jan. 13, 1970, Ser. No. 2,481

Int. Cl. F42d *1/00*

U.S. Cl. 102—23 **7 Claims**



A method for excavating by means of explosions is described wherein two or more explosive devices or charges are placed at selected depths and relative distances and are detonated with a predetermined time relationship. Various charge positions and detonation timing patterns are described for producing explosions in which the effects of one explosion are enhanced by the other in order to achieve excavations having desired configurations.

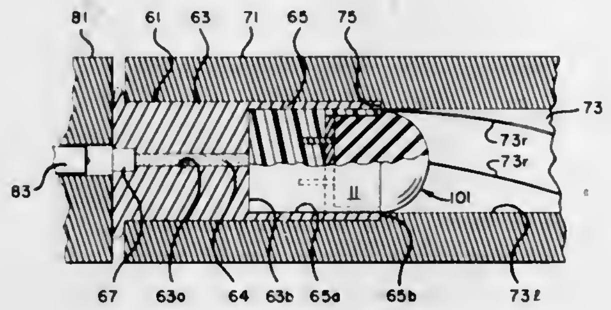
3,714,896
PROJECTILE, CARTRIDGE, AND METHOD

Robert B. Young, Jarrettsville, Md., assignor to AAA Corporation, Cockeysville, Md.

Filed Dec. 31, 1970, Ser. No. 103,111

Int. Cl. F42b *5/22, 9/20*

U.S. Cl. 102—41 **13 Claims**



An incapacitating or disabling projectile and method of forming such, including a longitudinally thick-based plastic cup having a forward open cavity with a soft resilient nose therein, and a weight slug secured in radially symmetrical relation within the cup cavity and at substantially the longitudinal center of mass of the cup and nose. The soft resilient nose mass is injected into the plastic cup and a forwardly extending mold cavity, and cured or otherwise set in situ in the plastic cup. The projectile is launched from a cartridge employing a charge of ignitable propellant powder for propulsion.

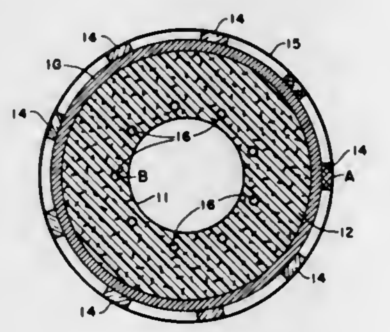
3,714,897
DIRECTED WARHEAD

Leland L. Parker, Corona, Calif., assignor to the United States of America as represented by the Secretary of the Navy

Filed Apr. 4, 1968, Ser. No. 720,436

Int. Cl. F42b *1/02*

U.S. Cl. 102—56 **9 Claims**



A warhead containing a liquid or plastic explosive is forced into a desired shape to give directional effect to the explosive for directing the major warhead blast towards a target.

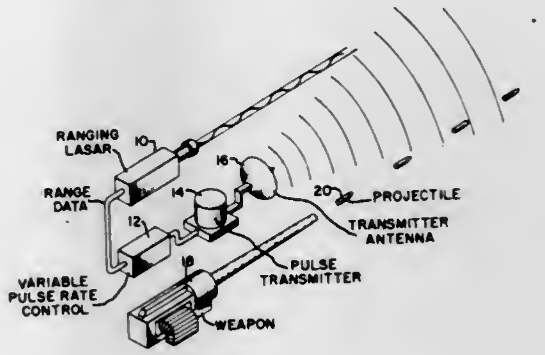
3,714,898
FUZE ACTUATING SYSTEM

Richard T. Ziemba, Burlington, Vt., assignor to General Electric Company

Filed July 22, 1969, Ser. No. 843,478

Int. Cl. F42c *11/04*

U.S. Cl. 102—70.2 R **7 Claims**



An electronic, digital, time fuze, has a time base which is introduced over a radar command link at a rate which is inversely proportional to the desired projectile flight time. A target following ranging device, such as a ranging laser, provides target range information to a pulsed radar transmitter. The range signal from the ranging device controls a variable pulse rate control unit which in turn adjusts the transmitter pulse rate to a value inversely proportional to the target range. The transmitter is fixed to the weapon system and radiates in the direction of the projectile flight path. Each projectile includes a fuze actuating circuit consisting of an antenna, an R.F. detector, a fixed-set counter and a firing circuit. At launch, the fuze actuating circuit within each projectile becomes actuated a short distance after departure from the gun muzzle. As the projectile travels towards its target it receives a series of R.F. pulses at a rate which will just fill the counter when the projectile is at the proper range. The counter within the fuze counts the pulses received during its flight to target. When the fixed-set number has been accumulated, the firing circuit detonates the payload.

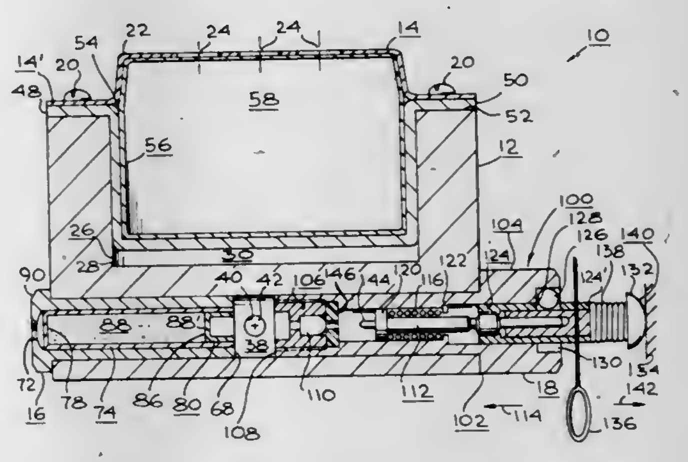
3,714,899
SCORING MODULE

Ernest A. Filippi, Northridge, Calif., assignor to Special Devices, Inc.

Filed July 1, 1970, Ser. No. 51,653

Int. Cl. F42b *13/42*

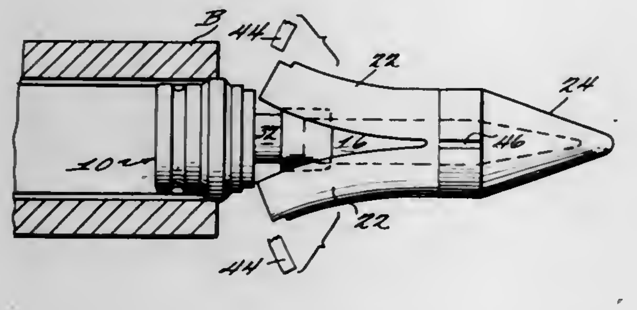
U.S. Cl. 102—90 **9 Claims**



An improved scoring module for a weapons training aid for producing noise and/or smoke and/or a flash for simulating an explosive and providing the expulsion of a marking dye for simulating the effect of shrapnel-type hits. The scoring module is adaptable to any type of simulated weapons training aid that may be desired for utilization in realistic simulated combat training procedures. The scoring module is reusable and is designed for field refurbishing after each use. A single noise, smoke and gas generating cartridge means is utilized to provide both the gas pressure for expelling dye as well as the simulated noise, smoke and flash. The primer system is mechanically actuated by either a lanyard pole or a bore rider. Both the gas generator cartridge and the ignition means are replaceable units in the body member and the marking dye is contained within a a rupturable dye sack that is merely placed in the appropriate cavity. A flexible bladder attached to the body means operates under gas pressure generated by the gas generator to rupture the dye sack and expel the fluid. Substantially complete expulsion of the dye is provided by selection of the burst pressure for the burst diaphragm sealing the gas generator charge means.

3,714,900
DISCARDING SABOT PROJECTILES

Fritz K. Feldmann, Santa Barbara, Calif., assignor to Pacific Technica Corporation, Santa Barbara, Calif.
Filed Aug. 29, 1969, Ser. No. 854,095
Int. Cl. F42b *13/16*
U.S. Cl. 102—93 **7 Claims**

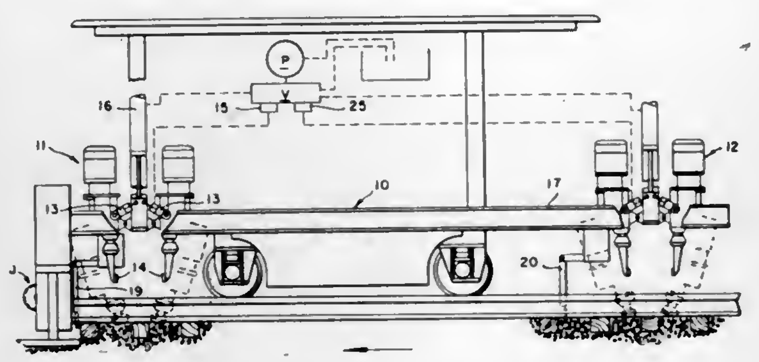


A discarding sabot projectile of novel construction is provided whereby separation of the components is accomplished by the combined effect of centrifugal force and the impingement of muzzle gases from the exhausting gun barrel. The sabot preferably comprises a metallic base incorporating means to impart spin to the projectile, and a plastic body firmly surrounding and supporting a sub-caliber core so that the longitudinal axis of the sub-caliber core is coincident with the axis of the full caliber projectile. The plastic body includes a plurality of longitudinally extending slots, or similar weakening lines, beginning at the rear of the plastic body and extending forward toward the tapered nose. Immediately after discharge from the muzzle, the sabot body starts to separate into symmetrical segments, beginning at the rear of the body, under the centrifugal force of projectile spin. The further opening of the body, which progresses along the weakened lines toward the nose, is such that the body segments are struck by the expanding muzzle gas which, in combination with the centrifugal force of spin, effects final separation and dispersal of body components. Projectile separation as described results in minimized muzzle velocity decay and dispersing effects on the sub-caliber core. Exterior configuration of the projectile is uniquely suited for automatic firing in modern, rapid-fire guns under variable environmental conditions.

3,714,901
TIE TAMPER

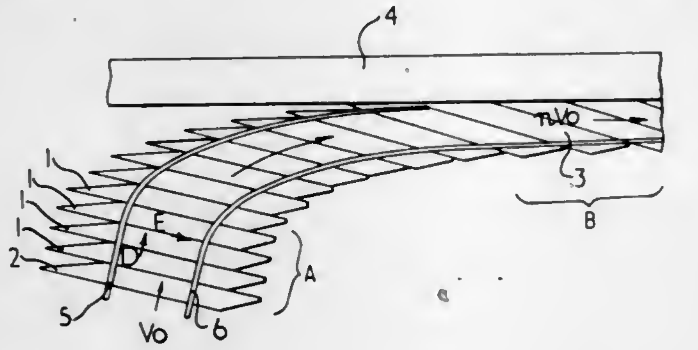
John Kenneth Stewart, Columbia, S.C., assignor to Canron, Inc., Phillipsburg, N.J.
Filed Oct. 12, 1970, Ser. No. 79,773
Int. Cl. E01b *27/16*
U.S. Cl. 104—12 **5 Claims**

The invention relates to a method and to an apparatus in which a railroad track tamping machine having front and rear tamping heads can operate with a relatively small power supply because the operation of the front and the rear tamping heads is so sequenced that their peak power demands are staggered.



3,714,902
CONVEYOR HANDRAILS

Paul Zuppiger, Geneva, Switzerland, assignor to Dunlop Holdings Limited and Battelle Memorial Institute, Geneve, Switzerland
Filed Aug. 24, 1971, Ser. No. 174,426
Claims priority, application Switzerland, Aug. 27, 1970, 12795/70
Int. Cl. B65g *17/06*
U.S. Cl. 104—25 **36 Claims**



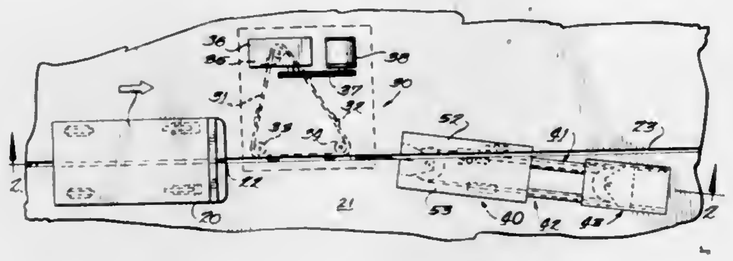
A variable speed handrail for a conveyor in which a series of relatively slidable overlapping elements provides a load bearing surface in the edge regions. The elements may slide transversely or slide in other directions simultaneously with a change of inclination. The handrail may follow a curved or straight path and a constant depth handrail is provided. The relative sliding is controlled by guide means and drive means are provided as well as positive means for maintaining the elements in mutual contact, of which the following is a specification.

3,714,903
TAKEUP APPARATUS FOR TRUCK TOW CONVEYOR SYSTEM

Chester A. Rosenberger, Jr., Perkasie, Pa., and Horace M. Swartz, Doylestown, Pa., assignors to FMC Corporation, San Jose, Calif.
Filed Dec. 31, 1970, Ser. No. 103,096
Int. Cl. B65g *23/60*
U.S. Cl. 104—196 **21 Claims**

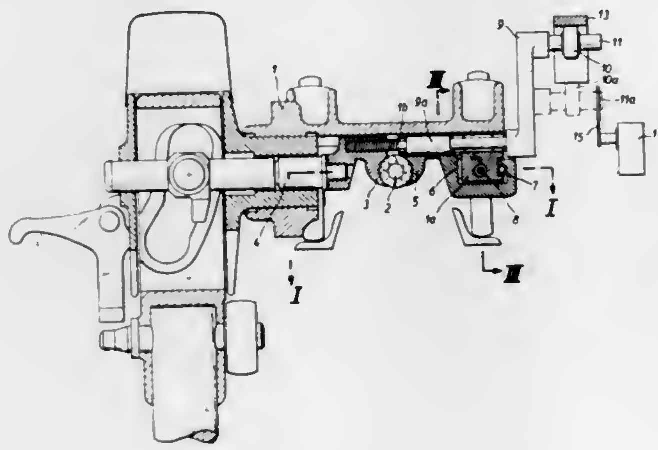
This invention involves a takeup apparatus for an endless chain in a materials handling truck tow conveying system. In particular, the endless chain operates in a shallow depth guideway immediately below the surface on which the truck operates, and spaced pusher-links in the chain engage a tow pin on the truck to propel the truck. In the takeup section, which is independent of the chain drive, the endless chain is trained around a horizontal adjustable sprocket, then backwards under the incoming section of the chain to an inclined fixed idler sprocket from which the outgoing section

of chain is redirected in a straight line continuation of the original direction of the incoming chain section. At the truck tow pin transfer area, the incoming and outgoing chain sections are parallel and adjacent to each other with the outgoing section slightly depressed in elevation so the tow pin can slide out from a pocket in the pusher-link onto the top of the adjacent section of chain where the tow pin will be picked up by a closely following pusher-link.



3,714,904
ARRANGEMENT FOR AUTOMATICALLY TESTING THE GRIP OF GRIPPING JAW MEANS OF CABLE CARS ON A TENSION CABLE

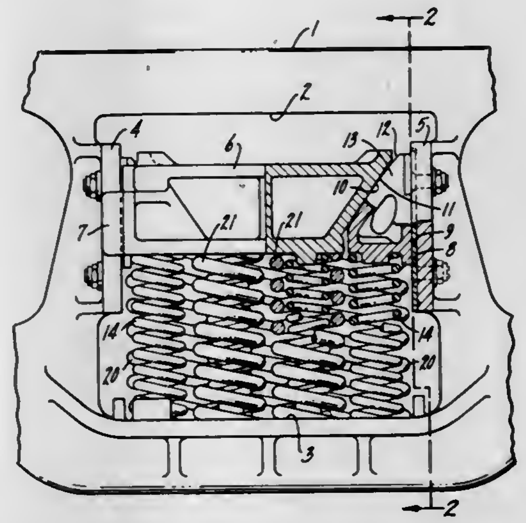
Hans Bruggemann and Rudolf Kulzer, Cologne, Germany, assignors to Pohlig-Heckel-Bleichert Vereinigte Maschinenfabriken Aktiengesellschaft, Cologne-Zollstock, Germany
Filed July 26, 1971, Ser. No. 165,896
Int. Cl. B61b *7/20, 11/02*
U.S. Cl. 104—202 **4 Claims**



The arrangement is intended for use in a cableway which comprises an endless tension cable operable to revolve in an endless path, and a plurality of cars each of which comprises gripping jaw means and means for operating said gripping jaw means to grip said tension cable and thus to couple said car to said tension cable. The cableway further comprises a shut-down switch operable to interrupt the operation of said tension cable. The arrangement comprises a testing lever carried by each of said cars, a testing rail disposed in the path of said testing lever and engageable thereby and adapted to apply to said testing lever a testing force which tends to impart to said testing lever a pivotal movement in a predetermined sense, and means operatively connecting said testing lever to said gripping jaw means and arranged to present to said pivotal movement a resistance depending on the grip of said gripping jaw means on said tension cable. The testing lever is arranged to operate said shutdown switch when said force has overcome said resistance. The arrangement further comprises compression spring means, a weighing rail which is subjected to an upward bias by said compression spring means and adapted to be engaged at its top by each car and to be depressed to an extent which depends on the weight of said car, and multi-position switch means adapted to control said testing force in dependence on the extent of the depression of said weighing rail by said car.

3,714,905
DAMPENED RAILWAY CAR TRUCK

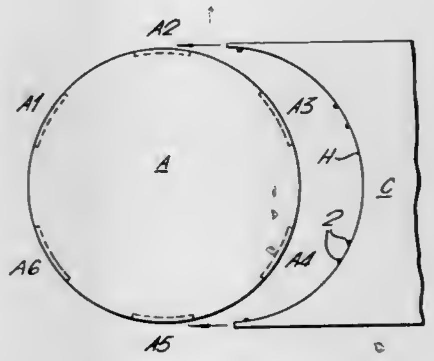
Franklin D. Barber, Flossmoor, Ill., assignor to Standard Car Truck Company, Chicago, Ill.
Filed Feb. 16, 1971, Ser. No. 115,184
Int. Cl. B61f *5/06, 5/12, 5/24*
U.S. Cl. 105—197 DB **5 Claims**



A dampened bolster and side frame assembly for a railway truck including widened lands on the side frame and a plurality of spaced wedges on each side of the bolster and on opposite sides of the frame center line.

3,714,906
TABLE UNITS

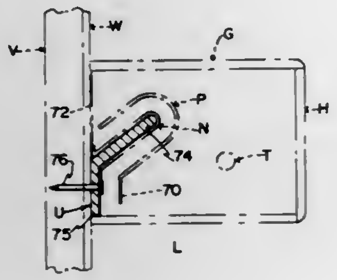
Paul Ian Finestone, 20, Sheldon Avenue, Highgate, London, N.6., England
Filed Feb. 8, 1971, Ser. No. 113,315
Claims priority, application Great Britain, Feb. 12, 1970, 6,816/70
Int. Cl. A47b *7/00*
U.S. Cl. 108—64 **14 Claims**



A system of table units comprising one or more basic units of circular form and auxiliary units whose peripheral shape includes a concavity of the same curvature as the basic unit and means for effecting edge-to-edge releasable connection of said main and auxiliary units.

3,714,907
CERAMIC TILE SHELF AND FORM FOR MAKING IT

Roy E. Michieli, 545 Begier Avenue, San Leandro, Calif.
Filed Dec. 9, 1970, Ser. No. 96,521
Int. Cl. A47b *5/00*
U.S. Cl. 108—152 **2 Claims**

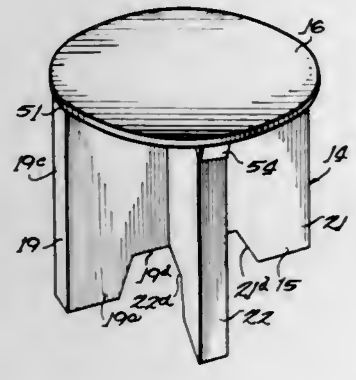


An adjustable form is used and its prism-shaped space has four walls and a base that can be lined with ceramic tile and then the interior is filled with concrete. A reinforcing bar is embedded in the concrete. Before the concrete has set a jig is used having a blade that has a length slightly less than the distance between the ceramic tiles that are disposed adjacent to the two end walls of the form. A removable sleeve is placed over the blade and a reinforcing screen or screen lath encloses the sleeve. The jig has handles which permit an operator to force the jig blade sleeve and reinforcing screen into the concrete at preferably an acute angle so that the sleeve and reinforcing screen will be embedded in the concrete. After the concrete has partially set, the jig is removed from the sleeve and when the concrete has completely set, the completed ceramic tile shelf is freed from the form.

A hanger can be secured to a wall or other vertical surface and the hanger will have a flat portion that extends upwardly and at an acute angle with the vertical surface. The operator takes the shelf and attaches it to the hanger by permitting the inclined portion of the hanger to enter the sleeve. The weight of the shelf will hold it in place and the inclination of the hanger flat portion will keep the shelf in contact with the supporting wall surface due to gravity.

3,714,908
FIBER BOARD TABLE

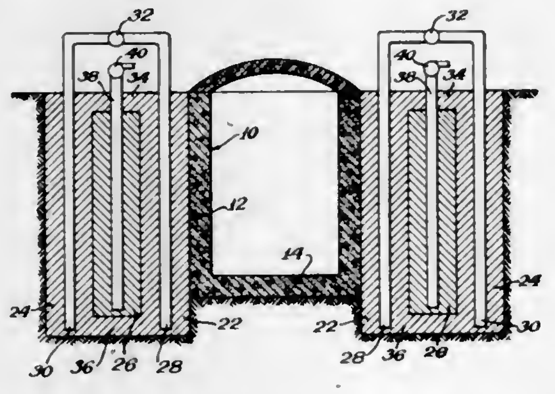
Michael F. Notko, Riverside, Ill., assignor to Druth Packaging Corp., Chicago, Ill.
Filed April 19, 1971, Ser. No. 135,014
Int. Cl. A47b *3/06*
U.S. Cl. 108—157 **6 Claims**



A fiber board table includes a generally horizontal top and an elongated generally vertically extending base for supporting the top. The base is formed from a single sheet of fiber board which is provided with spaced-apart fold lines to permit the base to be folded to provide a plurality of legs which extend radially outwardly from the central axial portion of the base. The sheet includes tab means adjacent the lower end thereof for interconnecting the spaced-apart walls of each leg, and the top includes downwardly extending tab means for connecting the top to the base and for reinforcing the upper end of the legs.

3,714,909
SYSTEM FOR INCREASING THE SHOCK LOADING RESISTANCE OF STRUCTURES

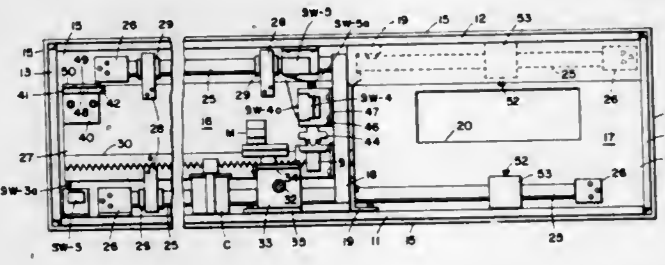
Philip J. Anderson, Deerfield, and Daniel Y. C. Ng, Chicago, both of Ill., assignors to Institute of Gas Technology
Filed Dec. 1, 1970, Ser. No. 93,981
Int. Cl. E04h *9/12;* **B65g** *5/00*
U.S. Cl. 109—1 S **12 Claims**



A reinforced underground structure and a method for constructing the same. A below ground chamber or excavation is surrounded and defined by a concrete support wall. A frozen earthen formation surrounds the concrete wall. Preferably, the frozen zone includes an inner frozen zone which is adjacent the concrete wall, an outer frozen zone which is spaced from the inner frozen zone, and an intermediate confined zone is frozen under a preselected internal compressive stress so as to increase the overal strength of the structure in resistance particularly to external shock loads.

3,714,910
VAULT AIR VALVE

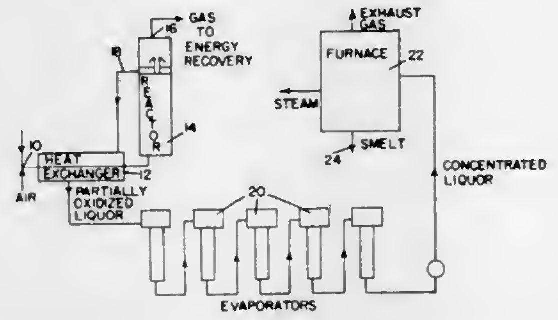
Larry I. Cutter, Cedar Rapids, Iowa, assignor to Walter Kidde & Company, Inc., Clifton, N.J.
Continuation of abandoned application Ser. No. 836,260 June 25, 1969. This application Apr. 29, 1971, Ser No. 138,777
Int. Cl. E06b *3/46*
U.S. Cl. 109—73 **4 Claims**



A closable air inlet assembly, often known as a "vault air valve," for ventilating a bank vault or the like is disclosed: The assembly features a horizontally sliding, doorlike closure which is suspended in such manner that, even when the assembly is placed in the floor, ceiling or side wall of a vault, the heavy door may be readily slid open or closed by a relatively small electric motor. The door is normally opened and closed from an electrical control panel within the vault, and a solenoid activated latch positively maintains the door in its closed position. An auxiliary electrical control panel is disposed outside the vault but is capable only of closing the door. A hand wheel is included within the vault so that the door may be manually closed, but not opened, in the event of power failure.

3,714,911
METHOD OF TREATMENT OF ALKALINE PULPING BLACK LIQUORS BY WET AIR OXIDATION

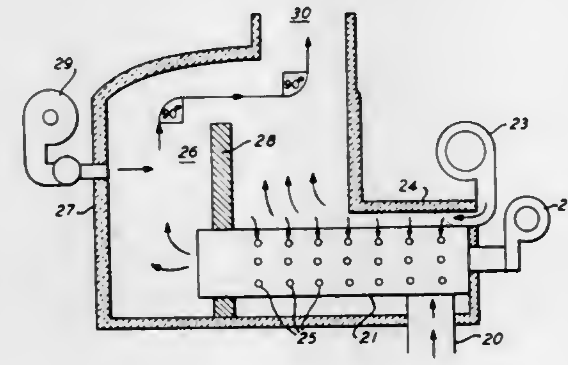
Louis A. Pradt, Wausau, Wis., assignor to Sterling Drug Inc., New York, N.Y.
Filed Mar. 10, 1971, Ser. No. 122,787
Int. Cl. F23g *7/00*
U.S. Cl. 110—7 R **2 Claims**



Wet oxidation and evaporation of alkaline pulping black liquor by approximately a fifty percent oxidation, e.g., evaporating two pounds of water per pound of air, without the use of conventional evaporators, and passing the partially oxidized concentrated black liquor directly to the furnace, or interposing a flash steam tank between the reactor and the furnace.

3,714,912
INCINERATOR

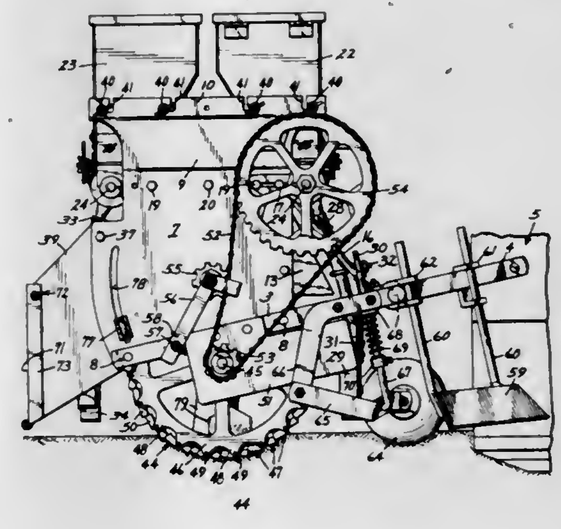
James M. Kehoe, 205 Vermont Ave., Irvington, N.J. 07111
Filed Nov. 4, 1971, Ser. No. 195,664
Int. Cl. F23g *5/12*
U.S. Cl. 110—8 A **5 Claims**



An incinerator wherein there is a primary and a secondary combustion chamber. The output of the primary combustion chamber discharging into a perforate sleeve in the secondary combustion chamber; a portion of the secondary combustion chamber surrounds the sleeve; a blower discharging air in the secondary combustion chamber, in a direction transverse to the direction of movement of gaseous combustion products, whereby the rate of flow of products of combustion is related.

3,714,913
CHEMICAL APPLICATOR ASSEMBLY FOR A ROW CROP PLANTER

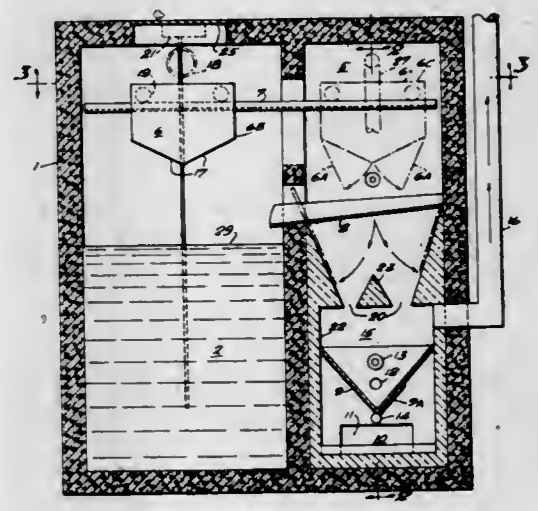
Ebenhard S. Gandrud, P.O. Box 528, Owatonna, Minn.
Filed Dec. 7, 1970, Ser. No. 95,501
Int. Cl. A01c *7/18*
U.S. Cl. 111—73 **5 Claims**



Apparatus having means for attachment to a mobile agricultural implement and arranged to apply chemicals to the earth. The apparatus includes a rotary incorporating wheel engaging the ground adjacent chemical applicators and operating to incorporate the chemicals with the earth material above planted seed for the purpose of preventing growth of weeds and injurious insects.

3,714,914
SEWAGE DISPOSAL DEVICE

William E. Dorn, R.R. 1 Box 72 F, Miami, Fla.
Filed Jan. 27, 1971, Ser. No. 110,133
Int. Cl. F23g *5/12*
U.S. Cl. 110—8 R **6 Claims**



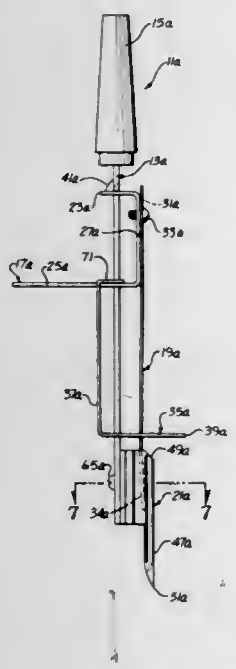
A sewage disposal device operative to separate solids from liquids in raw sewage and completely incinerate the solids and treat the fluids to eliminate pollution at the source of the sewage is described. A separation and filtration bucket movable between a settling chamber for containing fluids and a combustion chamber, receives intermittent charges of of raw sewage for filtration and drainage into the fluid separation chamber and transportation and depositing of the remaining solids into the combustion chamber for drying out and complete incineration of the solids for subsequent removal as inert ash. Means is provided for further treatment of the separated liquid sewage to render it substantially pollution-free effluent.

ERRATUM

For Class 111—73 see:
Patent No. 3,714,913

3,714,915
HOOKING NEEDLE

Joseph J. Montell, South Laguna, and George L. Houghton, Santa Ana, Calif., assignors to Rug Crafters, Santa Ana, Calif.
Continuation-in-part of application Ser. No. 722,349, Apr. 18, 1968. This application Mar. 29, 1971, Ser. No. 128,699
Int. Cl. D05c *15/06*
U.S. Cl. 112—80 **9 Claims**

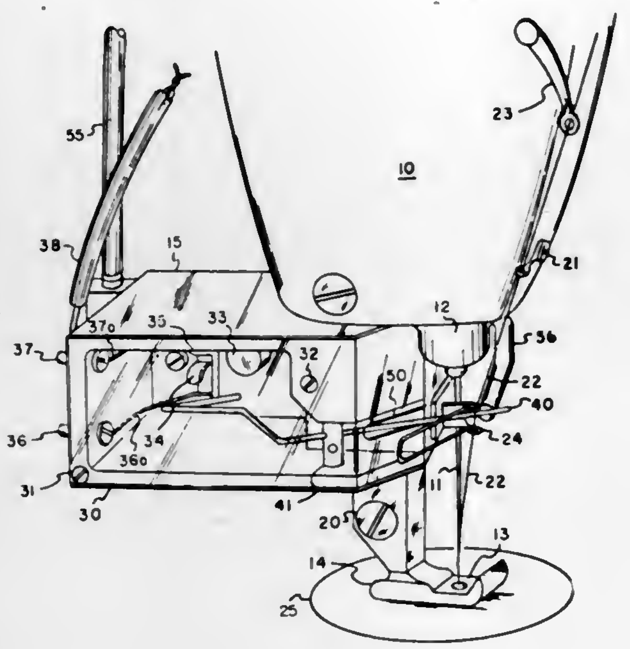


This disclosure describes a hooking needle which includes an elongated member and a needle with a passageway therethrough mounted on the elongated member. A shuttle is mounted for reciprocating movement on the elongated member. An elongated plunger is mounted on the shuttle for movement with the shuttle and extends through the passageway of the needle. Guide means are mounted on the elongated member to guide the reciprocating movement of the tongue member.

3,714,916
THREAD MONITORING DEVICE

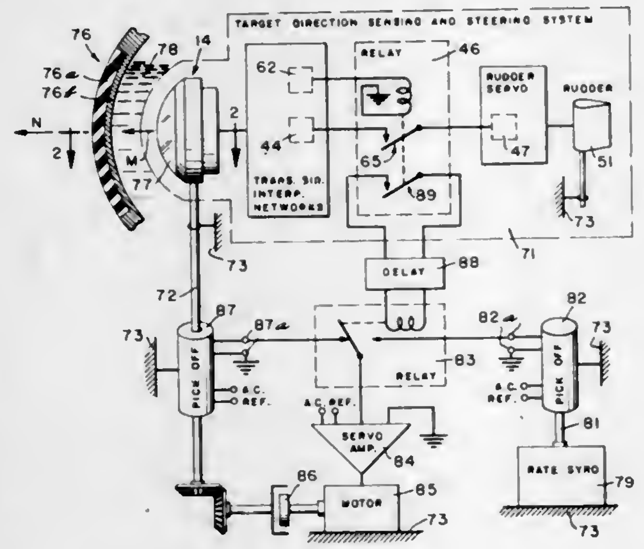
George B. Saray, New Fairfield, Conn., assignor to Ivanhoe Research Corporation, New York, N.Y.
Filed Mar. 27, 1968, Ser. No. 716,604
Int. Cl. D05b *51/00*
U.S. Cl. 112—218 R **1 Claim**

A sewing machine accessory for mounting onto the sewing machine and there monitoring thread to be presented to the needle of the machine. The device includes a modified thread guide which substitutes for the normal thread guide. The modified thread guide and thread therein cooperate forming an arresting combination for a pivotally mounted biased rod. The rod is biased toward escape from arrest upon absence of thread in the guide, and upon escaping from arrest the rod effectively actuates an indication device.



3,714,917
APPARATUS FOR STEERING A TORPEDO

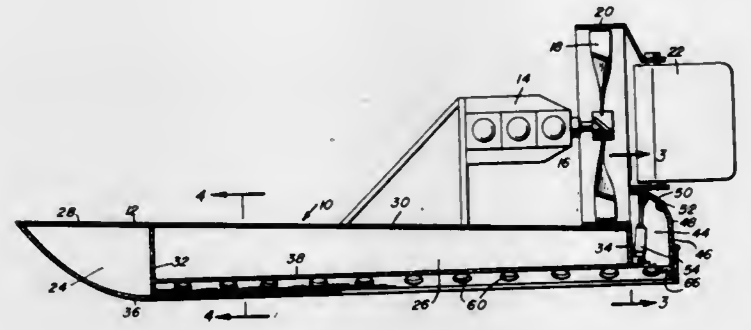
Dwight L. Supernaw, Baltimore, Md., assignor to The United States of America as represented by the Secretary of the Navy
Filed July 7, 1960, Ser. No. 41,461
Int. Cl. F42b *19/01, 19/06*
U.S. Cl. 114—20 **4 Claims**



1. In a homing torpedo having
a. a rigid elongated body having an outer shell and having front and rear ends,
b. a directional transducer having an axis of directionality, said transducer being disposed within said shell and rotatably carried by the rigid body adjacent its front end,
c. means forming an acoustic window in the frontal surface of the outer shell of the torpedo operatively associated with the transducer to transmit and receive acoustic signals,
d. means operatively associated with said transducer for sending an acoustic signal to a target,
e. means operatively associated with said transducer for receiving an echo-signal returned form the target and for producing an error signal corresponding to the deviation between target and the axis of directionality,
f. steering means controlled by said error signal to change the torpedo heading in a direction tending to restore alignment of the target and the axis of directionality of the transducer, the improvements, in combination, comprising;
g. means supporting said transducer for rotation solely about a vertical axis of rotation,
h. means rigidly coupled to the torpedo body for sensing the angular velocity at which the torpedo heading changes and for producing a transducer turning signal having an amplitude and signal polarity corresponding to the magnitude and angular direction of said angular velocity, and operable independent of movement of said transducer,
i. a reversible motor drivingly connected to said transducer to turn same about said axis of rotation,
j. and control means connected to operate said reversible motor, said control means being responsive to said transducer turning signal to turn the transducer in an angular direction opposite to the angular direction in which the torpedo heading changes and at an angular velocity proportional to and slower than the angular velocity of heading change.

3,714,918
AIR BOAT WITH AIR CUSHION

John Van Veldhuizen, Homestead, Fla. (Rte. 2, Box 54, Unionville, Tenn. 37180)
Filed July 6, 1970, Ser. No. 52,256
Int. Cl. B63b *1/38*
U.S. Cl. 114—67 A **12 Claims**

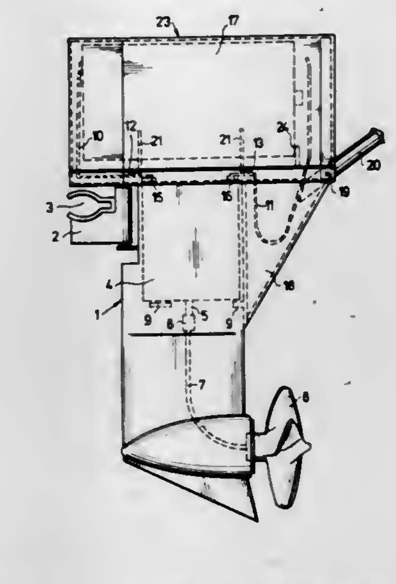


A water surface planing craft including a hull having a bottom surface provided with a plurality of air outlets opening downwardly therethrough. A motor driven air propeller is carried by the hull for discharging air rearwardly propelling the hull forwardly. Further, structure is provided for trapping and ducting a portion of the rearward discharge of air from propeller to the air outlets, whereby the trapped inducted portion of the rearward air discharged from the air propeller is used to form at least a partial blanket of air between the bottom surface of the hull and the surface of the water over which the hull is moving.

3,714,919
OUTBOARD DRIVING DEVICE FOR TOY AND MODEL SHIPS

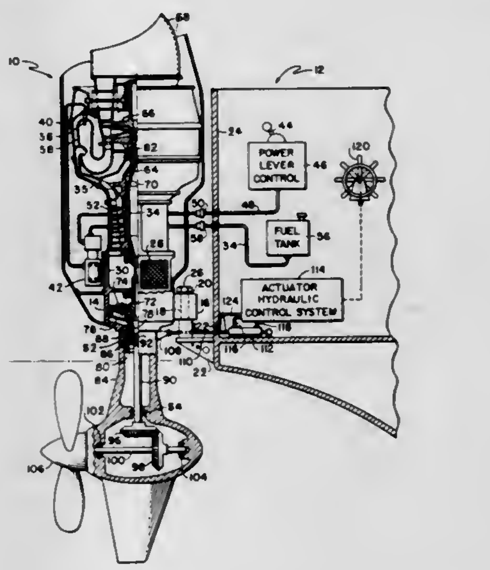
Max Ernst, Lohengrinstrasse 14, Nuremberg, Germany
Filed Oct. 20, 1970, Ser. No. 82,273
Claims priority, application Germany, Oct. 24, 1969, P 19 53 573.0
Int. Cl. B63h *21/26*
U.S. Cl. 115—17 **2 Claims**

An outboard driving device for toy and model ships, in which an exchangeable dry battery together with an electric motor electrically connectable thereto is located in a housing which is selectively and disengageably connectable to a ship so as to be pivotable about a substantially vertical axis.



3,714,920
MARINE PROPULSION UNIT

Earl O. Setterblade, Shelton, Conn., assignor to Avco Corporation, Stratford, Conn.
Filed Mar. 25, 1971, Ser. No. 127,883
Int. Cl. B63h *21/26*
U.S. Cl. 115—18 R **4 Claims**

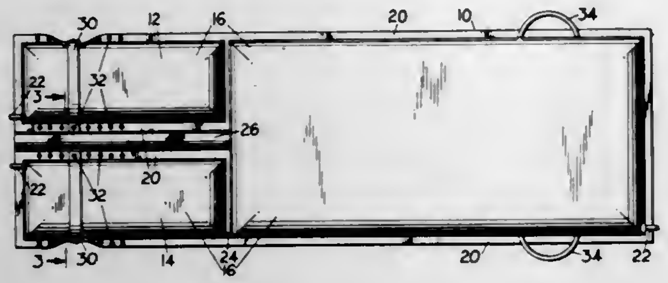


The disclosure illustrates a marine propulsion unit in which a gas turbine engine having a rotatable output shaft is vertically mounted on a pair of trunnions secured to a vessel. A propeller housing is pivotally mounted adjacent the output shaft and has a propeller driven by the output shaft. An actuator pivots the propeller housing relative to the engine housing to direct the thrust produced by the propeller.

3,714,921
WATER FLOAT WITH PADDLE EXTENSION MEANS

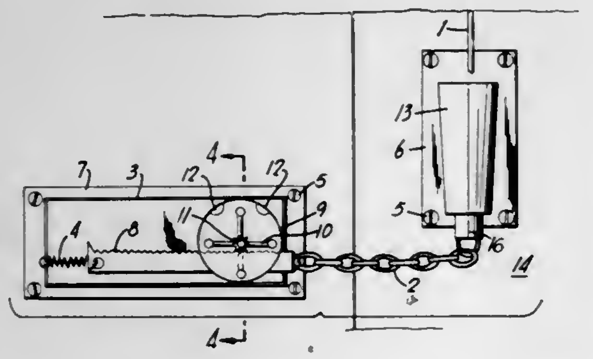
Stan Gibson, 2691 E. 49th, Vancouver 3, British Columbia, Canada
Filed Aug. 7, 1970, Ser. No. 61,873
Int. Cl. B63h *1/32*
U.S. Cl. 115—28 R **16 Claims**

A water float having a buoyant body portion and buoyant rear paddle portions hinged to the body portion. The two rear paddle portions are connected to the body portion by hinge means and have foot straps secured thereto. Upon lying on the float with the feet connected under the foot straps, a person can produce an up and down motion of the paddle portions to propel the float through the water. The paddle portions may be formed integrally with the body portion or may be detachable therefrom. Fins and flanges may be added to the paddles to increase the propelling efficiency thereof.



3,714,922
LOCK AND ALARM

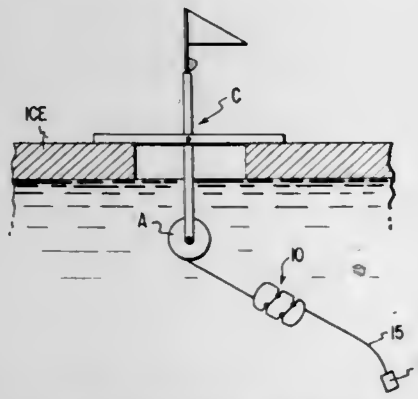
Miguel da Silva, 20 W. North Ave., Cranford, N.J. 07016
Filed Mar. 9, 1971, Ser. No. 122,347
Int. Cl. G08b *15/00*
U.S. Cl. 116—14 **3 Claims**



A chain type door lock having a bell and means responsive to an attempt to force the lock to sound the bell and thus create an alarm signal, said means including a rack and pinion gear, motion of the rack rotating the gear to turn a striker to strike the bell.

3,714,923
DEPTH MARKER FOR A FISH LINE

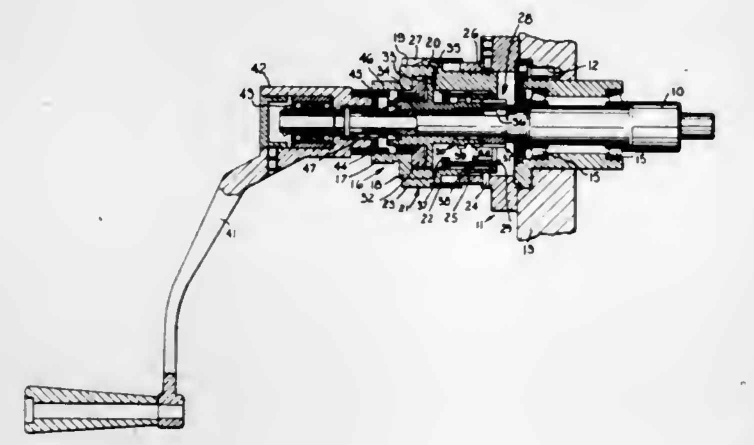
Louis J. Mariani, 605 Center Street, Jessup, Pa.
Filed April 12, 1971, Ser. No. 133,177
Int. Cl. G01d *21/00*
U.S. Cl. 116—114 **1 Claim**



A depth marker has a plurality of wedge-shaped openings or notches extending inward from opposite side edges of the marker and the notches on one side are offset relative to those on the other side. The marker can be releasably secured to a line by winding the line back and forth alternately from side to side to engage in the notches and overlying the front and back faces of the marker.

3,714,924
DIMENSION CONVERSION INDICATOR

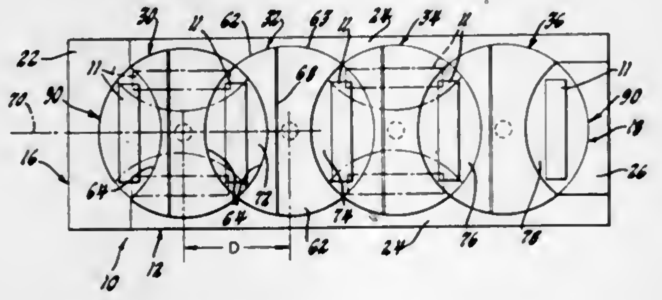
Stanislaw Jankowski, Birmingham, and William John Jackson, Tamworth, England, assignors to Cincinnati Milacron Inc., Cincinnati, Ohio
Filed July 23, 1971, Ser. No. 165,557
Int. Cl. B23q *17/00*
U.S. Cl. 116—115.5 **5 Claims**



A dimension conversion indicator for a machine having relatively movable members and adapted to indicate the relative displacement of the members selectively in English or metric units has a rotatable dial bearing respective scales in these units and driven through a variable ratio gearbox from a shaft which rotates with relative movement of the members. The gearbox comprises an axially shiftable outer gear unit and two inner gear units coupled respectively with the dial and with the shaft. The outer gear unit is constantly meshed with one inner gear unit and can be meshed with a selected one of the two gear elements on the other inner unit to select the required ratio. A rotatable handle can be clutched to the inner gear unit coupled with the dial to enable the shaft to be rotated manually, the gearbox providing a transmission ratio between the handle and the shaft corresponding to the scale for time being in use.

3,714,925
VACUUM PROCESSING MACHINE

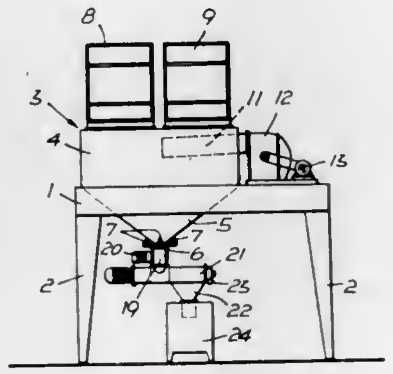
Eugene C. Helm, Anderson, Ind., assignor to General Motors Corporation, Detroit, Mich.
Filed July 30, 1971, Ser. No. 167,566
Int. Cl. C23c *13/10*
U.S. Cl. 118—49 **1 Claim**



A vacuum processing machine wherein an evacuated enclosure houses a series of intermeshing two-lobe rotors which are alternately oscillated a half-revolution to thereby circumferentially shift lenticular carrier boats received within concave recesses between the lobes to a transfer position between the rotors. The lobes of the succeeding rotors sweep the recesses to thereby shift the carrier boats to the next advanced transfer position whereby parts nested on the carrier boats are bidirectionally shifted along a common entrance and exit path in a series of arcs between handling and processing stations at opposite ends of the enclosure.

3,714,926
APPARATUS FOR ELECTROSTATICALLY COATING THE SURFACES OF ARTICLES WITH PULVERULENT MATERIALS

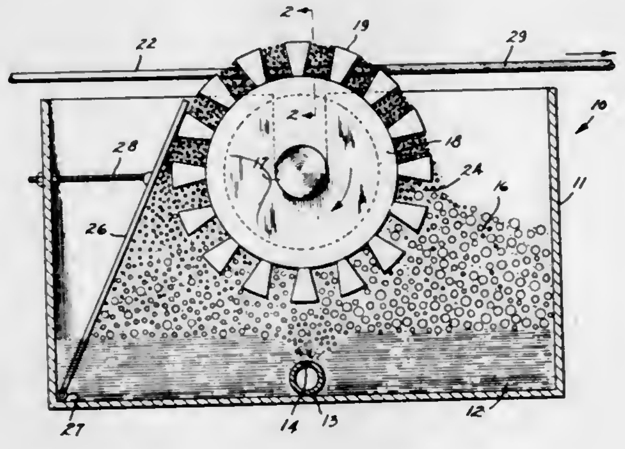
Max Ofner, Leonberg, Germany, assignor to SFB Spezial-Filterbau M. Ofner K.G., Friolzheim, Wuerttemberg, Germany
Division of Ser. No. 656,081, July 26, 1967, abandoned. This application Dec. 9, 1970, Ser. No. 96,349
Int. Cl. B05c *11/00*
U.S. Cl. 118—603 **16 Claims**



An apparatus for electrostatically coating the surfaces of articles with pulverulent materials, especially coloring substances, by spraying the material dispersed in an air current upon the article and permitting the recovery of the excessive material which is drawn off by suction from the spray chamber, treated, and then returned to the supply for immediate reuse in the spraying operation.

3,714,927
APPARATUS FOR SURFACE DYEING THE PULP INSULATION OF WIRE

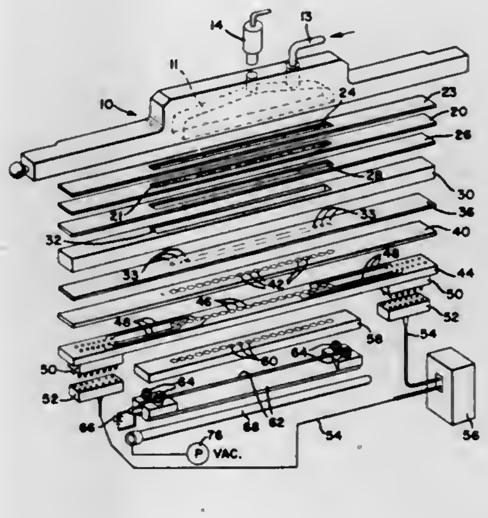
Christopher John Krogel, Cranford, N.J., assignor to Western Electric Company, Incorporated, New York, N.Y.
Filed Oct. 30, 1969, Ser. No. 872,675
Int. Cl. B05c *1/08, 1/16*
U.S. Cl. 118—612 **3 Claims**



A pulp-insulated wire is surface dyed by advancing the wire into frictional engagement with receptacles on a freely rotating roller. This rotates the roller to displace the receptacles through a dye solution to transfer the dye solution in the receptacles to the wire. In an alternate embodiment, air, under pressure, is introduced into the dye solution to form a layer of dye foam on the surface of the solution so that the dye foam is transferred by the receptacles to the wire.

3,714,928
MULTIPLE JET CHANNEL

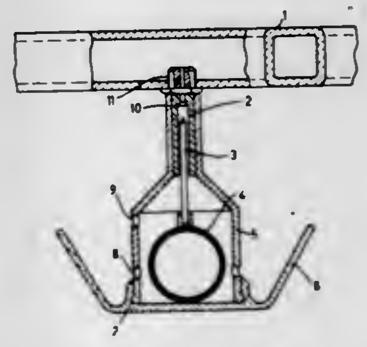
Richard P. Taylor, Dayton, Ohio, assignor to The Mead Corporation, Dayton, Ohio
Filed Nov. 17, 1970, Ser. No. 90,363
Int. Cl. B05c *5/02*
U.S. Cl. 118—624 **8 Claims**



In a noncontacting printing system in which drops of coating material are projected toward a receiving member and their trajectories controlled to provide a desired coating pattern, as in printing, the drops formed are much smaller in diameter than usual and are arranged in discrete packets of drops with each packet forming a single dot when it impinges on the receiving member.

3,714,929
WATERING APPARATUS FOR POULTRY

Jelle Boterweg, Steninstraat 20, Kampen, Netherlands
Filed Dec. 7, 1970, Ser. No. 95,864
Int. Cl. A01k *7/02*
U.S. Cl. 119—80 **7 Claims**



Drinking apparatus for poultry comprising a water conduit, a valve at the bottom of the conduit, and a central support for a drinking bowl detachably fastened to the valve casing below the valve.

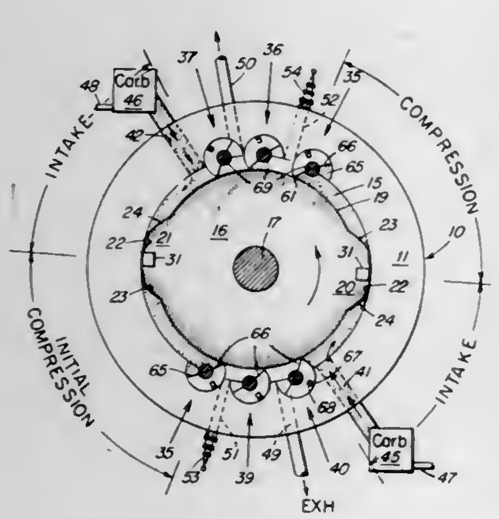
3,714,930
ROTARY ENGINE

Malcolm J. Kelson, Sr., 10260 East Outer Drive, Detroit, Mich.

Continuation-in-part of Ser. No. 67,374, Aug. 27, 1970, abandoned. This application Oct. 5, 1971, Ser. No. 186,657

Int. Cl. F02b *53/00, 55/08*

U.S. Cl. 123—8.27 **7 Claims**



A rotary internal combustion engine includes an engine block having a cylindrical chamber in which is rotatably mounted a power rotor having piston lobes which act in concert with a plurality of rotary valves located about the periphery of the cylindrical chamber so as to provide explosion impulses which act upon the lobes to drive the rotor.

3,714,931
CYLINDER WITH DRY CYLINDER SLEEVE

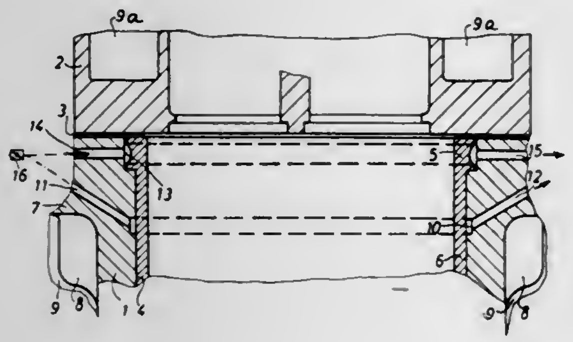
Alfred Neitz, and Hans Pickel, both of Nurnberg, Germany, assignors to Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft Zweigniederlassung Nurnberg, Nurnberg, Germany

Filed Nov. 5, 1970, Ser. No. 87,208

Claims priority, application Germany, Nov. 6, 1969, P 19 55 806.6

Int. Cl. F02f *1/14*

U.S. Cl. 123—41.79 **6 Claims**



A cylinder structure with a forced cooling fluid system and with a dry cylinder bushing for a water or air-cooled piston internal combustion, in which that upper cylinder block portion which is adjacent the cylinder head has annular passage means surrounding the cylinder bore defined by the cylinder block or by a bushing therein while feeding and discharge passage means establish communication between said annular passage means and said cooling fluid system.

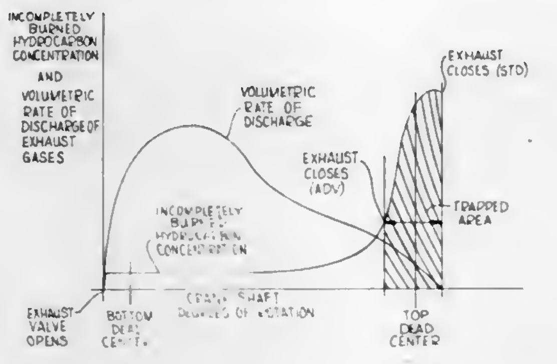
3,714,932
EMISSIONS CONTROL SYSTEM

George B. K. Meacham, Birmingham, Mich., and William S. Nagel, Cincinnati, Ohio, assignors to Eaton Yale & Towne Inc., Cleveland, Ohio

Continuation of Ser. No. 746,644, July 22, 1968, abandoned. This application Aug. 19, 1971, Ser. No. 173,068

Int. Cl. F01l *1/34*; **F02d** *39/02*

U.S. Cl. 123—75 E **14 Claims**



A method, system and apparatus for minimizing the amounts of undesirable pollutants emitted from an internal combustion engine after combustion of a fuel-air mixture within a cylinder of said engine in which a portion of the products of combustion of a given operating cycle, which portion contains a higher proportion of noxious constituents than does the expelled portion of such products, is retained in the cylinder and is mixed with the incoming charge for the next operating cycle. One particular form of the invention comprises varying the proportion of such retained products according to engine operating conditions in order to maintain the dilution of such incoming charge at the maximum level consistent with good engine performance. The retained products are in an amount in excess of that normally retained in the cylinder clearance volume at the exhaust manifold pressure.

3,714,933
AUTOMATIC TEMPERATURE CONTROL DEVICE FOR INTAKE AIR OF AN INTERNAL COMBUSTION ENGINE

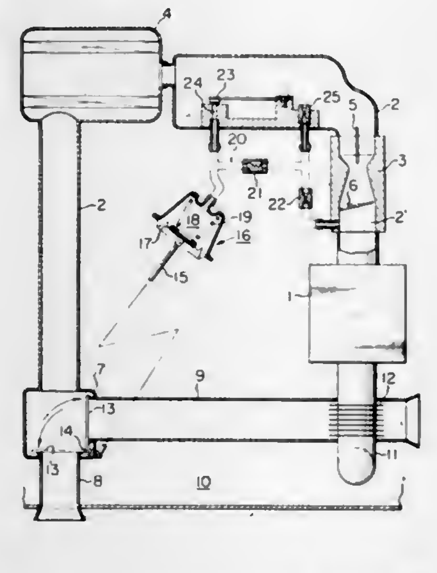
Masaaki Ozaki, Wako, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 11, 1971, Ser. No. 197,687

Claims priority, application Japan, Nov. 16, 1970, 45/100141

Int. Cl. F02m *23/14, 15/00, 31/08*

U.S. Cl. 123—122 D **2 Claims**



An automatic temperature control device for intake air of an internal combustion engine comprises a control valve for adjusting the ratio of the amount of cool air and hot air each supplied into the interior of the intake pipe of the engine so as to control the temperature of intake air, and a negative pressure motor for operation of said control valve which negative pressure chamber is, on one hand, in conjunction with the interior of the intake pipe downstream of a throttle valve, and is, on the other hand, opened into the atmosphere through a temperature sensitive valve being operatable according to variation of the temperature of the engine or an adjacent point thereof. The air passage between the negative pressure chamber of the negative pressure motor and the interior of the intake pipe has an one-way valve and two invariable orifices on its way. The one-way valve permit air to pass through the air passage just from the negative pressure chamber of the negative pressure motor to the interior of the intake pipe, and one of the invariable orifices is interposed between the one way valve and the intake pipe, while the other makes the air passage between said one-way valve and said other invariable orifice open into the atmosphere.

3,714,934
FUEL FEED DEVICES FOR INTERNAL COMBUSTION ENGINES

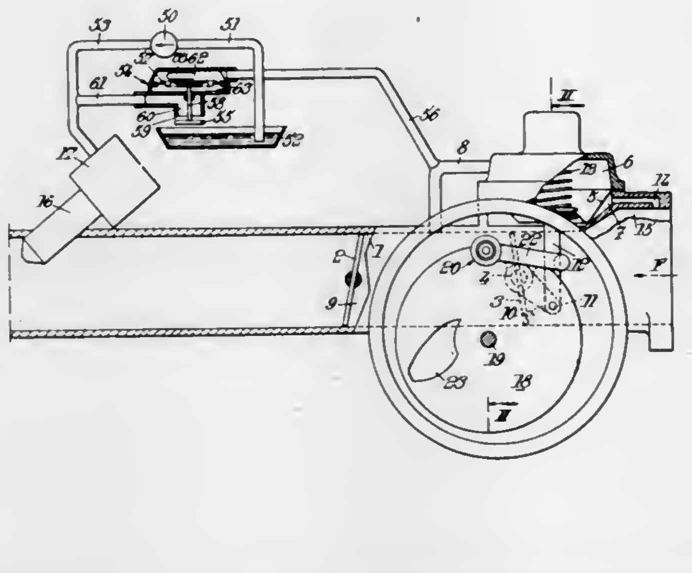
Francois Mennesson, 92 - Nanterre, France, assignor to Societe Industrielle de Brevets et d'Etudes S.I.B.E., Neuilly-sur-Seine, France

Filed Sept. 7, 1971, Ser. No. 178,217

Claims priority, application France, Sept. 15, 1970, 7033451

Int. Cl. F02m *51/02, 39/00*

U.S. Cl. 123—139 AW **2 Claims**



Valves supplied from a source of fuel under pressure are each actuated by an electromagnet energized over a variable fraction of each revolution of a rotary member driven by the engine. The energizing current is governed by a light source which illuminates a photo-sensitive element according to the position of an intermediate rotary member. The fuel is fed to the valve by a fuel pump whose delivery circuit includes a pressure regulator comprising a discharge valve controlled by the suction in the intake pipe of the engine. Variation of richness of the air/fuel mixture through temperature changes is compensated by a bimetallic element coupled to the discharge valve.

3,714,935
MULTIPLE PLUNGER FUEL INJECTION PUMP

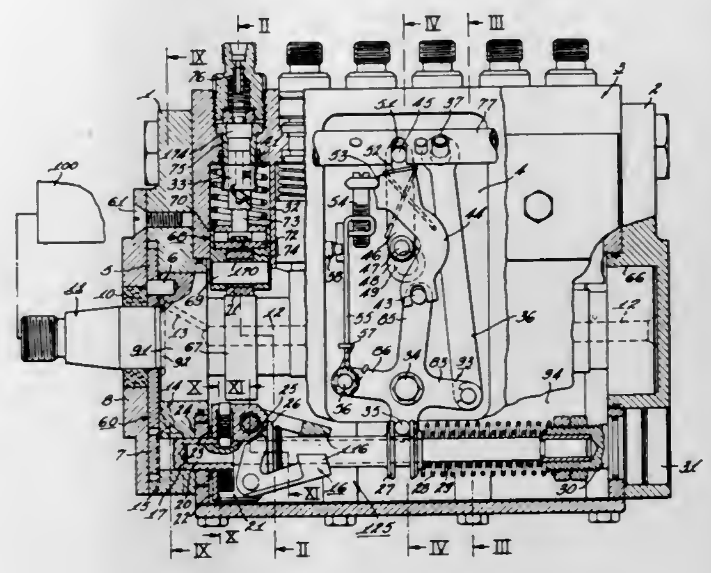
Alexander Dreisin, Olympia Fields, Ill., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Sept. 15, 1971, Ser. No. 180,689

Int. Cl. F02m *59/00*

U.S. Cl. 123—140 R **10 Claims**

A multiple plunger fuel injection pump having compact arrangement of the fuel supply pump, a high speed governor, an automatic fuel timing, fuel quantity, and programing of fuel delivery.



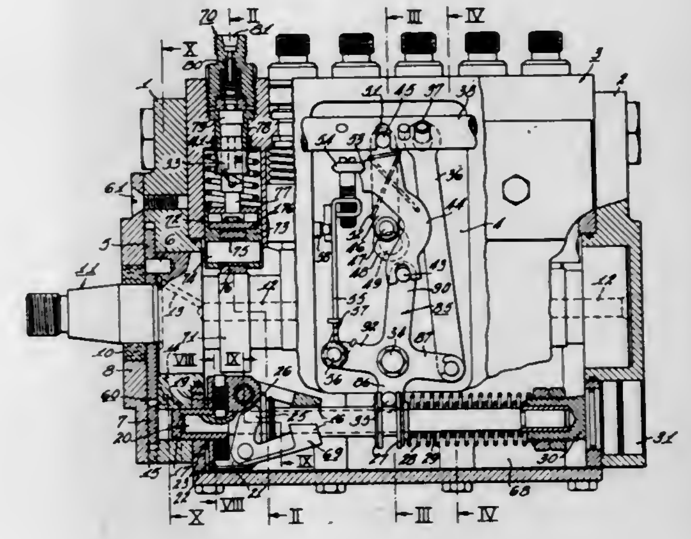
3,714,936
MULTIPLE PLUNGER FUEL CONTROL LINKAGE

Alexander Dreisin, Olympia Fields, Ill., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Sept. 16, 1971, Ser. No. 181,094

Int. Cl. F02m *59/00*

U.S. Cl. 123—140 R **10 Claims**



A fuel control linkage having a centrally pivoted lever with a drive arm receiving a driving force from the governor and a timing arm, a quantity control arm, and a fuel programing arm connected to a control rod to control fuel delivery for a multiple plunger fuel injection pump.

3,714,937
BARBECUE GRILL ASSEMBLY

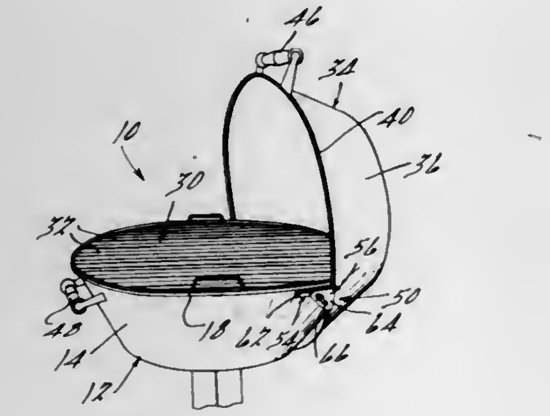
Robert S. Linstead, Rockford, Ill., assignor to King-Seeley Thermos Co., Ann Arbor, Mich.

Filed Jan. 11, 1971, Ser. No. 105,367

Int. Cl. A47j *37/00*; **F24b** *3/00*

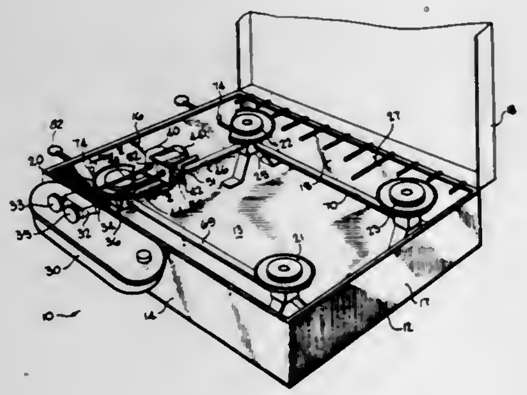
U.S. Cl. 126—25 R **4 Claims**

A barbecue grill assembly comprising a lower enclosure member provided with a generally horizontally disposed food supporting grill, an upper enclosure member adapted to be mounted on the first member, and means for movably connecting the upper and lower enclosure members whereby the upper enclosure member is movable between a first position substantially covering the grill and a second position providing access to the grill, the last mentioned means including means for pivotably supporting the upper enclosure member and for translating the upper enclosure member relative to the lower enclosure member as the former member is moved between the first and second positions.



3,714,938
CAMP STOVE

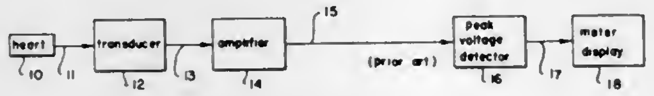
J. Willard Spotts, Huntsville, Mo., assignor to McGraw-Edison Company, Elgin, Ill.
Filed Apr. 20, 1971, Ser. No. 135,617
Int. Cl. F24c *5/20*
U.S. Cl. 126—38 **9 Claims**



A camp stove having separate burners that receive fuel from separate vaporizing tubes, but where one burner heats both of the vaporizing tubes; and further having a control as between two burners that receive fuel mixture from the same vaporizing tube such that when the control is closed it directs all of the mixture to the first burner but as it is shifted to admit fuel mixture to the second burner it also throttles the fuel mixture passage to the first burner so that fuel mixture is directed to the burners in approximately equal quantities when the control is fully shifted.

3,714,939
ANALOG SIGNAL SELECTIVE-PEAK SAMPLER SYSTEM FOR BLOOD PRESSURE SIGNALS

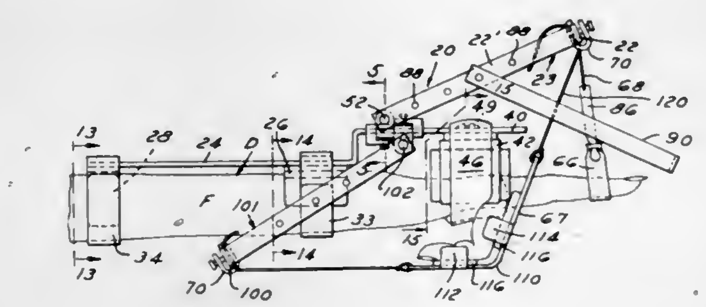
Christopher C. Day, Newtonville, and Wesley R. Grace, Andover, both of Mass., assignors to American Optical Corporation, Southbridge, Mass.
Filed June 1, 1970, Ser. No. 42,213
Int. Cl. A61b *5/02*
U.S. Cl. 128—2.05 A **14 Claims**



A system for sampling selected peak values of an analog signal. A system is disclosed for detecting peak occurrences of a signal and for triggering a device which operates on the signal. One such device described herein is a numerical display device. The system includes means for limiting the repetition rate of peak-indicating trigger pulses to a rate between upper and lower predetermined rate-limits. The system can be used in various applications and is particularly useful in the numerical display of systolic pressure as disclosed herein. The repetition rate limits employed herein are compatible with the ability of the human eye and brain to sense and absorb visual numerical information.

3,714,940
HAND BRACE

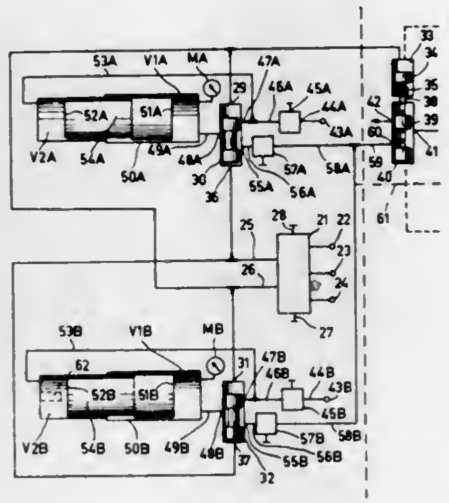
Robert M. Palmer, 20099 W. Ballantyne Court, Grosse Pointe Woods, Mich.
Filed March 17, 1971, Ser. No. 125,165
Int. Cl. A61f *5/10*
U.S. Cl. 128—77 **5 Claims**



A hand brace providing controlled individual flexion, extension, adduction and abduction tension of the digits particularly though not exclusively suited for post-operative use during formation of the fibrous joint capsule following metacarpophalangeal and proximal interphalangeal joint implant arthroplasty and the like, includes a longitudinal member adapted to overlie the forearm and be releasably secured thereto and having a stabilizing pad for juxtaposition on the flat dorsal area of the ulna and radius just above the carpus with the proximal end terminating just short of the elbow and the distal end overhanging the hand and having means for engaging and positioning the metacarpophalangeal area and further adjustably supporting a transverse member in spaced relation above and/or below the hand which adjustably carries digit slings for effecting the flexion and/or extension movement of the digits. The slings are connected to the frame means by connectors permitting quick and simple adjustment by the surgeon and one hand adjustment by the patient. In addition to or in lieu of the slings, pressure pads may be mounted to engage the phalanges to position them as required. The brace may be folded flat for shipping or storage.

3,714,941
MEDICAL RESPIRATORS

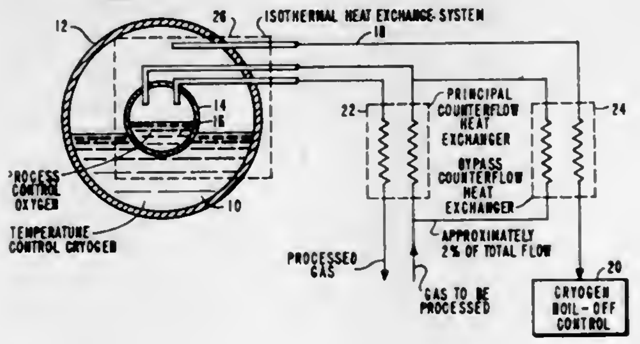
Barry John Kipling, Cambridge, England, assignor to Pye Limited
Filed April 24, 1970, Ser. No. 31,515
Claims priority, application Great Britain, June 5, 1970, 243/70
Int. Cl. A61m *15/00*
U.S. Cl. 128—145.8 **11 Claims**



A medical respirator in which gas is stored and passed to a patient in an adjustable predetermined time having switch means to control the flow of gas from a pressure source into a variable volume during the expiration period of the respirator and from the variable volume to the patient through restrictive means during inspiration period. The gas container is divided into two volumes separated by a movable member. Gas for the patient is expelled from the first volume, which is variable, by decrease of the first volume caused by movement of the movable member as a result of patient gas pressure in the second volume.

3,714,942
CRYOGENIC GAS PROCESSING SYSTEM

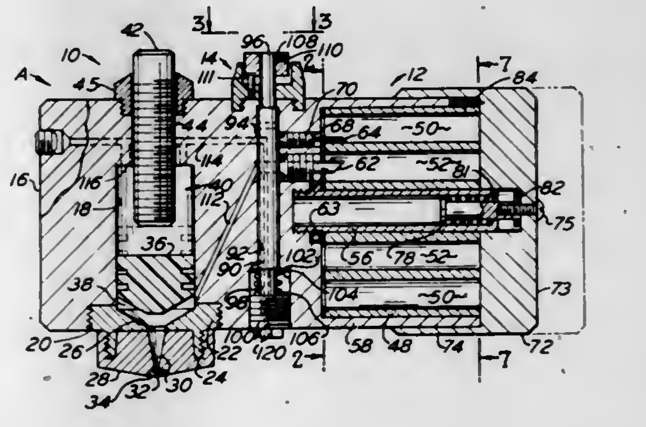
Halbert Fischel, Van Nuys, Anthony Dichiro, Sun Valley, and Kenneth W. Cowans, Los Angeles, Calif., assignors to Sub-Marine Systems, Incorporated
Filed Feb. 3, 1969, Ser. No. 795,838
Int. Cl. A26b *7/02*
U.S. Cl. 128—142 **9 Claims**


ISOTHERMAL HEAT EXCHANGE SYSTEM
PRINCIPAL COUNTERFLOW HEAT EXCHANGER
BYPASS COUNTERFLOW HEAT EXCHANGER
PROCESS CONTROL OXYGEN
TEMPERATURE CONTROL CRYOGEN
APPROXIMATELY 2% OF TOTAL FLOW
PROCESSED GAS
GAS TO BE PROCESSED
CRYOGEN BOIL-OFF CONTROL
10
12
14
16
18
20
22
24
26

Efficient use of the refrigeration capacity of a cryogenic supply, while also maintaining temperature control of a process control cryogen during passage of a gas mixture in communication with the process control cryogen, is achieved by employment of a bypass heat exchange between the cryogen supply and a portion of the gas mixture, which is also passed through a principal counterflow heat exchanger. Isothermal heat exchangers using the cryogenic supply and the processed gas mixtures may also be disposed along the gas flow path to restrict unwanted heat dissipation and to assure temperature uniformity, so as to obtain efficient and full range cooling of the gas mixture. Compact and efficient heat exchange units are disclosed that may be disposed at various regions along the gas flow path for these purposes.

3,714,943
MEDICAMENT INJECTORS

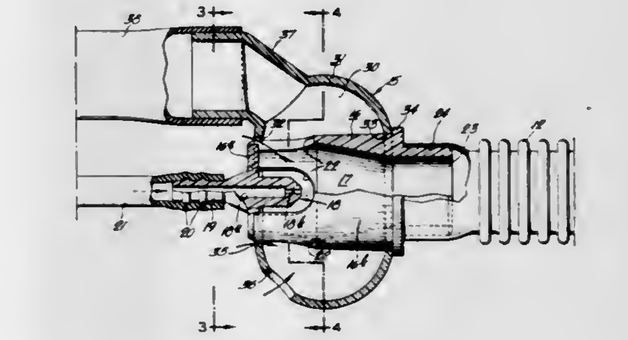
Howard M. Yanof, 5224 Keersdale, Toledo, Ohio; Ben Pansky, 2809 Manchester Boulevard, Toledo, Ohio, and James S. Poff, Findlay, Ohio, assignors to said Yanof and Pansky, by said Poff
Filed Dec. 1, 1970, Ser. No. 93,982
Int. Cl. A61m *5/30*
U.S. Cl. 128—173 H **22 Claims**



The specification and drawings disclose two embodiments of medicament injectors of the type commonly referred to as "velocity injectors." Both embodiments provide means by which the quantity of medicament can be varied. Each embodiment also has a single valve assembly which controls filling, cleaning, and firing. An important aspect of one embodiment is the use of a rotatable multiple dosage supply housing which can be sequentially indexed to bring medicament ampules into proper relationship with the valve assembly. In addition to the features noted above, the second embodiment discloses an injector which automatically injects when pressed against the patient.

3,714,944
MIXING AND HUMIDIFICATION APPARATUS FOR BREATHING DEVICES

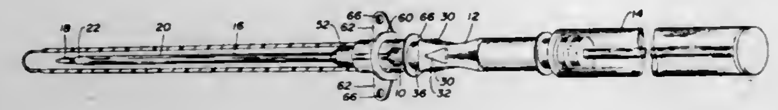
James F. Price, Center Valley, and Kenneth Shook, Nazareth, both of Pa., assignors to The Bethlehem Corporation, Bethlehem, Pa.
Filed Nov. 25, 1970, Ser. No. 92,658
Int. Cl. A61m *15/00*
U.S. Cl. 128—209 **3 Claims**



A breathing device having an elongated flexible inlet conduit is provided with removable apparatus for enriching ambient air with predetermined percentages of oxygen and for humidifying the mixture before the mixture is admitted to the device. The apparatus comprises a hollow cylindrical body with a mixing chamber and an oxygen injector extending coaxially into the chamber. An exhaust port is provided in one end of the body to open into the device-conduit, and a series of intake ports surround the injector at the other end of the body to coact with the injector for causing ambient air to mix with oxygen for inhalation by the patient. A removable hollow shell surrounds the body and registers with the intake ports, and the shell has means providing a connection to a source of water vapor for humidifying the oxygen-air mixture in the mixing chamber. In addition, a method is disclosed for weaning a patient away from oxygen dependency, the method comprising the steps of periodically replacing the mixing-body with like bodies having progressively lower percentages of oxygen in the mixture after predetermined time intervals.

3,714,945
DIGIT MANIPULABLE QUICK RELEASE CANNULA INSERTION DEVICE

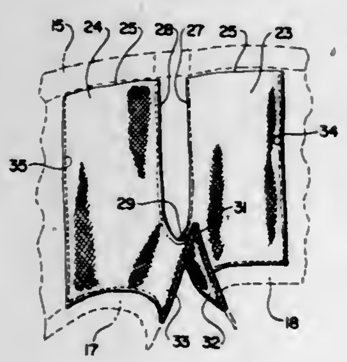
Vayden F. Stanley, Dallas, Tex., assignor to Vicra Sterile, Inc., Dallas, Tex.
Filed Dec. 17, 1970, Ser. No. 99,111
Int. Cl. A61m *05/00*
U.S. Cl. 128—214.4 **8 Claims**



An over-the-needle catheter insertion device wherein the catheter and needle are connected to respective interconnecting hub members. The catheter hub member is connectable to an infusion source. The catheter hub member has an outwardly extending ridge molded integrally therewith, providing a means by which the catheter hub and needle hub can be separated by manipulation of only one hand.

3,714,946
GARMENT WITH ABSORBENT FRONT AND CROTCH PAD POCKETS

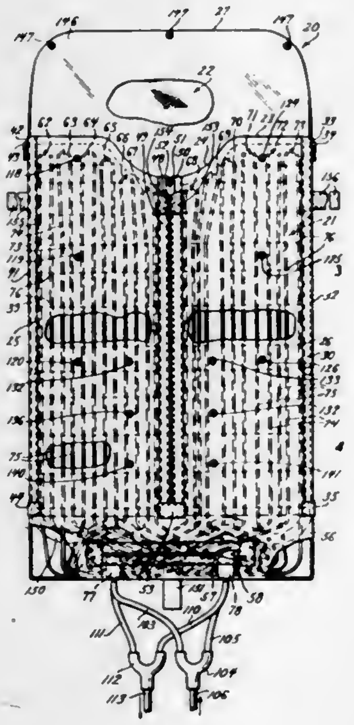
Harry L. Rudes, 996 E. 22nd St.,
Brooklyn, N.Y. 11210
Filed Apr. 5, 1971, Ser. No. 130,945
Int. Cl. A61f *13/16*
U.S. Cl. 128—295 **6 Claims**



A twin pocket wall piece is secured to the front and to the underside and crotch of the garment into which absorbent material can be extended to provide an area over the front and under the crotch of the wearer for the absorption of body perspiration in this area of the body to prevent the outer material of the garment from becoming wet. The twin pocket pieces are separated over the fly area, being cut away to accommodate the hems of a garment that opens in the front and have open upper edges through which the material is extended and extensions are provided at the lower ends to accommodate the crotch area and the inner sides of the legs at the front of the garment. According to further form of the invention a self contained pocket unit is provided of two pockets each of which having a back wall and a front wall, with the front wall being lower than the back wall and with the upwardly extending portions of the back wall serving for the attachment of the pad unit to the waist band of the garment so that the pocket elements or units will be suspended from the waist band at the front of the trousers and over the frontal area of the wearer. These pockets may be filled with absorption material to keep the moisture from the front of the trousers.

3,714,947
HYPOTHERMIA BABY BUNTING

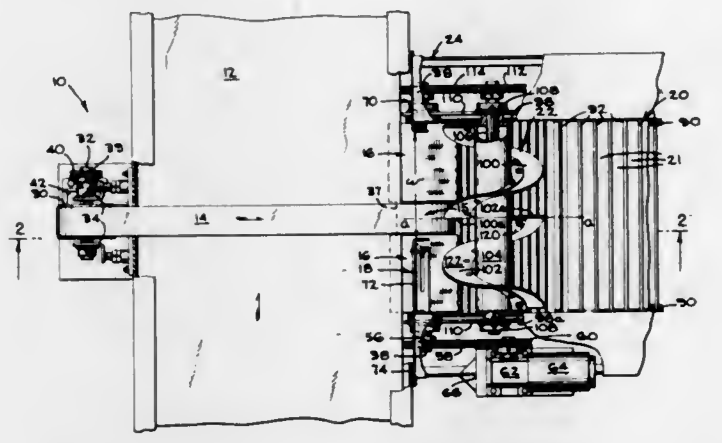
John C. Hardy, Weatogue, Conn., assignor to Angelica Corporation, St. Louis, Mo.
Continuation-in-part of Ser. No. 114,607, Feb. 11, 1971. This application Feb. 11, 1971, Ser. No. 114,466
Int. Cl. A61f *7/00*
U.S. Cl. 128—400 **9 Claims**



An infant's hypothermia bunting having front and rear panels of two-way stretch fabric. Longitudinally extending tubes connected to the front and rear panels for conveying temperature-controlled fluid. Snap fasteners for adjusting the lateral size of the bunting and snap fasteners for adjusting the longitudinal size of the bunting to conform to different infant body sizes. Zippers at the center and sides of the bunting to provide body access for hospital purposes. A plastic liner releasably fastened to the rear panel for distributing the loads of tube projections. A pocket at the bottom of the bunting for containing manifolds collecting inlet ends of the tubes and outlet ends of the tubes for common connections to the inlet and outlet fittings of a hypothermia machine.

3,714,948
BRUSH BACK ROLLER

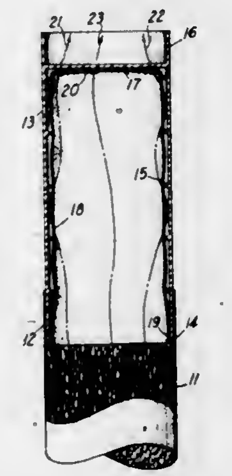
Bobby Joe Sears, and Wade E. Brown, both of Hoopeston, Ill., assignors to FMC Corporation, San Jose, Calif.
Filed Aug. 10, 1971, Ser. No. 170,536
Int. Cl. A01f *12/10*
U.S. Cl. 130—5 R **4 Claims**



A conveyor system for supplying ears or corn to a processing machine includes a cleated elevator conveyor for the corn, and a double helix brush back rotor is disposed above the elevator conveyor for leveling the ears of corn on the conveyor as well as for laying down upwardly projecting ears from the sides of the conveyor towards the midplane thereof.

3,714,949
CIGARETTE FILTER

David M. King, Route 7, P.O. Box 219, Dalton, Ga.
Filed Feb. 16, 1971, Ser. No. 115,317
Int. Cl. A24d *1/04;* **A24f** *7/04, 13/06*
U.S. Cl. 131—10.5 **10 Claims**

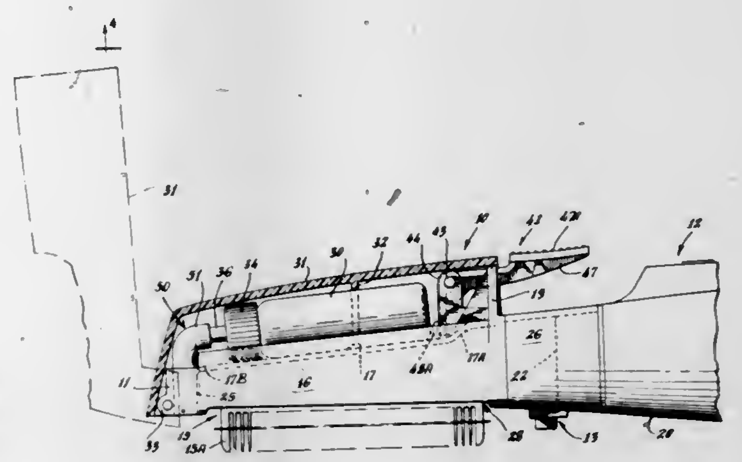


Filtering means for tobacco wherein the filter is composed of a permselective membrane supported in juxtaposition to the tobacco. Upon the application of the smoking process upon the tobacco, the smoke from he tobacco passes through the membrane and deposits the harmful tar particles and nicotine vapors on the membrane, allowing less harmful gas to pass into the mouth of the smoker.

3,714,950
SPRAY APPARATUS

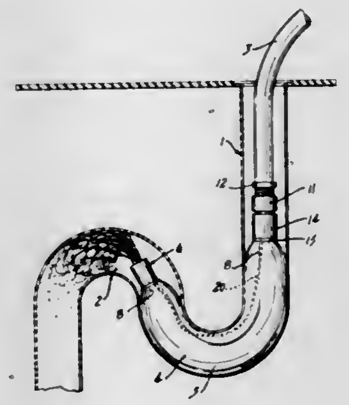
Aivars Miska, Bridgeport, and Howard L. Selman, Niantic, Conn., assignors to Sperry Rand Corporation, New York, N.Y.
Filed May 12, 1971, Ser. No. 142,513
Int. Cl. A45d *24/22*
U.S. Cl. 132—112 **6 Claims**

Spray apparatus for apparatus of the type which includes a source of supply of hot air and a hair grooming implement holder connectable to the source, wherein the holder is adapted to carry a hair grooming implement and guide hot air from the source laterally of the implement for heating the user's hair. The spray apparatus includes an elongated base upon which a liquid carrying container provided with a dispensing tube may be mounted, a nozzle assembly connected to one end of the base includes a conduit and liquid atomizing apparatus, and container moving apparatus connected to the other end of the base. The atomizing apparatus terminates one end of the conduit with an exit orifice for directing liquid, as a spray, towards the user's hair. The container moving apparatus is operable to move the container towards the other end of the conduit for dispensing liquid from the container through the dispensing tube and into the conduit for flow via the atomizing apparatus to the exit orifice.



3,714,951
CONDUIT FLUSHER

Philip L. Lundman, 1709 East Menlo Blvd., Milwaukee, Wis.
Filed Aug. 27, 1970, Ser. No. 67,395
Int. Cl. B08b *9/02*
U.S. Cl. 134—167 C **2 Claims**



A conduit flushing device including an elongated, inflatable bag connected at one end by a tubular fitting to a source of fluid pressure, such as a water hose, and having a smaller diameter tubular nozzle on the opposite end, so that the fluid inflates the bag. The bag has longitudinal folds which facilitates collapse of the bag when the fluid pressure is shut off, and an elongated, deformable strip extends within the bag from the fitting to the nozzle and aids in maintaining the desired shape of the bag.

3,714,952

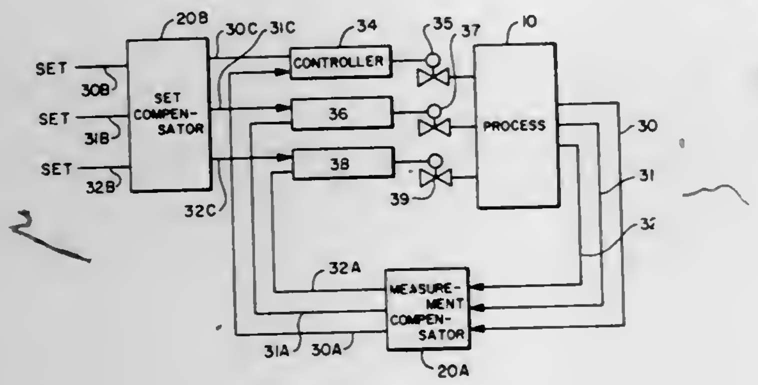
METHOD AND APPARATUS FOR COMPENSATORY CONTROL OF INTERACTING PROCESS VARIABLES

Edgar H. Bristol, II, Foxboro, Mass., assignor to The Foxboro Company, Foxboro, Mass.

Filed Mar. 24, 1971, Ser. No. 127,722

Int. Cl. G05b *13/00*

U.S. Cl. 137—1 **8 Claims**



When process valves reach their limits, a special control problem arises because the valve limit then effectively introduces a discontinuity in control behavior. An approach is taken for improved control of a process having interacting variables wherein valve controllers are connected directly to valves which in turn are in control of the process controlled variables. Compensation means for the process interacting variables processes the process measurements and set points either separately, in one version, or in an integrated fashion, in another version, providing compensated error signals to the respective process controllers. In this manner, saturation of a valve affects only its process controlled variable, and the limit discontinuity is restricted in its adverse effect, thereby providing improved control under conditions of process saturations.

3,714,953

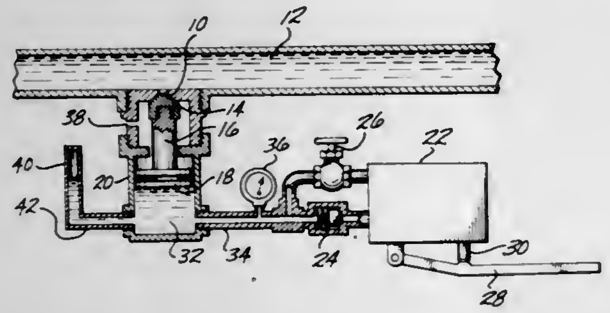
PRESSURE RELIEF VALVE

Paul O. Solvang, Tacoma, Wash., assignor to National Water-Blast Inc., Tacoma, Wash.

Filed Oct. 20, 1971, Ser. No. 190,928

Int. Cl. F16k *15/02*

U.S. Cl. 137—14 **12 Claims**



An apparatus and method of relieving excess fluid pressure using a hydraulic cylinder to urge a hydraulic plug against a valve seat in communication with the fluid to be controlled. The hydraulic fluid used in the hydraulic cylinder is selected to have a compressibility at least as great as the compressibility of a paraffinic base mineral oil having a viscosity of about 20 to 50 centipoises at 25° C. to act as a liquid spring in response to excess fluid pressure. Also disclosed is the use of an air chamber in communication with the hydraulic fluid in the hydraulic cylinder which in combination with ordinary hydraulic fluid acts as a fluid spring.

3,714,954

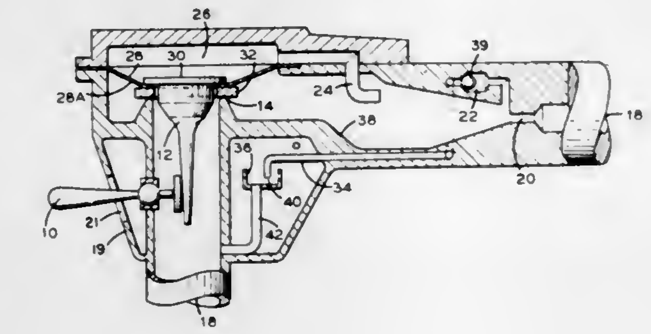
FLUIDIC FLUSHING MECHANISM

Barry S. Fichter, 526 Front Street, Dunellen, N.J.

Filed Aug. 21, 1970, Ser. No. 65,879

Int. Cl. F15c *3/04*

U.S. Cl. 137—81.5 **1 Claim**



A valve mechanism of the type used to flush toilets is provided with a timing device which automatically stops the water flow after a predetermined quantity of water has passed through the valve mechanism. The timing is achieved by filling a receptor with water to a predetermined height. The filling rate for the receptor is directly related to the rate of flow through the system but is not adversely dependent upon the water pressure in the system. At the predetermined time, the fluidic switch responds and causes the valve to close.

3,714,955

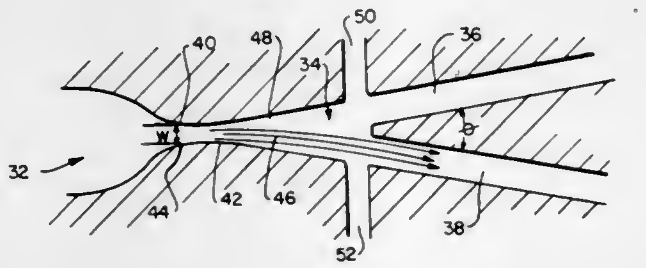
SIDE WALL SEPARATOR FLUIDIC LOGIC DEVICE

Roland Pierce Trask, II, Silver Spring, Md., assignor to The United States of America as represented by the Secretary of the Army

Filed July 7, 1971, Ser. No. 160,286

Int. Cl. F15c *1/08;* **F15d** *1/06*

U.S. Cl. 137—839 **5 Claims**



A low power side wall separation fluidic logic device is disclosed having laminar flow characteristics. The device defines an element having a smooth, continuous, and gradual transition from a power jet throat to receiver output lines with a minimized angle being maintained between the receiver lines so as to achieve low power operation.

3,714,956

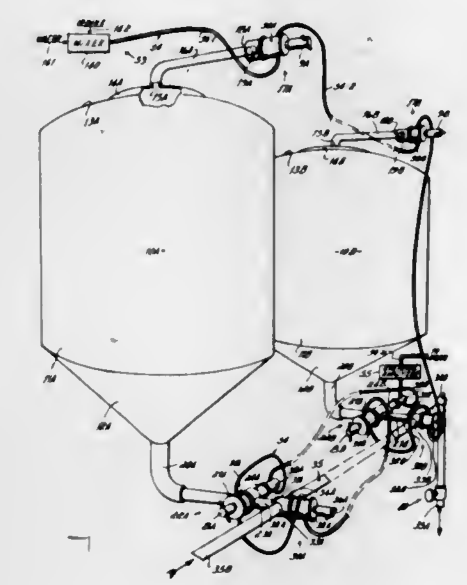
ASEPTIC STORAGE AND VALVING SYSTEM

Philip E. Nelson, West Lafayette, Ind., assignor to Purdue Research Foundation, Lafayette, Ind.

Continuation-in-part of Ser. No. 40,550, May 26, 1970, Pat. No. 3,678,956. This application May 18, 1972, Ser. No. 254,733

Int. Cl. F16k *51/00*

U.S. Cl. 137—238 **9 Claims**



A plurality of storage tanks for bulk storage of materials under aseptic conditions in which valves associated with the tanks have chambers filled with liquid chemical sterilant surrounding movable valve actuators for preventing the influx, via the valve actuators, of contaminants to the material stored in the tanks. The chemical sterilant is unheated to prevent the transfer of heat from the sterilant to the stored material. The sterilant chambers are connected serially to form a cascade between a source of fresh sterilant and a chemical analyzer, with the chambers which become more contaminated in use being connected in the cascade more remote from the fresh sterilant supply. The sterilant chambers are recharged with fresh sterilant by a flow of fresh sterilant from the supply through the cascade, which flow is terminated when the sterilant leaving the last chamber of the cascade upon analysis by the chemical analyzer has reached a sterile level indicating that the fresh sterilant has propagated through the cascaded chambers successively flushing the chambers in the cascade of inactive, or stale, sterilant and replenishing the chambers with fresh sterilant. Each sterilant chamber is provided with an inlet passage and an outlet passage located at the bottom and top of the chambers, respectively, such that fresh sterilant enters the bottom of the chamber, forcing inactive, or stale, sterilant from the chamber through the top, insuring complete recharging of the entire chamber with fresh sterilant.

3,714,957

SELF-CLEANING STORM CHOKE

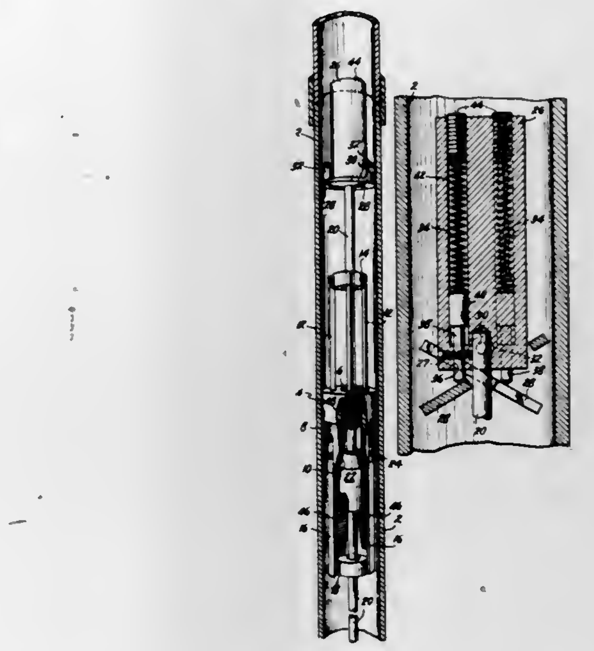
William N. Schoeffler, Rte. 1, P.O. Box 389, Carencro, La.

Filed July 21, 1971, Ser. No. 164,654

Int. Cl. F16k *17/28, 29/00*

U.S. Cl. 137—244 **10 Claims**

A conduit has a valve with a valve seat fixed in the conduit and a valve member movable longitudinally to open or close the valve. Vanes fixed relative to the valve member cause the assembly to rotate during fluid flow in the conduit to cause cleaning means to constantly wipe the valve seat and valve member clean of any foreign matter in the fluid. The vanes respond to pressure or velocity surges to assume positions substantially closing the conduit and to then act like a piston to pull the valve closed.



3,714,958

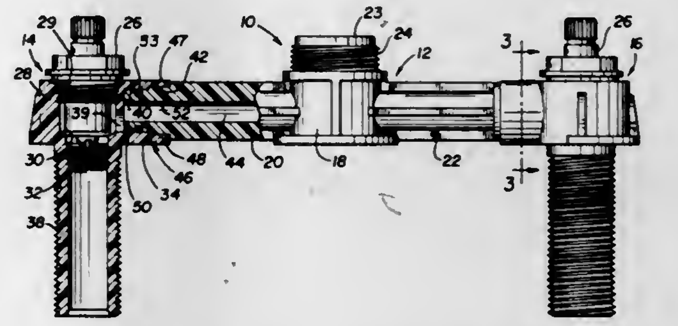
MIXING VALVE ASSEMBLY

Tom W. Johnson, and Joe L. Johnson, both of Burton, Ohio, assignors to Sajar Plastics, Inc., Middlefield, Ohio

Continuation-in-part of Ser. No. 101,810, Dec. 28, 1970, abandoned. This application March 1, 1972, Ser. No. 230,592

Int. Cl. F16k *19/00*

U.S. Cl. 137—315 **6 Claims**



A mixing valve assembly constructed of plastic parts in which end pieces that form valve bodies receive the ends of conduits of a mixing chamber. Ends of the conduits are received in recesses of the end pieces, are secured by an adhesive or solvent, oriented by mating non-circular portions, and sealed by both the adhesive or solvent and an O-ring between each conduit and the connected end piece. In addition, the parts can be further secured and sealed by an ultrasonic weld.

3,714,959

PERMANENT PIERCING ACCESS VALVE

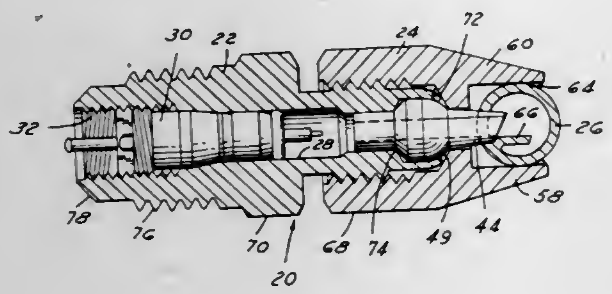
Tony Pignataro, Jr., Montpelier, Ohio, assignor to Robinair Manufacturing Corporation, Montpelier, Ohio

Filed March 5, 1971, Ser. No. 121,357

Int. Cl. B23b *41/08;* **F16e** *41/04*

U.S. Cl. 137—318 **7 Claims**

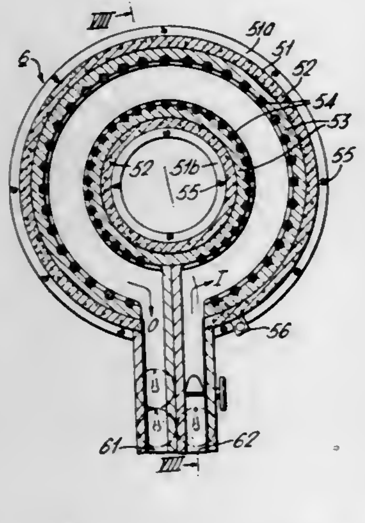
A permanent access valve for use in sealed fluid systems to pierce a fluid line thereof without leaking fluid from the system or allowing contaminants to enter the system. The device includes a straddle nut having a tube embracing portion adapted to be soldered or brazed to the fluid line, and a valve body threadably engageable within the straddle nut. A piercing needle is rotatably supported within the body, and has a line-piercing portion which projects through an aperture in the nut and pierces the fluid line as the valve body is screwed into the nut. The piercing portion of the needle is rearwardly tapered to engage the marginal edge of the aperture in the straddle nut before penetration of the fluid line,



thereby providing an initial seal to prevent the escape of fluid or entry of contaminants before the tube is pierced, and additionally to prevent rotation of the needle during the actual piercing of the tube. Additional sealing around the needle is accomplished as the valve body is completely engaged within the straddle nut.

3,714,960
SPECIAL THERMAL ELECTRIC POWER GENERATING UNIT USING PRESSURIZED HOT AIR TOGETHER WITH SUPERHEATED STEAM

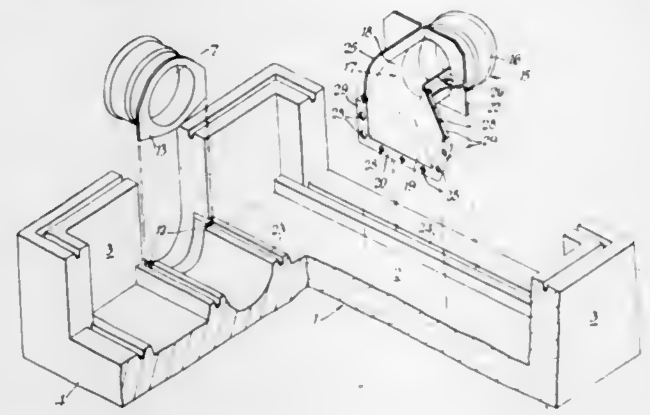
Kiichi Yamada, No. 15-12, 1-chome, Jengumae, Shibuya-ku, Tokyo, Japan
Continuation-in-part of Ser. No. 772,239, Oct. 31, 1968, Pat. No. 3,597,621. This application Dec. 30, 1970, Ser. No. 102,873
Claims priority, application Japan, Dec. 1, 1967, 42/76761
Int. Cl. F16k *49/00*
U.S. Cl. 137—340 **5 Claims**



A thermal electric power generating unit using pressurized hot air together with superheated steam, which is useful for storing superfluous electric energy of thermal power plants in the form of compressed air during an off-peak load period, and for regenerating electric power by using the thus stored compressed air during succeeding peak load periods. The unit comprises a means for producing compressed air, a boiler to produce superheated steam, a drum within the boiler for heating the compressed air, a special injection nozzle to simultaneously inject said superheated steam and the pressurized heated air, a gas turbine to be driven by gaseous mixture jets from said nozzle, and an electric generator driven by said gas turbine. The injection nozzle comprises a hollow toroidal member having adjacent but separated input and output orifices, and having a heating coil disposed therein for maintaining the gas at a desired temperature as it is being discharged.

3,714,961
MANHOLE ASSEMBLIES

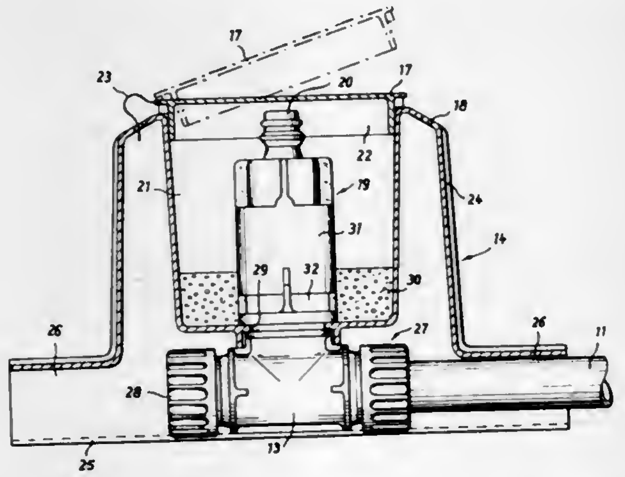
Alastair Ritchie Davidson, and Eric Robert Percival, both of London, England, assignors to Reed International Limited, London, England
Filed Oct. 15, 1971, Ser. No. 189,668
Claims priority, application Great Britain, Oct. 28, 1970, 51,237/70
Int. Cl. E02d *29/00*
U.S. Cl. 137—363 **7 Claims**



A preformed manhole base member comprises a bottom and integral side members. The bottom has a main outlet channel extending to an outlet orifice in one side member. The bottom and at least one other of the side members have locating means such as grooved portions for receiving cooperating locating means such as flanges on inflow channel bends so that correct location of an inflow bend with respect to the main outlet channel is obtained.

3,714,962
PIPELINE SYSTEMS

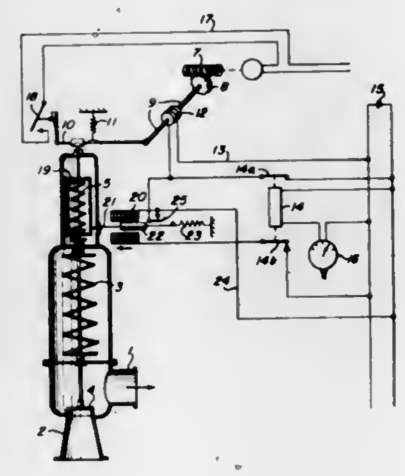
Roland Sauer, Einsingen, Johannes Katzer, Neu-Ulm, and Christian Stephany, Erbach, Germany, assignors to Kupex AG
Filed July 15, 1971, Ser. No. 162,807
Claims priority, application Germany, July 21, 1970, P 20 36 215.6
Int. Cl. B05b *1/14*
U.S. Cl. 137—371 **27 Claims**



The invention provides a pipeline system, advantageously an underground pipeline system, having a number of coupling elements at various localities all connected to a mains liquid supply and each adapted to receive a quick fastening plug-in connector. Each coupling element includes a shut-off valve which is automatically opened when the plug-in connector is fitted. The pipeline system includes a plurality of lengths of plastics piping, a peripheral groove being provided in each end of each pipe length. A resilient ring is fitted in each groove and is received within an end portion of a hollow connecting body and clamped by means of a clamping nut screwed onto the connecting body end portion. The connecting body forms part of connecting means for connecting the pipe lengths to one another and to the coupling elements.

3,714,963
SPRING LOADED SAFETY VALVE

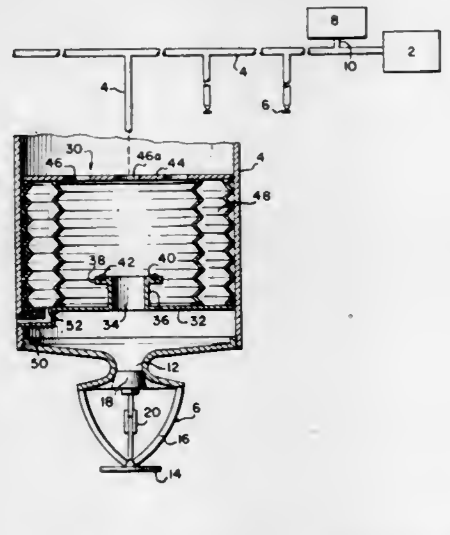
Carl Heinz Hafele, 83 Bergstrasse, 4050 Monchengladbach, Germany
Filed Sept. 13, 1971, Ser. No. 179,980
Claims priority, application Germany, Sept. 14, 1970, P 20 45 282.8
Int. Cl. F16k *31/00*
U.S. Cl. 137—487.5 **14 Claims**



A safety valve in which a valve member is biased toward valve closing position and in which an auxiliary spring is provided for acting on the valve in closing direction. In response to a certain maximum pressure at the valve inlet, the auxiliary spring is suddenly released from the valve member to permit quick opening thereof. The spring is then automatically preloaded without imposing any load on the valve member and thereafter, upon the pressure at the valve inlet reducing to a predetermined minimum pressure, the load of the spring is again imposed on the valve member.

3,714,964
DOUBLE RATE FLOW CONTROLLER

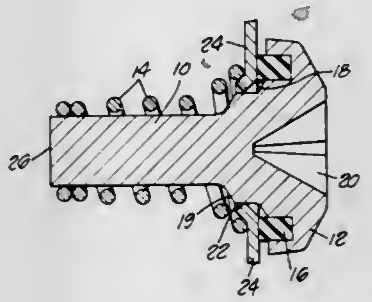
William L. Livingston, Sharon, Mass., assignor to Factory Mutual Research Corporation, Norwood, Mass.
Original application Oct. 24, 1968, Ser. No. 770,248, now Patent No. 3,592,270. Divided and this application Aug. 6, 1970, Ser. No. 61,801
Int. Cl. F16k *13/04*
U.S. Cl. 137—513.3 **4 Claims**



A double rate flow controller including a means for permitting fluid flow at a first high flow rate, a means for reducing the first flow rate to a second lower flow rate and a means for regulating the volume of water passing through the flow controller during the high flow condition before the high flow rate is terminated and the low flow rate begins.

3,714,965
PRESSURE RELIEF VALVE

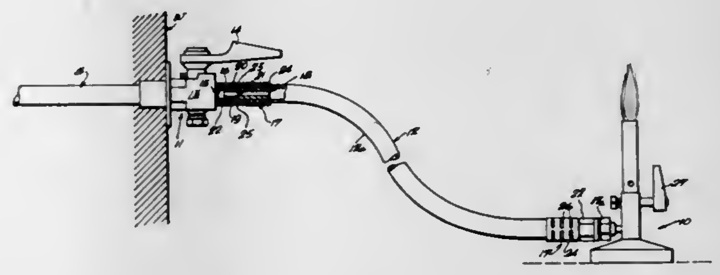
Clarence H. Bentley, Los Angeles, Calif., assignor to Delbert John Bentley, Albert Byron Bentley, Douglas Rodney Bentley, and David Alan Bentley, fractional part interest to each
Filed Mar. 24, 1971, Ser. No. 127,734
Int. Cl. F16k *17/04*
U.S. Cl. 137—541 **5 Claims**



A pressure relief valve for aerosol cans comprising a stem portion and a head portion, a stepped spring on said stem portion, a washer between said head portion and the stepped spring. The stepped spring being utilized to threadably engage a hole in said aerosol can until the stem is completely inside of said can placing said washer adjacent the outside of said can between said can wall and the head, then the stepped spring acting to cause a complete closure between the can wall and the washer. On increase in internal pressure in the can the stem will move outwardly to expand this assembly, thus slowly venting excess pressure.

3,714,966
FLEXIBLE HIGH PRESSURE GAS LINE CONNECTOR FOR BUNSEN BURNERS AND THE LIKE

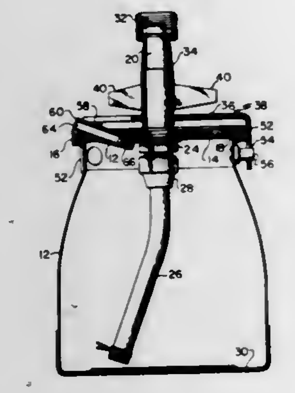
Melvyn N. Zobler and Joy Zobler, both of 1829 NE. 185th St., North Miami Beach, Fla.
Filed Feb. 1, 1971, Ser. No. 111,243
Int. Cl. F23d *13/40;* **F16b** *15/00*
U.S. Cl. 137—560 **3 Claims**



A flexible gas line or conduit for connection between a fixed gas supply line and a movable gas burning appliance such as a Bunsen burner or hand torch, and which is capable of withstanding high internal pressures without leakage, is described. Both the gas service cut-off valve outlet nipple of the fixed installation and the gas feed nipple of the appliance are externally threaded to receive, removably screw-fitted thereon, connector fittings provided at each end of a high pressure flexible hose.

3,714,967
SIPHON PAINT SPRAY CUP ASSEMBLY

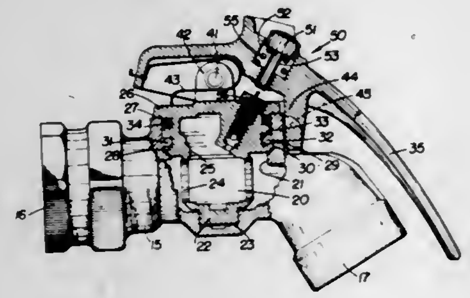
Frank M. Zupan, Arlington Heights, Ill., and Jerome N. Zurek, Chicago, Ill., assignors to Stewart-Warner Corporation, Chicago, Ill.
Filed May 14, 1971, Ser. No. 143,313
Int. Cl. F16k *45/04*
U.S. Cl. 137—588 **6 Claims**



The following specification describes a spray gun paint cup assembly having an angularly disposed elongate vent passageway and reservoir in the cup cover to limit paint drip and a three-spoked screw sleeve on the cup conduit to enable the application of large torque for fastening the cover to the cup.

3,714,968
ANGLE COCKS WITH VENT VALVES

Henry R. Billeter, Deerfield, Ill., assignor to Sloan Valve Company, Franklin Park, Ill.
Filed Sept. 29, 1971, Ser. No. 184,838
Int. Cl. F16k *11/00*
U.S. Cl. 137—596.2 **13 Claims**

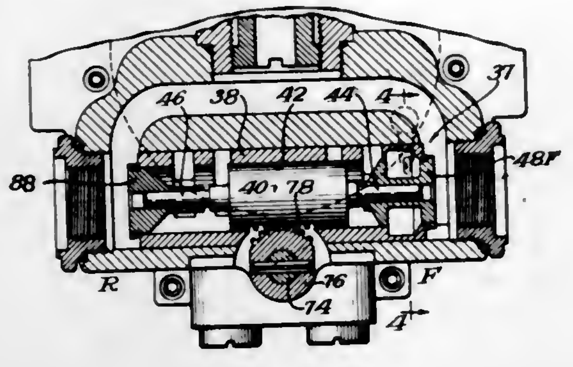


A railroad car angle cock having a vent valve incorporated therein for manually bleeding the interior of the angle cock to atmosphere so that the air hoses between the railroad cars can be easily disconnected and without danger.

3,714,969
SEQUENTIAL VALVE FOR ROTARY VANE AIR MOTORS

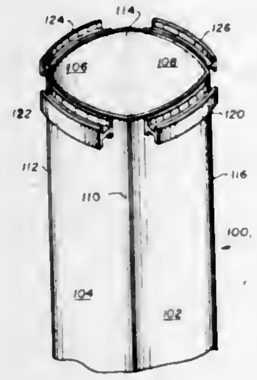
John R. Hanning, Bryan, Ohio, assignor to The Aro Corporation, Bryan, Ohio
Continuation-in-part of Ser. No. 781,061, Dec. 4, 1968, abandoned. This application Dec. 30, 1970, Ser. No. 102,802
Int. Cl. F04b *49/02*
U.S. Cl. 137—630.15 **14 Claims**

An improved valve assembly has one inlet and two outlets. The valve is operable to sequentially provide a fluid flow path first between the inlet and one outlet and next between the inlet and both outlets. Utilization of the valve assembly for a rotary vane type air motor driven hoist is described as a preferred embodiment.



3,714,970
LARGE DUCTS

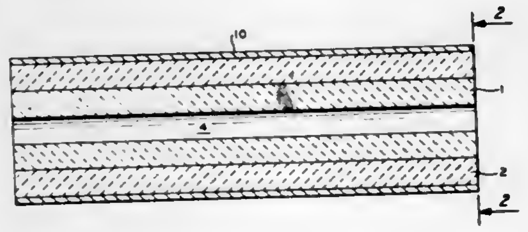
Laszlo Kunsagi, New York, N.Y., assignor to Foster Wheeler Corporation, Livingston, N.Y.
Continuation of Ser. No. 850,541, Aug. 14, 1969, abandoned. This application May 26, 1971, Ser. No. 147,259
Int. Cl. F16l *9/04*
U.S. Cl. 138—109 **1 Claim**



Large fluid ducts made up of plates require little or no reinforcement, are relatively free of vibration and create comparatively little resistance to fluid flow. The plates are bowed to reinforce them against vibration and thereby obviate or reduce the use of reinforcing members.

3,714,971
HIGH TEMPERATURE REFRACTORY LINING

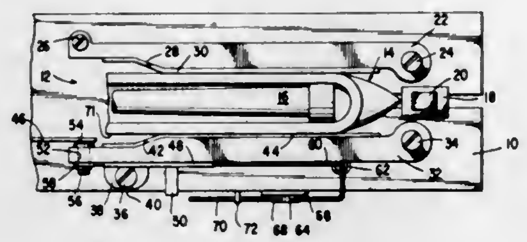
Charles R. Venable, Jr., Bartlesville, Okla., assignor to Phillips Petroleum Company
Filed Jan. 25, 1971, Ser. No. 109,683
Int. Cl. F16l *9/14;* **B32b** *15/04*
U.S. Cl. 138—143 **5 Claims**



A refractory lining composition comprising an inner chrome alumina prefired shape and an outer layer comprising lightweight alumina castable.

3,714,972
SHUTTLE BOXING DETECTOR FOR FLY-SHUTTLE LOOMS

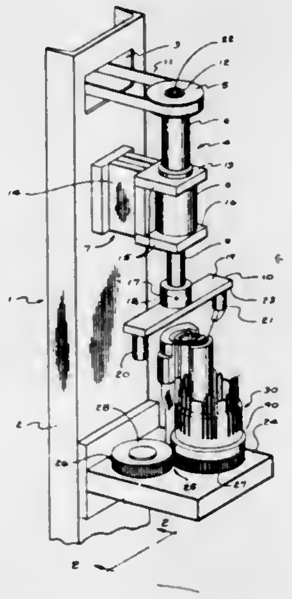
Jack C. Amato, Mine Hill, N.J., and Eugene A. Sansone, Belle Meade, N.J., assignors to The Singer Company, New York, N.Y.
Filed June 18, 1971, Ser. No. 154,528
Int. Cl. D03d *51/00*
U.S. Cl. 139—336 **4 Claims**



A relatively fail-safe fly-shuttle boxing detector for fly-shuttle weaving looms is disclosed. The apparatus provides automatic shut down of a loom if a fly-shuttle fails to box or if sensing switches fail either in the open or closed mode and utilizes the normally available warp stop voltage as a source of power. The electronic circuitry disclosed provides a voltage to a motor controller which enables the loom drive motor to continue to operate only if the fly-shuttle is boxed at a prescribed time in the loom cycle.

3,714,973
COIL TRANSFER AND STORAGE TOOL AND MACHINE FOR WINDING SAME

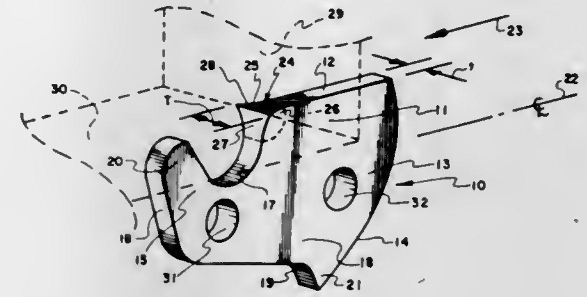
Vernon E. Kieffer, St. Louis, Mo., and Frank S. Korski, St. Louis County, Mo., assignors to Emerson Electric Co., St. Louis County, Mo.
Filed Feb. 8, 1971, Ser. No. 113,198
Int. Cl. B21f *3/00*
U.S. Cl. 140—92.1 **18 Claims**



An apparatus for winding and a method for storing electrical coils used in the axial insertion of motor windings provides for placing the winding coil on a transfer and storage tool in a manner similar to that required for axial insertion. The tool is inverted and the coil is transferred to an axial insertion machine prior to placement in a stator core. The tool preferably is an injection molded plastic, form, with a series of blades arranged similarly to the blades of the axial inserter. While prewound coils may be placed on the tool manually, the apparatus of this invention winds successive coil throws and automatically places them on the transfer and storage tool.

3,714,974
CHAIN SAW CUTTING TOOTH AND METHOD FOR MAKING IT

Martin B. Bullard, 7111 Pomelo Drive, Canoga Park, Calif.
Division of Ser. No. 857,336, Sept. 12, 1969, Pat. No. 3,589,215. This application March 15, 1971, Ser. No. 124,109
Int. Cl. B27b *33/14*
U.S. Cl. 143—135 R **7 Claims**

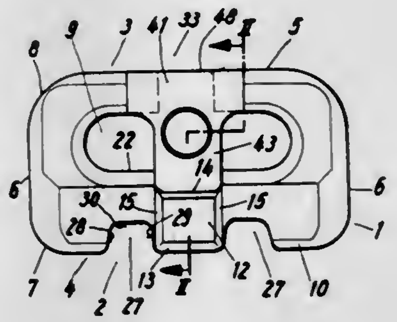


A chain saw cutting tooth is fabricated by forming a laterally extending retaining hole through a portion of a metal plate and press-fitting a round-shaped carbide object into the retaining hole. After bonding metal has been deposited and hardened in the space defined between the carbide object and plate, sufficient material is removed by grinding for example from the carbide object, plate and bonding metal in order to construct a cutting tip.

The plate may be integrally formed with a depth gauge and a drive tang.

3,714,975
CONNECTING LINK FOR TIRE ANTI-SKID CHAINS

Anton Muller, Unterkochen/Wurttemburgh, Germany, assignor to Pistor-Kette GmbH, Wuppertal-Cronenberg, Germany
Filed Sept. 28, 1970, Ser. No. 75,925
Claims priority, application Germany, Sept. 26, 1969, P 19 48 718.4
Int. Cl. B60c *25/04*
U.S. Cl. 152—243 **10 Claims**



A connecting link member for an anti-skid chain for tires in which the link member has a recess to receive chain links and an opening in one side of the link member giving access to the recess. A closure member in the form of two jaws is clamped into said opening with the jaws in opposed relation and traversed by a clamping bolt. The closure member includes a portion extending across said recess to the other side of the link member and dividing the recess into two parts each adapted to receive a respective chain link.

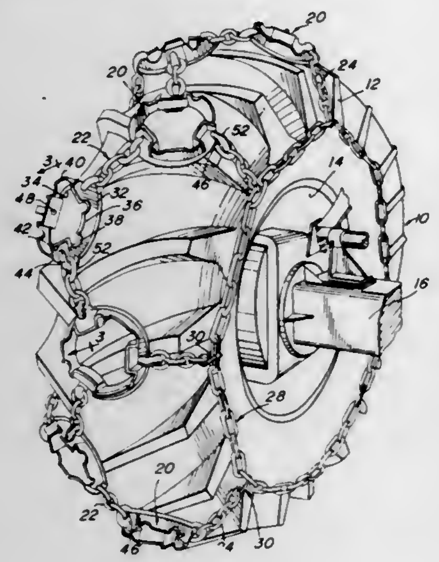
3,714,976
TIRE CHAIN AND CONNECTOR

Robert H. Caldwell, 1042 W. State St., Jacksonville, Ill. 62650

Continuation-in-part of abandoned application Ser. No. 815,816, Apr. 14, 1969. This application Nov. 23, 1970, Ser. No. 91,797

Int. Cl. B60c *27/20*

U.S. Cl. 152—228 **17 Claims**



A tire chain having circumferentially spaced cleat members incorporated in a heavy duty linked chain device each spaced from each other on the tire tread, offset one from the other, and connected together by short links of chain. The alternate ones of the cleat members are connected in staggered relationship to side chains. The advantages of the assembly are increased traction for off-the-road equipment, ease of assembly and disassembly, adjustability, self-cleaning action, and prevention of chain wind-up and twisted or broken links.

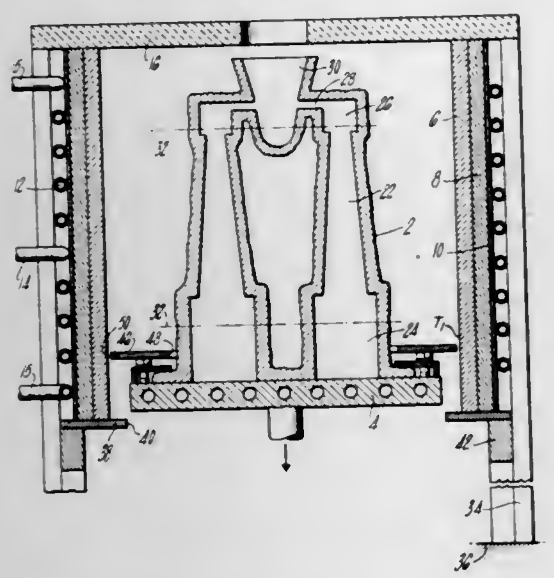
3,714,977
METHOD AND APPARATUS FOR THE PRODUCTION OF DIRECTIONALLY SOLIDIFIED CASTINGS

Bruce E. Terkelsen, Cheshire, Conn., assignor to United Aircraft Corporation, East Hartford, Conn.

Filed July 23, 1971, Ser. No. 165,619

Int. Cl. B22d *27/06*

U.S. Cl. 164—60 **8 Claims**



In making directionally solidified castings, a vertically movable radiation shield is supported in such a way that it may move upwardly with respect to the mold and the mold heater to permit upward movement of the mold and the supporting chill plate into the surrounding heater but upon retraction of the mold from the heater the radiation shield will be supported adjacent to the lower end of the heater and continued downward movement of the mold will withdraw the latter through the shield.

3,714,978
APPARATUS FOR HANDLING URANIUM HEXAFLUORIDE AT ELEVATED PRESSURE

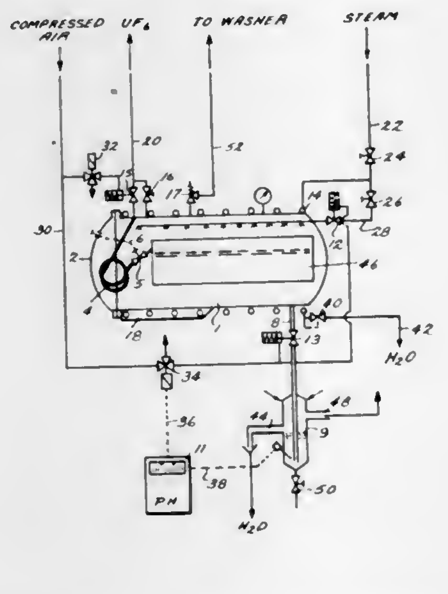
Hans Pirk, Dornigheim, and Ulrich Tillessen, Grossauheim, both of Germany, assignors to Nukem Nuklear-Chemie und-Metallurgie, GmbH, Wolfgang near Hanau am Main, Germany

Filed April 21, 1970, Ser. No. 30,503

Claims priority, application Germany, May 14, 1969, P 19 24 595.5

Int. Cl. F28f *11/00*

U.S. Cl. 165—1 **4 Claims**



The danger of UF_6 break out is eliminated by placing the container with the UF_6 in an outer container, heating the outer vessel with a condensible gas, catching the condensible gas and any UF_6 leakage, measuring the leakage with an indicating device, e.g. a pH instrument, shutting off the heating and closing the outer vessel when the indicating device exceeds a predetermined value.

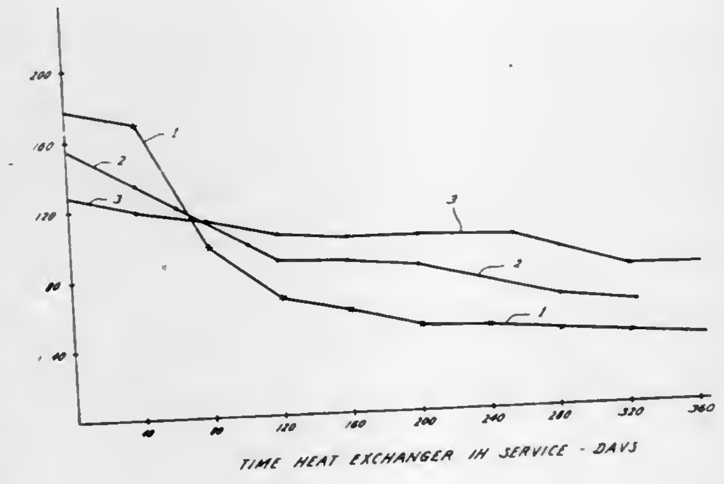
3,714,979
CLEANING ALUMINUM HEAT EXCHANGE SURFACES

Clifford A. Stevens, Port Neches, Tex., assignor to Texaco Inc., New York, N.Y.

Filed Aug. 25, 1971, Ser. No. 174,590

Int. Cl. F28g *9/00*

U.S. Cl. 165—1 **8 Claims**



In a furfural refining process the average heat exchange capacity of an aluminum heat exchange surface employed to transfer heat between process streams may be improved by cleaning relatively soft accumulated deposits from such surface in a manner such that thin, relatively hard deposits adjacent the heat exchange surface is substantially undisturbed.

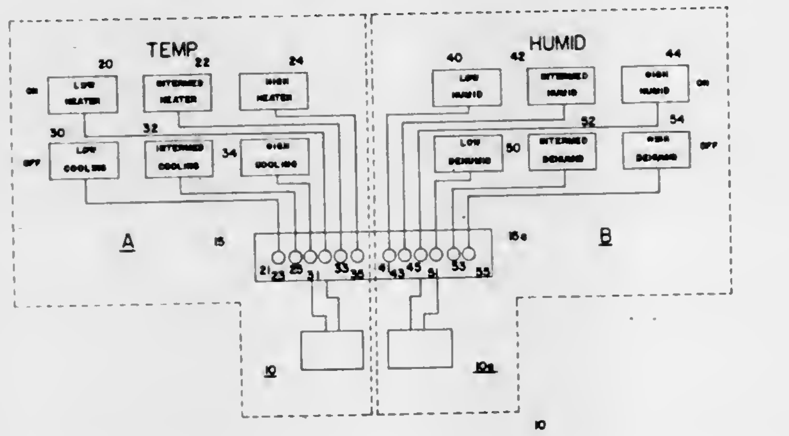
3,714,980
AIR CONTROL SYSTEM

Frederick N. Lancia, Columbus, and Ralph C. Liebert, Worthington, Ohio, assignors to Liebert Corporation, Columbus, Ohio

Original application Aug. 29, 1968, Ser. No. 756,093. Divided and this application Mar. 16, 1970, Ser. No. 24,450

Int. Cl. F24f *3/14*

U.S. Cl. 165—11 **5 Claims**



This invention relates to temperature and/or humidity electrical/electronic controls to maintain an enclosure at a constant temperature and humidity. Specifically, the electrical/electronic controls provide a step function to actuate one or more temperature and/or humidity conditioners in response to the degree of change.

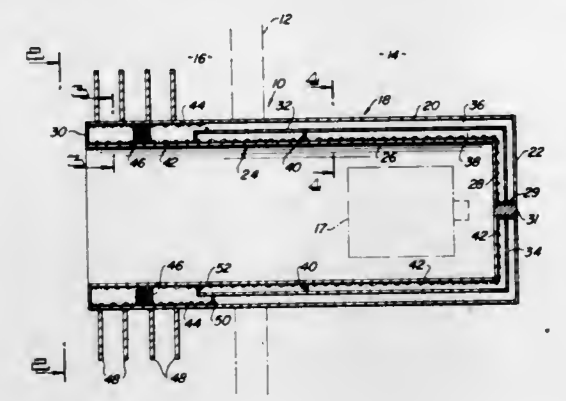
3,714,981
HEAT SHIELD ASSEMBLY

Don W. Noren, Redwood City, Calif., assignor to Noren Products, Inc., Redwood City, Calif.

Filed Feb. 3, 1971, Ser. No. 112,360

Int. Cl. F28d *15/00*

U.S. Cl. 165—47 **4 Claims**



The specification and drawing disclose a heat pipe type of heat shield assembly comprising a double walled member positioned to extend between a high temperature area and a low temperature area and having a sealed inner-chamber. The outer face of one of the walls is adapted to face the high temperature area and wick material is positioned in engagement with the entire inner face of the other wall. A portion of the inner face of the wall exposed to the high temperature area is also covered with wick material and the remaining inner surface of the wall is bare. A partition member is positioned within the inner chamber. The partition member extends throughout the bare portion of the outer wall to reduce heat transfer by convection. Cooling fins are connected to the outer wall throughout at least the portion exposed to the lower temperature area.

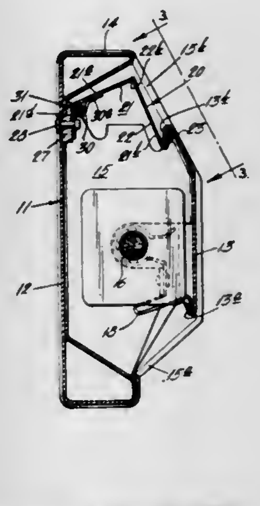
3,714,982
CLEAN-OPERATING BASEBOARD HEATER

Charles S. Shriver, Oreland, Pa., assignor to Orbit Manufacturing Company, Perkasie, Pa.

Filed March 1, 1971, Ser. No. 119,563

Int. Cl. F24h *9/04*

U.S. Cl. 165—55 **11 Claims**



A baseboard heater is provided with diffuser means having a series of apertures for causing heated air to the exit therefrom in a series of discrete upwardly flowing columns spaced from the wall against which the heater is mounted to reduce the tendency for the heated air to deposit entrained foreign matter on the wall. Preferred dimensional relations are disclosed for the apertures in the diffuser means to ensure satisfactory performance of the heater.

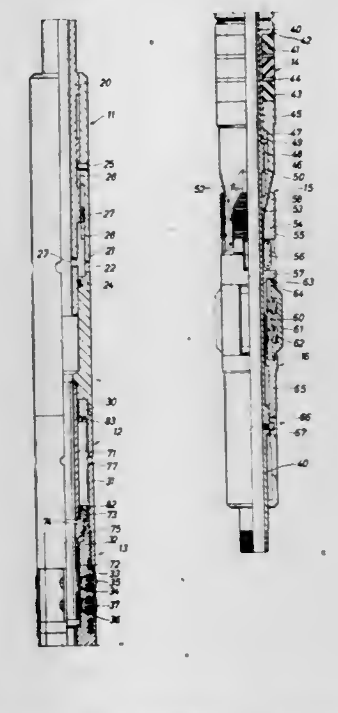
3,714,983
RETRIEVABLE WELL PACKER

Gerald E. Wilson, Houston, Tex., assignor to Schlumberger Technology Corporation, New York, N.Y.

Filed Sept. 9, 1971, Ser. No. 178,992

Int. Cl. E21b *23/00*

U.S. Cl. 166—120 **8 Claims**



In accordance with an illustrative embodiment of the present invention, a retrievable well packer apparatus includes a body structure carrying expansible packing, slip and expander means for anchoring against downward movement, and hydraulically operable gripping means to anchor against upward movement. In the event fluid pressures cannot be equalized in a typical manner to enable release of the packer, the body structure includes a first safety joint means that can be released to enable opening of a pressure equalizing valve means and the operation of tubular telescoping members as a jar or bumper sub. If this fails to release the hydraulically operable gripping means, the body also includes a second safety joint means that can be disconnected to enable release of the pipe string from the packer.

3,714,984

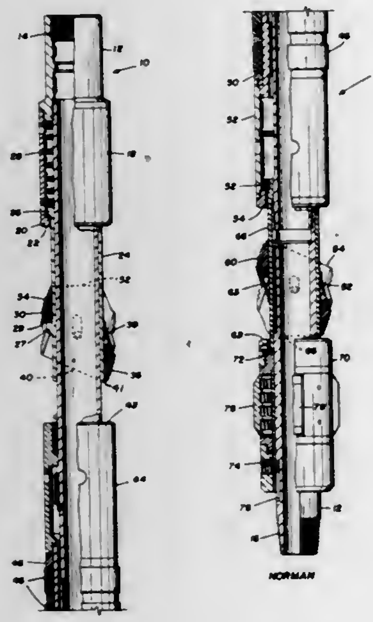
WELL TOOLS AND GRIPPING MEMBERS THEREFOR

Norman W. Read, Dallas, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Dec. 20, 1971, Ser. No. 209,744

Int. Cl. E21b *23/06*

U.S. Cl. 166—134 **10 Claims**



An improved slip or gripping member that is used on well tools to lock the well tools at a desired location in a well bore. The slip is pivotally located on the well tool and is provided with wall engaging teeth on relatively opposite sides therein adjacent each end. The slip is positioned between relatively moveable abutments that are moved together to engage the ends of the slip and pivot the slip into and out of engagement with the well bore wall. One end of the slip, referred to as the active end, is provided with a plurality of spaced points or surfaces with each being arranged to engage the adjacent abutment whereby the optimum force will be exerted on the slip to move the slip teeth into holding engagement with the well bore wall. The opposite end of the slip, referred to as the passive end, is similarly provided with a plurality of points or surfaces that are arranged to engage the other abutment and are located in such a position as to cause the slip teeth to move relatively away from the well bore wall. The points or surfaces on each end of the slip are arranged to maintain a relatively constant ratio between the distance from each operative points on the active and passive ends and the adjacent well bore wall thereby permitting the predetermination of the force that is exerted on the slip during setting of the well tool.

3,714,985

STEAM OIL RECOVERY PROCESS

Jack H. Bayless, Houston, Tex., assignor to Esso Production Research Company, Houston, Tex.

Filed Sept. 1, 1971, Ser. No. 177,124

Int. Cl. E21b *43/24*

U.S. Cl. 166—303 **10 Claims**

Disclosed herein is a method for recovering oil from a subterranean oil bearing formation using steam. The steam is generated from water which has been treated to reduce the concentration of scale forming anions and to retain substantially all of the scale forming cations. The generated saturated steam has a gaseous phase and a liquid phase which contains scale forming cations, such as magnesium and calcium, and which is substantially free of scale forming anions, such as carbonate, bicarbonate, and sulphate. The steam including the cation-containing liquid phase is injected into the oil bearing formation in a steam oil recovery process.

3,714,986

METHOD OF AND MEANS FOR COMBATING SODIUM FIRES

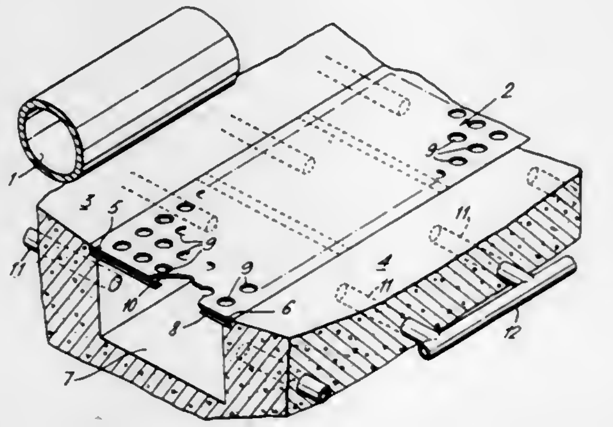
Donald Broadley, Warrington, England (℅ United Kingdom Atomic Energy Authority, 11 Charles II St., London SW. 1, England)

Filed Dec. 7, 1970, Ser. No. 95,560

Claims priority, application Great Britain, Dec. 17, 1970, 61,606/70

Int. Cl. A62c *1/00*

U.S. Cl. 169—1 A **7 Claims**



Spreading of particulate material such as vermiculite or perlite onto a porous plate beneath which is a trough into which burning sodium is conducted serves to prevent the spread of sodium fumes to operating areas. Inert gas supply to the space between the perforated plate and the burning sodium in the trough puts out the sodium fire.

3,714,987

HELICOPTER SUPPORTED AERIAL FIRE SUPPRESSANT APPLICATOR

Larry L. Mattson, 3624 164th Place SE., Bellevue, Wash. 98008

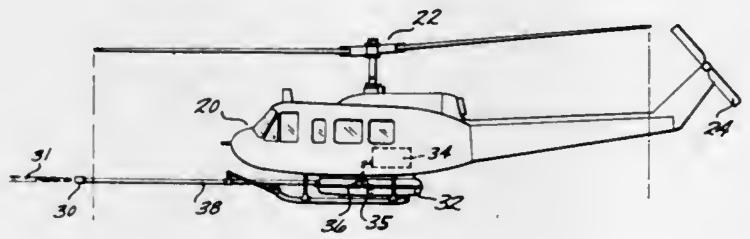
Filed May 17, 1971, Ser. No. 143,995

Int. Cl. A62c *3/02;* **B64d** *1/16;* **B05b** *17/02*

U.S. Cl. 169—2 A **6 Claims**

A helicopter-transported fire suppression system and method is described wherein a fire suppression medium such as water, aqueous foam, slurries and the like are

accurately directed to the precise location of a fire or to a portion of a fire to be treated by projecting a coherent stream of the fire suppression medium outwardly from the fire suppression system by locating a nozzle means beyond the effective area of helicopter rotor downwash to avoid interference with the stream by the downwash.



The helicopter pilot controls the location and direction of application of the fire suppression medium by controlling the altitude, attitude and location of the helicopter and controls the quantity and composition of fire suppression medium by actuating pumping means therefore from the pilots control station.

3,714,988

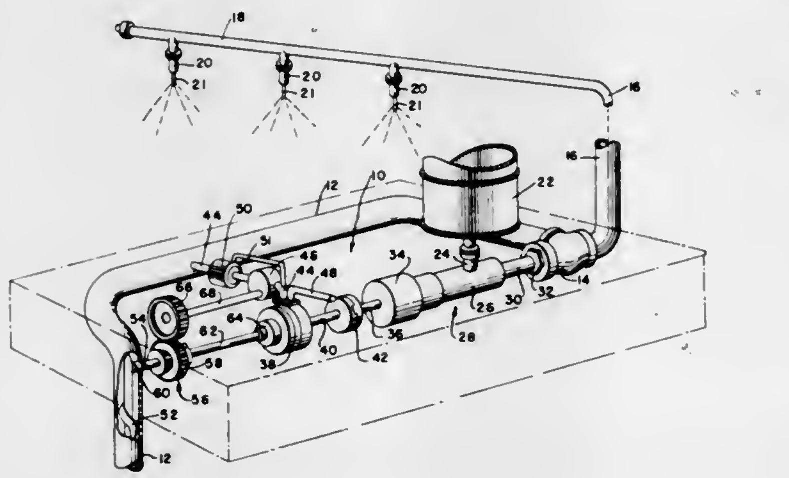
ADDITIVE INJECTION SYSTEM

William L. Livingston, Sharon, Mass., assignor to Factory Mutual Research Corporation, Norwood, Mass.

Filed Mar. 18, 1971, Ser. No. 125,635

Int. Cl. A62o *35/00*

U.S. Cl. 169—13 **8 Claims**



An injection apparatus for introducing an additive into a fluid line feeding a fixed fire extinguishing system to form an ablative extinguishant therein. A pump is provided which is driven by a hydraulic motor using the fluid as a driving medium, and a servomechanism controls the motor to insure injection rates corresponding to flow rates of water in the line. The apparatus includes a device for stopping the increase of the injection with increasing flow rates after a predetermined flow rate is attained.

3,714,989

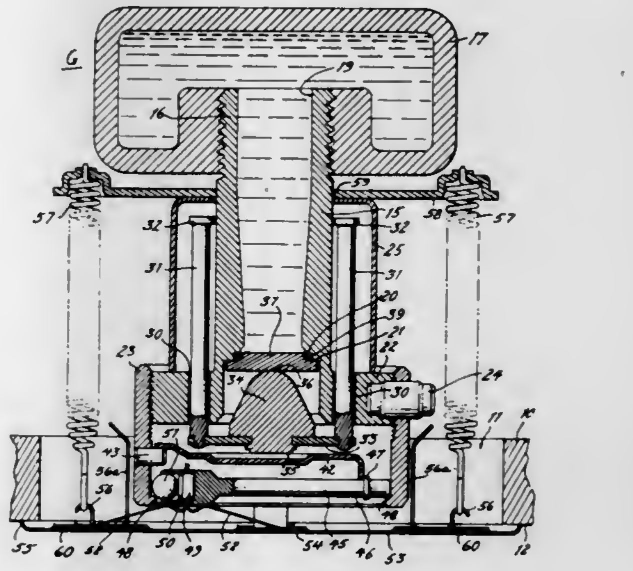
FLUSH TYPE SPRINKLER

Fred A. Gloeckler, Huntingdon Valley, Pa., assignor to Star Sprinkler Corporation of Florida, Philadelphia, Pa. Continuation-in-part of application Ser. No. 24,596, Apr. 1, 1970, now Patent No. 3,633,676. This application June 7, 1971, Ser. No. 150,474

Int. Cl. A62c *37/06, 37/12, 37/30*

U.S. Cl. 169—19 **5 Claims**

A sprinkler is provided mounted flush in a ceiling and has an overlapping outer escutcheon plate releasably held in place by resilient upwardly extending members connected to the escutcheon plate by heat responsive elements. The escutcheon plate is normally secured in covering relation to the sprinkler which has a strut containing a heat responsive element with a different selected heat release temperature. Heat sensing fins in contact with the escutcheon plate are movable downwardly below the ceiling line to an exposed position upon release of the plate and thereby increase the sensitivity of the strut heat responsive element.



3,714,990

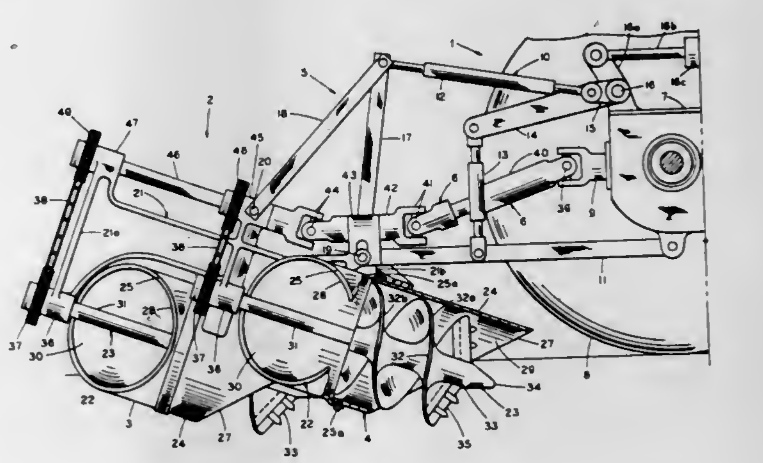
AUGER PLOW

George A. Tomik, Willow Hill Farm, Peotone, Ill.

Filed Nov. 12, 1970, Ser. No. 88,636

Int. Cl. A01b *33/04*

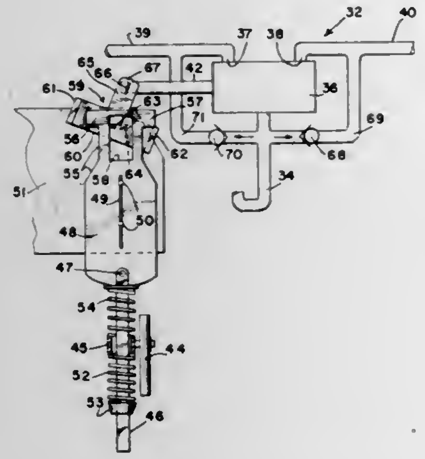
U.S. Cl. 172—58 **9 Claims**



A pair of laterally and vertically spaced powered auger type plow arrangements in furrow overlapping relation to one another and coupled to the rear of a tractor, each plow arrangement including a tubular auger housing and auger disposed therein and inclined downward at its forward end, the auger having a protruding earth penetrating tapered nose portion and a removable leading cutting edge with forward scarifiers thereon spaced just rearwardly of the nose portion and an auger shaft extending longitudinally in the housing and having a plurality of rearwardly located screw lead portions, the housing having a forward downwardly rearwardly sloped flat portion and an elliptical inlet opening therein and having laterally rearwardly curved rear end portion having adjustable discharge opening whereby the earth is scooped into the front of each arrangement and discharged out the rear and upwardly therefrom propelling the plow arrangements forwardly in aid of the motive power of the tractor.

3,714,991
ALTERNATING MECHANISM FOR HYDRAULIC MARKERS

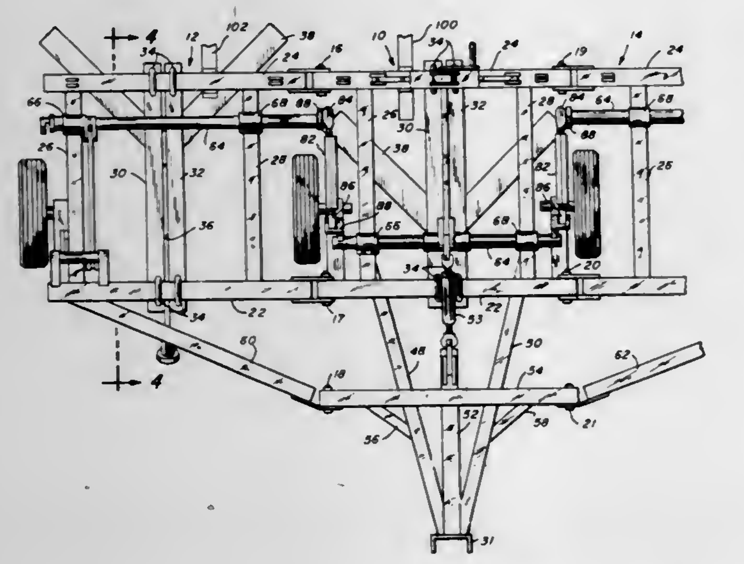
Donald E. Rieser, Wheaton, Ill., assignor to International Harvester Company, Chicago, Ill,
Filed Feb. 26, 1971, Ser. No. 119,274
Int. Cl. A01b *17/00*
U.S. Cl. 172—130 **16 Claims**



In a planter vertically movable between operating and transport positions and having alternately operating right and left hand markers raised and lowered by hydraulic cylinders, a hydraulic circuit is provided wherein fluid under pressure is directed to one of the marker cylinders to raise the operating marker when the planter is raised, and alternator valve means in the circuit is shiftable between two positions by the vertical movement of the planter to alternately lower the markers when the planter is lowered.

3,714,992
STUBBLE MULCHER DEVICE

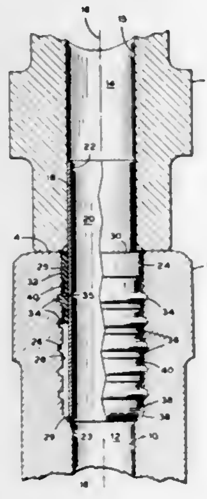
Leon G. Meier, P.O. Box 94, Higgins, Tex. 79046
Continuation-in-part of abandoned application Ser. No. 608,604, Jan. 11, 1967. This application Oct. 20, 1969, Ser. No. 867,603
Int. Cl. A01b *5/00*
U.S. Cl. 172—175 **2 Claims**



A sweep blade plow assembly for tilling the soil utilizes V-shape sweep blades operating at relatively shallow depths below the earth's surface. The sweep blades are carried on and supported by a central frame member and side frame members pivotally attached to the central member. The depth of the blade's cut is controlled by wheels attached to the frame members, and vertically pivotal relative to the blade. The wheels on the various sections are interconnected to each other and to a unitary control switch for simultaneous vertical movement. Turnbuckles used in the interconnection permit depth adjustment even when one or more of the pivotal side sections is pivoted upwardly into a vertical inoperative position. Secured to the plow assembly rearward of the blade plows are toothed discs rotatably journaled on a pivotal shaft.

3,714,993
VALVING TUBE SUBASSEMBLY FOR PERCUSSION BIT

Robert H. Nolley, Houston, Tex., assignor to Hughes Tool Company, Houston, Tex.
Filed Nov. 23, 1970, Ser. No. 91,699
Int. Cl. E21b *1/00*
U.S. Cl. 173—78 **4 Claims**



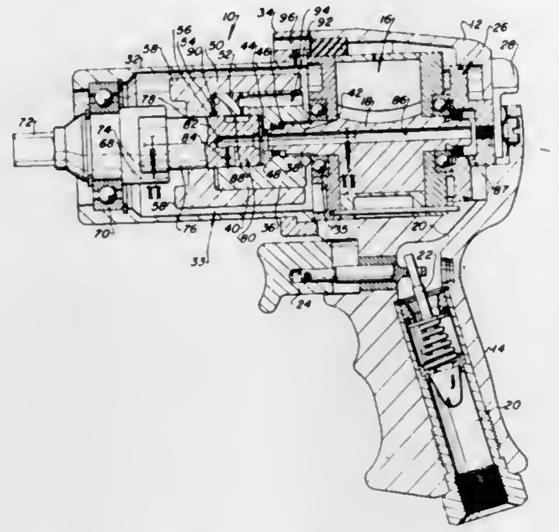
A rigid cylindrical valving tube having its lower portion surrounded by a resilient member which is secured to the tube to effect a good seal therewith and to prevent gross relative movement in the axial direction. This subassembly is mounted in the upper portion of the flushing fluid passageway of a percussion bit so that the rigid tube projects out of the passageway and above the anvil surface of the bit. The resilient member includes at least a sleeve, which is the part making sealing contact with the rigid tube, and the member also engages part of the passageway wall in both sealing and seating relationship. The seating is accomplished by providing the bit passageway with one or more constrictions or necks of smaller diameter than the subjacent part of the passageway, and by making parts of the resilient members with a diameter larger than that of the contriction—so that after squeezing such part of the resilient member past the neck it will fit under the constriction and be restrained thereby.

The assembly furnishes lateral as well as axial freedom of motion to the valving tube, enabling it to make the small but important shifts in position which are necessary to accommodate small and usually transient misalignments between hammer and bit, misalignments which otherwise could result in destruction of the tube by the rapidly moving hammer. The shape of the subassembly also makes field insertion simple and practicable.

3,714,994
FLUID ACTUATED IMPACT MECHANISM

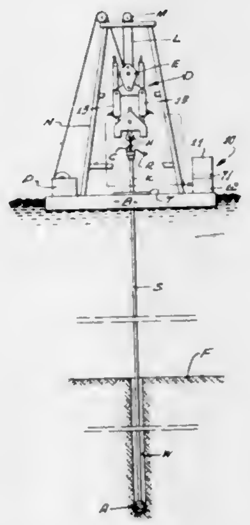
Richard L. Zoerner, Marne, and Larry D. Ruiter, Grand Haven, Mich., assignors to Gardner-Denver Company, Quincy, Ill.
Filed Nov. 29, 1971, Ser. No. 202,925
Int. Cl. B25d *15/00*
U.S. Cl. 173—93 **9 Claims**

A rotary fluid actuated mechanism for an impact wrench including a rotary drive member coupled to a rotating hammer member through a pin and slot coupling which provides for rotary and axial displacement of the hammer with respect to the drive member. The hammer is mounted in sleeved arrangement over the drive member to form an expansible chamber. Pressure air is supplied to the chamber through a rotary valve formed by the drive member and a portion of a rotary anvil for forcing the hammer to move axially and accelerate rotatively to impact the anvil.



3,714,995
MOTION COMPENSATING APPARATUS

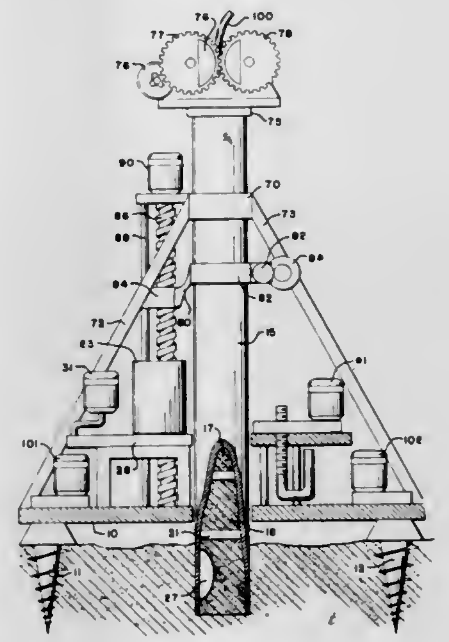
James W. E. Hanes, Ventura, Calif., and Edward Larralde, Santa Barbara, Calif., assignors to Vetco Offshore Industries, Inc., Ventura, Calif.
Filed Sept. 4, 1970, Ser. No. 69,759
Int. Cl. E21b *7/12*
U.S. Cl. 175—5 **24 Claims**



Compensating apparatus connected between a travelling block of a well bore rig mounted on a vessel float in a body of water and a hook from which a running string is supportable, the compensating apparatus including a pair of elongate cylinders straddling and connected to the travelling block and a pair of companion piston rods connected to and straddling the hook and secured to pistons relatively longitudinally shiftable in the cylinders, liquid under pressure being maintained in the cylinders under the pistons to support a substantial portion of the weight of the running string suspended from the hook. The compensating apparatus can be rendered inoperative when desired. Shock absorbers retard sudden upward movement and retraction of the compensating apparatus in the event of sudden release or diminution of the load on the apparatus, as might result from failure of the running string.

3,714,996
UNDERSEA CORING MACHINE WITH MEANS FOR SEPARATING SAMPLES

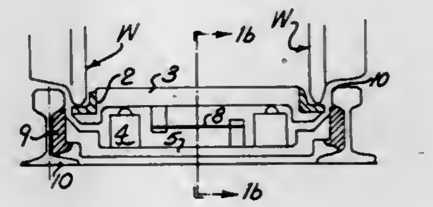
Ernest Blaney Dane, Jr., 57 Tyler Road, Belmont, Mass. 02178
Filed Aug. 10, 1971, Ser. No. 170,455
Int. Cl. E21b *7/12;* **E21c** *19/00*
U.S. Cl. 175—6 **10 Claims**



The machine, intended for operation at ocean depths up to several miles, comprises a generally triangular platform with a motor-operated auger at each corner by which it may be attached to the ground, and a centrally situated coring tube with which are associated means for raising and lowering the tube, and means for inserting plastic spacers between successive samples. The whole is connected by a cable to a ship. The tube is driven and withdrawn by operation of an eccentric vibrator coacting with a biasing lead screw and flexible strut. A supply of saucer-like disks is contained in a magazine situated vertically and parallel to the sampling tube, and transfer means are provided to slide the bottom disk out of the magazine, and to press it up into the bottom of the sampling tube past the check valve in its foot.

3,714,997
WEIGHING DEVICE

Nils Goran Ahl, and Lars Herbert Larsson, both of Vasteras, Sweden, assignors to Conrail AB, Vasteras, Sweden
Filed Sept. 16, 1971, Ser. No. 181,047
Claims priority, application Sweden, Sept. 21, 1970, 12802/70
Int. Cl. G01g *19/08*
U.S. Cl. 177—136 **21 Claims**



A weighing device comprising a frame extending between and supported by a pair of rails for movement therewith, a load supporting platform adapted to engage the wheels of a railway guided vehicle and a plurality of load sensing means supporting the platform on the frame.

3,714,998

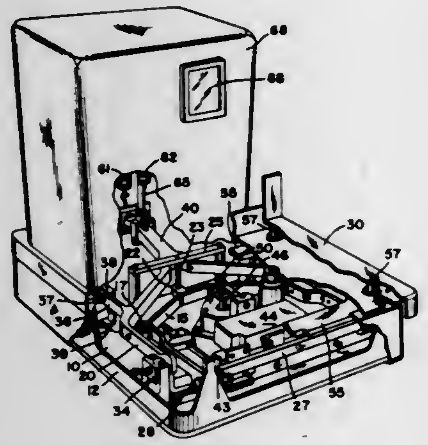
WEIGHING SCALE WITH IMPROVED DASH POT

Kenneth C. Allen, and Edwin E. Boshinski, Dayton, Ohio, assignors to The Hobart Manufacturing Company, Troy, Ohio

Filed Feb. 4, 1971, Ser. No. 112,588

Int. Cl. G01g *23/08*

U.S. Cl. 177—189 **3 Claims**



An improved dash pot for use with a weighing scale allows a scale platter to move to a balance position quickly while providing the necessary dampening of scale movement which will permit accurate reading of an indication representing the weight placed on the platter. The dash pot includes a cylinder containing a liquid and a plate mounted to move within said cylinder in response to platter movement. The plate is provided with openings which are closed by leaf springs until the force exerted on the plate by the liquid increases above a predetermined magnitude at which time the valve opens, allowing a more rapid transfer of liquid from one side of the plate to the other thus permitting the platter to move quickly to a new position. When the platter reaches the new balance position, the valves close and more effective dampening of minor movements of the platform is then provided by the dash pot. Different size openings and/or leaf spring thicknesses and tensions may be provided to control the speed of movement of the platter in opposite directions.

3,714,999

HYDROSTATIC DRIVE FOR VEHICLE

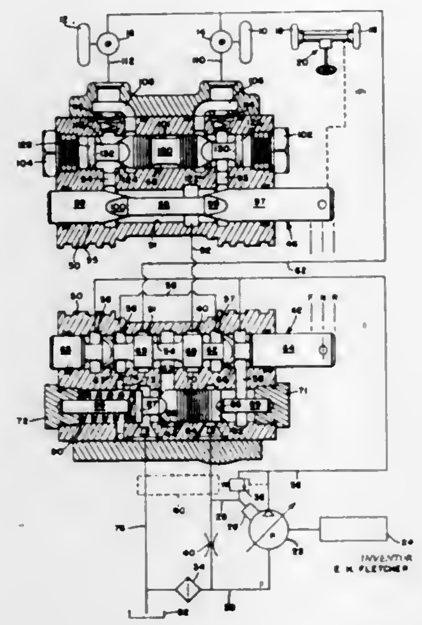
Edward Horton Fletcher, Waterloo, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Jan. 29, 1971, Ser. No. 110,852

Int. Cl. B62d *11/04*

U.S. Cl. 180—6.48 **12 Claims**

A vehicle has a pair of rear drive wheels respectively driven by a pair of hydraulic motors and a pair of steerable front wheels. The hydraulic motors are driven by fluid pressure supplied by a variable displacement hydraulic pump through a valve system that includes a manually shiftable speed and direction control valve having a variable orifice through which the pressurized fluid flows. A flow control valve is responsive to the pressure drop across the variable orifice to control the flow of fluid to a pressure responsive stroke control system associated with the pump. The pressurized fluid from the speed and direction control valve is delivered to the respective motors through a flow divider valve actuated by the steering mechanism to throttle the flow of fluid to the wheel motor on the inside of the turn. The fluid also flows through a differential control valve which operates to restrict the fluid flow to the motor having the lesser load and consequently the lesser pressure, providing a limited slip differential action. The flow control valve is also connected to the return line to provide dynamic breaking after it causes the pump to go out of stroke.



3,715,000

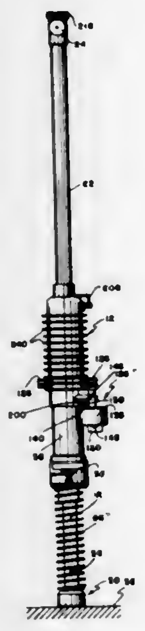
ENGINE POWERED JUMPING STICK

Herbert J. Ottaway, 3702 Elmwood Drive, Wichita, Kans. 67218

Filed May 21, 1971, Ser. No. 145,822

Int. Cl. B62d *57/00*

U.S. Cl. 180—8 R **4 Claims**



A jumping stick of the type including a downwardly extensible ground-contacting plunger that is spring urged toward its extended position together with an improved two-stroke cycle internal combustion engine having its piston movable with the plunger and arranged on its power stroke to urge downward extension of the plunger.

3,715,001

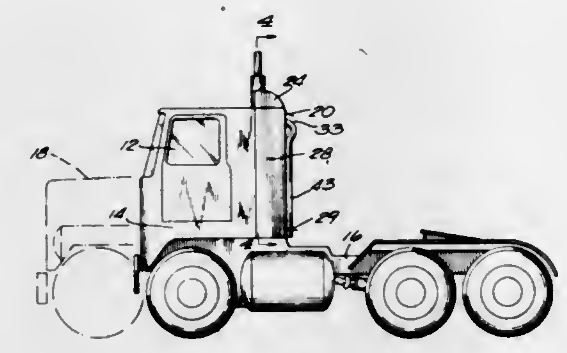
ENGINE COOLING SYSTEM FOR VEHICLES

Harry R. Wilson, Milwaukee, Wis., assignor to McQusy-Perfex Inc.

Filed June 4, 1970, Ser. No. 43,367

Int. Cl. B60k *11/04*

U.S. Cl. 180—68 R **12 Claims**



This invention comprises a self-contained engine cooling system for a vehicle. This cooling system has a housing with an air inlet near the top of the housing and an air outlet located below the air inlet in a generally vertical direction. A radiator and one or more air circulators for moving air past the radiator are located within the housing and between the air inlet and air outlet. This self-contained engine cooling system is adaptable particularly for behind the cab mounting on trucks and similar vehicles.

3,715,002

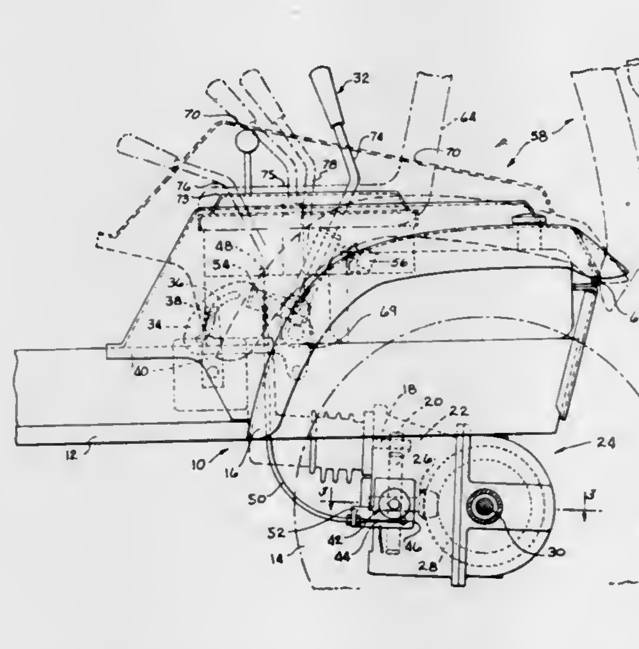
SUBURBAN TRACTOR AND CONTROLS

Lawrence M. Halls, New Holland, Pa., and Shaun A. Seymour, Lebanon, Ohio, assignors to Sperry Rand Corporation, New Holland, Pa.

Filed Oct. 5, 1970, Ser. No. 78,138

Int. Cl. B60k *27/08*

U.S. Cl. 180—82 **3 Claims**



A surburban tractor having a transmission control lever moveable between park and drive positions cooperatively related to a rear pivotable deck, a starter switch, and a parking lock. The control is so structured and orientated that when in the drive position the starter switch is open, the parking lock disengaged, and the rear deck is substantially prohibited from pivotable movement. In the park position the starter switch is closed, the parking lock engaged, and the rear deck is free to be pivoted.

3,715,003

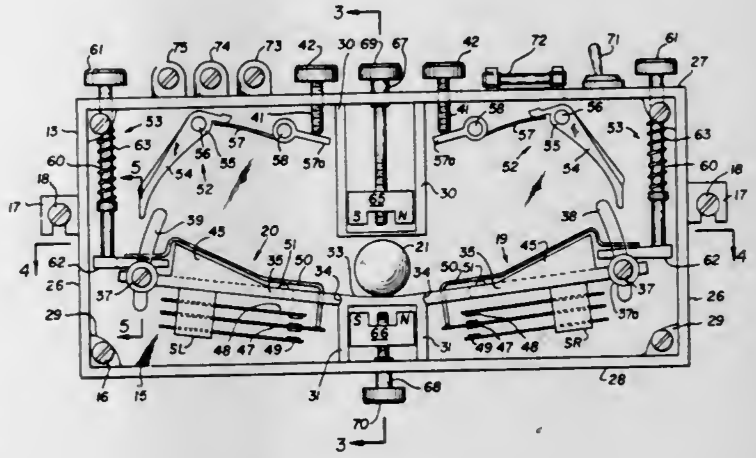
TRAILER ANTIFISHTAIL CONTROL SYSTEM

Arthur R. Jubenville, 20 Grist Mill Lane, Halesite, N.Y. 11743

Filed Oct. 15, 1970, Ser. No. 80,834

Int. Cl. B60t *7/20*

U.S. Cl. 180—103 **34 Claims**



A towed vehicle antifishtail control system in which a ferromagnetic ball functions as an acceleration sensing body and is movable in response to lateral acceleration of the towed vehicle, from a central rest position to either side relative to the inclined branches of a path provided by ramp assemblies which preferably are movably mounted. Magnetic apparatus is provided for adjustably biasing the ball to hold it in its rest position. Movement of the ball along either path branch results first in actuation of a warning device and then actuation of the towed vehicle's brakes. Apparatus is also disclosed for releasably trapping the ball at either extremity of its path.

3,715,004

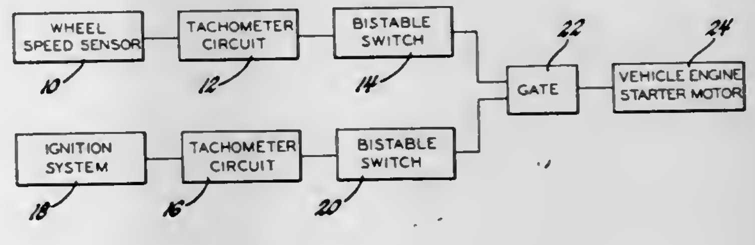
AUTOMATIC ENGINE CRANKING SYSTEM

James E. Pasek; Frederick L. J. Rehfeld, both of Saginaw, and William B. Thompson, Frankenmuth, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Sept. 1, 1971, Ser. No. 176,813

Int. Cl. B60k *27/00*

U.S. Cl. 180—103 **1 Claim**



A system for energizing the vehicle engine starter motor when the vehicle engine stalls while the vehicle is at a speed greater than a predetermined minimum so as to maintain the operation of the vehicle driven accessories while the vehicle speed is greater than the predetermined minimum and to maintain the requirement of manual start while the vehicle is at rest.

3,715,005

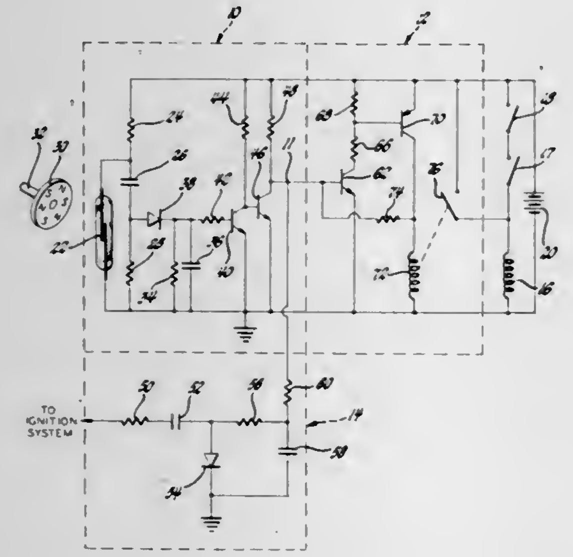
AUTOMATIC CRANKING SYSTEM FOR PROVIDING POWER ASSIST UPON VEHICLE ENGINE STALL

Robert J. Byram, Grand Blanc; Mark N. Culver, Davison, and David L. Van Ostrom, Flint, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Sept. 1, 1971, Ser. No. 176,814

Int. Cl. B60k *13/00*

U.S. Cl. 180—103 **2 Claims**



A system for energizing the vehicle engine starter motor when the vehicle engine stalls while the vehicle is at a speed greater than a predetermined minimum so as to maintain the operation of the vehicle engine driven accessories. A vehicle speed switch maintains the output of a summing junction, which output constitutes the input to a power switch, at ground so as to inhibit the power switch when the vehicle speed is below the predetermined speed and switches to supply a positive current signal to the summing junction at speeds equal to or greater than the predetermined speed. A vehicle engine speed tachometer supplies a negative current signal to the summing junction having a magnitude related to engine speed. The net current output of the summing junction when the vehicle engine speed is at or above the minimum engine idle speed, is insufficient to energize the power switch. When the engine speed decreases below the minimum idle speed, the net current output of the summing junction increases to energize the power switch which in turn energizes the vehicle starter solenoid. The vehicle starter motor cranks the vehicle engine so as to maintain the operation of the engine driven accessories while the vehicle speed is above the predetermined minimum speed.

3,715,006

VEHICLE SPEED CONTROL

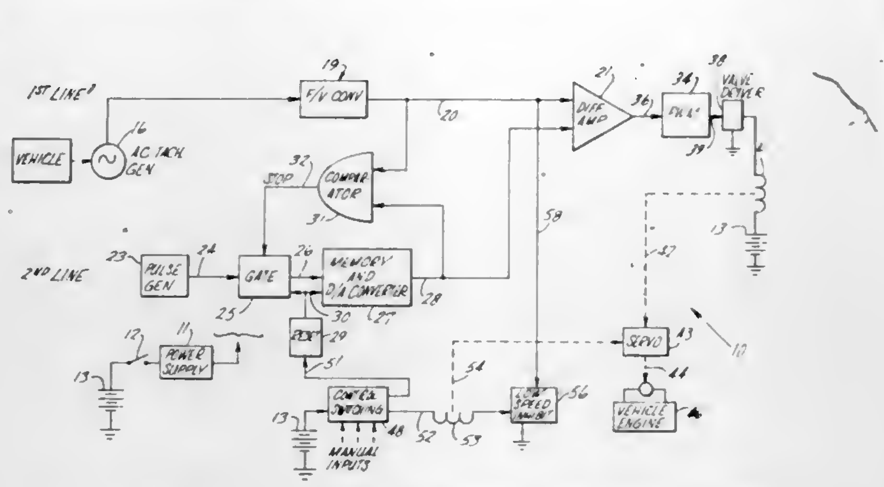
William J. Walsh, Birmingham; Joseph A. Livers, Roseville; Robert S. Mueller, Southfield, and Warren R. Hill, Dearborn, all of Mich., assignors to Eaton Yale & Towne Inc., Cleveland, Ohio

Filed April 3, 1969, Ser. No. 813,038

Int. Cl. B60k *31/00*

U.S. Cl. 180—105 E **27 Claims**

A device for automatically maintaining the speed of an automotive vehicle at, or substantially at, any currently existing value when same is suitably selected by the operator. The apparatus comprises means for remembering and producing a signal proportional to the speed of the vehicle at the moment the control mechanism is activated by the operator. It further comprises means for producing a signal proportional to a subsequent instantaneous speed of the vehicle. Said signals are then compared and caused to alter proportionately the duty cycle of an oscillator output. Such variations in said duty cycle are then utilized to control the vehicle throttle in a manner to adjust the speed toward the selected valve.



3,715,007

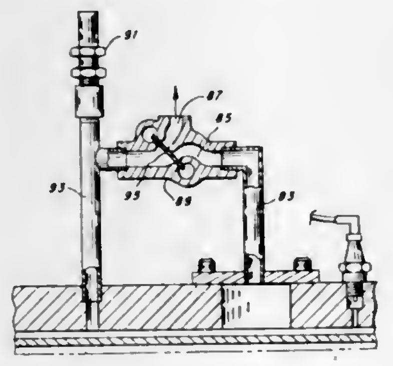
GAS CUSHION CONTROL FOR SEISMIC GAS EXPLODER

Gilbert H. Kelly, Irving, and Herbert D. Coburn, Dallas, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Oct. 5, 1970, Ser. No. 77,767

Int. Cl. G01v *1/10*

U.S. Cl. 181—.5 NC **17 Claims**



Disclosed is a seismic gas exploder in which the exhaust system is controlled to cause the retention of exhaust gases in a pressurized volume within the body of the exploder. This volume of gas then acts as an energy absorbing cushion or shock absorber against which the gas exploder can bounce and rebound without injecting unwanted secondary shock energy into the ground. Retention of the exhaust gases in this manner allows near peak pressure to be developed from a charge.

3,715,008

LOUDSPEAKER CABINET ASSEMBLY AND METHOD

Seth E. Lover, Garden Grove, Calif., assignor to Columbia Broadcasting System, Inc., New York, N.Y.

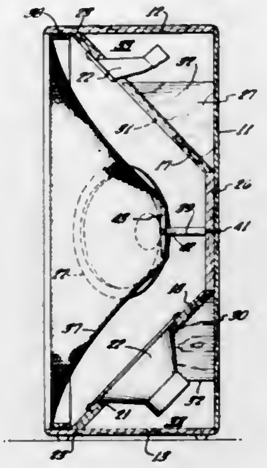
Filed Jan. 31, 1972, Ser. No. 221,930

Int. Cl. G10k *13/00;* **H04r** *1/28*

U.S. Cl. 181—31 B **25 Claims**

An extremely rigid and acoustically-excellent, yet low-cost, loudspeaker cabinet assembly is formed by combining two trapezoidal speaker baffles with two triangular speaker baffles. Such baffles, with their associated speakers, are mounted in inclined manner in a rectangular cabinet and are braced by triangular braces which connect from adjacent edges of the baffles to the back of the cabinet. The braces do not extend outwardly to the cabinet corners, so that the chambers defined behind the baffles are in communication with each other. The baffle edges, at regions between the braces and the cabinet

corners, are spaced from each other to form ports for the speakers. Elastic knit grill cloth is stretched over the cabinet front and is centrally depressed by means of a connector member, the result being a highly attractive horn-shaped configuration.



In accordance with the method, the baffles are mounted individually. The braces are then inserted through speaker openings in the baffles, and are slid radially inwardly as far as permitted by the baffles. Loudspeakers are then front-mounted on the baffles, and the grill cloth is mounted and stretched.

3,715,009

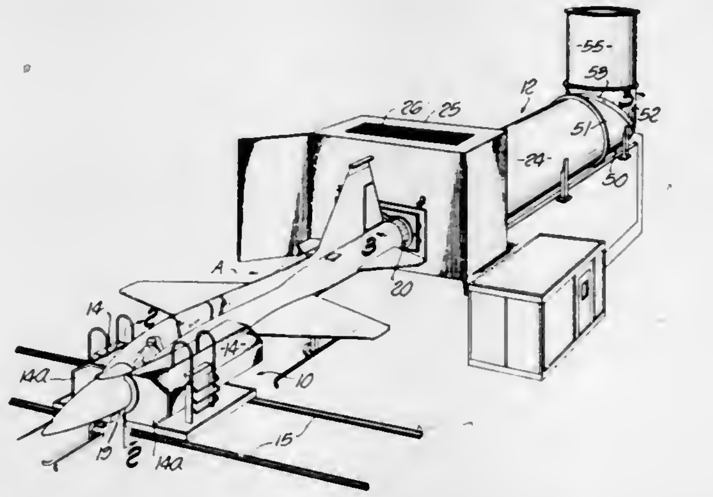
JET ENGINE NOISE SUPPRESSION SYSTEM

Cloyd D. Smith, Pacific Palisades, and James H. Schmidt, Berkeley, both of Calif., assignors to General Acoustics Corporation, Los Angeles, Calif.

Continuation-in-part of Ser. No. 766,910, Oct. 11, 1968, Pat. No. 3,525,418. This application Aug. 17, 1970, Ser. No. 64,494

Int. Cl. B64d *33/06;* **F01n** *1/14, 7/18*

U.S. Cl. 181—33 HC **5 Claims**



A noise suppression system for testing jet engines includes both an intake silencer and an exhaust noise suppressor. The latter is designed to remove energy from the exhaust gases by cooling them quickly and to this end provides an acoustical tubular shell with a removable liner which provides a water-cooled coil for absorbing thermal energy from the gases. The coil is part of a water circulation system which includes a cooling tower or other means through which the water is circulated to cool it, thereby permitting operation of the system over an extended period of time. At the anterior end of the shell is a housing having a sonically sealable opening which receives the tail pipe of the jet engine. This housing provides also a tortuous intake passageway for secondary air, which is fed to a concentric augmenter tube extending into the anterior end of the shell.

3,715,010

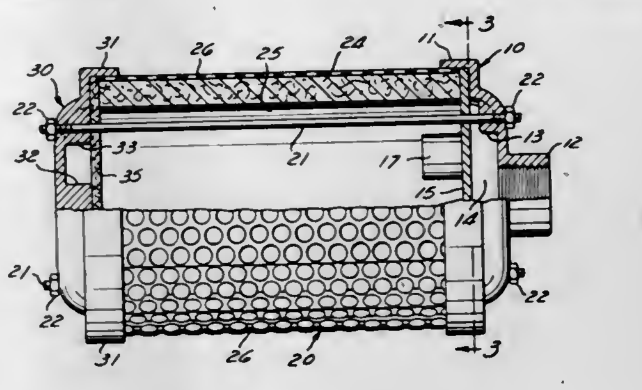
MULTIPLE COLLIMATOR MUFFLER

Stephen J. Gibel, 5846 Edgerton Road, North Royalton, Ohio 44133

Filed Feb. 2, 1972, Ser. No. 222,876

Int. Cl. F01n *1/10*

U.S. Cl. 181—50 **8 Claims**



Muffler for pneumatic exhausts, particularly exhausts at supersonic velocities. Muffler comprises a primary expansion chamber and secondary silencing chamber; air from the primary chamber passes through a plurality of collimating nozzles into the secondary chamber, from which the air is disseminated through a porous wall of acoustical material. The nozzles and the structure supporting them appear to break up ultrasonic shock waves and dissipate some of their energy in the primary chamber. Interference between jets of air entering the secondary chamber through the nozzles additionally dissipates sound energy. Further dissipation is obtained by impingement of the jets against and passage through acoustical material constituting internal wall surfaces of the secondary chamber.

3,715,011

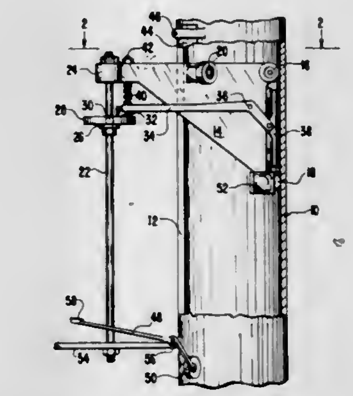
GRAVITY ESCAPE MEANS

Alfred G. B. Prather, 5700 Lincoln Ave., P.O. Box 53, Lanham, Md. 20801

Filed Apr. 10, 1972, Ser. No. 242,404

Int. Cl. A62b *1/20*

U.S. Cl. 182—100 **10 Claims**

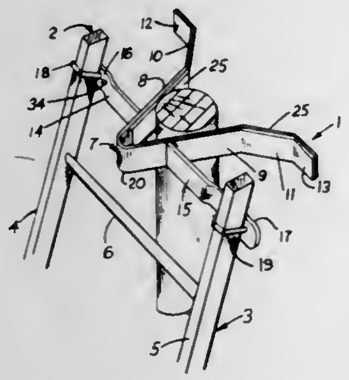


The post extends upwardly from the ground level alongside of a building to one or more windows of the floors above the ground, and provides opposed tracks for roller and brake means of the portable carriers placed near the windows for use of occupants of those floors to lower themselves to the ground in case of fire or other imminent danger. In an emergency, the occupants can easily escape through said windows by each one seizing a carrier and mounting it on the post and releasing the brakes from the platform of the carrier carefully to lower himself or herself, with due regard for other carriers at lower levels, to the ground or other safe level, where the carriers are removed from the post to permit other escapes to follow and make their escape.

A pulley system may be used for automatically returning the removed carriers back to their original floors by means of a counter-balance slightly heavier than the carrier.

3,715,012
SAFETY LADDER BRACE

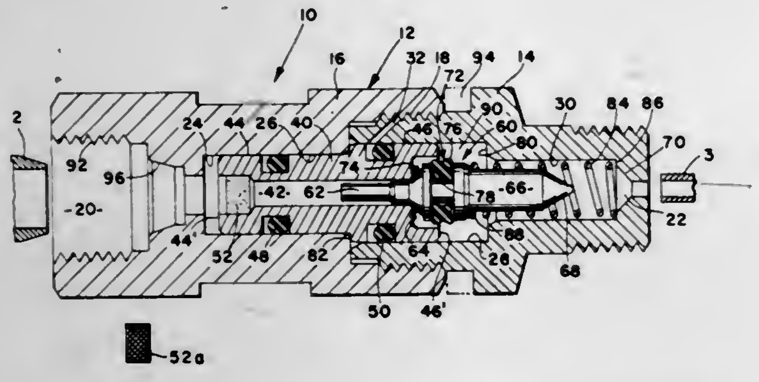
Adelbert W. Perry, 7709 High Grove Road, Grandview, Mo.
Filed Sept. 27, 1971, Ser. No. 184,054
Int. Cl. E06c *7/48*
U.S. Cl. 182—107 **8 Claims**



A safety device for supporting an upper end portion of a ladder having a pair of side rails joined by rungs wherein the safety device includes a body member having a pair of diverging arms forming a generally V-shape, each having an extension with the extensions being in substantially normal planes and a flange extending outwardly from a free end of each of the extensions with the flanges being substantially coplanar and a wing extending outwardly from each of the diverging arms and having a portion engageable with a respective side rail of the ladder and a clamping member on each wing for securing the respective side rails of the ladder thereto.

3,715,013
LUBRICANT INJECTOR

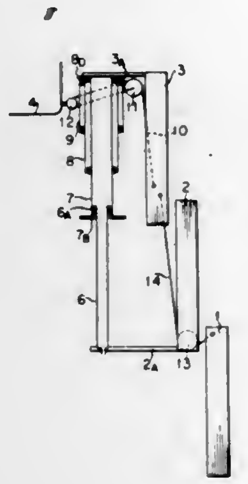
William Lyth, Cleveland, and Roy Smith, Washington Court House, both of Ohio, assignors to Eaton Corporation, Cleveland, Ohio
Filed Aug. 19, 1971, Ser. No. 173,169
Int. Cl. F16n *25/00*
U.S. Cl. 184—7 D **28 Claims**



A lubricant meter valve of the injector type comprising a generally cylindrical body having a central axial cavity therethrough and a slidable differential-area piston therein. The piston has an axial bore therethrough and carries a forwardly opening poppet which is spring biased to a closed position. The application of pressure lubricant to the inlet side of the cavity is effective to first move the piston and poppet forwardly injecting lubricant out the outlet and then to unseat the poppet, closing the outlet and allowing lubricant to flow through the piston bore forcing the piston backwardly thus recharging the meter valve.

3,715,014
INDUSTRIAL TRUCK

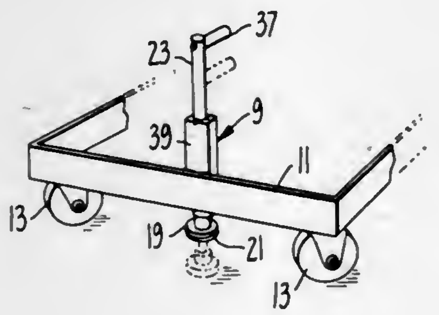
Shuji Ohta, Toyohashi, Japan, assignor to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Kariya, Aichi Prefecture, Japan
Filed Mar. 16, 1971, Ser. No. 124,781
Claims priority, application Japan, Mar. 18, 1970, 45/23,257
Int. Cl. B66b *9/20*
U.S. Cl. 187—9 **1 Claim**



An industrial truck of the type of so-called full free triple stage uprights or masts, comprising an outer mast, an intermediate mast vertically movable relative to said outer mast, an inner mast vertically movable relative to said intermediate mast, a load carriage vertically movable relative to said inner mast, a second ram connected with said inner mast, an inner cylinder concentrically arranged within said second ram, a first ram engaging concentrically with the outer side of said second ram, an outer cylinder concentrically engaging with the outer side of said first ram, chain wheels rotatably supported by said outer cylinder, and intermediate mast and said load carriage respectively, a chain of which one end and other end being mounted on said outer mast and said inner mast respectively and guided by said chain wheel at said intermediate mast, and a chain connected at one end with said outer cylinder and at the other end with said inner mast after passing over said chain wheels at said load carriage and at said outer cylinder.

3,715,015
BRAKE FOR ROLLABLE PLATFORM

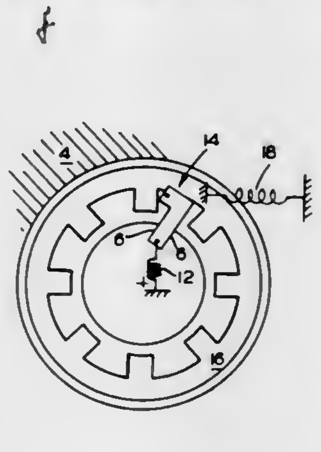
Arthur L. Morris, 1031 Crestview Drive, Mountain View, Calif. 94040
Filed Dec. 22, 1971, Ser. No. 210,702
Int. Cl. B60t *1/14*
U.S. Cl. 188—5 **3 Claims**



A brake for a rollable platform is provided which consists of a simple lever actuated pad adapted to hold the platform on level or irregular surfaces and independent of the wheels.

3,715,016
ROTATIONAL RATE REGULATOR

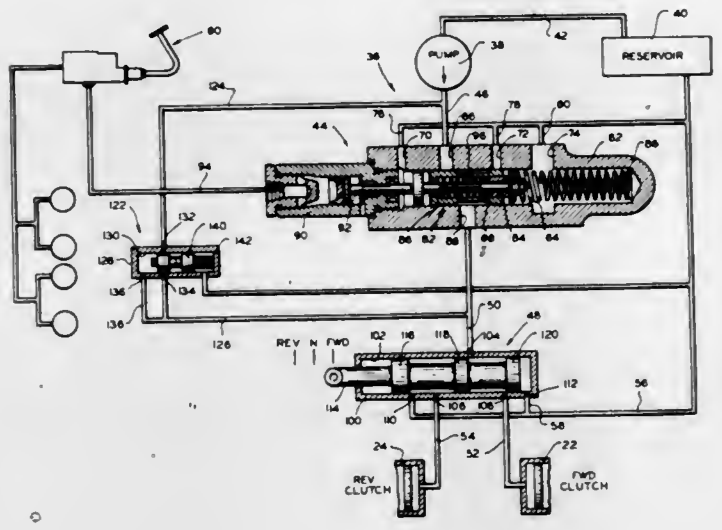
Marcus A. Frieder, Tenafly, N.J., assignor to The Bendix Corporation
Filed Sept. 29, 1970, Ser. No. 76,353
Int. Cl. F16d *59/00*
U.S. Cl. 188—184 **1 Claim**



Means including an element pivotally mounted to a rotating member and effected by the rotational rate of the member above a predetermined limit for pivoting to engage a stationary member whereby a force for restraining rotation is generated.

3,715,017
INCHING VALVE WITH BYPASS VALVE FOR FILLING CLUTCHES

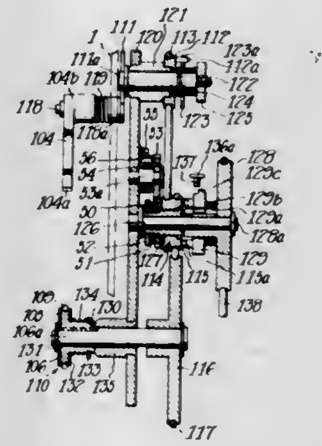
Asa R. Jenney, Battle Creek, Mich., assignor to Clark Equipment Company
Filed Oct. 30, 1970, Ser. No. 85,537
Int. Cl. B60k *29/02*; **F16d** *67/04*
U.S. Cl. 192—4 A **3 Claims**



A system for controlling gradual engagement and disengagement of the forward and reverse clutches of a fluid power shifted transmission. The system includes a pump for supplying pressurized fluid to the clutches via a pressure regulating valve responsive to brake actuation and a clutch selector valve. Connected between the pump and selector valve is a normally open valve which bypasses the regulator valve and is operable to close when the pressure of fluid being supplied to the selector valve rises above a predetermined pressure.

3,715,018
CLUTCH ENGAGING AND DISENGAGING DEVICES

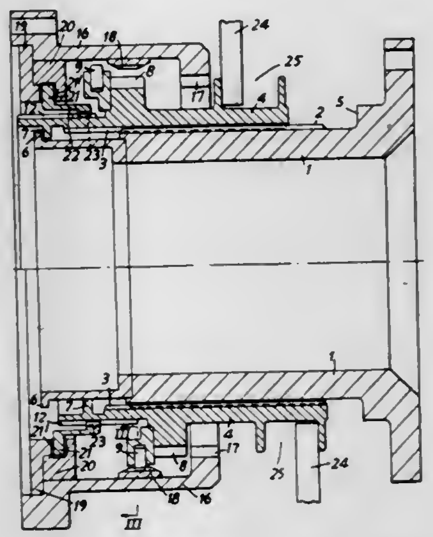
Tatsusuke Kadowaki, Midori-ku, Yokohama-shi, Kanagawa-ken, and Makoto Kurasawa, Sumida-ku, Tokyo, both of Japan, assignors to Kabushiki Kaisha Ricoh, Tokyo, Japan
Filed Dec. 17, 1970, Ser. No. 99,074
Claims priority, application Japan, Dec. 22, 1969, 44/122091
Int. Cl. F16d *11/06*
U.S. Cl. 192—24 **5 Claims**



A clutch includes an axially fixed member and an axially movable member arranged coaxially of each other for interengagement. The rotatable axially movable member has a rib projecting from its circumferential periphery and inclined to the generating line of the periphery. A pin is mounted on the end of a pivoted lever and extends toward the periphery of the axially movable clutch member, and may be moved into engagement therewith to engage a side surface of the rib. When the pin engages the side surface of the rib, the rotatable clutch member is displaced axially to disengage the axially fixed clutch member. The opposite side edge of the rib preferably is bevelled, and spring means may be provided to bias the axially movable clutch member in a direction opposite to the direction of displacement thereof by engagement of the pin with the rib.

3,715,019
SYNCHRONOUS SELF-SHIFTING CLUTCHES

Robert Howard Heybourne, East Molesey, Surrey, and Herbert Arthur Clements, Oatlands Park, Weybridge, Surrey, both of England, assignors to S.S.S. Patents Limited, London, England
Filed May 3, 1971, Ser. No. 120,425
Claims priority, application Great Britain, March 11, 1970, 11,614/70
Int. Cl. F16d *23/08*
U.S. Cl. 192—67 A **10 Claims**

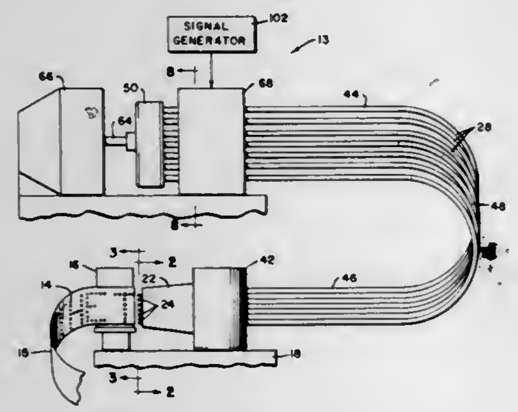


In pawl and ratchet mechanism capable of being set selectively to a pawl free condition or to a ratcheting condition, baulking means are provided which operate in response to relative rotation of the pawls and ratchet teeth to permit or prevent a change from the pawl free condition to the ratcheting condition according to whether the direction of relative rotation is appropriate or inappropriate for the change to be made.

The invention is applicable to toothed clutches wherein pawl and ratchet mechanism is employed for automatically aligning the clutch teeth for interengagement.

3,715,020
WIRE RECORDING AND MECHANISM THEREFOR

Robert W. Nordin, Skokie, Ill., assignor to Teletype Corporation, Skokie, Ill.
Filed Sept. 21, 1970, Ser. No. 73,938
Int. Cl. B41j *5/00*
U.S. Cl. 197—1 R **17 Claims**



A flexible wire with an input end and an output end extends through an arcuately bent tubular guide that has an input end portion, an output end portion and an arcuate connecting section. The output end portion of the guide is relatively secured. Its input end portion is mounted for movement longitudinally of the guide.

A restraint is arranged about the input end portion of the guide and has a first condition in which said input end portion is secured from moving and a second condition in which the output end portion is free from restraint to permit guide movement.

The wire and guide are proportioned such that a force applied to the input end of said wire axially thereof will (1) cause the wire to slide through and thereby project the output end of said wire from the output end portion of the guide, if the restraint is in said first condition; and (2) cause the guide to extend at its arcuate section in a direction away from the output end of said wire in consequence of frictional coupling of the guide and wire, if the restraint is in said second condition.

This switching phenomenon is employed in a recorder having means for applying an oscillating force simultaneously to an input end of each wire in an array of flexible wires which respectively are arranged through arcuately bent flexible tubular guides. The input end portion of each guide is arranged for selective restraint, and release from restraint, in a fixed position such that:

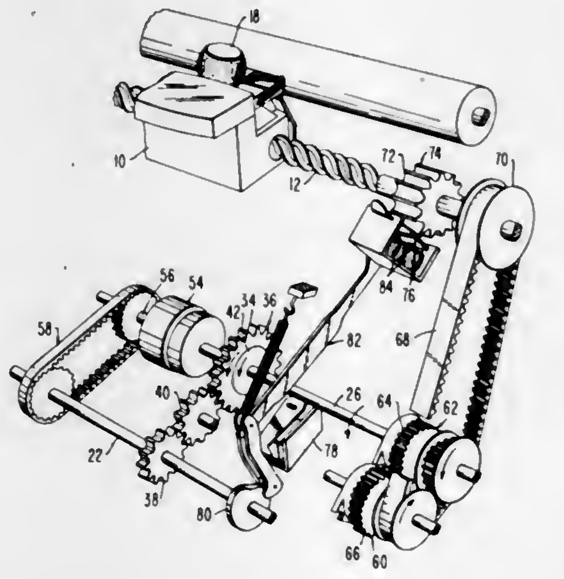
1. when restrained, a rigid path is provided for the associated wire by such guide and, alternately during respective phases of each oscillatory cycle, the output end of the wire will be (a) first projected from the output end portion of the guide into printing position relative a record carrier, and (b) then withdrawn; and

2. when free or released from restraint, alternately during respective phases of each oscillatory cycle, such guide and its associated wire (a) first become frictionally coupled and bend to cause elongation of intermediate portions thereof which are remote from the output end of the wire, thereby to prevent its projection into printing position, and (b) then return to original position.

A character generator produces effects which are representative of the characters to be reproduced. It is coupled to restraining assemblies for the guides, whereby, simultaneously in one phase of each oscillatory cycle, selected wires will be projected for printing and the remaining wires will be prevented from printing.

3,715,021
VARIABLE DRIVE APPARATUS

Georg K. Caspari, Plymouth, Mich., assignor to Burroughs Corporation, Detroit, Mich.
Filed Nov. 27, 1970, Ser. No. 93,339
Int. Cl. B41j *19/00*
U.S. Cl. 197—82 **11 Claims**

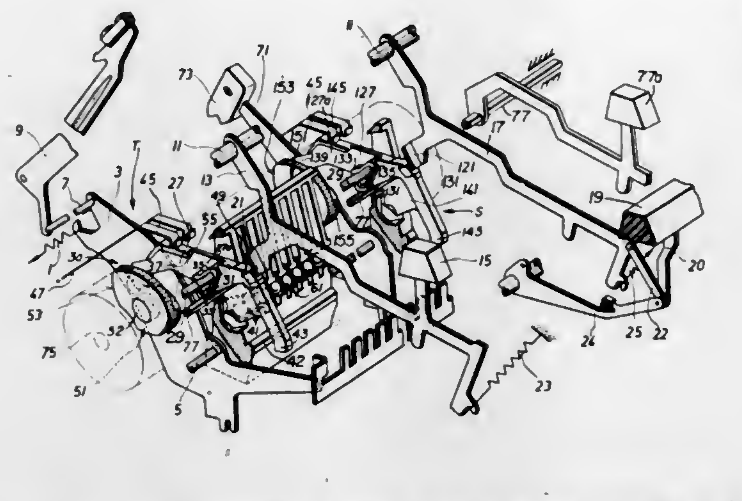


Apparatus for imparting various rotational motions to a driven member in which a constantly rotating driving member transmits a predetermined angular velocity to the driven member by means of a frictional coupling. The angular velocity of the driven member is varied by overcoming the driving torque applied to the driven member by the frictional coupling. Means cooperating with the driving and driven members serve, respectively, to brake and to reverse the rotational motion of the driven member.

3,715,022
APPARATUS FOR POSTPONING AND STORING KEY CONTROLLED FUNCTIONS OF A TYPEWRITER

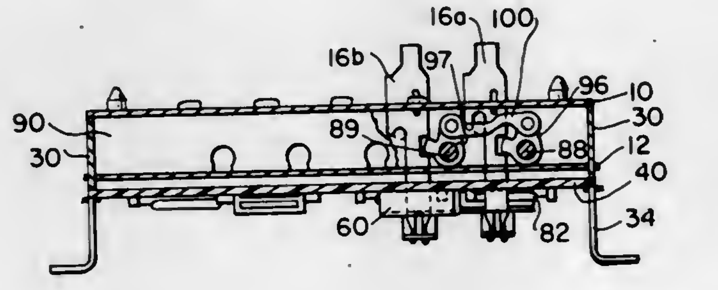
Albert Rix, Wilhelmshaven, Georg Werner, Heidmuehle, and Hans Fuchs, Wilhelmshaven, Germany, assignors to Olympia Werke AG, Wilhelmshaven, Germany
Continuation-in-part of application Ser. No. 40,514, May 26, 1970. This application Nov. 12, 1970, Ser. No. 88,767
Claims priority, application Germany, Nov. 15, 1969, P 19 57 471.1
Int. Cl. B41j *5/08*
U.S. Cl. 197—98 **10 Claims**

The type action mechanisms and the function releasing mechanisms of a typewriter, for example the spacing device with the space bar, or the case shifting device, have control means cooperating with blocking means to permit only one mechanism to operate, while any other mechanism actuated during operation of a first actuated mechanism, is blocked in a storage position until the first operation is completed, whereupon the respective control means is moved by a spring to a position for starting the operation of the second actuated mechanism. If the space bar is actuated before a previously actuated type action returns to its position of rest, the spacing function is stored, and takes place when the operation of the type action is completed.



3,715,023
CAM-AND-LINKAGE ARRANGEMENT FOR SIMULTANEOUS MOVEMENT OF MULTIPLE KEYSTEMS CONNECTED TO A COMMON KEY

Dean B. Jackson, Kettering, Edward S. Stork, Dayton, and Darrell L. Flory, Brookville, Ohio, assignors to The National Cash Register Company, Dayton, Ohio
Filed Aug. 7, 1970, Ser. No. 62,037
Int. Cl. A01b *5/14*
U.S. Cl. 197—98 **1 Claim**

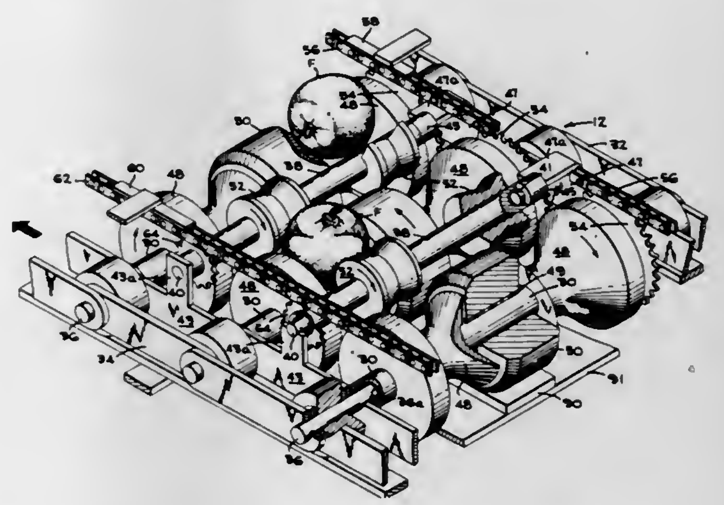


A modularly-constructed matrix-arranged keyboard having a printed circuit board and means associated therewith for opening and closing circuits for the purpose of relaying input information to a separate encoding system. The keyboard includes a plurality of keys with keystems, each stem capable of carrying a shunt member on its lower end for movement in a path between a switch and a magnet as the key is depressed and then released. A cam-and-linkage arrangement is provided for maintaining even distribution of the movement of multiple keystems connected to a common key.

3,715,024
FRUIT ORIENTING APPARATUS

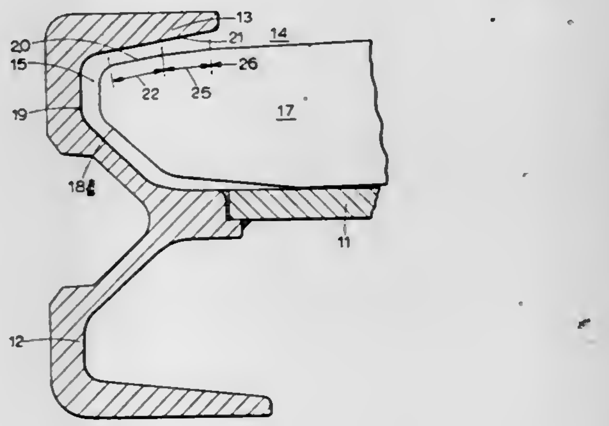
Harold J. Mumma, Riverside, Calif., assignor to FMC Corporation, San Jose, Calif.
Filed Apr. 23, 1971, Ser. No. 136,809
Int. Cl. B65g *47/24*
U.S. Cl. 198—33 AA **8 Claims**

An apparatus for orienting oblate spheroidally shaped fruit so that they roll upright on their major circumference includes pairs of parallel grommeted rollers having annular fruit contacting surfaces which cooperate to form fruit retaining pockets. Each roller of a pair of rollers rotates at a speed different from that of the other roller of the pair with the slowest rotating one of the two rollers contacting the fruit on two spaced circumferential bands and the faster moving one contacting the fruit on a circumferential band intermediate the two contact bands of the slower roller. Frictional contact between the rollers and a fruit retained thereby causes the fruit to shift around in the pocket until there is substantially no relative surface movement between the rollers and the fruit at the points of contact. When this state is attained, the fruit is rolling on its major circumference with the major circumferential area being in contact with the faster moving roller and with the smaller circumferences of the fruit, which are laterally displaced from the major circumference, being in contact with the slower moving roller. In such position, the stem-blossom axis of the fruit is substantially horizontal and perpendicular to the direction of movement of the rollers.



3,715,025
SCRAPER CHAIN CONVEYORS AND SCRAPER ELEMENTS

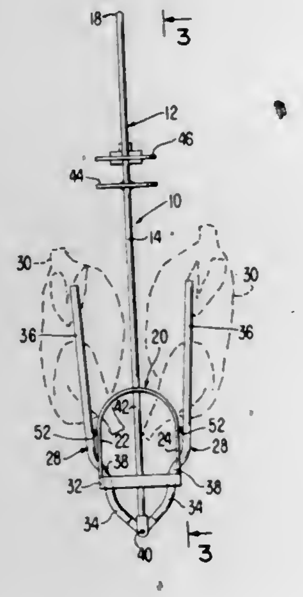
Helmut Temme, Waltrop, Germany, assignor to Gewerkschaft Eisenhutte Westfalia, Westfalia, Germany
Filed Jan. 11, 1971, Ser. No. 105,570
Claims priority, application Germany, June 20, 1970, G 70 23 248.3; Great Britain, Dec. 15, 1970, 59485/70
Int. Cl. B65g *19/00*
U.S. Cl. 198—171 **1 Claim**



A scraper element for a scraper chain conveyor of the type having sigma-shaped side walls connected by a base wall and two chains moved along the center region of the base wall. The element is guided at its ends in guide channels defined by the inner parts of the side walls and including the inner faces of the upper flanges of the side walls. The upper surface of the scraper elements near each of its ends which is disposed facing one of the aforesaid inner faces is composed of a number of, preferably three, adjoining portions inclined at different angles to the base wall with the angle of inclination of said portions increasing outwardly of the element.

3,715,026
POULTRY SHACKLE

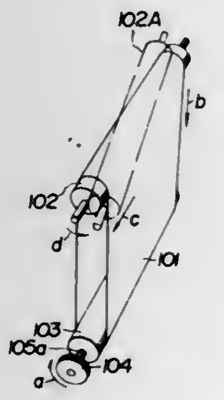
Onald R. Barnes, Oakdale, Calif., assignor to John Mohr & Sons, Milwaukee, Wis.
Filed Sept. 21, 1970, Ser. No. 73,993
Int. Cl. A22c *15/00;* **B65g** *17/20*
U.S. Cl. 198—177 **12 Claims**



A shackle having a rod for extending and supporting an eviscerated bird in a position so that moisture can drip from the bird as the shackle is moved by an overhead conveyor. The shackle has means for pivoting the rod from a generally upright position at which it supports the bird to a downwardly extending position at which the bird can gravitate from the rod. The pivoting means can operate to return the rod to its upright position.

3,715,027
DEVICE FOR CORRECTING THE DEFLECTION OF A LARGE WIDE ENDLESS BELT

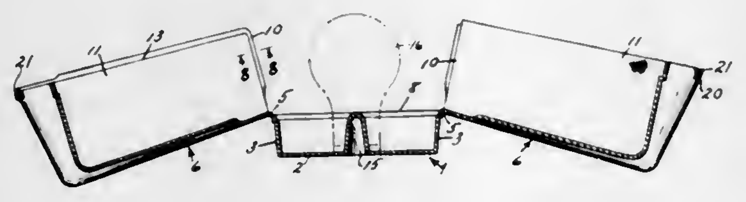
Sakae Fujimoto, Chofu-shi, Tokyo, Japan, assignor to Kabushiki Kaisha Ricoh, Tokyo, Japan
Filed Dec. 8, 1970, Ser. No. 96,078
Claims priority, application Japan, Dec. 17, 1969, 44/102021; March 31, 1970, 45/27213
Int. Cl. B65g *15/62*
U.S. Cl. 198—184 **10 Claims**



An endless belt is trained over at least a pair of rollers, including at least one driven roller, and one of the other rollers is mounted for swinging about a pivot axis perpendicular to its axis of rotation. A pair of belt deflection detecting rollers are rotatably mounted adjacent respective opposite side edges of the belt and are spaced apart a distance slightly greater than the width of the belt so as normally to be out of engagement with the adjacent belt side edge. The detecting rollers are operatably connected to the mounting means for the swingable roller and are operable, responsive to rotation of the detecting roller by engagement with a belt side edge as a result of belt deflection, to swing the swingable roller about the pivot axis thereof in a direction to correct belt deflection.

3,715,028
WIG AND WIGLET CARRYING CASE

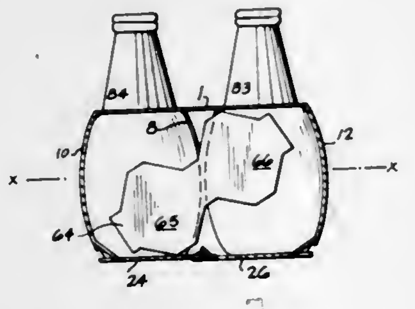
Louis Schumer, 5402 Beverly Road, Brooklyn, N.Y.
Filed July 13, 1971, Ser. No. 162,051
Int. Cl. B65d *85/18*
U.S. Cl. 206—8 **4 Claims**



The disclosure describes a plastic carrying case for wigs and wiglets molded in a single mold in its entirety into a hinged device comprising a base container upon which two integrally hinged open-faced hollow covers fold into each other and interlock with the walls of the base to form a closed carrying case. The closure means and the handle or carrying means are molded integral therewith. Similarly the rigid standard for supporting a removable wig block is also molded integral therewith.

3,715,029
ARTICLE CARRIER

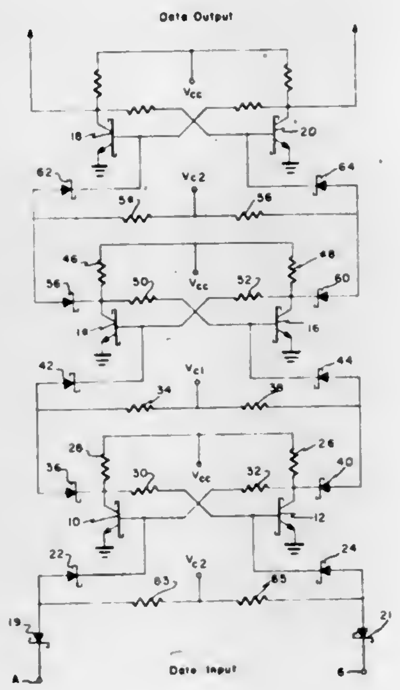
Prentice J. Wood, Jonesboro, Ga., assignor to The Mead Corporation, Dayton, Ohio
Filed April 29, 1971, Ser. No. 138,564
Int. Cl. B65d *77/26, 5/48*
U.S. Cl. 206—65 E **4 Claims**



An article carrier for primary packages having outwardly bowed sides of barrel-like configuration includes spaced top, bottom and side walls interconnected to form a tubular structure adapted for disposition about the primary packages arranged in rows in rectilinear relationship. An insert is provided with a pair of article separating elements interconnected with each other and disposed transversely within the carrier between pairs of adjacent primary packages disposed in different rows. The insert is configured so as to be formable from a minimum of material and is configured so that adequate article separation is afforded between adjacent articles in the same row of articles irrespective of the angular disposition of the insert with respect to a transverse axis of the carrier.

3,715,030
INTEGRATABLE HIGH SPEED REVERSIBLE SHIFT REGISTER

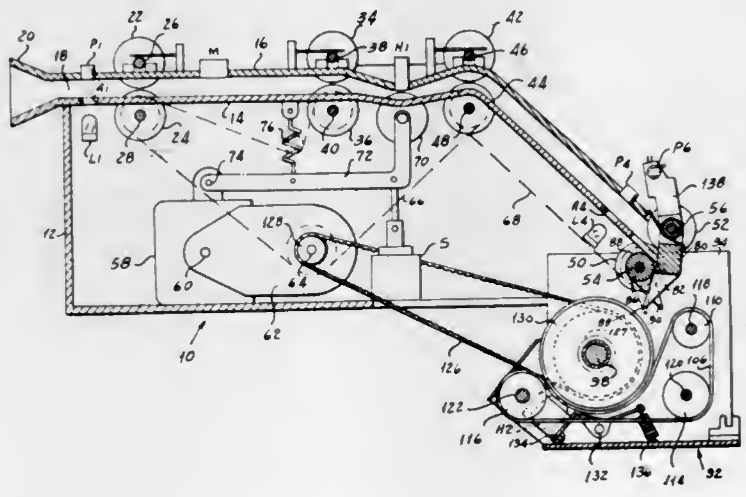
David R. Breuer, Malibu, Calif., assignor to TRW Inc., Redondo Beach, Calif.
Filed Jan. 3, 1972, Ser. No. 214,902
Int. Cl. G11c *19/00;* **H03k** *23/08*
U.S. Cl. 307—221 R **8 Claims**



In a shift register composed of a multiplicity of transistor flip-flops, information is clocked from one flip flop to the next one by interposing a resistor in series with a Schottky diode Schottky each clock input and the output circuit of one transistor pair and the same resistor in series with another Scottky diode between each clock input and the input circuit of the next transistor pair.

3,715,031
POST VALIDATOR FOR BILL ACCEPTOR

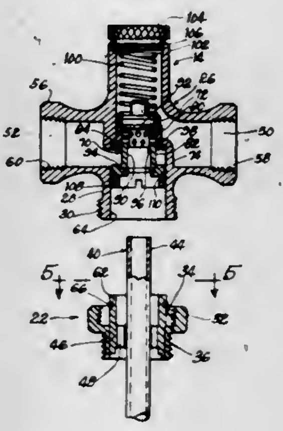
Oliver G. Okkonen, Comstock Park, Mich., assignor to Rowe International, Inc., Whippany, N.J.
Filed April 14, 1971, Ser. No. 133,847
Int. Cl. B07c *3/16*
U.S. Cl. 209—75 **17 Claims**



A post validator arrangement for a bill acceptor of a type known in the prior art utilizing a combination of photoelectric and magnetic checks of an item of currency passing therethrough in which the item is required to pass a secondary magnetic test at a location beyond an improved one-way mechanical gate positioned at the outlet of the bill acceptor.

3,715,032
FLUID TREATMENT DEVICES

Stanley Nicko, 905 Pontiac Avenue, Lafayette, Ind.
Continuation-in-part of Ser. No. 88,874, Nov. 12, 1970, abandoned. This application Nov. 3, 1971, Ser. No. 195,202
Int. Cl. B01d *35/02, 27/10*
U.S. Cl. 210—133 **2 Claims**

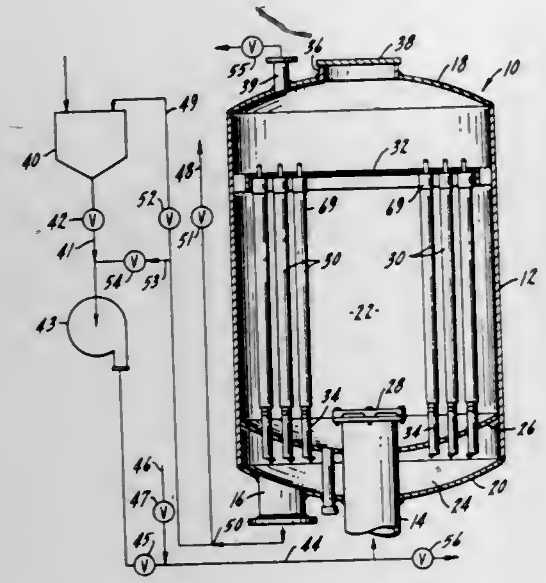


Fluid treatment devices are disclosed utilizing a removable and preferably disposable fluid treatment unit, which may take the form of a filter, strainer, water softener or the like. The fluid treatment unit is removably mounted on a valve body which is arranged to direct the fluid through the treatment unit when it is mounted on the body. Inlet and outlet ports are preferably formed in the valve body and are adapted to be connected to the fluid supply system. The valve body is also preferably provided with discharge and return ports adapted to be connected to the fluid treatment unit. An automatic valve mechanism is provided in the valve body to disconnect the discharge port from the inlet port when the treatment unit is removed from the body. The outlet port is also preferably disconnected from the return port. In this way, no substantial quantity of the fluid will be discharged from the valve body when the treatment unit is removed. The automatic valve mechanism also preferably opens a bypass passage between the inlet and outlet ports when the treatment unit is removed. When a new fluid treatment unit is mounted on the body, the automatic valve mechanism is preferably operated so as to close the bypass passage while opening the normal service passages so that the fluid can flow from the inlet port to the discharge port, through the treatment unit, and then from the return port to the outlet port. Preferably, the valve mechanism is operated by a tube projecting out of the fluid treatment unit and adapted to be inserted into the valve body. The tube may be provided by a coupling component, adapted to receive a disposable canister or the like and arranged to be removably mounted on the valve body.

3,715,033
FILTER CARTRIDGE

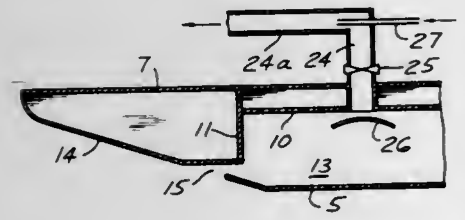
Alfonse J. Soriente, Gillette, N.J., assignor to Ecodyne Corporation
Filed Nov. 9, 1970, Ser. No. 87,698
Int. Cl. B01d *29/08*
U.S. Cl. 210—193 **4 Claims**

A precoat filter cartridge for removing impurities from a liquid, comprising: a rigid tubular core element having holes therein, said holes having a total area in the range of 3 to 9 percent of the total surface area of said core element; a layer of course screen wrapped about said core element; and a layer of fine mesh screen wrapped about said layer of course screen.



3,715,034
DEVICE FOR REMOVING OIL SLICKS

Alexander Ivanoff, 20 Brookside Drive, Greenwich, Conn.
Filed May 6, 1970, Ser. No. 35,154
Int. Cl. C02b *9/02*
U.S. Cl. 210—242 **12 Claims**



Oil floating on a body of water is collected by moving a shallow-draft water craft, such as a barge, having a sternwardly slanted bow section and below the water line an ingress opening in or near the bow section through an oil slick. The slant of the bow section forces oil in its path downwardly thereby causing the oil, possibly intermingled with water, to flow as a flat layer along the bottom of the barge. As the oil reaches the ingress opening it is propelled into a hold of the barge due to the pressure differential between the outside and the inside of the barge. Oil thus accumulating in a hold of the barge may be removed therefrom from time to time and clear water as may also enter the hold is returned to the body of water.

3,715,035
HIGH CAPACITY PORTABLE WATER PURIFIER

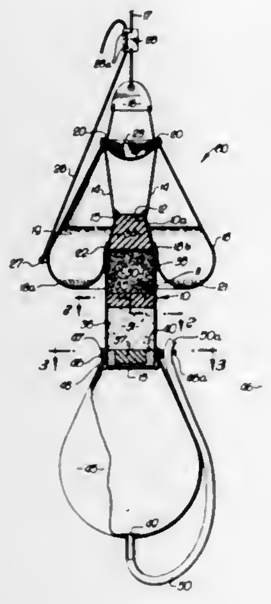
Gifford H. Teeple, Jr., 720 26th St., Manhattan Beach, Calif. 90266, and James W. Welsh, 776 North First East, Logan, Utah 84321
Filed Apr. 12, 1971, Ser. No. 133,252
Int. Cl. B01d *29/08*
U.S. Cl. 210—249 **16 Claims**

A high capacity, portable water purifier comprises:

(a) Lower container means having an upper inlet and a lower outlet, said container means adapted to contain particulate media for treating liquid,

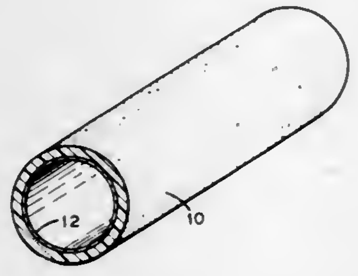
(b) Support structure for said lower container means, and

(c) Upper container means including a flexible bag adapted to receive and hold liquid to be purified, the upper container means suspended by said support means so that said bag extends below the level of said lower container means inlet, and the bag interior communicating with said inlet so that liquid in the bag may be caused to flow to said inlet in response to elevation of the upper container means relative to the lower container means.



3,715,036
TUBULAR OSMOTIC MEMBRANE

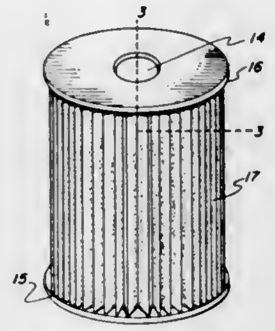
Edward A. G. Hamer, 7 Elm Court, Metuchen, N.J.
Continuation of applications Ser. No. 508,052, Nov. 16, 1965, and Ser. No. 1,982, Jan. 12, 1970, both now abandoned. This application July 15, 1971, Ser. No. 165,791
Int. Cl. B01d *31/00*
U.S. Cl. 210—321 **24 Claims**



A reverse osmosis purification system in which the osmotic membrane is formed from a flat membrane which is curled and lap seamed. An adhesive is employed to seal the lap seam. The adhesive does not permanently bond together the lapped surfaces of the membrane until after the membrane is positioned in contact with the support tube and fluid pressure is applied to force the membrane into firm and conforming contact with the support member.

3,715,037
NOVEL LUBRICATING OIL SYSTEM AND OIL FILTER FOR INTERNAL COMBUSTION ENGINES

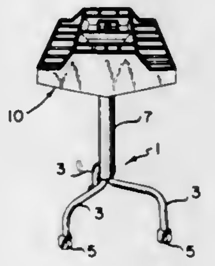
Shih-en Hu, Westfield, and Jerome Geyer, Elizabeth, N.J., assignors to Esso Research and Engineering Company
Filed Dec. 16, 1968, Ser. No. 784,221
Int. Cl. B01d *39/00*
U.S. Cl. 210—501 **7 Claims**



A lubricating oil treatment system for internal combustion engines involves the circulation and recirculation of the oil from the engine through an oil filter and the return of the filtered oil to the engine. The novel system contains a filter cartridge within the filter chamber which cartridge is charged with at least one relatively oil-insoluble solid inorganic or organo-inorganic simple or binary, or complex or ternary, compound containing a chemically bound transition metal selected from the group consisting of metals of Groups I–B, II–B, III–B, IV–B, V–B, VI–B, VII–B and VIII of the Periodic Table of the Elements. The passage of the circulating oil in the system may be, optionally, through a chamber in the system which is ahead of or after the oil filter, which chamber contains the solid particles of such a compound or mixture of compounds retained within the chamber and in place of or in addition to such compounds being placed within the oil filter.

3,715,038
HAIR STYLISTS ACCESSORY TRAY OF THE LIKE

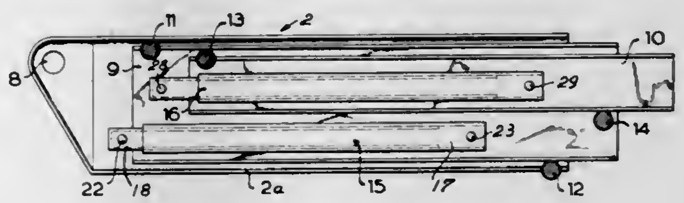
Frederic V. Winkler, 14713 Waterway Drive, Rockville, Md.
Filed Sept. 21, 1971, Ser. No. 182,348
Int. Cl. A47t *3/14;* **B65d** *1/24*
U.S. Cl. 211—128 **6 Claims**



A hair stylists accessory tray is comprised of a base receptacle having a V shaped bottom and upstanding peripherial walls, the receptacle being adjustably supported on a mobile stand. A second receptacle is disposed above the base receptacle and has smaller dimensions length and width wise to provide manual access to the base receptacle at its sides. The upper receptacle has sloping sides merging into a horizontal bottom. Both upper and base receptacles are positioned in such fashion as to hold specific sizes of curling rollers, hair pins, clamps, etc., used in hairdressing in an orderly fashion readily accessable to an operator. Preferably the unit is formed of one piece of plastic or similar material by molding.

3,715,039
TELESCOPIC BOOM

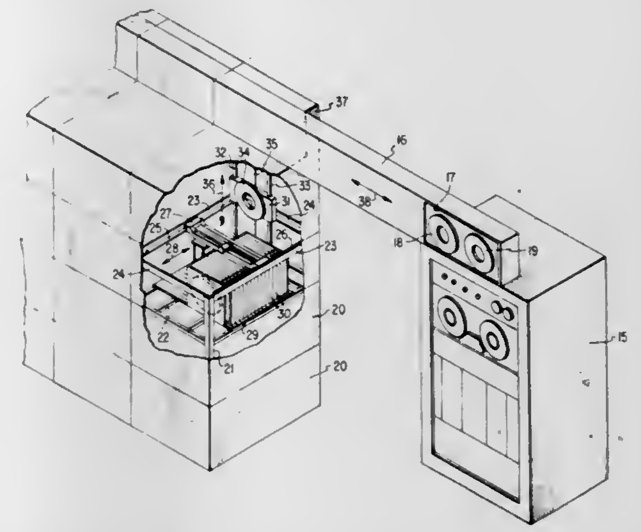
Wolfgang Kollmann, and Dieter Schwappach, both of Dortmund-Wellinghofen, Germany, assignors to Orenstein & Koppel Aktiengesellschaft, Berlin, Germany
Filed Dec. 15, 1970, Ser. No. 98,228
Claims priority, application Germany, Dec. 16, 1969, P 19 62 945.9
Int. Cl. B66c *23/06*
U.S. Cl. 212—55 **4 Claims**



A composite boom having a boom section pivotally connected to a supporting member and also having a boom means telescopically movable into and out of said boom section while hydraulically operable cylinder-piston means arranged in telescopically movable housing elements are operable to actuate said boom means through the intervention of at least one of said housing elements, said hydraulically operable cylinder-piston means including serially arranged cylinder and pistons.

3,715,040
DATA ACCESSING SYSTEM

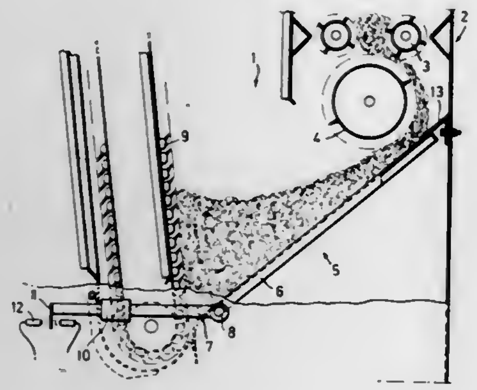
Anthony P. Polus, Ilion, and Russell H. Scheel, Liverpool, both of N.Y., assignors to Advanced Digital Systems Inc., Mohawk, N.Y.
Filed July 14, 1970, Ser. No. 54,827
Int. Cl. B65g *1/06*
U.S. Cl. 214—16.4 R **10 Claims**



A tape reel retrieval system having a plurality of bins or frames which can be stacked in groups depending on the size of the tape library. Each bin includes a plurality of reels, each in its own storage box, each box having an open side and interior gripping fingers. The frame carries a bridge which is movable along the reels until it reaches a selected one which it then extracts from the side-by-side reel arrangement. The reel is removed from the box, the box is returned to its storage location, and the reel is carried to the end of the bin by a gripping and transfer device on the bridge. The reel is then transferred to a conveyor which takes the reel to a point of use adjacent a tape transport.

3,715,041
REGULATOR FOR FEEDING MATERIAL TO A PROCESSING MACHINE

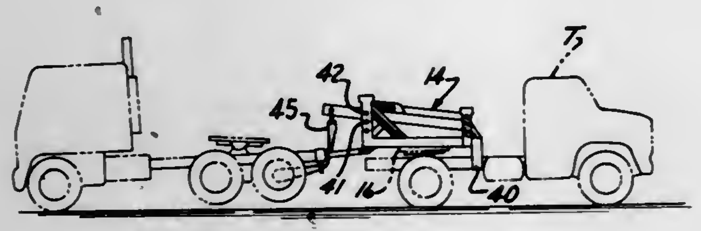
Franz Peters, Dulmen, Germany, assignor to Hergeth KG. Maschinenfabrik und Apparatebau, Dulmen, Germany
Filed July 8, 1970, Ser. No. 53,122
Claims priority, application Germany, July 11, 1969, P 19 35 184.9
Int. Cl. B65g *67/56*
U.S. Cl. 214—17 CA **7 Claims**



A device having a pivotally mounted load sensing means and a motor actuating means responsive to movement of the load sensing means is provided. The device regulates the feeding of material to a processing machine. The motor actuating means is for switching on and off a flow of material to be fed to the processing machine. The load sensing means is responsive to the weight of material flowing into a supply container for subsequent feeding to the processing machine. The load sensing means is adapted to move about its pivotal axis when material in the supply container reaches a predetermined level. A specific embodiment of this regulating device includes a mechanism for feeding spinning material or the like to a processing machine such as a carding machine, carders or the like.

3,715,042
TRUCK RETRIEVER HOIST

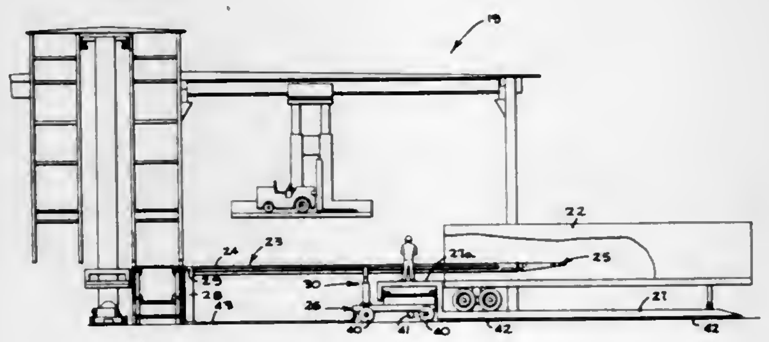
Oscar A. Rellinger, P.O. Box 12, Helena, Ohio
Filed March 23, 1971, Ser. No. 127,227
Int. Cl. B60p *3/12*
U.S. Cl. 214—86 A **4 Claims**



This invention consists of two equally spaced, parallel and horizontally disposed steel beams to which there is attached by welding a ½ inch × 32 inches diameter plate and a standard SAE kingpin, such as all standard semi-trailers are equipped with. This kingpin engages in and is held firmly to any fifth wheel that is equipped with standard fifth wheel locking device. Two equally spaced, parallel and vertically disposed steel beams extend upward from the rear end of the aforesaid horizontally disposed steel beams. The purpose of the just-mentioned beams is to act as both a guide and partial support for the steel boom whose rear end is provided with a chain for the lifting of a disabled truck or the like. The aforesaid steel boom has its front end swingably supported by steel structure extending upward from the front end of the first-mentioned steel beams of this invention. A hydraulic cylinder, located on top of the steel boom, raises and lowers the boom. A second steel boom is swingably secured at one end to the underside of the rear end of this invention. This boom is provided with a laterally disposed steel beam for the stabilizing of one end of the disabled truck once it has been lifted by the first-mentioned steel boom. The previously mentioned hydraulic cylinder receives its power from the hydraulic system of the towing tractor or the like on which this invention is mounted.

3,715,043
LOADING AND UNLOADING CONVEYOR

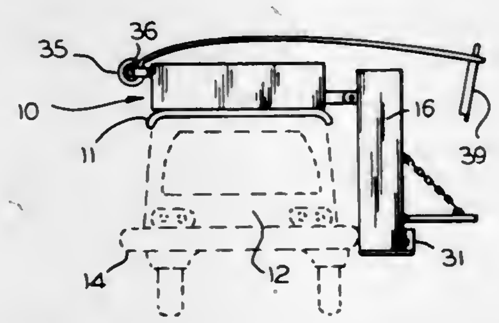
Stanley M. Weir, Santa Clara, Calif., assignor to FMC Corporation, San Jose, Calif.
Division of Ser. No. 20,711, March 18, 1970, Pat. No. 3,613,910. This application May 28, 1971, Ser. No. 147,921
Int. Cl. B65g *67/02*
U.S. Cl. 214—38 B **9 Claims**



A loading-unloading conveyor boom is vertically adjustable with a ramp pivotally attached at one end that can be independently tilted up or down. The ramp has a set of movable wedge-shaped finger members for moving freight from its wedge-shaped finger tips to the conveyor boom or vice-versa. All motions of the loading-unloading conveyor boom are controlled by an operator working in the vicinity of the ramp. The loading-unloading boom is of fixed length, and is pivoted by a motorized cart that also moves an air-bearing supported platform on which a freight carrier or container rests, backward or forward and sideways left or right.

3,715,044
ROOF MOUNTED CARRIED FOR AUTOMOTIVE VEHICLES

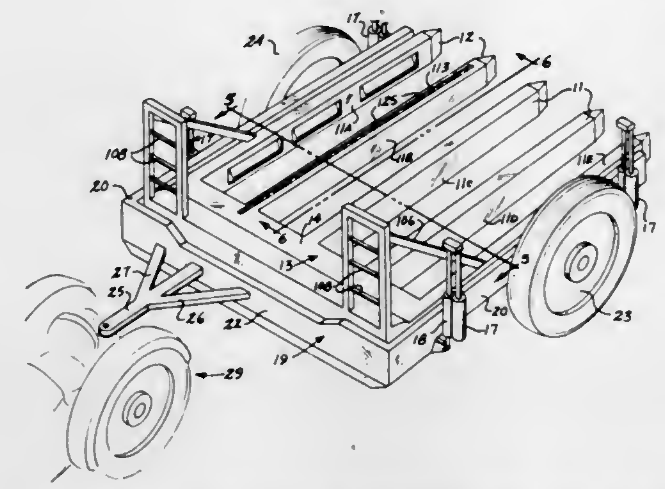
Gary A. Simons. 2980 S. 149th St., New Berlin, Wis.
Filed Oct. 7, 1970, Ser. No. 78,833
Int. Cl. B60r *9/00*
U.S. Cl. 214—450 **5 Claims**



A rooftop carrier for an automotive vehicle includes a tray which slides out in a horizontal position and then swings down into a vertical position over the side of the auto. A front panel on the tray swings down to provide a table or counter for receiving a camp stove or forming a picnic table. Other compartments in the carrier receive suitable camp gear such as sleeping bags, cots and lamps.

3,715,045
APPARATUS FOR HANDLING BALED HAY

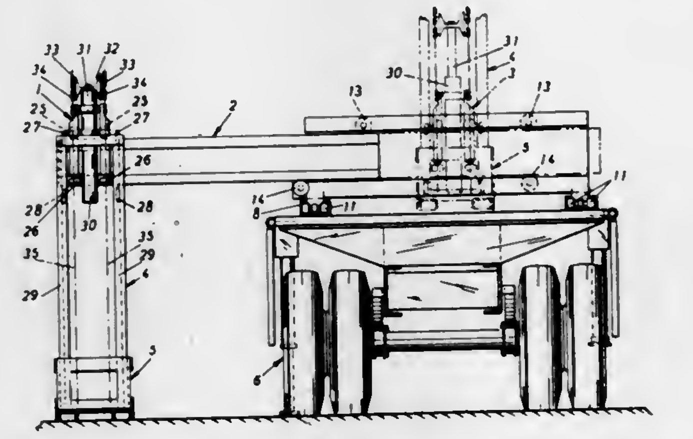
John B. Shawcroft, Route 2, P.O. Box 290, Alamosa, Colo.
Continuation of Ser. No. 10,573, Feb. 11, 1970, abandoned. This application Dec. 20, 1971, Ser. No. 209,936
Int. Cl. B66f *9/18*
U.S. Cl. 214—655 **10 Claims**



A bale handling machine for gathering baled hay or straw from a field, has spaced bars or tines mounted in a lifting frame and adapted to gather bales between them. The tines have projectable bale holders to grip and support a bottom layer of bales in spaced rows. The bottom bale layer serves as a floor or pallet for upper layers of bales. The tines can be projected between spaced rows of bales in the bottom of a stack to lift and remove a whole section from a stack. The machine can be pushed or pulled by a tractor and can be combined with a baler.

3,715,046
CARRIAGE WITH VERTICALLY AND HORIZONTALLY SHIFTABLE MAST AND CARRIER

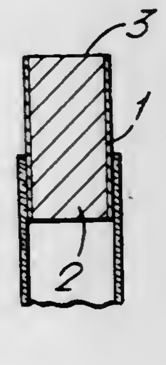
Karl Georg Erland Marklund, Skelleftea, Sweden, assignor to Hiab-Foco Aktiebolag, Hudiksvall, Sweden
Filed March 10, 1971, Ser. No. 122,814
Claims priority, application Sweden, March 11, 1960, 3207/70
Int. Cl. B66f *9/10*
U.S. Cl. 214—674 **5 Claims**



A loading apparatus for handling preferably loads supported on pallets. By means of this apparatus it is possible to lift loads positioned at floor or ground level at either side of for instance a truck, up to the loading platform of said truck and to then deposit said loads in any position on the platform, if desired in a stacked pattern. For this purpose the loading apparatus comprises a carriage movable in the longitudinal direction of the truck platform, a mast movable in the vertical direction relatively said carriage and supporting the lifting tool proper, such as a lifting fork, and a projection arm. The projection arm is arranged for movement in its longitudinal direction perpendicularly to the direction of movement of the carriage and horizontally relatively the carriage frame, and it supports the mast which is arranged for vertical displacement thereon. The mast may be arranged to move in a trolley in the vertical direction and the trolley moves in the horizontal direction of the projection arm. This arrangement provides for loading and unloading in an easy and quick manner and on a minimum of space.

3,715,047
SILICONE STOPPER FOR A STERILE CONTAINER

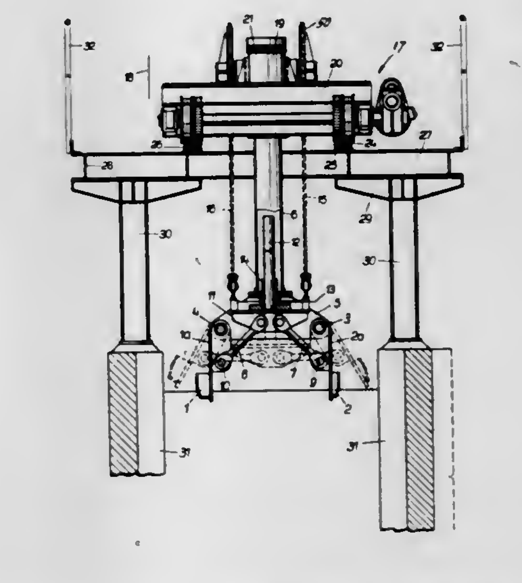
Ryoichi Sado, Oomiya, Japan, assignor to Shinetsu Chemical Company, Tokyo, Japan
Filed July 28, 1970, Ser. No. 58,814
Claims priority, application Japan, Aug. 4, 1969, 45/30557
Int. Cl. B65d *39/00*
U.S. Cl. 215—47 **7 Claims**



An otherwise closed sterile container is closed by inserting into the mouth thereof a removable plug. The plug is of silicone rubber having an open cell cellular structure. Sterility of the container is maintained. Moisture evaporation therefrom is reduced.

3,715,048
COMBINED GRIPPING AND LIFTING MECHANISM FOR HANDLING ANODE PLATES IN AN ANODE PLATE CASTING PLANT

Stefan Raab, Essen, Germany, assignor to Demag A.G., Duisburg, Germany
Filed Nov. 4, 1970, Ser. No. 86,798
Claims priority, application Germany, Nov. 19, 1969, P 19 58 074.6
Int. Cl. B65g *1/04*
U.S. Cl. 214—16 B **9 Claims**



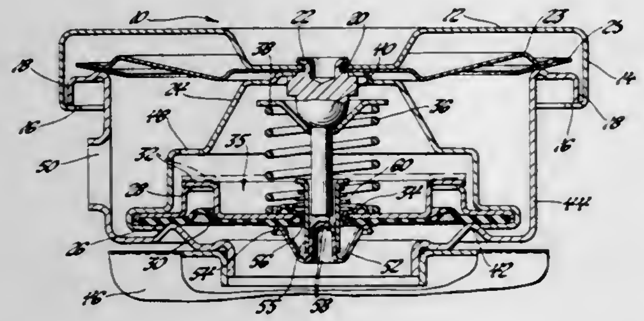
A combined lifting and gripping mechanism for use in an anode plate casting plant includes a vertically movable column which may be driven upwardly and downwardly for effecting the lifting of the anode plates in conjunction with a traverse carrying a pair of pivotally supported engagement members or grippers which have moved inwardly into gripping engagement during the initial stages of lifting, is carried on a lower end of a guide pin which is telescopic within the column. The traverse is moved vertically relative to the column by means of separate lifting elements such as lifting chains and these chains are moved upwardly and downwardly for the purpose of effecting a closing gripping movement of the grippers, or an outward releasing movement thereof for the engagement or disengagement of the associated anode plates.

ERRATUM

For Class 215—47 see:
Patent No. 3,715,047

3,715,049
RADIATOR PRESSURE CAP

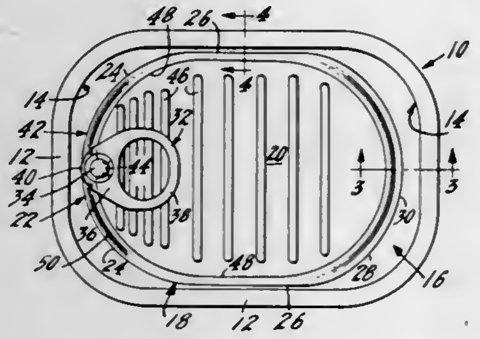
Wesley W. McMullen, Flint, and Tom B. Miller, Grand Blanc, both of Mich., assignors to General Motors Corporation, Detroit, Mich.
Filed Oct. 20, 1971, Ser. No. 190,740
Int. Cl. B65d *51/16*
U.S. Cl. 220—44 R **3 Claims**



This invention relates to a closure cap and more particularly to a radiator closure cap. The cap is to be used on automobile type radiators and provides for the automatic relief or release of pressure and vacuum in the radiator. Pressure and vacuum relief is accomplished at the center of the cap, through a common opening.

3,715,050
FULL PANEL EASY OPEN END

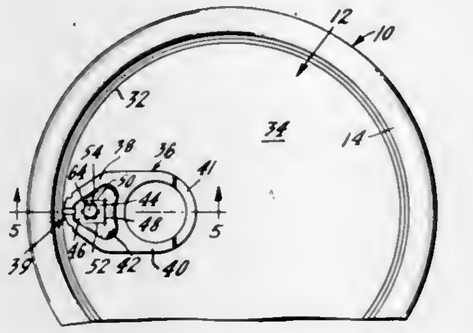
Raymond Luscombe Batchelar, Westwood, and Carl William Heinle, Short Hills, both of N.J., assignors to American Can Company, Greenwich, Conn.
Filed Feb. 25, 1971, Ser. No. 118,807
Int. Cl. B65d *17/20*
U.S. Cl. 220—54 **6 Claims**



In a full open end closure for a container having a peripheral score defining a removable section in the panel of the end closure, a novel combination of structural features is provided to stiffen the portion of the panel encompassing the peripheral score. The peripheral score is comprised by a pop section at the forward end of the removable section which merges into adjoining start tear sections of the peripheral score, a detach section at the rearward end of the removable section which merges into adjoining minimum tear sections of the peripheral score, and full diameter tear sections at the sides of the removable section which merge into adjoining start tear and minimum tear sections. The end panel also has a hinge score adjacent to the pop section of the peripheral score and a securement for attaching an opening tab to the removable section of the panel, the attachment being positioned between the peripheral score and the hinge score. The novel structural features in the panel are comprised by an inner score in the removable section which runs substantially parallel to the peripheral score, has a depth shallower than that of the peripheral score, and adjoins and merges at its ends into the ends of the hinge score, and stiffening means in the removable section in the form of a ridgelike feature projecting outwardly from the removable section between the peripheral and inner scores both at the forward and rearward ends of the removable section. The novel combination of the inner score with the stiffening means provide a line along the inner score about which the central portion of the removable section is allowed to flex when subjected to forces directed against the removable section to thereby reduce the susceptibility of the peripheral score to abuse and premature fracture which would occur if the removable section should flex on a line along the peripheral score.

3,715,051
EASY OPENING CONTAINER

Edward Herman Hanke, Barrington, Ill., assignor to American Can Company, Greenwich, Conn.
Filed Nov. 30, 1971, Ser. No. 203,327
Int. Cl. B65d *17/20*
U.S. Cl. 220—54 **2 Claims**



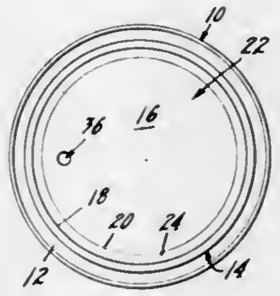
An improved pull tab for a container end closure. The improvement comprises providing in the front panel of the front non-handle portion of the tab a slit perpendicular to the longitudinal axis of the tab, and two score lines adjoining and perpendicular to the slit and parallel to each other and to the longitudinal axis of the tab. The slit and score lines together partially define a hinged section of the front panel of the tab through which a rivet affixes the tab to the central wall of the container end closure. The slit and score configuration protects the tab from being accidentally lifted and pivoted and from accidentally rupturing the score in the central wall.

3,715,052
FULL PANEL SELF-OPENING END CLOSURE

Christian Frederick Kinkel, Arlington Hgts., Ill., and Thomas Lawrence Phalin, Cary, Ill., assignors to American Can Company, Greenwich, Conn.
Filed Nov. 8, 1971, Ser. No. 196,670
Int. Cl. B65d *17/24*
U.S. Cl. 220—54 **6 Claims**

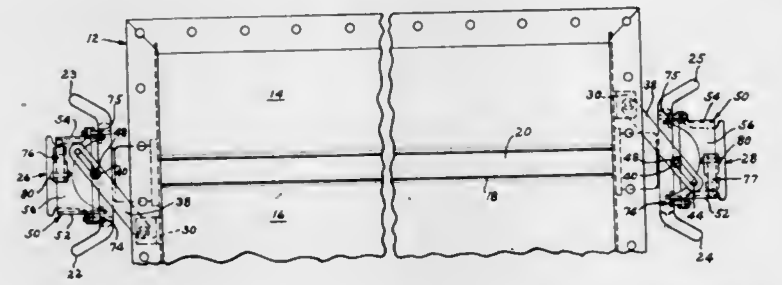
A self-opening end closure made of a steel basis sheet metal has both a rupturable score and a shallower non-rupturable

score formed in the interior surface of a generally flat central end panel of the end closure. The rupturable score is formed near the periphery of the central panel to define a large removable portion within the central panel, and the non-rupturable score is disposed closely adjacent to but radially inwardly of the rupturable score. This combination of scores and their placement in the interior surface of the central end panel make possible the commercial manufacture, within realistic manufacturing tolerance, of a self-opening steel end closure having acceptable score integrity and openability characteristics.



3,715,053
CAP LOCKING DEVICE FOR PNEUMATIC HOPPER OUTLETS

John H. Carter, Webster Groves, Mo., assignor to ACF Industries Incorporated, New York, N.Y.
Filed Sept. 10, 1971, Ser. No. 179,448
Int. Cl. B65d *45/00*
U.S. Cl. 220—55 R **6 Claims**

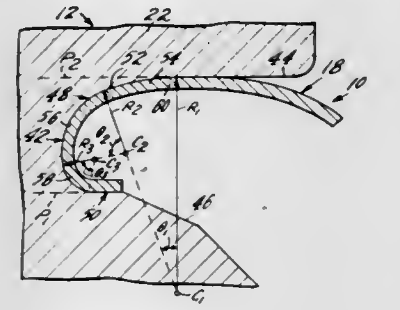


Mechanism for locking an end cap on each end of the rotary lading discharge tube of a pneumatic hopper outlet of a railway car includes a bail pivoted to the end cap on a transverse axis, and having arms extending inwardly from the pivots and provided with catches for engaging lugs fixed to the rotary tube. The outermost portion of the pivoted bail has a transversely extending lever mounted thereon provided with camming lugs adapted to bear against the top of the end cap. When the camming lever is turned down, the bail is held tightly against the end cap with the catches at the other end thereof forcefully pressed against the lugs on the rotary tube. Thus the end cap is securely latched to the rotary tube. Simply raising the camming lever permits the bail to be unlatched to ready the end cap for removal.

3,715,054
CAN END CLOSURE CURL

Erik Gedde, Park Ridge, Ill., assignor to American Can Company, Greenwich, Conn.
Filed June 11, 1971, Ser. No. 152,066
Int. Cl. B65d *7/42*
U.S. Cl. 220—67 **6 Claims**

A continuous curl formed on the periphery of a can end component prior to the first and second operations of double seaming the can end component to an end of a can body has an inner annular portion of a configuration substantially that of a surface of revolution generated by three successive merging arcs including an inner arc struck by a first radius R_1, a middle arc struck by a second radius R_2, and an outer arc struck by a third radius R_3, where $R_1 > R_2 > R_3$, and an outer annular portion of a configuration substantially that of a generally planar surface which is parallel to a plane formed by the innermost marginal edge of the inner arc of the inner annular portion of the continuous curl. A curler tool for forming the continuous curl has a curl-forming groove which has a contour substantially the same as the configuration of the inner and outer annular portions of the continuous curl formed by the curler tool.

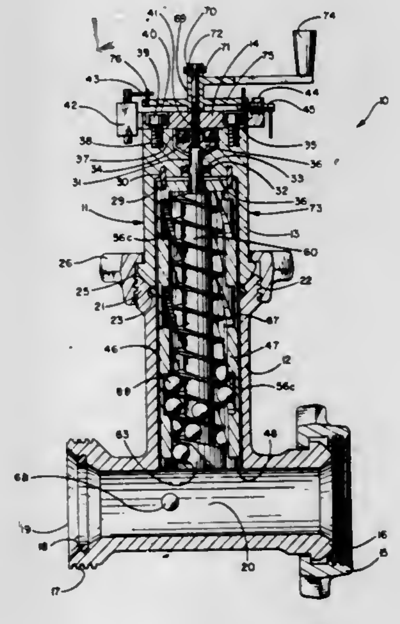


ERRATUM

For Class 220—39 see:
Patent No. 3,715,075

3,715,055
APPARATUS FOR INJECTING ONE OR MORE ARTICLES INDIVIDUALLY INTO A TUBULAR FLOW PATH

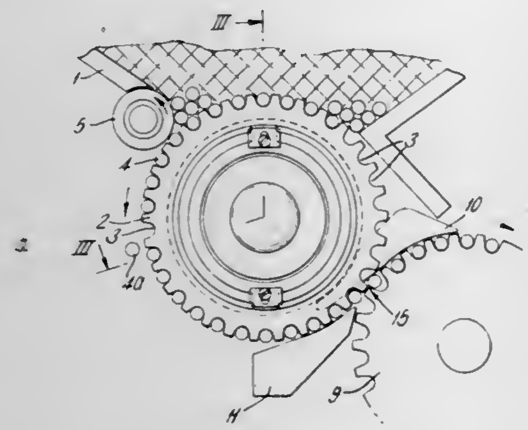
William D. Kendrick, Bruce J. Frazier, Norman L. Freeman, and Lyndel G. Ferguson, Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.
Filed June 16, 1971, Ser. No. 153,537
Int. Cl. B65g *29/00*
U.S. Cl. 221—75 **10 Claims**



This invention relates to an apparatus for dispensing objects and more particularly to an apparatus with a grooved sleeve and a shaft having a helical rib thereon rotatably mounted in the sleeve, the objects being dispensed by the rib pushing them along the groove and out of the apparatus as the shaft is rotated.

3,715,056
HANDLING APPARATUS FOR ROD-LIKE ARTICLES

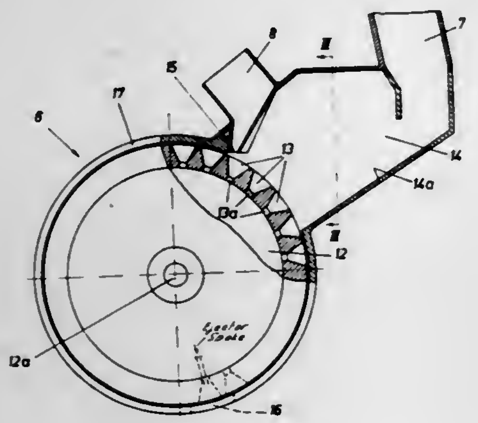
Edward George Preston, London, England, assignor to Molins Machine Company Limited, London, England
Filed Dec. 30, 1970, Ser. No. 102,753
Claims priority, application Great Britain, Dec. 31, 1969, 63451/69
Int. Cl. G01m *3/34*
U.S. Cl. 221—211 **3 Claims**



A fluted drum forms the base of a hopper for multiple length rods of filter plug material and has suction applied to the flutes to assist in loading the flutes with the rods. The suction is maintained over part of the length of each flute outside the hopper so that only full length rods are retained.

3,715,057
APPARATUS FOR SEPARATING AND/OR COUNTING INDIVIDUAL ELEMENTS OF A PLURALITY

Reinhard Becker, Gieselwerder, Germany, assignor to Karl Becker KG Maschinenfabrik, Gieselwerder, Germany
Filed Dec. 9, 1971, Ser. No. 206,282
Claims priority, application Germany, Dec. 29, 1970, P 20 64 336.1
Int. Cl. A01c *7/04*
U.S. Cl. 221—211 **9 Claims**



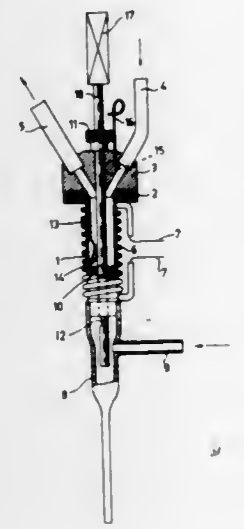
Apparatus for separating and/or counting individual ones of a plurality of substantially similarly shaped particles, elements, grains, or the like, such as grains of seed, pills, etc., and including a hollow rotating drum, constructed to have plural, inwardly tapering indentations, terminating in a bore open to the interior of the drum and having at the bottom of the indentation dimensions smaller than the particles so that the particles cannot traverse the bore, the indentations being wider than the particles at the surface of the drum, the indentation dimensioned to hold at least one particle each. A nozzle directs an air jet towards the drum at direction and position so that the air strikes along the leading wall portion of the closest indentation as the drum rotates. Particles are fed towards the drum, so that at least one particle is in each indentation as it passes the jet.

ERRATUM

For Class 222—241 see:
Patent No. 3,715,119

3,715,058
DOSING APPARATUS

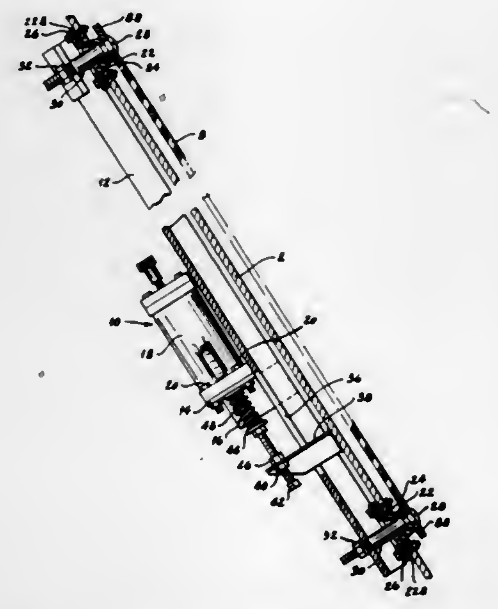
Augustien Maria Clymans, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Filed March 3, 1971, Ser. No. 120,664
Claims priority, application Netherlands, April 4, 1970, 7004874
Int. Cl. B67d *1/08*
U.S. Cl. 222—148 **9 Claims**



A dosing device having a pin which is movable through a liquid chamber and comprises a recess which passes into the liquid and is filled after the forward stroke of the pin. The recess is emptied outside the chamber after a return stroke. Capable of cooperating with this pin is a spring-loaded member which is in the form of the recess and is capable of displacing a quantity of gas which may be in said recess after which the recess is filled with liquid.

3,715,059
AGITATOR ASSEMBLY FOR PARTICULATE MATERIAL HOPPER

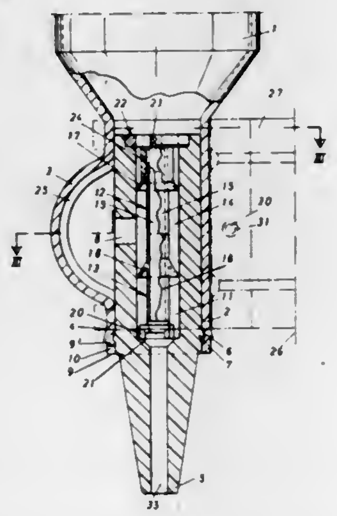
Frank S. Hyer, Duxbury, Mass., assignor to Cutler-Hammer, Inc., Milwaukee, Wis.
Filed Mar. 12, 1971, Ser. No. 123,616
Int. Cl. B65g *3/14*
U.S. Cl. 222—199 **13 Claims**



A gravity feed hopper has an agitator assembly comprising an internal screen and external vibrator rigidly joined in spaced apart relation by bolts passing through openings in the hopper wall. The bases of resilient conical bushings are secured to the wall adjacent the openings to surround and connect with the respective bolts and resiliently support the agitator assembly on the hopper. Resilient upward bias is provided the agitator assembly by a compression spring coacting between the vibrator and an adjustable platform on the exterior of the hopper to compensate for the weight of the agitator assembly and the load imposed upon the screen by the material in the hopper.

3,715,060
DISPENSING APPARATUS

Gustav Eric Valdemar Benson, Malmo, Sweden, assignor to Perpedos AB, Malmo, Sweden
Filed July 30, 1970, Ser. No. 59,526
Claims priority, application Sweden, July 28, 1969, 10565/69
Int. Cl. B65d *37/00*
U.S. Cl. 222—207 **4 Claims**

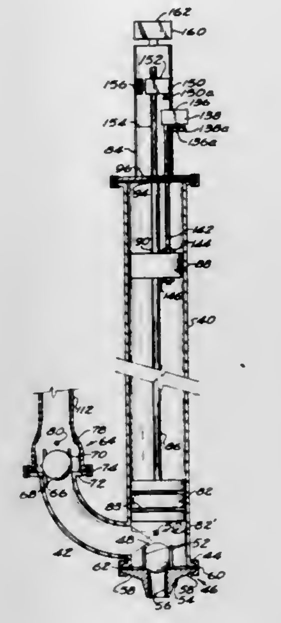


A dispensing apparatus comprising a container and a pump housing carrying a pressure bulb which, when compressed, effects the discharge of a metered quantity of the product to be dispensed through the positive pressure arising in the pressure bulb at this compression and whereby two valves, arranged in the pump housing are displaced. The pump housing is arranged in a narrow portion or neck of the container which neck has a swelling forming the pressure bulb. The container with its neck and pressure bulb are formed in one piece from non-rigid plastic or rubber materials.

3,715,061
DISPENSING PUMP ASSEMBLY FOR BAKERY MATERIALS

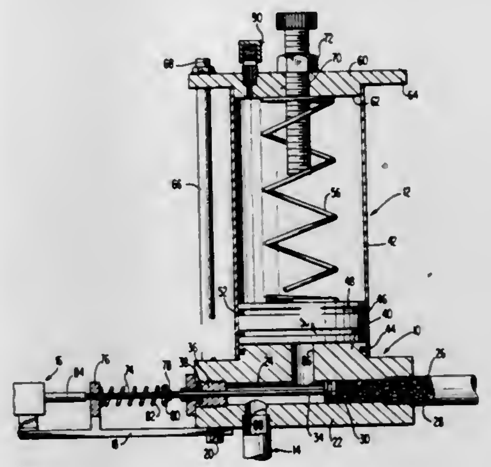
Richard L. Morine, Mentor, and James J. Hokes, Lakewood, both of Ohio, assignors to Fedco, Inc., Mentor, Ohio
Filed April 29, 1971, Ser. No. 138,475
Int. Cl. G01f *11/06*
U.S. Cl. 222—334 **4 Claims**

The specification and drawings disclose a dispensing pump assembly which includes a first, vertically extending tubular cylinder for a piston mounted therein and adapted to reciprocate vertically. At the lower end of the cylinder, there is an inlet provided with a check valve which permits flow in only one direction into the cylinder. Immediately above the check valve is a discharge outlet having an outlet check valve. Preferably, the inlet and outlet check valves are relatively large diameter balls. Extending upwardly from the discharge check valve is a discharge pipe or tube which connects to a horizontally extending dispensing control assembly. The dispensing control assembly includes a pipe having an outlet and a reciprocal slide valve which controls flow through the outlet. Both the piston and the slide valve are controlled by separate double acting air cylinders. Additionally, control means are provided for controlling the operation of the air cylinders so that the valve is opened only when the piston is moving toward the inlet valve.



3,715,062
METHOD AND APPARATUS FOR DISPENSING MATERIAL

Donald L. Todd, 560 10th St. NW., and Cecil W. Scoggins, 1189 Holley St. NW., both of Atlanta, Ga. 30318
Continuation of abandoned application Ser. No. 799,157, Feb. 14, 1969. This application Aug. 16, 1971, Ser. No. 172,284
Int. Cl. G01f *11/36*
U.S. Cl. 222—340 **5 Claims**



A method and aparatus for dispensing a slurry of material. The method includes the steps of accumulating a predetermined quantity of the slurry from a pressure source subsequently discharging the accumulated quantity of the slurry. The apparatus comprises a valve and accumulator assembly for receiving material such as a crushed ice slurry under pressure. In one position of the valve, the accumulator accepts a predetermined quantity of the material and when the valve is returned to its normal position, the accumulator expels the predetermined quantity of material through a dispensing nozzle.

3,715,063
CAP STRUCTURE HOLDING AN INNER CLOSURE

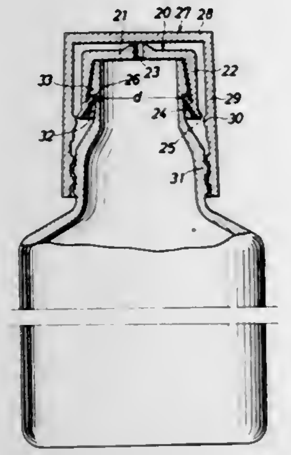
Rinnosuke Susuki, Tokyo; Hiroshi Hoshi, Narashino, Chiba-ken; Shinichi Araki, Funabashi, and Shinzo Miyamoto, Soka, all of Japan, assignors to Raion Yushi Kabushiki Kaisha, Tokyo, Japan

Filed March 11, 1971, Ser. No. 123,199

Claims priority, application Japan, March 18, 1970, 45/26067; March 19, 1970, 45/26654

Int. Cl. B67d *3/00*

U.S. Cl. 222—545 **5 Claims**



A cap structure holding an inner closure within an outer cap as one body, which is conveniently fixed to a container neck by means of a capping machine and leaves the inner closure on a container neck when the outer cap is removed from a container neck after the cap has been fixed on a container neck.

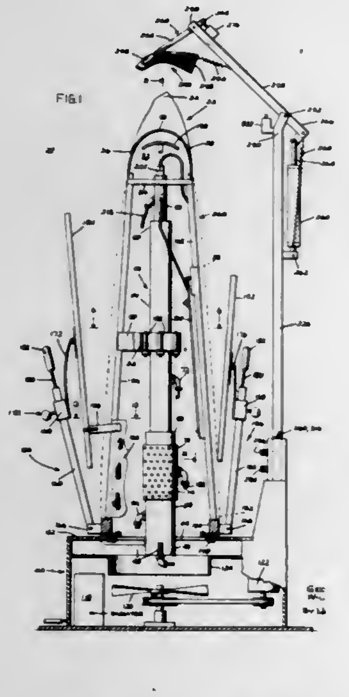
3,715,064
GARMENT FINISHING APPARATUS

William L. North, Morristown, and George S. Eubank, Newport, Tenn., assignors to Forenta, Limited, Kincardine, Ontario, Canada

Filed Feb. 10, 1971, Ser. No. 114,253

Int. Cl. D06c *5/00*

U.S. Cl. 223—57 **32 Claims**



A steam-air coat and dress finisher comprising an upstanding post having lower and upper ends, the lower end being supported on a base enclosure generally centrally of an opening in the top wall thereof. A buck is mounted on the upper end of the post and an inflatable bag is suspended therefrom surrounding the post and having an open lower end communicating with the opening in the top wall of the enclosure. The post has a cavity therein extending substantially between its ends and a chamber surrounds the post intermediate its ends in heat-transfer relationship therewith, the chamber including an exterior wall having passages therethrough communicating with the interior of the bag. A steam line is coupled to the post cavity and a conduit has one end communicating with the post cavity and its other end communicating with the chamber, the conduit having a valve therein for selectively admitting steam from the post cavity to the chamber for outward flow through the passages therein into the bag thereby to heat and moisten a garment which is suspended from the buck and which surrounds a portion of the bag. A blower in the enclosure forces air through the top wall opening and into the bag to inflate the bag and dry the garment thereon. In one embodiment, a generally U-shaped, relatively narrow band formed of relatively thin, flexible mesh material is provided selectively movable between an inactive position spaced from the buck and an active position with the band embracing the collar of the garment and its ends engaging the lapels thereby to restrain and finish the collar and lapels.

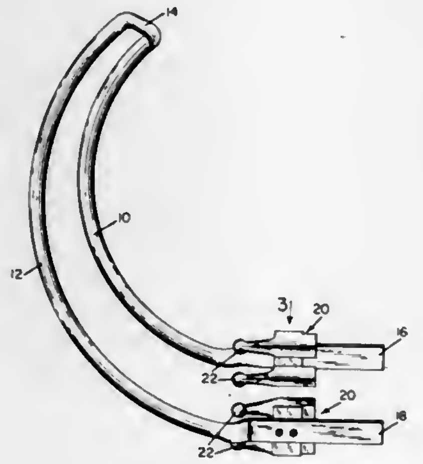
3,715,065
DEVICE FOR PUTTING ON STOCKINGS AND SOCKS

Edmond C. Peck, 50 Heard St., Worcester, Mass.

Filed Nov. 11, 1971, Ser. No. 197,712

Int. Cl. A47j *51/06*

U.S. Cl. 223—111 **3 Claims**



A tubular member in the form of an arc having two spaced longitudinal and curved members with an open end and a closed end, and at each free end at the open end there being a pair of components representing the first two fingers of the hands over which the stocking is applied prior to use.

3,715,066
HANDY TIRE RACK

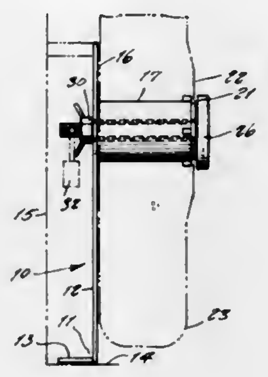
Charles L. Owen, Route No. 4, P.O. Box 1025, Conroe, Tex.

Filed April 8, 1971, Ser. No. 132,354

Int. Cl. B62d *43/00*

U.S. Cl. 224—42.24 **3 Claims**

A device for supporting a tire and wheel upon a truck, the device composing a vertical bracket forming a stanchion, at the lower end of the bracket being fixedly mounted within a bed of a truck, the bracket having a sidewardly extending cylinder welded thereto with lugs welded there around and against which a wheel may be positioned while a removable bolt is inserted through the cylinder with the bolt head positioned against the outer side of the wheel, the end of the bolt then receiving a securing nut.



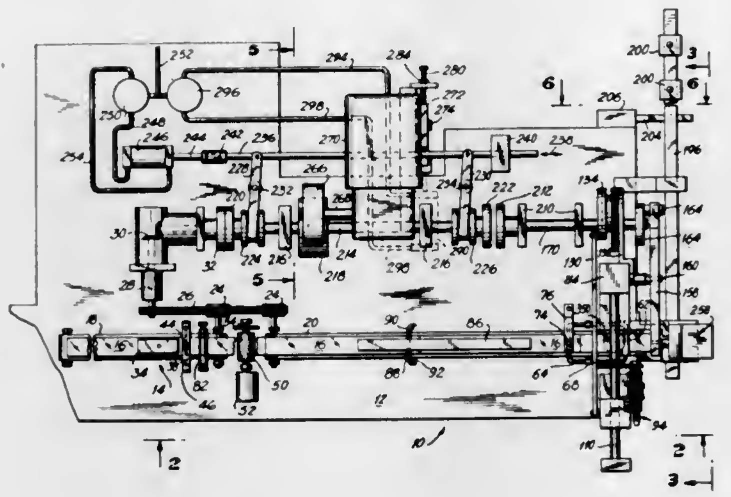
3,715,067
APPARATUS FOR MANUFACTURING SLIDE COVERS

Peter Hunsinger, Brooklyn, N.Y., and James C. White, Rutherford, N.J., assignors to Propper Manufacturing Company, Inc.

Filed Feb. 16, 1971, Ser. No. 115,211

Int. Cl. B26f *3/00*

U.S. Cl. 225—96.5 **4 Claims**



Slide covers and method and apparatus for manufacturing the same. The slide cover is made of a transparent material such as glass and has a smooth, polished surface. An elongated blank the length of which is several times that of the slide covers is fed by a suitable feeding structure through and beyond a cutting location until a leading end of the blank is situated at a distance beyond the cutting location equal to the required length of the slide cover. A control assembly then automatically terminates the feeding of the blank and a cutting structure cuts across the blank at the cutting location so that a slide cover of predetermined length is separated from the blanks, whereupon this cycle of operations is automatically repeated. The elongated blanks from which the slide cutters are derived are fed automatically one after the other through and beyond the cutting location where the above operations take place. As the slide covers are cut from the blanks they are collected at a collecting station where a predetermined number of the slide covers are collected. Upon reaching this predetermined number the operations are automatically terminated until the collected predetermined number of covers are removed from the collecting location, whereupon the above cycle of operations then automatically starts again.

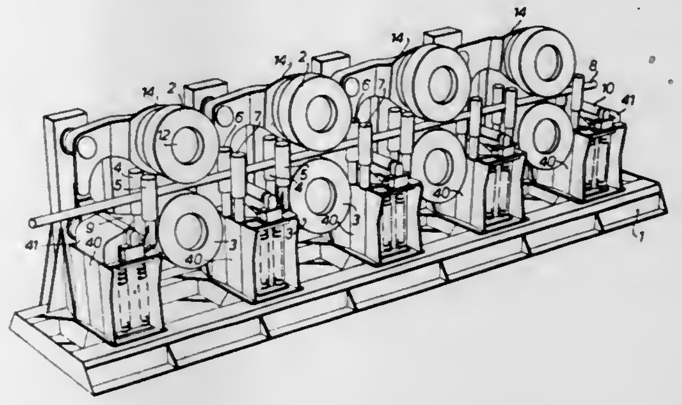
3,715,068
APPARATUS FOR THE LAYING OR RECOVERY OF CABLES

Eric Fifield Stuart Clarke, Harrow; James Edwin Henry Cosier, Northolt; Jan Kolanowski, London; Peter Seaton Halls, St. Albans, and Alexander Duncan Lindley Laidlaw, Harrow, all of England, assignors to The Post Office, London, England

Filed Aug. 28, 1970, Ser. No. 67,941

Int. Cl. B65h *12/22*

U.S. Cl. 226—108 **13 Claims**



A cable engine for the laying or recovery of submarine cables includes hydraulically powered traction wheels fitted with pneumatic tires to apply traction to a cable. The traction wheels are arranged in pairs, each pair contacting the cable at opposite ends of a diameter, and are resiliently mounted to enable a repeater to pass through the engine without damage. Resiliently mounted guide rollers may be employed in addition to the traction wheels. A shipboard mounting for the engine is shown and includes a load cell arrangement to enable cable tension to be monitored. A hydraulic control system for use in both laying and recovering operations is described.

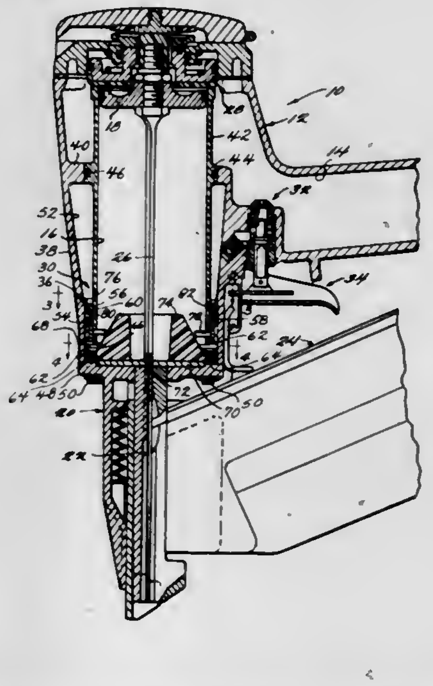
3,715,069
PNEUMATICALLY ACTUATED FASTENER DRIVING DEVICE WITH IMPROVED SLEEVE VALVE FOR CONTROLLING THE PRESSURE BENEATH THE DRIVE PISTON

Robert F. O'Connor, Greenville, R.I., assignor to Textron Inc., Providence, R.I.

Filed July 8, 1971, Ser. No. 160,794

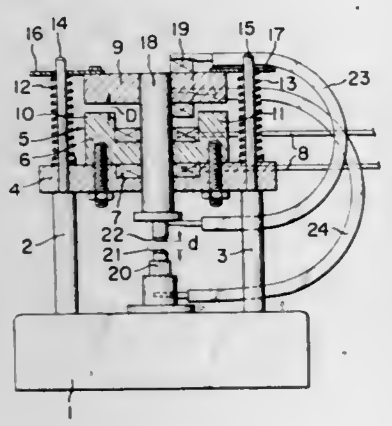
Int. Cl. B25c *1/04*

U.S. Cl. 227—130 **6 Claims**



A pneumatically actuated fastener driving device having a conventional plenum chamber air return system and a sleeve valve mechanism normally biased into an inoperative position permitting unrestricted exhaust flow of air outwardly of the lower end of the drive cylinder through enlarged exhaust ports during the drive stroke of the drive piston and fastener driving element, the sleeve valve mechanism being operable in response to the charging of the plenum chamber with return air at a predetermined pressure to move into an operative position closing off the unrestricted flow through the exhaust ports and communicating the return air with the drive cylinder to effect the return stroke of the drive piston and fastener driving element, the valve mechanism being operable in response to a predetermined decrease in the pressure of the air in the plenum chamber due to expansion into the drive cylinder during the return stroke and to controlled dissipation to atmosphere through a separate path to move back into its normally biased inoperative position at or near the end of the return stroke so as to be properly conditioned for the next drive stroke.

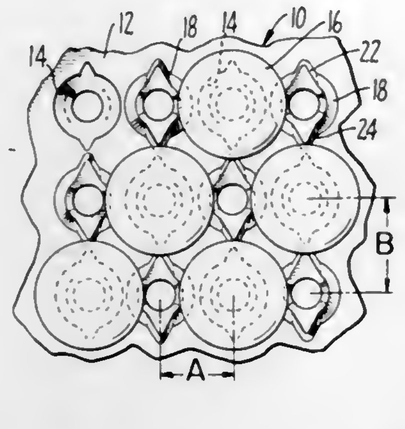
3,715,070
COLD WELDING MACHINE
Akira Shibata, Yokohama, Japan, assignor to Chugai Denkikogyo Kabushiki Kaisha, Tokyo, Japan
Filed Dec. 1, 1970, Ser. No. 94,026
Claims priority, application Japan, Dec. 12, 1969, 44/99972
Int. Cl. B23k *19/00*
U.S. Cl. 228—44 **4 Claims**



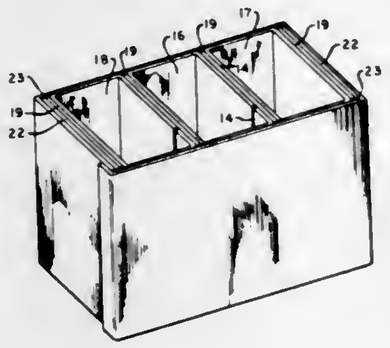
A cold welding machine which includes a special transformer adapted to carry out two functions, one of which is the upsetting of metal pieces to be bonded, and the other of which is the releasing of stress or strain caused by the pressure applied to the metal pieces by the hammering member, the strain being released by the electric current in the secondary winding of the special transformer.

3,715,071
PROTECTIVE ARTICLE TRAY
Stanley F. Flynn, 34 Sotelo Way, Novato, Calif.
Filed May 7, 1970, Ser. No. 35,314
Int. Cl. B65d *1/36*
U.S. Cl. 229—2.5 **2 Claims**

A tray adapted to be positioned inside a container in stacked relationship with at least one additional tray of like construction to support and protect a plurality of fragile articles against breakage. The tray includes a substantially flat plate defining a plurality of article-seating spaced throughbores formed in rows with throughbores of adjacent rows being disposed in staggered relationship to each other. The tray further includes a plurality of spacer members projecting outwardly from at least one side of said flat plate and alternating with said throughbores in each row. Each of the spacer members is of substantially resilent construction and is of a size and configuration adapted to engage articles seated in adjacent throughbores in both the same row occupied by said spacer member and rows adjacent to said same row to prevent the articles from contacting one another.

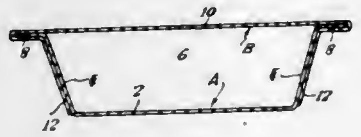


3,715,072
MULTIPLE-CELL BOX FOR FLOWABLE MATERIAL
Billy J. Muskopf, and Ronald W. Wiemann, both of Houston, Tex., assignors to Crown Zellerbach Corporation, San Francisco, Calif.
Filed March 5, 1971, Ser. No. 121,414
Int. Cl. B65d *5/48*
U.S. Cl. 229—15 **7 Claims**



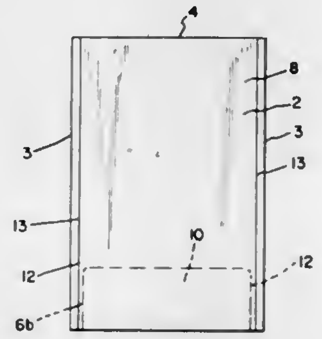
A box for flowable material comprises a plurality of independent cells in which coextensive facing walls are secured together by a reenforcing sheet coextensive with and bonded by adhesive to such walls. To facilitate registry of adhesive, both faces of the reenforcing sheet have adhesive applied thereto, and bonding of the sheet to the walls is then effected.

3,715,073
DECORATED OR PRINTED CONTAINERS
Gilbert Leslie Gibbs, Frampton Cotterell, Bristol, and Timothy Muir Davies, Clifton, Bristol 8, both of England, assignors to E S & A Robinson Limited, Bristol, England
Filed Feb. 18, 1971, Ser. No. 116,390
Claims priority, application Great Britain, Feb. 19, 1970, 8,125/70
Int. Cl. B65d
U.S. Cl. 229—43 **6 Claims**



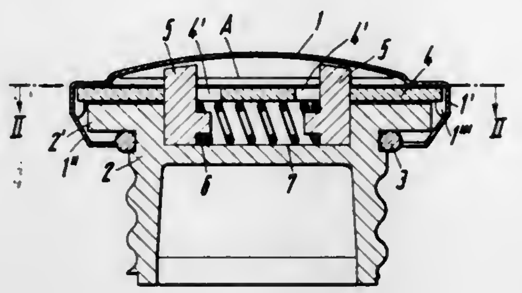
A formed container body having a planar top with straight edges is decorated by applying a preprinted blank of sheet material to the top, around the edges and over the sides. Apparatus for applying the blank has a pattern or cam the same shape as the external profile of the side portions of the container. A cam follower operates a pressure member which brings the sheet material into face-to-face contact with the side portions of the container.

3,715,074
STANDABLE BAG MADE FROM FLEXIBLE FILM MATERIAL
Wolfgang Michel, Wiesbaden-Biebrich, Germany, assignor to Kalle Aktiengesellschaft, Wiesbaden-Biebrich, Germany
Filed Feb. 23, 1971, Ser. No. 118,106
Claims priority, application Germany, Feb. 25, 1970, P 20 08 780.3
Int. Cl. B65d *33/00*
U.S. Cl. 229—57 **17 Claims**



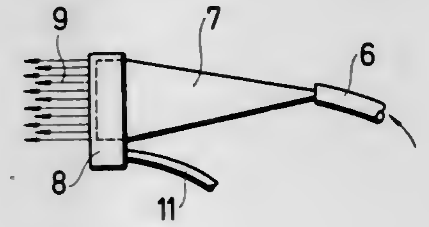
This invention relates to a bag-like container made from a single piece of flexible film and a process for making the same, the container comprising two lateral surfaces, an inwardly domed bottom adjacent the lower ends of said surfaces, and sealed seams between two layers of film laterally limiting the bag and extending over the entire bag length.

3,715,075
TWO-PART SCREW CLOSURE COVER
Werner Blau, 52, Gladbacherstrasse, and Theo Gerdes, 24, Lortzingweg, both of Langenfeld, Rhineland, Germany
Filed June 18, 1971, Ser. No. 154,409
Claims priority, application Germany, June 22, 1970, P 20 30 600.7
Int. Cl. B65d *41/04*
U.S. Cl. 220—39 R **5 Claims**



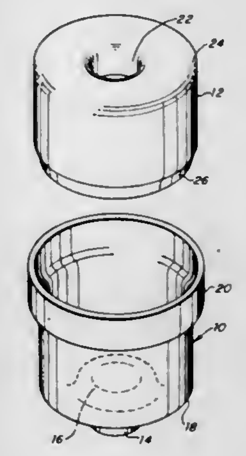
A two-part screw closure cover for containers or a pipe or tube socket, comprising coupling members in mutual engagement for connecting purposes and having a ratchet-like action, for automatic disengagement upon reaching a predetermined tightening torque of the cover, in which the coupling members are outwardly supported between both mutually freely rotatably mounted cover parts and are mounted in the inner circumference of one part of the cover, which coupling parts, which are provided with groove-like recesses, cooperate, in a radial direction, with a coupling means engaging with a ratchet-like action in the other part of the cover and, when a predetermined tightening torque for the screw cover part is reached, automatically disengage therefrom.

3,715,076
METHOD AND APPARATUS FOR SPRAYING POWDERED THERMOPLASTIC SUBSTANCES
Tibor Kenderi, Budapest, Hungary, assignor to Hajtomu es Felvonogyar, Budapest, Hungary
Filed Apr. 23, 1971, Ser. No. 136,936
Int. Cl. B05b *1/24, 1/28;* **C23c** *7/00*
U.S. Cl. 239—8 **14 Claims**



Powdered themoplastic substances are sprayed in heated form against a substrate, by entraining the powder cold in a gas stream, and ejecting the gas stream from a nozzle in the form of a flat cloud. The cloud is confined between a pair of further gas streams and is heated on the way to the substrate. Heating may be effected by passing the cloud sandwiched between its confining streams, between a pair of opposed electric heating elements. Alternatively, heating may be effected by heating the confining streams themselves, particularly if the confining streams are flames emerging from a burner.

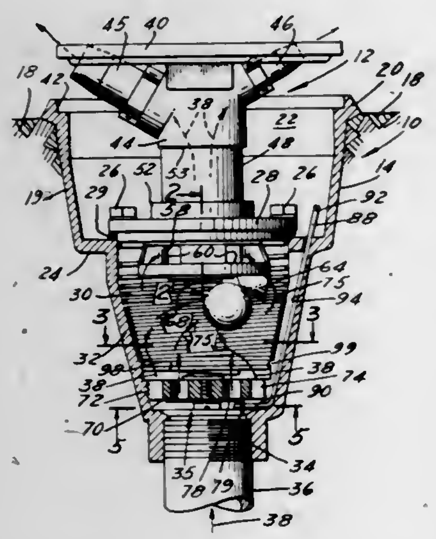
3,715,077
SHEET METAL TWO-PART SPRINKLER HEAD AND APPARATUS AND PROCESS FOR MAKING
Wilfred J. Grenier, Rutland, Mass., assignor to General Industries, Inc., Worcester, Mass.
Filed Dec. 18, 1970, Ser. No. 99,595
Int. Cl. B05b *1/02*
U.S. Cl. 239—200 **12 Claims**



A two-part sheet metal sprinkler head housing is disclosed in which the metal grain is continuous and is in line with the contours of the parts and an apparatus and process for making it.

3,715,078
WATER SPRINKLER DEVICE

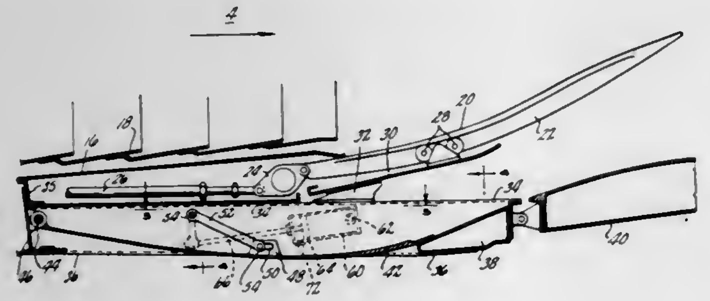
Elmer N. Reynolds, 15915 Arbela Dr., Whittier, Calif.
Filed July 22, 1971, Ser. No. 165,158
Int. Cl. B05b *3/04*
U.S. Cl. 239—206 **10 Claims**



A water sprinkler device comprising a main body housing having a dual pop-up spray nozzle with a cover attached thereto for movement with the spray nozzle, the nozzle being axially aligned within the main body and movably supported in a bearing wall member which is secured intermediate the ends of the main body housing, the spray nozzle being provided with a striking base member for rotating the dual spray nozzles by means of a ball striking the base member. A helical spring is disposed within the base member and a second helical spring is also disposed and secured in the lower portion of the main housing. A valve disc is secured into the lower portion of the main body, said disc having annularly arranged slots and a pair of centrally positioned flow passages which are adjustable for regulating the amount of water passing therethrough by a valve member and a connecting valve-adjusting stem.

3,715,079
BLOW-IN-DOOR ACTUATION FOR AFTER BURNER NOZZLE

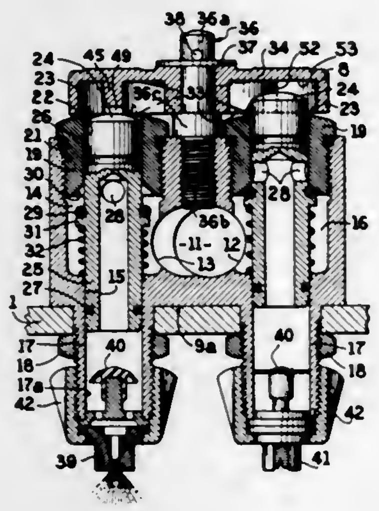
Charles L. Thompson, Vernon, Conn., assignor to United Aircraft Corporation, East Hartford, Conn.
Filed April 7, 1971, Ser. No. 131,971
Int. Cl. B63h *25/46*
U.S. Cl. 239—265.17 **4 Claims**



The blow-in-doors for an exhaust nozzle are held in open position by an air piston located between adjacent doors that permits the doors to close when a predetermined pressure differential is built up on the doors. A cable and pulley connection from the air piston to the doors permits the doors to move independently with an actuating pressure still maintained on the doors.

3,715,080
SPRAYING DEVICE FOR A LIQUID DISTRIBUTING SYSTEM FOR AGRICULTURAL USE

Claude Bastide, Colombes, France, assignor to Etablissements Roffo, Livry-Cargan, France
Filed Nov. 3, 1971, Ser. No. 195,211
Claims priority, application France, Nov. 23, 1970, 7041984, Sept. 27, 1971, 7134666
Int. Cl. A62c *31/00*
U.S. Cl. 239—444 **16 Claims**



A spraying device for agricultural use having two spray nozzles and supplied with liquid under pressure such as a liquid fertilizer. The device has a liquid supply chamber which communicates with the two nozzles through two distributing chambers. The two nozzles give different sprays. A cam means acts on two valve members respectively movable in the two distributing chambers for causing, in a first position of the cam means, a first of the valve members to close off the corresponding distributing chamber from the supply and the second valve member to allow the supply of liquid into its corresponding distributing chamber and, in a second position of the cam means, the first valve member to allow the supply of the liquid into its corresponding distributing chamber and the second valve member to close off its corresponding distributing chamber from the supply. A third position of the cam means causes both valve members to allow the supply of the liquid to their distributing chambers.

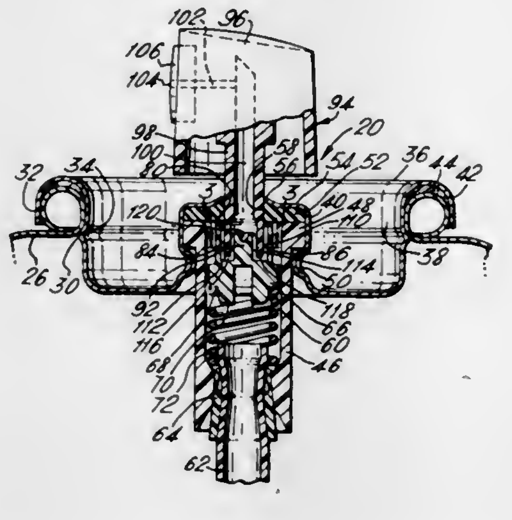
The spraying device is adapted to be mounted on a liquid spraying distributor with a plurality of other such devices.

3,715,081
AEROSOL VALVE AND SPRAYHEAD

Edward H. Green, 11 Army Trail Road, Addison, Ill.
Filed March 26, 1971, Ser. No. 128,404
Int. Cl. B05b *1/30*
U.S. Cl. 239—573 **13 Claims**

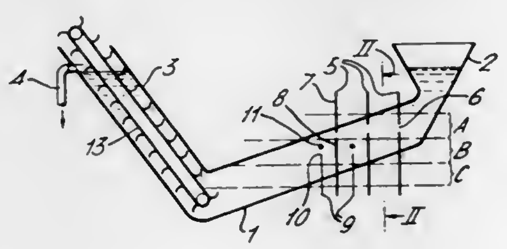
An aerosol spray valve of the type which uses a reciprocable plunger moving within a valve housing that is in turn mounted to a cover member. The cover member is adapted to be crimped to a canister and has a dip tube extending from the interior or the valve housing to the bottom of the canister. Pressurized product is forced from the interior of the canister through the dip tube into the valve housing and out of the cover member through a central hole into a sprayhead that is mounted in the hole. An elastomeric gasket surrounds the hole and the upper end of the reciprocable plunger forms a valve seat that is spring-biased against the underside of the gasket to prevent pressurized product from emerging. The sprayhead has an associated stem that enters a socket formed

in the plunger, the stem being slidably and sealingly engaged through the hole and the passageway in the elastomeric gasket. The stem is imperforate and hollow and has an axial end opening at its bottom. The socket of the plunger has channel means formed in its interior wall along the vertical length thereof so that there are one or more passageways formed between the outer surface of the stem and the socket to transport the pressurized product down into the socket. The socket has a central upstanding post and the bottom end of the stem fits into the annular space between the post and the inner surface of the socket wall. The post has vertically extending channels formed therein and there are grooves in the floor of the socket to convey the pressurized product from the bottom end of the channel means formed in the wall to the channels formed in the post. In this case, the bottom end of the stem is engaged against the floor of the socket. In the alternative, means may be provided to space the bottom end of the stem above the floor so that there is no need for grooves in the floor. Metering is preferably controlled by the total cross section of the channels in the post.



3,715,082
ELECTRO-HYDRAULIC CRUSHING APPARATUS

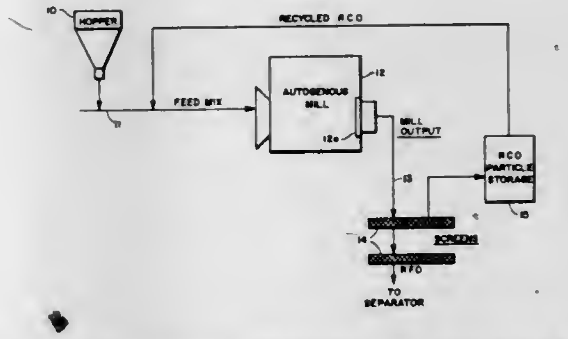
Kenneth Wallace Carley-Macauly, Didcot; James Witham Hitchon, and Robert James Moulton, both of Newbury, all of England, assignors to United Kingdom Atomic Energy Authority, London, England
Filed Dec. 7, 1970, Ser. No. 95,561
Int. Cl. B02c *19/00*
U.S. Cl. 241—1 **11 Claims**



Coarse feed material in a liquid medium is allowed or introduced to stratify and the material in the coarse stratum is then subjected to shocks from a spark discharge. Preferably, also, the material in each successively finer stratum is subjected to further shocks by spark discharges at an energy and frequency optimized according to the particle size range in each stratum.

3,715,083
METHOD FOR CONTROLLING THE GRIND IN A SINGLE STAGE AUTOGENOUS GRINDING MILL

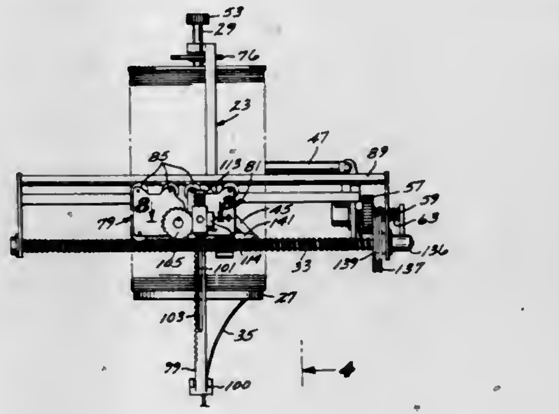
Robert M. Funk, Allentown, Pa., assignor to Bethlehem Steel Corporation
Filed Dec. 17, 1970, Ser. No. 99,182
Int. Cl. B02c *17/00*
U.S. Cl. 241—24 **1 Claim**



Crushed run-of-the-mine ore is fed to an autogenous mill in size ranges arbitrarily classified as relatively coarse (RCF), relatively medium (RMF) and relatively fine (RFF) particles. The output from the autogenous mill is also arbitrarily classified as relatively coarse (RCO), relatively medium (RMO) and relatively fine (RFO) particles. The particles in the output are smaller than the crushed run-of-the-mine ore fed to the mill. The relatively coarse particles (RCO) of the output are stored, and, intermittently, amounts thereof are returned to the mill as a portion of the feed thereto to maintain a ratio of the size consist in the mill at 35/40 percent relatively coarse:20/30 percent relatively medium:35/40 percent relatively fine particles. The relatively medium particles (RMO) can be recycled to the mill as a part of the feed. The relatively fine (RFO) particles in the output from the mill are passed to beneficiation. Maximum throughput of run-of-the-mine ore at constant power input to the mill is maintained.

3,715,084
QUICK DUMP HOIST

Joseph Weiss, Jr., 1010 Larch No. 6, Inglewood, Calif.
Continuation-in-part of Ser. No. 745,532, July 17, 1968, abandoned. This application March 5, 1970, Ser. No. 9,005
Int. Cl. B65h *75/00*
U.S. Cl. 242—54 R **8 Claims**



A quick dump hoist for rapidly lowering a cable from a helicopter and including a main frame secured to the helicopter and a pivotal frame mounted on the main frame and cantileverally carrying a rotatable drum. Means is provided for rotating the pivotal frame to selectively orient the drum in a horizontal, take-up position, wherein the drum may be rotated to wrap cable thereon and a vertical, feed-out position, wherein the cable will fall freely from the end thereof. A track is provided along one side of the drum and supports a threading means which includes an eye for feeding the cable uniformly on the drum as such means is fed along the track in accordance with rotation of the drum during cable take up.

3,715,085

DEVICE FOR SUPPLYING CONTINUOUS SHEET OF PAPER FROM A ROLLED PACKAGE USED IN A COPYING APPARATUS

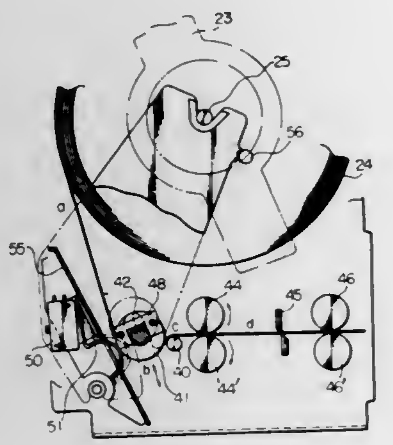
Akira Kobayashi; Toshio Koike, and Keiichi Sato, all of Tokyo, Japan, assignors to Iwatsu Electric Co., Ltd., Tokyo, Japan

Filed Sept. 15, 1970, Ser. No. 72,258

Claims priority, application Japan, April 9, 1970, 45/33611; April 9, 1970, 45/33612; April 13, 1970, 45/34833

Int. Cl. B65h *19/20*

U.S. Cl. 242—56 R **9 Claims**



An electrophotographic apparatus comprises supporting means for rotatably supporting a roll of paper, a mechanical system for advancing the paper through the apparatus, a roller rotatably mounted along the advancing path of the paper for eliminating the tendency of the paper to reroll; a cutting device for cutting the paper into separate sheets, and sensing means for sensing the consumption of the roll of paper. The supporting means comprises a rotatable shaft having a flange mounted on each end thereof for supporting therebetween the roll of paper. One end of the shaft is provided with a helical thread which cooperates with a pivotal lever on one flange to releasably and adjustably mount the flange on the shaft. A biasing spring urges the lever into engagement with the helical thread to releasably lock the flange on the shaft and the spring may be compressed by manually pivoting the lever against the spring force whereby the flange may be slid off of the shaft so that another roll of paper may be mounted thereon.

3,715,086

FILM MOVING MEANS IN MACHINE FOR READING BUBBLE CHAMBER PHOTOGRAPHS

Borje Angelstrand, and Ragnar Mostrom, both of Jonkoping, Sweden, assignors to Saab Aktiebolag, Linkoping, Sweden

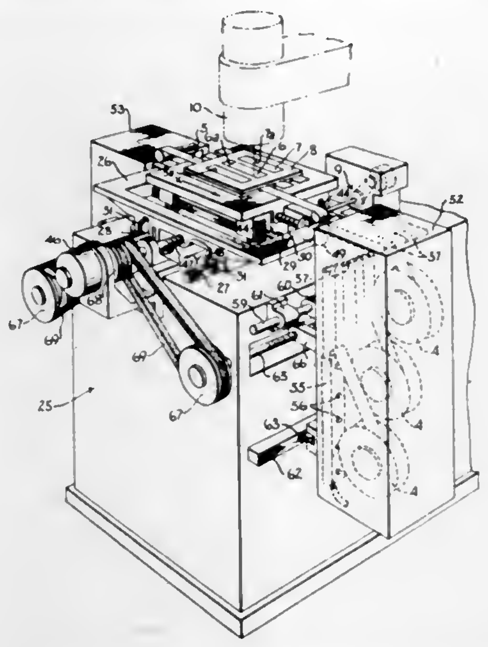
Filed Aug. 28, 1969, Ser. No. 854,147

Claims priority, application Sweden, Aug. 28, 1968, 11532

Int. Cl. B65h *17/02;* **G01n** *21/30*

U.S. Cl. 242—67.3 **4 Claims**

A reading machine for bubble chamber photographs has a horizontal film table across which film is lengthwise advanced, frame by frame, from a supply reel at one side of the table to a takeup reel at the other side thereof, and to which the film is flatwise clamped for horizontal movement with the table. Carriers for the reels, extending below the table at opposite sides thereof, are mounted for motion transverse to film length and are driven in such motion in unison with the table to avoid twisting the film.



3,715,087

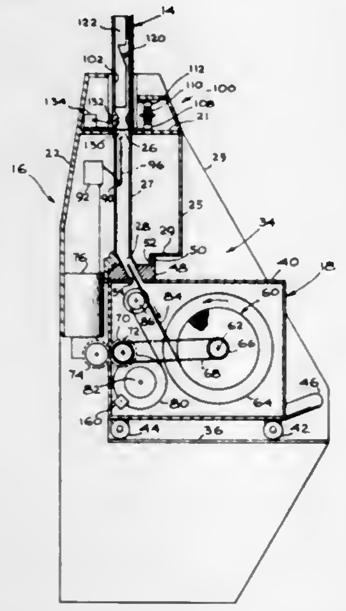
SHEET FILM STORAGE MAGAZINE

Gunter Schmidt, Malibu, Calif., assignor to Production, Inc., Los Angeles, Calif.

Filed Feb. 18, 1971, Ser. No. 116,550

Int. Cl. G03b *17/30*

U.S. Cl. 242—67.3 R **10 Claims**



Apparatus particularly useful for facilitating the handling of X-ray film sheets in daylight. The apparatus includes an X-ray film sheet cassette adapted to cooperate with a cassette unloader for dispensing film sheets into a storage module. The storage module includes a light tight housing having a film access slot therein. A drum and spool are mounted within the housing for rotation about spaced parallel axes. A web of opaque material terminally secured to the drum and spool extends around an intermediate guide roller. A film sheet dispensed from the cassette into the unloader is directed by guide means therein onto the web within the storage module. A motor mounted on the unloader is coupled to a drive gear which operatively engages a pick-up gear coupled to the storage module drum. Actuation of the unloader is controlled by a sensor mounted adjacent the film sheet path so that as a film sheet moves through the unloader, the motor is actuated to rotate the drum to thus wind the web thereon with the film sheet being wound between the web turns. In this manner, a multitude of exposed but unprocessed film sheets of various sizes can be stored. The storage module is portable and can be moved out of cooperative relationship with the unloader in cooperation with an X-ray film sheet processor. A processor adaptor module at the processor carries a motor driving a gear engageable with a spool pick-up gear in the storage module. Energization of the processor adaptor motor winds the web back from the drum to the spool to thus dispense film sheets one at a time from the web into the processor entrance slot.

3,715,088

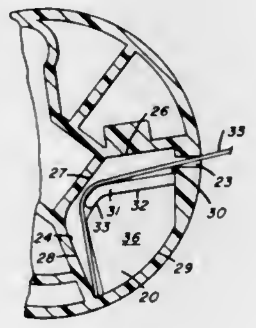
STRIP STORAGE DEVICE

Arthur C. Rissberger, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed June 29, 1970, Ser. No. 50,769

Int. Cl. B65h *75/28*

U.S. Cl. 242—74 **6 Claims**



1 A film spool including a hub cavity formed in the hub. A film slot is provided in the hub and communicates with a channel formed in the cavity to hold the film end during take-up onto the spool. The channel is comprised of a raised rib formed in spaced relationship from a portion of the cavity sidewall. The rib cooperates with the sidewall to force the film end into an arcuate path and restrains the film end from springing back out through the film slot during take-up.

3,715,089

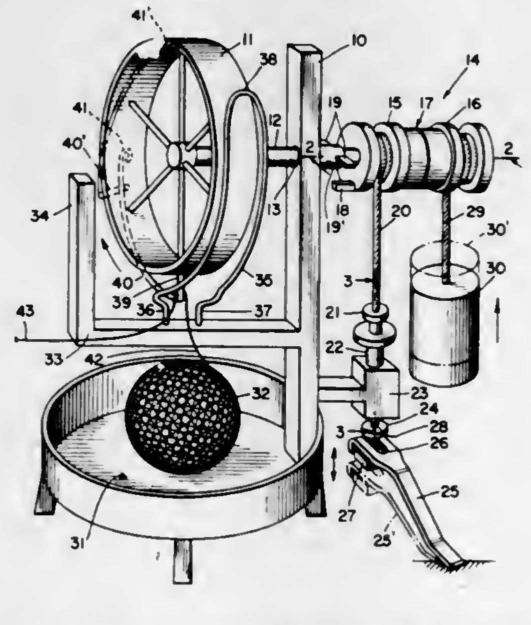
SPIN OFF WHEEL FOR CROCHETING

Howard A. Stevens, Thousand Oaks, Calif., assignor of a fractional part interest to Stanley H. Stevens, Hatboro, Pa.

Filed Dec. 23, 1971, Ser. No. 211,322

Int. Cl. B65h *49/00;* **D01h** *7/16*

U.S. Cl. 242—129.5 **7 Claims**



A wheel is rotatably mounted with a thread receiving opening on its periphery for receiving the end of thread from a ball of yarn. A stationary guide leads the thread into the thread receiving opening so that oscillation of the wheel pulls off a length of thread from the ball of yarn to provide slack in the thread. The oscillation of the wheel may be effected by a foot treddle so that a person crocheting need not use his or her hands for pulling off slack thread.

3,715,090

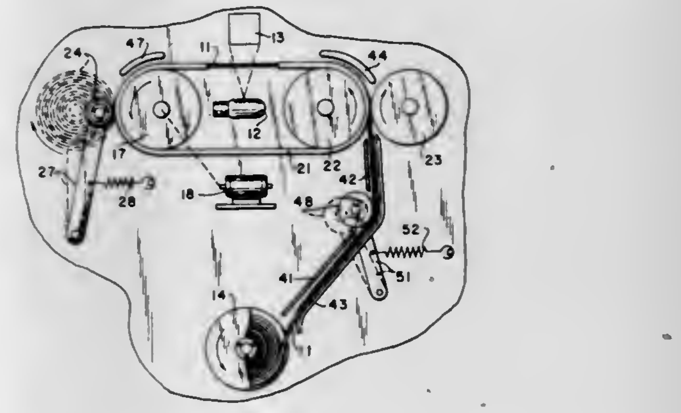
DEVICE FOR ADVANCING A WEB OF FLEXIBLE STRIP MATERIAL

Karl H. Kostusiak, Pittsford, and Lynn A. Selke, Fairport, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 6, 1970, Ser. No. 9,172

Int. Cl. G11b *15/18, 15/32;* **B65h** *17/26*

U.S. Cl. 242—188 **11 Claims**



An advance mechanism for a web of flexible strip material utilizes a flexible, transparent carrier belt having a web receiving channel therein. The web is trapped in the channel and is supported by the belt as it is moved thereby through the transducer area. A circuit for controlling the belt advance, and thereby the web advance, includes a differential optical detector for observing the position of a reference mark on the web after the web has been advanced. Deviation from the desired position of the mark causes the generation of an error signal which in one embodiment actuates the advance mechanism to correct the error. In another embodiment, the error signal is used to cause the following advance step to be either greater or lesser than normal depending upon the direction of deviation.

3,715,091

FILM TENSION SENSING SYSTEM FOR USE ESPECIALLY IN ELECTRICALLY DRIVEN AUTOMATIC STEP AND REPEAT CAMERAS

Jacobus van Vonderen, Covina, Calif., assignor to Teledyne, Inc., Los Angeles, Calif.

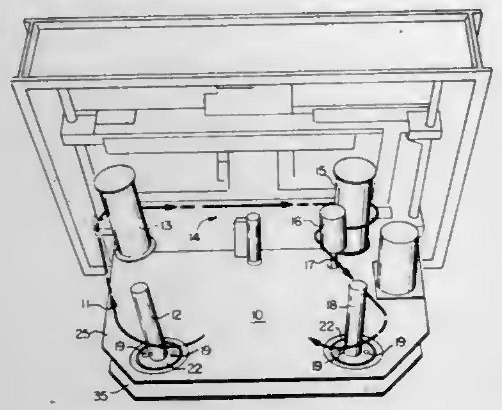
Filed Mar. 1, 1971, Ser. No. 119,468

Int. Cl. B65h *59/38;* **G03b** *1/02;* **G11b** *15/13*

U.S. Cl. 242—191 **9 Claims**

A film tension sensing system for use especially in electrically driven automatic step and repeat cameras.

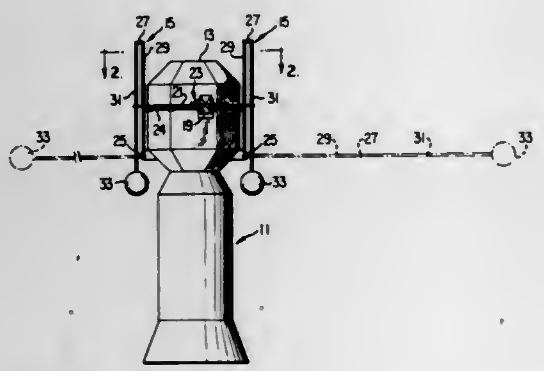
The system comprises a film supply spool rotation direction sensor and film tensioner in conjunction with a rotatable film supply spool shaft, and a film tension sensor in conjunction with a film take-up spool shaft. The film supply spool shaft is coupled to a film supply spool rotatably mounted thereon by one or more spring biased drive pins which engage drive holes in the supply spool. The supply spool rotation direction sensor includes an override switch which cuts off electrical power to the film drive system when the supply spool rotates in the wrong direction. The film tension sensor employs a roller rotatably mounted on a non-rotating pivotally mounted shaft. Positive film tension on the sensor roller pivots the shaft to engage and close an override switch



while lack of film tension permits the override switch to open and cut off power to the film drive system.

3,715,092
DELAYED SIMULTANEOUS RELEASE MECHANISM

Xopher W. Moyer, New Carrollton, and John B. Webb, Annapolis, both of Md., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration
Filed May 28, 1970, Ser. No. 41,404
Int. Cl. B64g *1/00*
U.S. Cl. 244—1 SS **10 Claims**

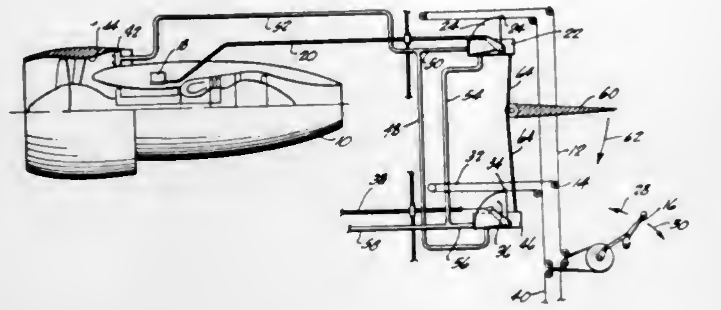


The disclosed appendage release mechanism is particularly adapted for use with spacecraft operating with despin mechanisms and releasable appendages. It includes a flexible loop and a plurality of appendage releasing devices which are attached to the flexible loop. The appendage releasing devices are made up of piston-cams and ball latches which hold the appendages as long as the flexible loop is maintained in a taut condition but which release the appendages upon relaxation of the flexible loop. The flexible loop remains taut as long as the despin weights, which weights are attached to the flexible loop by cords, remain attached but relaxes when the despin weights are released.

3,715,093
AUTO-ADVANCE THROTTLE CONTROL

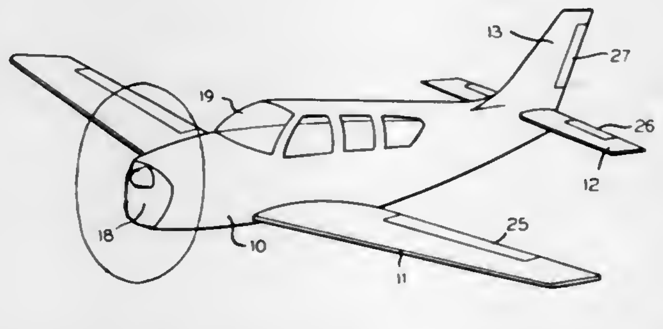
Roscoe H. Van Dyke, Santa Ana, Calif., assignor to McDonnell Douglas Corporation
Filed Dec. 27, 1971, Ser. No. 212,443
Int. Cl. B64c *13/16*
U.S. Cl. 244—76 B **7 Claims**

A system compensating for sudden and unexpected loss of thrust resulting from engine failure in a short takeoff and landing (STOL) aircraft in a high angle of attack attitude, such as in the landing mode, by advancing the throttle of an adjacent engine on the same side of the longitudinal centerline of the aircraft as the faulty engine. An overcenter actuating mechanism combines amplification of a small signal source with rapid rate of response. The small signal force results from comparison of adjacent engine selected parameters.



3,715,094
SIMPLIFIED AIRCRAFT CONTROL SYSTEM

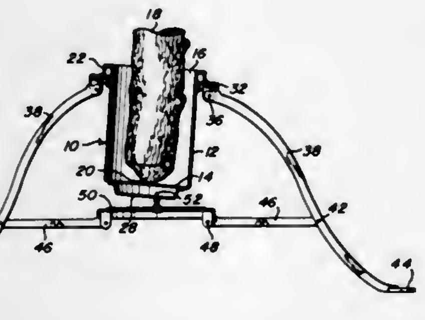
Robert L. Cohn, c/o Robert L. Cohn, Inc., 500 N. Michigan Ave., Chicago, Ill.
Filed June 5, 1970, Ser. No. 43,663
Int. Cl. B64c *13/04*
U.S. Cl. 244—83 B **8 Claims**



A control system resiliently interconnects aileron and rudder controls. When the aileron is controlled, the rudder is trimmed sufficiently to maintain a desired bank and turn orientation without separately controlling the rudder. For stall minimization the elevator is restricted from moving up to the position where the angle of attack of the air foil is at the burble point.

3,715,095
ADJUSTABLE CHRISTMAS TREE STAND

William J. Drablowski, Ludington, Mich., assignor to Wolverine Industries, Inc., Grand Rapids, Mich.
Filed June 16, 1971, Ser. No. 153,589
Int. Cl. A47g *33/12*
U.S. Cl. 248—46 **16 Claims**

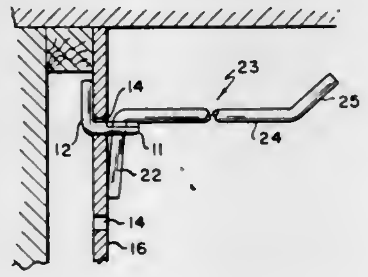


A receptacle for attachment to the end of a Christmas tree trunk is loosely and removably receivable in and peripherally supported from an upper supporting ring of a collapsible stand. A platform carried by the legs of the stand is movable relative to the supporting ring and carries an upstanding pin which is receivable within one of a plurality of perforations provided in the bottom portion of the receptacle for further supporting the receptacle and maintaining it in adjusted position relative to the stand.

3,715,096
ARTICLE SUPPORT

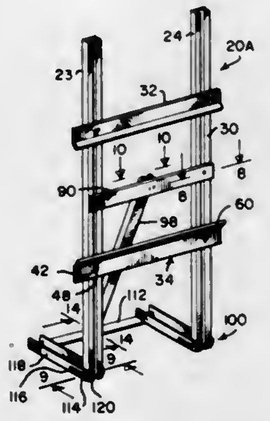
Wilbur C. Filbert, 113 Tapawingo Road SW., Vienna, Va. 22180
Filed June 18, 1971, Ser. No. 154,489
Int. Cl. A47f *5/00*
U.S. Cl. 248—223 **17 Claims**

An article support for use with a pegboard having horizontal rows of uniformly spaced holes therein comprising a base with integrally formed legs thereon spaced a distance equal to the distance between centers of the holes in said horizontal rows of holes or any multiple thereof and adapted to be received within the holes within said pegboard, the base having at least one rectangular aperture therein adapted to detachably receive and rotatably suport a rectangular end portion extending angularly from a body portion of a hook member so the legs, base and end portion cooperate to support said hook member on said pegboard. A plurality of angularly spaced rectangular apertures may be provided at each hook position whereby the hook member may be supported by said base at selected angle relative to said pegboad. The end portion of the hook member may be provided with corresponding and angularly off-set rectangular portions separated by a cylindrical portion whereby the hook member may be angularly adjusted relative to the pegboard within a single rectangular aperture in the base.



3,715,097
ADJUSTABLE EASEL

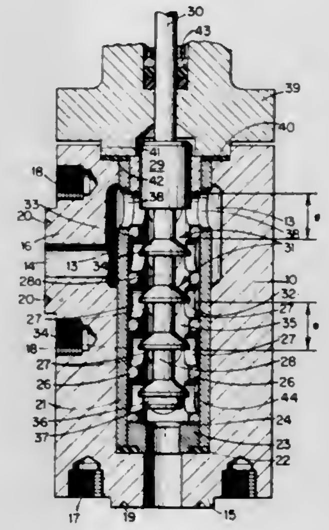
John Kalajian, 340 Starr St., Brooklyn, N.Y.
Filed Jan. 7, 1971, Ser. No. 104,722
Int. Cl. A47b *97/04*
U.S. Cl. 248—449 **3 Claims**



An adjustable easel for supporting a rectangular stretcher frame for canvas has a frame comprising a pair of vertical channel shaped rails with longitudinal slots in front sides. Upper and lower angle bars extend transversely across the rails and are adjustably positioned by bolts engaging clamp blocks inside the rails. A palette is removably mounted on the lower angle bar. A stand can be provided for adjustably supporting the easel frame in various angular positions. The palette support may have a removable platform and a removable plate for supporting paint tubes.

3,715,098
ADJUSTABLE FLUID RESTRICTOR METHOD AND APPARATUS

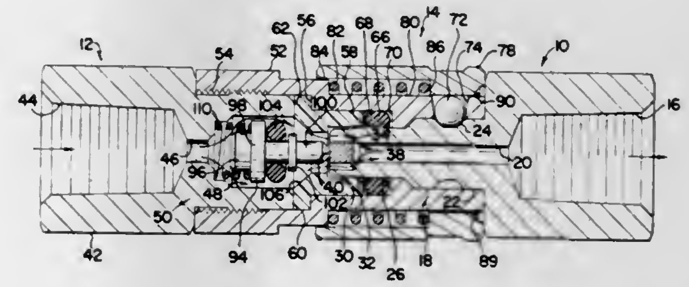
Hans D. Baumann, 29 Villa Drive, Foxboro, Mass.
Filed July 6, 1971, Ser. No. 159,769
Int. Cl. F16k *47/00*
U.S. Cl. 251—121 **15 Claims**



The present invention constitutes an adjustable fluid restrictor providing throttling means to reduce pressure of liquid or gaseous media through a process of adiabatic flow with friction in contrast to conventional orifice type throttling devices which utilize rapid acceleration and deceleration as primary means of energy conversion. Said adjustable fluid restrictor containing labyrinth-type restrictions which are adjusted by conventional actuating means and provide constant enthalpy pressure reduction at substantially constant velocity regardless of variations in flow area.

3,715,099
VALVED QUICK-DISCONNECT COUPLING

Ashok S. Shendure, Warrensville Heights, Ohio, assignor to Crawford Fitting Company, Solon, Ohio
Filed June 2, 1971, Ser. No. 149,162
Int. Cl. F16l *29/00, 37/28*
U.S. Cl. 251—149.1 **1 Claim**



The specification and drawings disclose a quick disconnect tube coupling which includes a female body member with an axially extending bore defining a flow passage and an internal valve chamber. A resilient sleeve member is positioned within the chamber and forms an annular valve seat. A male body member is associated with the female body member and includes a cylindrical stem portion of reduced diameter and a flow passage extending axially through the stem. The diameter of the stem is sized so as to be closely received within the bore of the female body portion. Positioned within the valve chamber and biased toward the seat and the stem is a plug valve member of stepped diameter with a reduced diameter portion that extends through the valve seat. The diameter of the plug's reduced diameter portion is substantially less than the diameter of the valve seat and the diameter of the end of the stem. The end of the stem is provided with flow passage openings which are located radially outward at a distance greater than the maximum diameter of the reduced diameter end portion of the plug member.

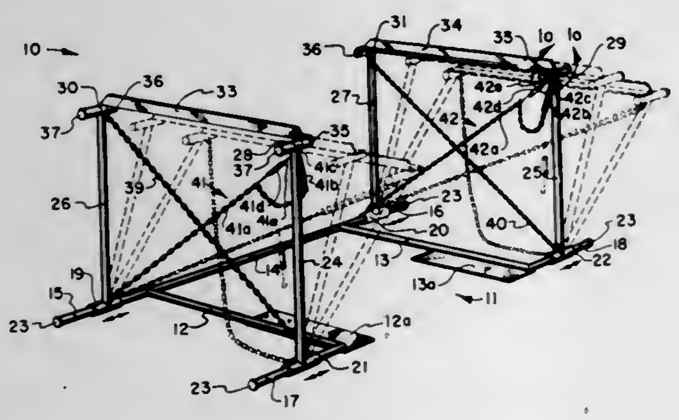
3,715,100
SUPPORT RACK FOR CAMPER BODIES

Calvin D. Spencer, Murray, Utah, assignor to Rax Corporation, Salt Lake City, Utah

Filed Feb. 16, 1971, Ser. No. 115,191

Int. Cl. B66f *7/26*

U.S. Cl. 254—49 **7 Claims**



A support rack for camper bodies and the like, having pivotally interconnected parallelogram frames, frame locking means and flexible frame holding means. The parallelogram frames pivot within the limits of the flexible frame holding means to move a camper body onto and off of a truck bed as the truck is moved and the frame locking means hold the parallelogram frames rigid to support the camper body in an elevated position.

3,715,101
CONVERTER HANDLING VEHICLE

Othmar Puhringer, Linz, Austria, assignor to Vereinigte Osterreichische Eisen-und Stahlwertze Aktiengesellschaft, Linz, Austria

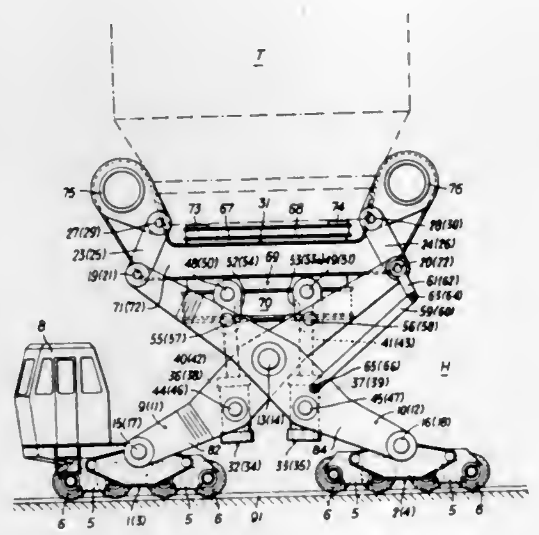
Filed March 8, 1971, Ser. No. 121,991

Claims priority, application Austria, Oct. 14, 1970, A 9254/70

Int. Cl. B60s *9/14;* **B60p** *1/48;* **B66f** *3/22*

U.S. Cl. 254—87 **9 Claims**

A converter handling vehicle adapted to lower or raise a converter and to transport the converter in any direction along the ground. The vehicle comprises bogie trucks on each side of the vehicle, a pair of levers on each side of the vehicle, the arms intersecting and being pivotally connected to a point between the ends of the levers, the lower ends being connected to the bogie trucks, a converter holding member that is pivotally connected to the upper ends of the levers, hydraulic cylinders and piston rods connected to the levers to raise or lower the converter, a support plate rotatably mounted under the holding member to support the vehicle and the converter when the direction of travel is to be changed, and a driver to cause the converter and the vehicle to rotate about the support member to change directions when the support member supports the weight of the vehicle and converter.



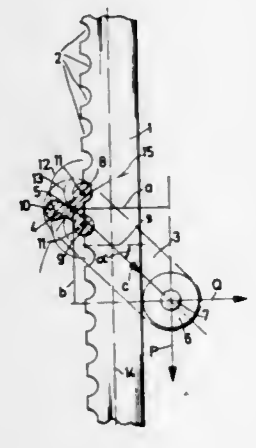
3,715,102
LIFTING JACK

Ferdinand Braselmann, Ennepetal-Oberbauer, Germany, assignor to Firma Ferd. Braselmann, Ennepetal-Oberbauer, Kotthausstrase, Germany

Filed Mar. 2, 1971, Ser. No. 120,105

Int. Cl. B66f *3/08*

U.S. Cl. 254—96 **8 Claims**



A jack having a column with equally vertically spaced notches on one side thereof, a load supporting carrier slides along the column and rotatably supports a member having projections complementary to said notches. As the member is rotated the projections sequentially engage said notches and when two adjacent projections are seated in adjacent notches the supported load acts along an oblique line between said projections whereby the carrier and load are self-locking on the column.

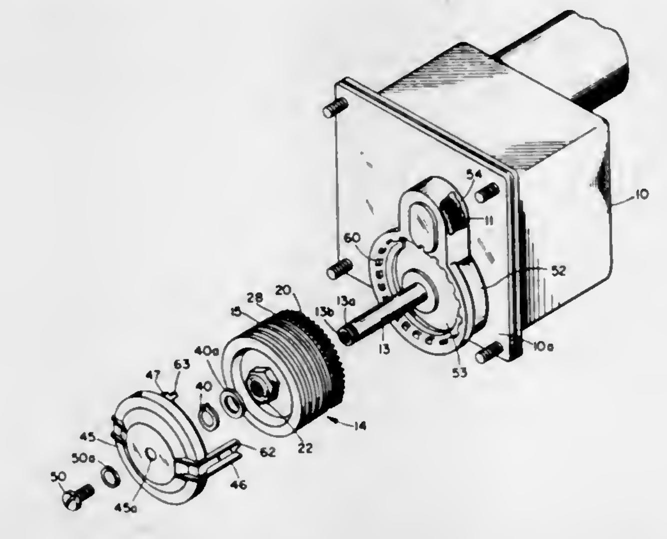
3,715,103
GEAR AND CAPSTAN GUARD FOR FLIGHT CONTROL SERVO

Luis Enrique Carreras, Ft. Lauderdale, Fla., assignor to The Bendix Corporation

Filed June 24, 1971, Ser. No. 156,224

Int. Cl. B66d *1/30*

U.S. Cl. 254—150 R **4 Claims**



A capstan pulley coaxially driven through a slip clutch by a first gear which in turn is driven by a second gear. A gear guard which covers the gear train so as to prevent a capstan cable from becoming enmeshed therein includes a plurality of lock tab slots which cooperate with a capstan guard to permit the capstan guard to be locked over the capstan in any one of a plurality of positions.

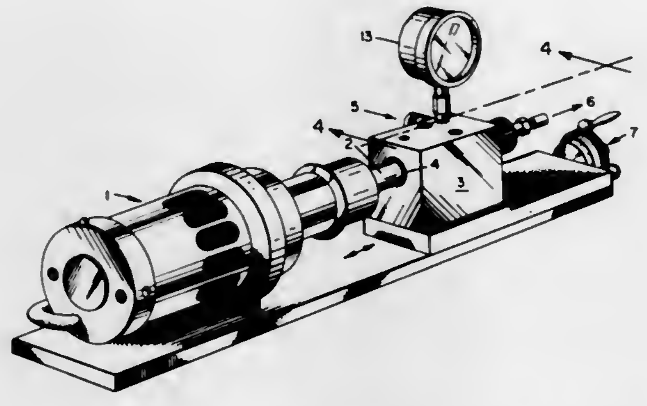
3,715,104
APPARATUS FOR CARRYING OUT ULTRASONIC AGITATION OF LIQUID DISPERSIONS

Eric Charles Cottell, Windermere, Bayville, N.Y.

Filed Nov. 5, 1970, Ser. No. 87,263

Int. Cl. B01f *11/02*

U.S. Cl. 259—1 R **5 Claims**



Liquid systems, such as aqueous dispersions of cells, are passed across the space between plates, one of which is attached to the end of an ultrasonic probe. The other plate is stationary and mounted in a container which permits carrying out the operation under any desired pressure. The plates are spaced the desired distance for maximum efficiency and there are two liquid conduits into the container, one at the side and directed across the space, and the other axial. One or both plates may be provided with baffles, such as spiral baffles or labyrinths to keep the liquid flowing thereover in the ultrasonic zone for a sufficient time. The direction of flow of the liquid is important, and the best results are obtained if the liquid flows in the inlet conduit across the plates and out the axial conduit instead of the reverse. Efficiency is greatly increased, and certain very tough cells, such as yeast cells, can be ruptured with relatively small outputs of energy.

3,715,105
HOMOGENISING

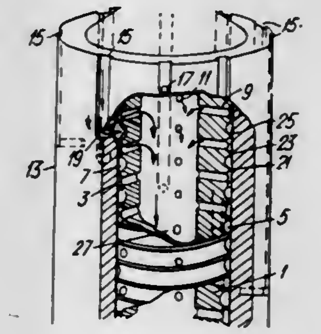
Thomas Reuben Griffin, Pontypool, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Jan. 5, 1970, Ser. No. 1,072

Claims priority, application Great Britain, Jan. 10, 1969, 1,664/69

Int. Cl. B01f *15/02*

U.S. Cl. 259—2 **3 Claims**



Process and apparatus whereby a mixture comprising a liquid is sheared and homogenised by passing it through dimensionally precisely pre-defined paths arranged in a parallel system which paths include dimensionally precisely pre-defined narrow sections and wherein the walls of said narrow sections are in controlled relative movement one with the other.

3,715,106
FEED ARRANGEMENTS FOR A MIXER OR MIXER-CONVEYOR UNIT

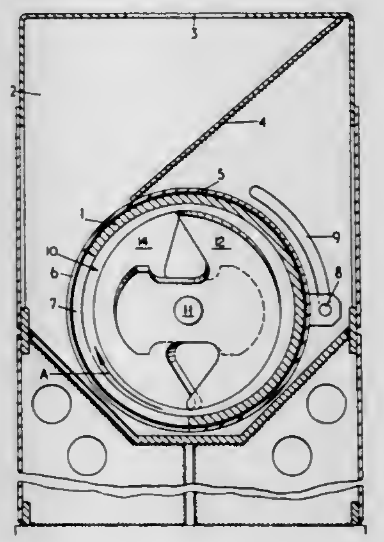
Albert Edwards, Peterborough, England, assignor to Baker Perkins Limited, Peterborough, England

Filed Jan. 11, 1971, Ser. No. 105,422

Claims priority, application Great Britain, Jan. 27, 1970, 3,983/70

Int. Cl. B01f *7/02*

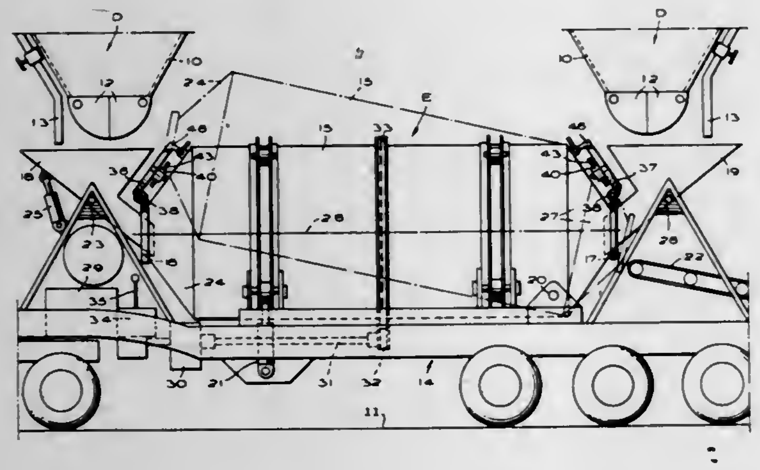
U.S. Cl. 259—25 **5 Claims**



A feed arrangement for providing a controlled rate of feed of free-flowing material to a screw-type conveyor. The arrangement consists of a gate opening in the side of the conveyor barrel, a sliding sleeve around the barrel leaving an opening adapted to register with the barrel opening to a varying degree dependent on the position of the sleeve, and a supply enclosure above the barrel with a partition for directing material towards the gate.

3,715,107
TRANSIT CONCRETE MIXER AND METHOD OF MIXING CONCRETE COMPONENTS

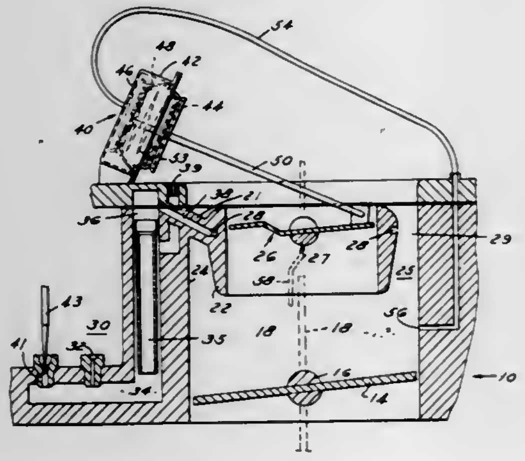
Hugh P. Paris, 3101 Middlefield Road, Palo Alto, Calif.
Filed March 9, 1972, Ser. No. 233,041
Int. Cl. B28c *5/18*
U.S. Cl. 259—148 **10 Claims**



A transit concrete mixer and method of mixing concrete components, wherein a rotatable drum is provided with a series of inclined blades on its interior, the blades being disposed to move concrete components delivered to the interior of the drum toward the center of the drum when the drum is rotated in one direction and to move them toward an end of the drum when the drum is rotated in the opposite direction. The concrete components may be delivered to the drum through either one or both ends thereof, and the mixed concrete components may be discharged from an end of the drum when the latter is rotated in the opposite direction.

3,715,108
STAGED SINGLE VENTURI CARBURETOR

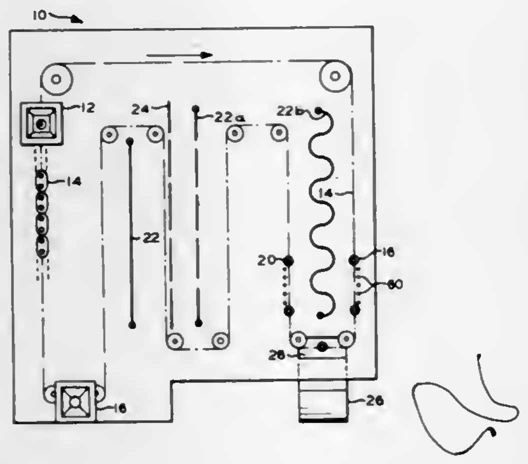
Ronald T. Denton, Birmingham, Mich., assignor to Ford Motor Company, Dearborn, Mich.
Filed May 7, 1971, Ser. No. 141,181
Int. Cl. F02m *9/08*
U.S. Cl. 261—50 A **9 Claims**



A downdraft type carburetor induction passage has a throttle valve above which is a coaxially mounted flow controlling member consisting of a fixed area venturi integrated with a movable venturi bypass valve member to provide high fuel metering signals at low air flows and high air flow potential for wide open throttle operation.

3,715,109
RAPID HEATING OF PARISON PREFORMS

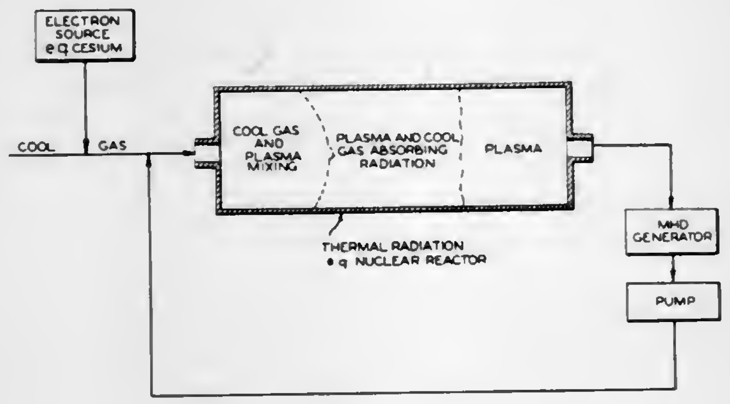
Dixie E. Gilbert, Bartlesville, Okla., assignor to Phillips Petroleum Company
Filed May 13, 1971, Ser. No. 143,006
Int. Cl. F27b *9/24*
U.S. Cl. 432—122 **9 Claims**



Tubular parison preforms are heated to orientation temperature by means of external radiant heat combined with affirmative heating of the parison on the inside.

3,715,110
RADIANT HEATING OF GAS STREAMS

Carl A. Jensen, Davis, and Lowell L. Wood, Jr., Simi, Calif. (both of Department of Geophysics and Planetary Physics, ℅ University of California, Los Angeles, Calif. 90024)
Continuation-in-part of application Ser. No. 706,590, Feb. 19, 1968. This application Jan. 27, 1969, Ser. No. 794,265
Int. Cl. F27f *17/00*
U.S. Cl. 432—29 **8 Claims**

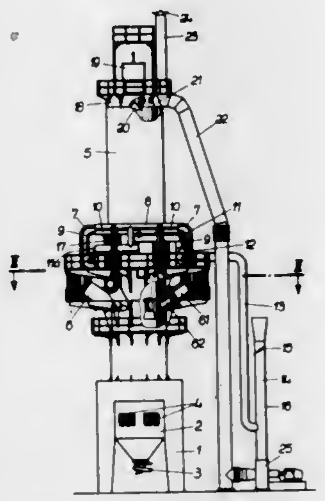

ELECTRON SOURCE e.g. CESIUM
COOL
GAS
COOL GAS AND PLASMA MIXING
PLASMA AND COOL GAS ABSORBING RADIATION
PLASMA
THERMAL RADIATION e.g. NUCLEAR REACTOR
MHD GENERATOR
PUMP

This disclosure is concerned with a novel process for rapidly heating a gas stream to a specific range of very high temperatures by introducing said gas stream together with electrons or a source thereof into a heating zone which is subjected to thermal radiation and which contains a substantial quantity of a hot plasma which is preferably maintained under pressure.

The gas stream entering the heating zone mixes with the hot plasma and absorbs heat therefrom as well as from the walls of the heating zone itself by radiation. The heated plasma is then withdrawn from the heating zone at a rate such that the amount of plasma in the heating zone remains substantially constant.

3,715,111
SHAFT LIME KILN

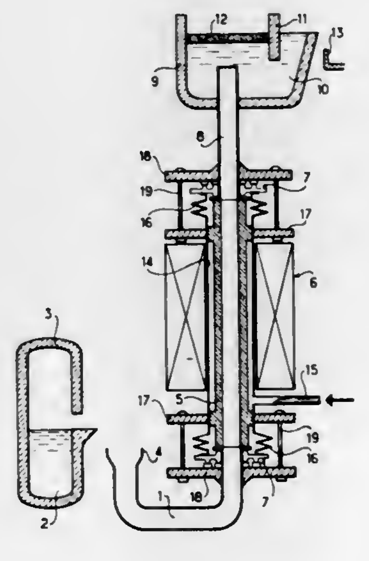
Felix Sobek, Friedrichstrasse 37, Dusseldorf, Germany
Filed Oct. 26, 1970, Ser. No. 84,107
Claims priority, application Germany, Mar. 9, 1970, P 20 10 974.4
Int. Cl. C04b *1/00*
U.S. Cl. 432—4 **18 Claims**



In a process for calcining and sintering granulated, crushed or shaped material in a completely enclosed kiln, a treated lean gas at very low pressure is used as the fuel. The progress of combustion for extending the firing zone is controlled by altering the calorific value of the lean gas. Further, the kiln atmosphere is controlled on the basis of separate and independent regulation of the pressure and volume of the waste gas generated in the combustion and in the de-oxidizing processes as well as by supplementary reactions during combustion.

3,715,112
MEANS FOR TREATING A LIQUID METAL AND PARTICULARLY ALUMINUM

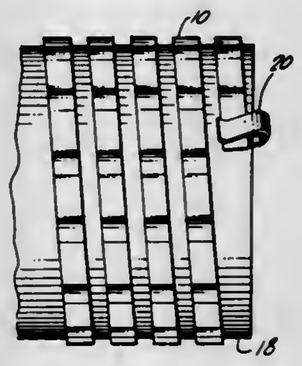
Henri Carbonnel, Antony, France, assignor to Groupement Atomique Alsacienne Atlantique, Plessis Robinson, France
Filed July 30, 1971, Ser. No. 167,736
Claims priority, application France, Aug. 4, 1970, 7028793
Int. Cl. C22b *21/06*
U.S. Cl. 266—34 T **9 Claims**



Apparatus for treating liquid metal, such as aluminum, with a gas, comprising an input pipe and an output pipe connected together by the conduit of an electromagnetic pump. The conduit is made of a porous refractory material arranged inside a fluid-tight tube receiving the treating gas under pressure. The treating gas entering the conduit is intimately mixed with the liquid metal by the currents induced by the windings of the pump.

3,715,113
PISTON RING EXPANDER

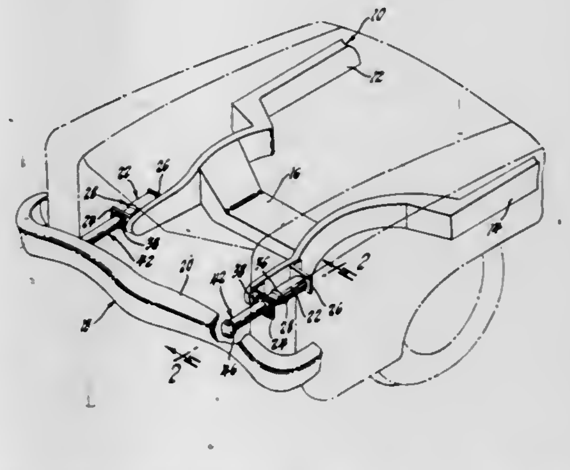
James V. Walker, Redondo Beach, Calif., assignor to McDonnell Douglas Corporation
Filed Sept. 28, 1970, Ser. No. 76,134
Int. Cl. F16f *1/34*
U.S. Cl. 267—1.5 **5 Claims**



A helical piston ring expander for use with plastic or plastic-like piston rings is constructed by crimping a strip of metal, spirally winding the crimped strip around a cylindrical mandrel into a helix, heat treating the resultant assembly and cutting portions therefrom at predetermined points therealong to form the desired expander.

3,715,114
SHOCK ABSORBING BUMPER

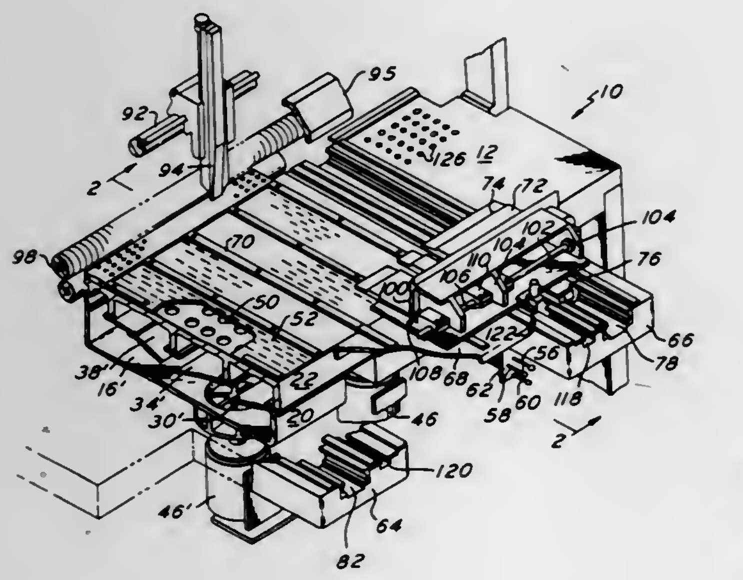
Claude A. Thorsby, Saginaw, and Robert L. White, Frankenmuth, both of Mich., assignors to General Motors Corporation, Detroit, Mich.
Filed Oct. 7, 1971, Ser. No. 187,418
Int. Cl. B61f *19/02, 19/04;* **F16f** *9/30*
U.S. Cl. 267—140 **4 Claims**



An energy absorbing support unit for an automobile bumper bar, the support unit including a pair of telescopically related tube members adapted for disposition between the bumper bar and the vehicle chassis, an orificed piston rigidly attached to one tube member and adapted to effect throttled flow of an incompressible medium situated in a chamber in the other tube member to effect energy absorption, a free piston slidably mounted in the one tube member and resiliently biased toward a normal position corresponding to a fully extended position of the one tube member, the free piston urging reverse flow of the incompressible medium to provide a self-restoring preload on the one tube member, and a reciprocating valve member on the free piston movable between an open position and a closed position partially obstructing the piston orifices to increase the rate of energy absorption. The free piston, in the normal position thereof, engages the valve member to positively locate the latter in the open position whenever the one tube member is in its fully extended position.

3,715,115
SHEET FEEDING APPARATUS

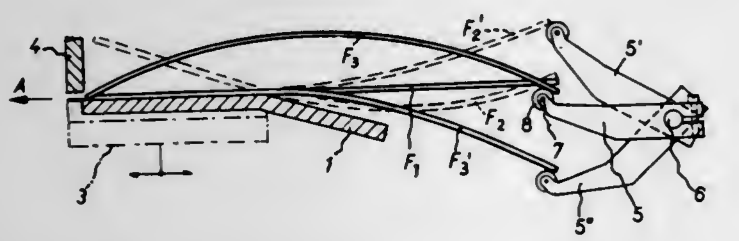
William Grobman, Philadelphia, Pa., assignor to Harris-Intertype Corporation, Cleveland, Ohio
Filed March 15, 1971, Ser. No. 124,076
Int. Cl. B65h *1/06*
U.S. Cl. 271—44 A **22 Claims**



Sheet feeding apparatus of the bottom feed type is disclosed. Stationary vacuum chambers are used to flatten out the sheets prior to feeding. Some of the vacuum chambers are provided with valve means to control the pressure effect on the juxtaposed portion of the sheet.

3,715,116
LEVELING DEVICE FOR SHEET MATERIAL FEEDING MECHANISM

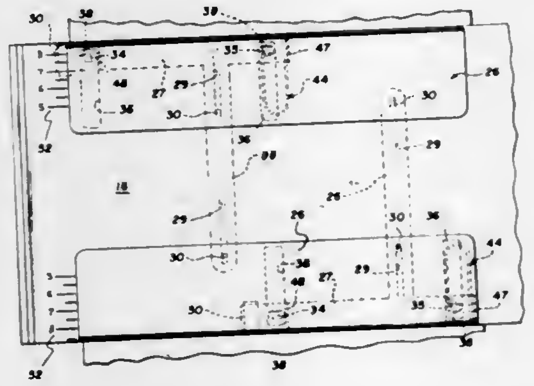
Gennaro Salvade, Preverenges, Switzerland, assignor to J. Bobst & Fils, S.A., Prilly, Switzerland
Filed Oct. 15, 1971, Ser. No. 189,510
Claims priority, application Switzerland, Oct. 20, 1970, 15505/70
Int. Cl. B65h *1/06*
U.S. Cl. 271—44 A **8 Claims**



A levelling device for cardboard sheet material and the like located at a feed station of a sheet material processing station to assure that the forward marginal area of each sheet lies flat on the feed surface of the processing machine. It is particularly concerned with sensing whether both the forward edge of a sheet as well as a portion of the sheet spaced a short distance rearwardly of the forward edge are lying flat on the feed surface; and if not, raising or lowering the rear edge of the sheet until the forward marginal edge is lying flat on the feed surface.

3,715,117
ADJUSTABLE SHEET GUIDE APPARATUS

Anthony P. Di Fulvio, and William C. Wilson, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.
Filed Nov. 5, 1971, Ser. No. 195,958
Int. Cl. B65h *1/04*
U.S. Cl. 271—61 **7 Claims**



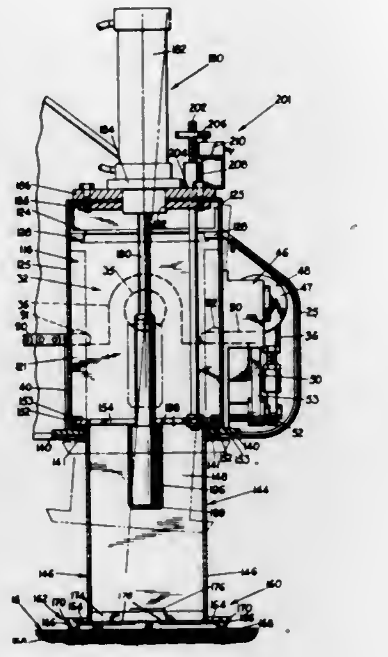
Document side guides seated on opposite sides of a receiving shelf of a document feeder are spring biased in the longitudinal direction of the receiving shelf so that a wedge-shaped brake pad attached to each of the side guides normally engages a wedge-shaped receiving bracket attached to the underside of the receiving shelf. When the brake pads are disengaged from the wedge-shaped brackets by manually pushing the side guides against the bias of the springs, the side guides are free to move laterally to the extremes of pin slots located in the receiving shelf. When the side guides are released, the springs return the side guides to the wedging mode, thus braking the guides as positioned.

3,715,118
SHEET SEPARATOR AND FEEDER ASSEMBLY

Charles L. Larson, Grants Pass, Oreg., assignor to Jeddeloh Bros. Sweed Mills, Inc., Gold Hill, Oreg.
Filed Dec. 3, 1970, Ser. No. 94,643
Int. Cl. B65h *3/08, 3/46*
U.S. Cl. 271—26 R **4 Claims**

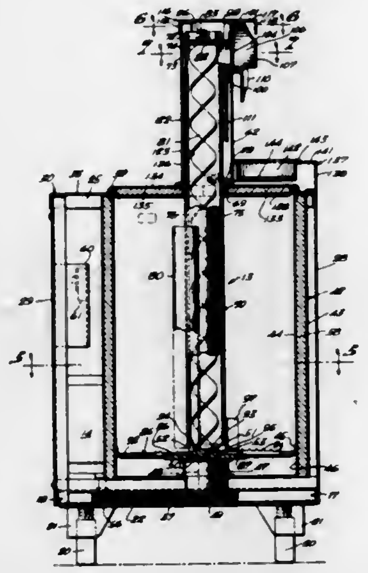
An automatic feeder assembly especially adapted for handling thin sheets, such as veneer, arranged in stacks. A vacuum-operated automatic feeder is provided for separating and lifting individual sheets from a stack and transferring the sheets to a desired location, such as the inlet of a loading mechanism for a multideck conveyor. The automatic feeder assembly includes a vacuum manifold provided with a telescoping head for each stack of sheets, adapted to engage the top surface of the uppermost sheet on the stack for lifting thereof. Means are provided for elevating and then plunging the head down with the upper sheet retained thereon, for separating the sheet from any lower sheets that are adhered thereto. The manifold and the sheet are then tilted to further ensure separation of the sheet from any lower sheets, and driven forward until

the leading edge of the sheet is engaged by the inlet rollers of a loading mechanism. A plural array of telescoping heads can be arranged in side-by-side relationship to service multiple stacks of sheets.



3,715,119
AUTOMATIC ICE DISPENSER

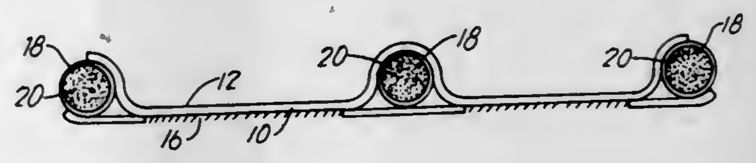
George R. Shelley; Robert J. Shelley, Jr.; Arthur B. Dixon, and Bruce House, all of 4225 N. W. 72nd Avenue, Miami, Fla. Continuation-in-part of Ser. No. 862,587, Aug. 25, 1969, Pat. No. 3,608,786. This application May 4, 1970, Ser. No. 34,280
Int. Cl. G01f *11/20*
U.S. Cl. 222—241 **9 Claims**



An ice dispenser for automatically dispensing crushed ice fed from an ice bin to a delivery opening of the ice bin in response to actuation of a push-plate beneath the opening is described. Crushed ice is lifted from the ice bin by means of an ice-elevating mechanism in the form of an auger having an ice feeder disc at its lower end and a stationary auger tube within which the auger turns for elevating the ice. The auger and its feeder disc are driven at the bottom through a drive pin mechanism journalled in the bottom of the ice bin and releasably connectable with the drive pin mechanism to permit removal and disassembly of the ice-elevating mechanism for cleaning.

3,715,120
CHILD'S SLIDE

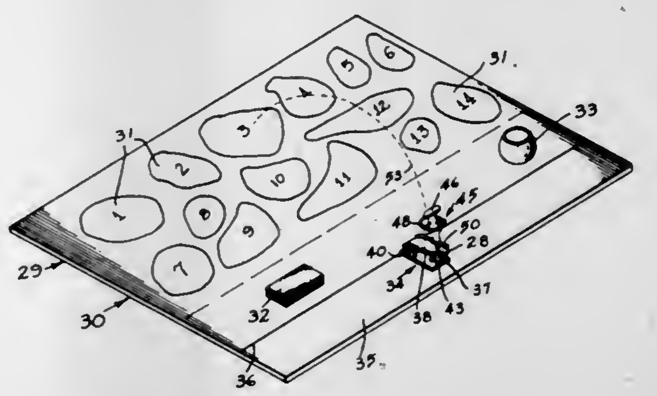
Fred R. Peltola, 67-41 211 Street, Bayside, N.Y.
Filed July 20, 1970, Ser. No. 56,371
Int. Cl. A63g *21/04*
U.S. Cl. 272—56.5 R **5 Claims**



An exercising and amusement slide adapted to be detachably secured to the side of a hill and to extend downward with a flat flexible runner providing the sliding surface and means secured to opposite edges of the runner to form protective guide rails therefor.

3,715,121
TARGET AND PROJECTING APPARATUS INCLUDING A BALANCED PROJECTILE

Neil R. Renn and Madeline S. Renn, both of 2020 North St., Harrisburg, Pa. 17103
Filed July 2, 1971, Ser. No. 159,302
Int. Cl. A63b *71/02*
U.S. Cl. 273—101 **1 Claim**

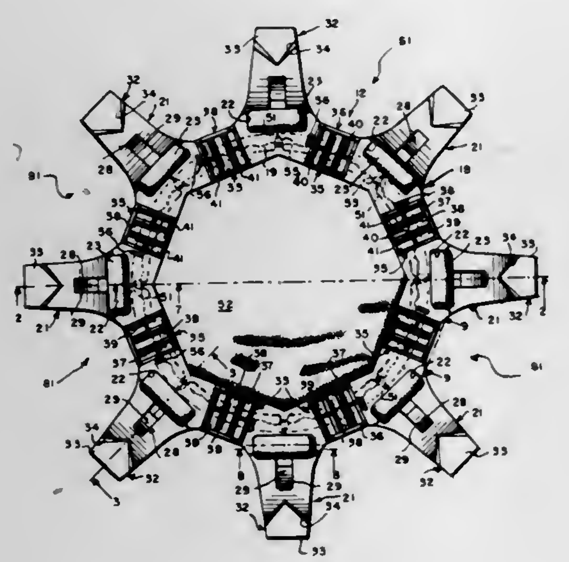


A game that includes a playing surface, a springboard, cards, tokens, and a figure that is adapted to be propelled by the springboard onto the playing surface, and wherein the figure or body member has a balancing ring thereon for assuring that it will land upright.

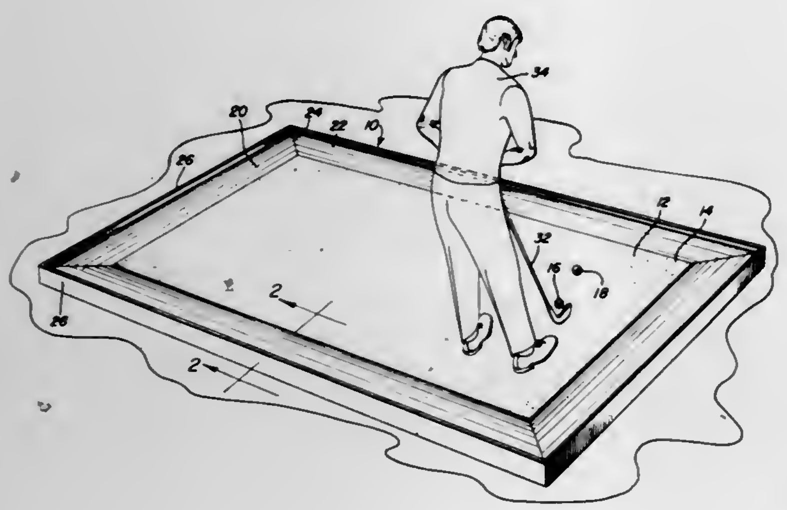
3,715,122
GAME TABLE

Theodore G. Brown, 4401 Lantana Ave., Sacramento, Calif. 95824
Filed Feb. 23, 1971, Ser. No. 117,886
Int. Cl. A63f *3/00;* **A47b** *13/00*
U.S. Cl. 273—136 Z **9 Claims**

A game table for the playing of card games involving the use of chips and which is especially intended for commercial card rooms. The table includes a detachable rim portion divided by circumferentially spaced outwardly and downwardly projecting arms into sections or stations, each located between adjacent arms, one of which is allotted to each player, thus preventing any player from occupying more than his allotted space. Each station contains facilities to accommodate a drinking glass, an ashtray, chips and matches, as well as a conveniently located arm rest.

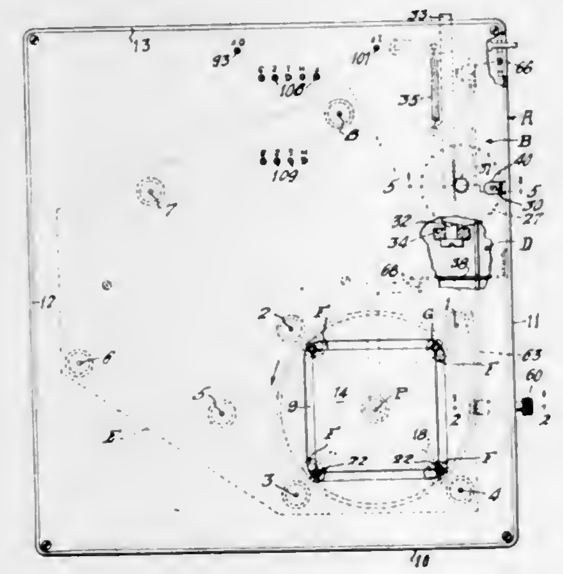


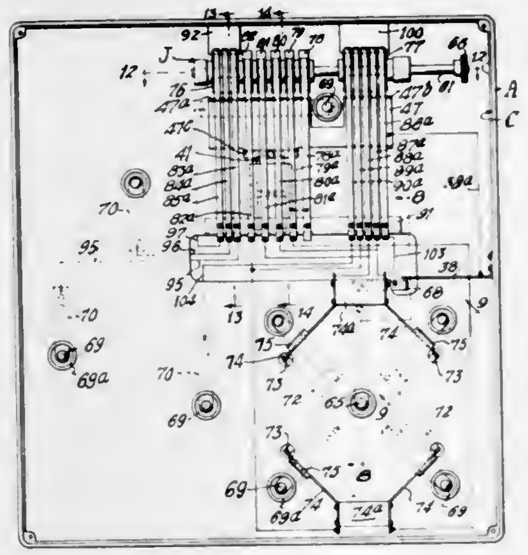
3,715,123
GOLF GAME DEVICE
Donald J. Baum, 3402 Curtis Drive, Hillcrest Heights, Md.
Filed Dec. 16, 1971, Ser. No. 208,716
Int. Cl. A63b *69/36, 67/02*
U.S. Cl. 273—35 R **3 Claims**



A game device in the form of a generally rectangular playing surface of generally planar construction for receiving two or more golf balls with one of the balls being white and to be struck by a golf putter and the other ball to be distinguishably colored and forming an object ball. The playing surface is provided with a covering material simulating the putting green surrounding a hole in a golf course and the playing area is surrounded by an upwardly slanted peripheral wall terminating in an upwardly and slightly inwardly inclined rail by which a game may be played and points scored in accordance with a set of rules when the white golf ball is struck by a putter and caused to contact the colored or object ball after it has been banked off of the slanted peripheral wall in a predetermined manner.

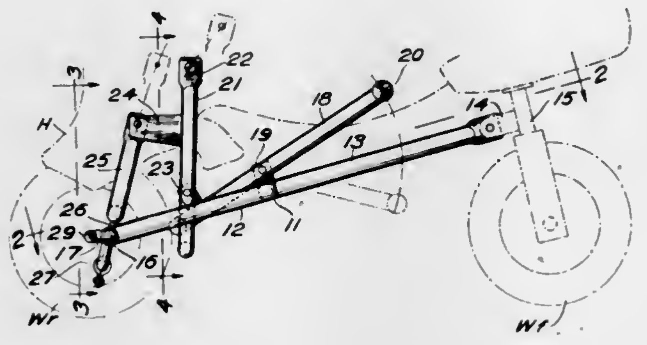
3,715,124
SIMULATED BALL GAME APPARATUS
George A. Swartz, Box 808, R.D. 1, Martinsville, N.J.
Filed Nov. 17, 1969, Ser. No. 877,179
Int. Cl. A63f *7/06*
U.S. Cl. 273—93 R **3 Claims**





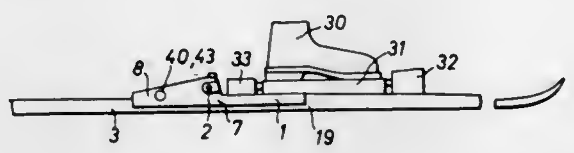
Game piece carriers to and from which selectively a game piece can be separably connected and disconnected manually, are moved over a predetermined path under control of a player through successive offensive plays directed by a player operated indicator. Selectively operable defensive play means through a continually changing chance mechanism are either active or inactive and each thereof has associated therewith an indicium which may be designated by rules of play as correlated with a selected indicium on the offensive play indicator, the chance mechanism being changed by and with the mechanism for moving the game piece carriers. Also included are selectively operable defensive play indicating means, and means for actuating one thereof in response to operation of a defensive play means which is energized when so actuated. The separable connection of the game pieces to the carriers permits movement of the game pieces from one carrier to another in simulation of base stealing.

3,715,125
LINKAGE MECHANISM FOR RIDER PROPELLED TOYS
William E. Payne, 1204 Alpine Road, Walnut Creek, Calif. 94596
Filed Dec. 10, 1971, Ser. No. 206,759
Int. Cl. A63g *17/00*
U.S. Cl. 280—1.194 **2 Claims**



A toy horse, propelled by the rider, which simulates the loping action, characteristic of horses, as it moves in a forward direction. The actuating force is provided by the rider and consists of a cyclic combination of muscular action and applied weight. The propelling mechanism is so designed as to eliminate the usual tendency of such devices to become "hung up" on center.

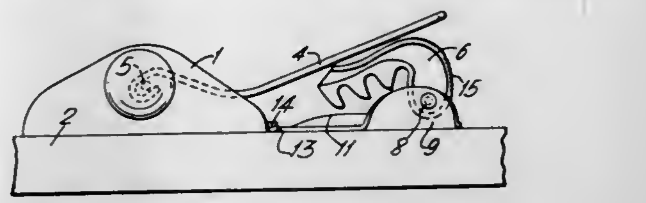
3,715,126
DEVICE FOR CATCHING A RUNAWAY SKI
Gunter Schwarz, Pflugstrasse 6, Zurich, Switzerland
Filed July 22, 1970, Ser. No. 57,289
Claims priority, application Switzerland, July 22, 1969, 11212/69
Int. Cl. A63c *7/10*
U.S. Cl. 280—11.13 B **6 Claims**



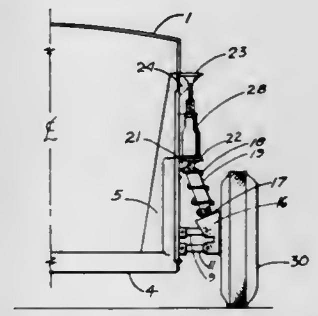
A catching device for use with a ski to prevent its running away upon becoming loose from the foot of the skier comprising an axle, a yoke fixedly mounted on the axle for rotation therewith and having a shank portion extending beyond the axle at both sides thereof, a spring biasing the axle and the shank portion thereby in a direction which is transverse to the general direction of the running surface of a ski, when the catching device is mounted on a ski, and pointing downward from the running surface, thereby engaging the snow and braking the movement of the ski.

3,715,127
SKI BINDING WITH CLAMPING BAIL
Bror With, Olaf Schous vei, 4, Oslo 5, Norway
Filed Jan. 25, 1971, Ser. No. 109,222
Claims priority, application Norway, Feb. 2, 1970, 366/70; Oct. 15, 1970, 3895/70
Int. Cl. A63c *9/20*
U.S. Cl. 280—11.35 B **10 Claims**

In a ski binding of the toe binding type having a clamping bail engaging the sole rim and pivoted in a toe iron, and a toothed hook engaging a transverse portion of the bail and pivoted at an axis in a structurally defined distance from the pivotal axis of the bail, the hook has on its front side a corrugated edge onto which the said transverse portion can be pressed firmly in an inwardly turned inoperative position of the hook. The pivotal support for the hook is integral with the toe iron or engages a forward portion of the same. In the latter case it is attached to the ski by only one screw located behind the pivotal axis of the hook and is locked against lateral rotation by engaging the bottom plate of the toe iron. The said transverse portion of the bail is the bight portion of the same or a cross-bar interconnecting the legs of the bail at bends forming downwardly and inwardly facing angles, while the bail has an outward spring bias.



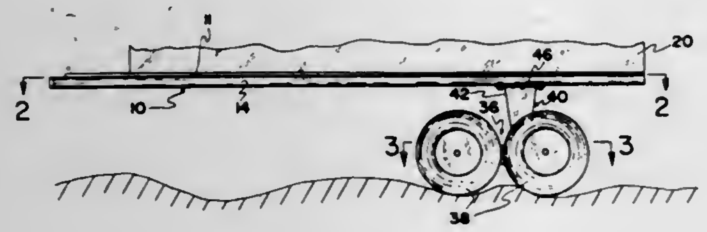
3,715,128
RETRACTABLE SUSPENSION AND RUNNING GEAR FOR TRAILERS
George W. Allen, 810 W. Limberlost Rd., and Charles S. Gray, 1127 E. 10th St., both of Tucson, Ariz.
Filed Aug. 16, 1971, Ser. No. 171,927
Int. Cl. B62d *21/18*
U.S. Cl. 280—43.22 **4 Claims**



A retractable suspension and running gear is provided which lends itself to easy mounting upon the side walls of existing road trailers. Firmly mounted on the side of the trailer are two pairs of steel angular bars, such pairs forming vertical spaced channels for receiving in slidable engagement therewith a steel plate which may be locked in various positions in its vertical channels. A lower portion of said plate carries a pair of swing arms the ends of which are pivoted thereto in spaced relationship to each other and the other ends of which are pivoted (also in spaced relationship) to a substantially vertically disposed part of the wheel assembly which receives the lower end of a coil spring suspension member. The upper portion of the slidable plate is provided with means for receiving and securing the upper end of said spring member. The upper part of the steel channel assembly is provided with a suitable ledge against which a jack or other means may bear when downward force is applied to said spring receiving means on said slidable plate in order to move said plate into the designed vertical position. Locking means is provided to hold the slidable plate in such desired position. An indicator of proper tire pressure is actuated by one of the swing arms.

3,715,129
SUSPENSION SYSTEM
Ezra Cordell Lundahl, Idaho Falls, Idaho, assignor to Ezra C. Lundahl, Inc., Logan, Utah
Filed Feb. 22, 1971, Ser. No. 117,574
Int. Cl. B60g *5/06*
U.S. Cl. 280—104.5 R **5 Claims**

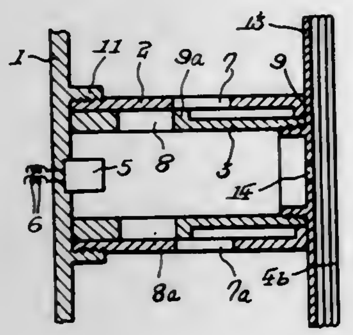
A bracket-supported suspension system for a hay wagon or the like capable of being operated over relatively rough terrain, comprising method and apparatus which allow continuous ground contact of a plurality of support wheels over such irregular terrain as is encountered in day-to-day farming and further readily accommodates tilting of the vehicle in respect to the wheels to load or unload cargo. The apparatus is designed to absorb terrain irregularities such as or similar to those developed by furrows or small ditches without immobilizing the hay wagon and damp the magnitude of any such irregularities transferred to the hay wagon. The illustrated suspension system comprises a tripod support including three wheels, two mounted in laterally-spaced relation to absorb lateral irregularities encountered by the wheel set and one mounted in longitudinally-spaced relation to the other two to absorb longitudinal terrain irregularities. All wheels float or travel over the ground with individual floatation area unaffected by the action of the single wheel action.



3,715,130
SHOCK ABSORBING DEVICE FOR PROTECTING A RIDER IN A HIGH SPEED VEHICLE SUCH AS AUTOMOBILE

Ikuo Harada, 5–6–1 Minamisawa, Kurume-cho, Tokyo, Japan; and Masabumi Hamazaki, 5003–14 Midorigaoka, Nobeoka-shi; and Nobuyuki Isawa, 607–3 Midorigaoka, Nobeoka-shi, both of Nobeoka, Japan

Filed Nov. 2, 1970, Ser. No. 86,201
Claims priority, application Japan, Nov. 5, 1969, 44/88,060; Feb. 24, 1970, 45/15,187; Aug. 5, 1970, 45/68,009
Int. Cl. B60r *21/10*
U.S. Cl. 280—150 AB **2 Claims**

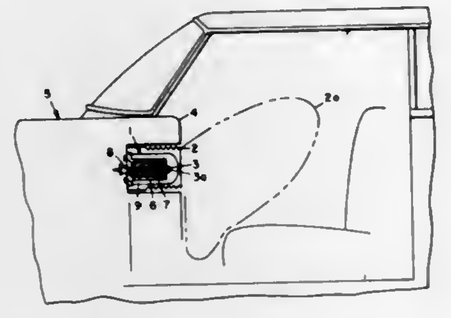


A shock absorbing device designed to prop the rider's body in a collision of the vehicle and including a telescopically extensible structure or structures each comprised of a plurality of slidably interfitting tubular members. In a collision, high gas pressure is produced in the structure by gas producing means operable in association with a shock sensor provided therefore to cause the structure to extend quickly. Various forms of cushion or pad can be secured to one of the tubular members of the structure which extends outermost in operation to softly support the rider's body when it is thrown forward.

3,715,131
CHEMICAL GAS GENERATING DEVICE FOR AN AUTOMOBILE SAFETY SYSTEM

Eldon K. Hurley, Wharton; Robert S. Maule; Rocco C. Musso, both of Kenvil, and Lowell E. Smith, Bernardsville, all of N.J., assignors to Hercules Incorporated, Wilmington, Del.

Continuation-in-part of Ser. No. 35,795, May 8, 1970, abandoned. This application June 4, 1971, Ser. No. 149,981
Int. Cl. B60c *21/10*
U.S. Cl. 280—150 AB **13 Claims**

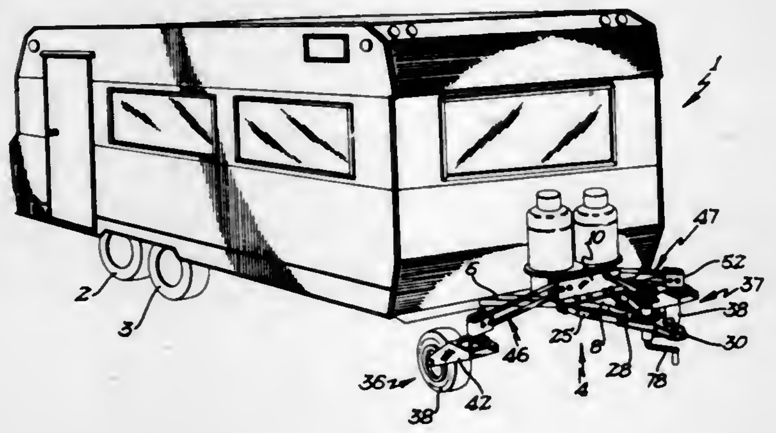


A gas generator capable of supplying sufficient gas to inflate an inflatable bag of a bag-type automobile safety system within the time limitations of the system is provided. A gas generating charge comprising a stabilized admixture of alkali or alkaline metal nitride and an ammonium salt is initiated to a sufficient reaction rate by an initiating charge extending substantially through the length of the gas generating charge to supply the necessary gases.

3,715,132
LOAD SUPPORTING CARRIAGE STRUCTURE FOR TRAILERS

Donald I. Denny, 2626 Loomis St., La Crosse, Wis.

Filed Feb. 24, 1971, Ser. No. 118,328
Int. Cl. B62d *53/04*
U.S. Cl. 280—405 R **10 Claims**

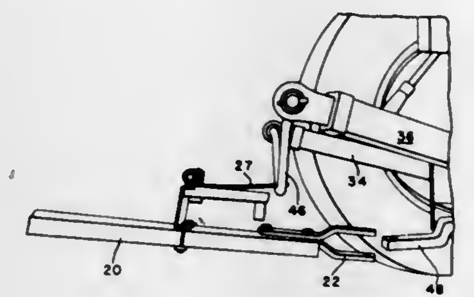


A wheeled carriage assembly for supporting the front end of trailer including a mounting beam assembly which is rigidly attached to the front end of a trailer, a draw bar assembly pivotally connected to the mounting beam for pivotal movement about a horizontal axis, and a pair of torsion bar units rigidly connected to the mounting beam assembly and extending laterally outwardly on opposite sides thereof, each of the torsion bar units being connected at its outer end to a caster wheel at a location offset from the center of the wheel. An elongated spring bar rigidly attached at one end to the aforesaid beam assembly and having its forward end engaged by a coupling on the front of the pivotal draw bar assembly limits relative vertical movement between the front end of the trailer and the rear end of a towing vehicle.

3,715,133
ATTACHMENTS PERMITTING A VEHICLE TONGUE TO BE LIFTED BY ACTUATION OF TRACTOR DRAFT LINKS

Richard Arthur Schafer, Hudson, Iowa, assignor to Deere & Company, Moline, Ill.

Filed May 10, 1971, Ser. No. 141,904
Int. Cl. B60d *1/04*
U.S. Cl. 280—479 A **6 Claims**

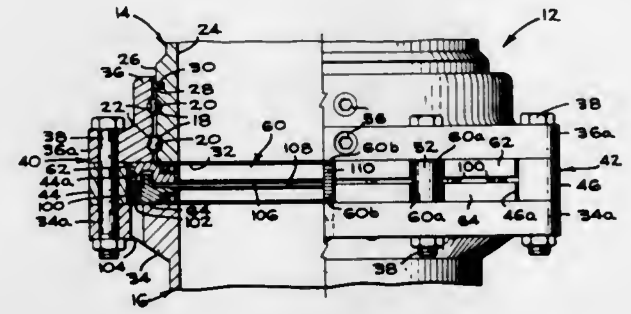


A two-wheeled vehicle and an agricultural tractor have cooperative attachments for permitting the tractor draft links to be operated to raise the tongue of the vehicle from the ground into position for connection to the tractor drawbar. Specifically, a spring member is fixed to the vehicle tongue, rearwardly of the forward end of the latter, and includes a free end portion extending forwardly above the tongue. A V-shaped pickup rod has its opposite ends received in ball connectors at the rear ends of the lift arms of the tractor and is adapted to liftingly engage the free end portion of the spring member.

3,715,134
PIPE SWIVEL JOINT WITH A CARTRIDGE-TYPE PACKING UNIT

Armand L. Faccou, Santa Ana, Calif., assignor to FMC Corpration, San Jose, Calif.

Filed June 25, 1971, Ser. No. 156,874
Int. Cl. F16l *27/00*
U.S. Cl. 285—276 **8 Claims**

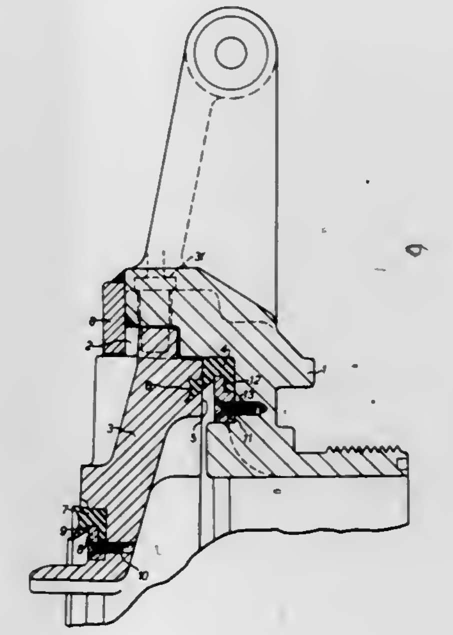


A pipe swivel joint with an annular cartridge-type packing unit for providing a fluid-tight seal between the joint's male and female relatively rotatable conduit elements. The female conduit element includes a pair of opposed radial flanges spaced axially to form an annular packing chamber, and one or more removable spacers between the flanges to permit installation and replacement of the packing unit without having to disassemble the joint. The axial dimension of the packing unit is adjustable, whether it is inside or outside the joint's packing chamber, to facilitate its contraction to less than the axial dimension of the packing chamber so that it can be easily slipped into and out of the chamber, and also its expansion when in the chamber into fluid-tight relationship with the joint's relatively rotatable elements.

3,715,135
SEALING MEANS FOR PIPES

Arthur Loftus Paddington, Radbrooke, England, assignor to British Ropes Limited, Doncaster, Yorkshire, England

Filed June 22, 1970, Ser. No. 48,211
Claims priority, application Great Britain, July 2, 1969, 33,488/69
Int. Cl. F16l *17/00*
U.S. Cl. 285—379 **7 Claims**

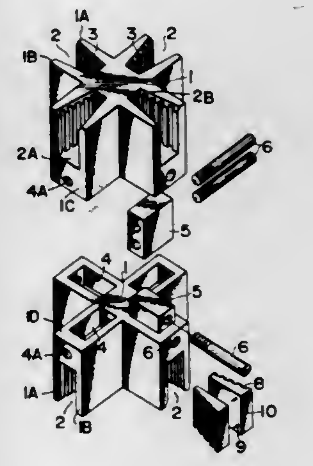


Sealing means for providing a fluidtight connection between two pipe sections. The sealing means comprises an annular housing arranged to be secured to one of the pipe sections, a floating ring mounted loosely in an annular recess in the housing so as to be capable of limited radial and axial movement relative thereto, and a resilient annular sealing member between the housing and the floating ring. The floating ring is arranged to make sealing contact with the other pipe section and, by virtue of its ability to move radially and axially relative to the housing, it can compensate for misalignment between the two pipe sections.

3,715,136
THICKNESS-ADJUSTABLE JOINT ASSEMBLY FOR BUILDING USE

Tsukasa Yoshida, Nikko Danchi 15-202, 1-3 Nikkoch, Fuchushi, Tokyo, Japan

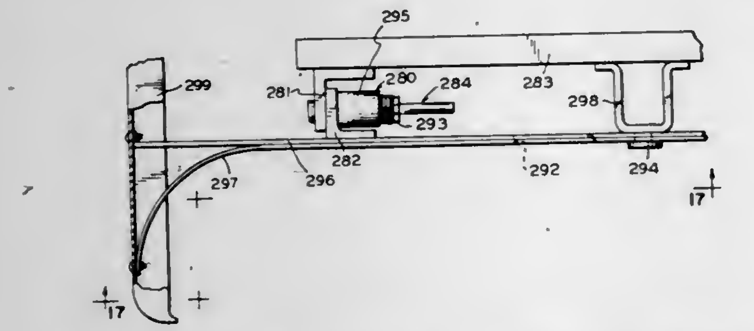
Filed Feb. 5, 1971, Ser. No. 113,019
Int. Cl. F16b *5/06*
U.S. Cl. 287—189.36 D **5 Claims**



A joint assembly for the fabrication of building units, furniture, display cases and the like, including basically at least two main joint bodies having a plurality of panel receiving grooves, each formed in a different direction, and a plurality of coupling grooves for combining the two main joint bodies. The coupling grooves are provided on the bottom of the joint main bodies and coupling pins are used to couple at least two such bodies with each other. The panel receiving grooves are each provided with two opposite side walls formed to have at least the forward and upper sides opened. The inner side faces of the respective side walls are inclined and provided with a plurality of dovetail grooves. A pair of wedges are associated with each panel receiving groove. Each wedge has two sides faces, one of which acts to fit on a panel end portion, and the other of which is provided with dovetail protrusions. The use of these wedges allows panels of uniform or different thicknesses to be combined. By this construction, the present joint assembly offers easy connection of panels without the need of any other supporting elements.

3,715,137
ENERGY ABSORBING STRUCTURES

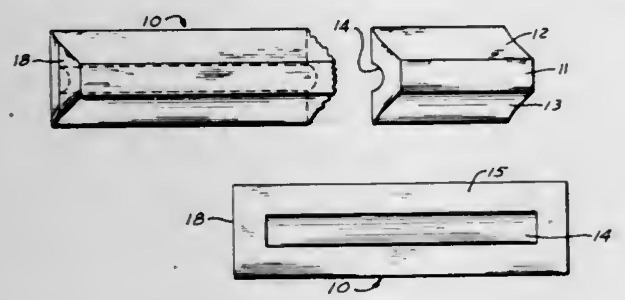
Gary K. Sandberg, Aloha, Oreg., assignor to Omark Industries, Inc., Portland, Oreg.
Filed Sept. 18, 1970, Ser. No. 73,403
Int. Cl. B60r *19/04*; F16d *63/00*
U.S. Cl. 293—1 **16 Claims**



A fastener unit has a drawable rod and a retainer at one end of the shank and a die at the other end of the shank. The retainer in one embodiment is a riveted head on the shank. In another embodiment the retainer is a threaded head on the shank. In another embodiment the retainer includes a threaded plug on the shank. A further embodiment includes a vehicle bumper having a bracket bolted to a frame bracket by an energy absorbing fastener.

3,715,138
RESILIENT FRANGIBLE BUMPER GUARD

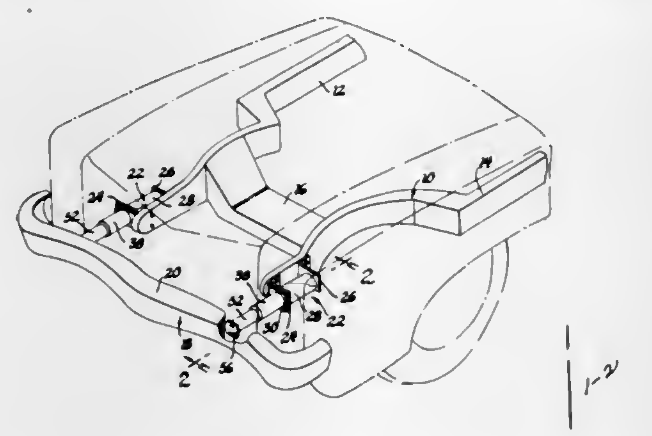
Milton Finkle, 2724 Vandiver Street, West Palm Beach, Fla.
Filed Jan. 22, 1971, Ser. No. 108,833
Int. Cl. B60r *19/08*; B61f *19/04*; E04f *19/00*
U.S. Cl. 293—1 **7 Claims**



A resilient, flexible breakaway bumper guard for breakaway attachment to a vehicle bumper. The resilient guard is mounted on the bumper with an adhesive that allows for the breaking away of the guard upon a sizable collision, thus reducing or eliminating damage to the bumper. The adhesive may also hold air in a trapped space between the bumper and the resilient member providing additional resiliency prior to break-away.

3,715,139
SHOCK ABSORBING BUMPER

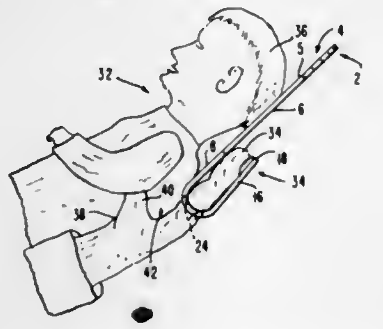
Robert E. Tuggle, Saginaw, Mich., assignor to General Motors Corporation, Detroit, Mich.
Filed Aug. 12, 1971, Ser. No. 171,238
Int. Cl. B60r *19/02*; B61f *19/04*; F16f *9/30*
U.S. Cl. 293—70 **4 Claims**



An energy absorbing support unit adapted to mount a bumper bar on a vehicle frame for bodily movement through a predetermined stroke in response to impacts thereon, the support unit including a mounting tube rigidly affixed to the frame, a support tube of length substantially exceeding the bumper stroke and telescopically supported on the mounting tube, a pressure chamber of length generally equal to the bumper stroke filled with a combined damping and spring return medium and rigidly attached to the support tube, and an orificed piston and piston rod assembly slidably supported on the pressure chamber and connected to the mounting tube. Under impact, the pressure chamber and support tube are forced rearward relative to the piston and rod so that the damping and return medium is extruded through the piston for damping and compressed by the rod for effecting restoration of the support tube after impact.

3,715,140
INFANT HEAD SUPPORT

Steven Arnold Seiden, 1120 Park Ave., New York, N.Y. 10028
Filed Jan. 21, 1972, Ser. No. 219,768
Int. Cl. B65g *7/12*
U.S. Cl. 294—25 **7 Claims**

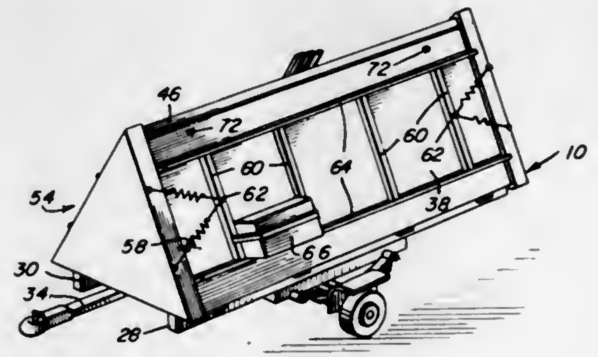


A hand-held device for supporting the head of an infant being held. The support device comprises a head support plate having a top and bottom surface and a handle connected to one edge of the support plate. The handle consists of a top portion, a central portion and a bottom portion. The top portion of the handle is connected at one end thereof to the support plate and at the other end to the central portion of the handle which extends downwardly from the top portion of the handle and away from the bottom surface of the support plate. The central portion of the handle is connected to a bottom portion of the handle which extends under the top portion of the handle and towards the bottom surface of the support plate. The central portion has a centrally located aperture for the insertion of fingers of the user between the lower portion of the handle and the top portion of the handle and support plate.

In a preferred embodiment, the free end of the bottom portion of the handle is resiliently biased upwards towards the bottom surface of the support plate. The support is formed integrally of a thermoplastic sheet.

3,715,141
CONVERTIBLE TRAILER CONSTRUCTION

John W. Cary, Route 2, Kimberly, Idaho
Filed Jan. 5, 1971, Ser. No. 103,977
Int. Cl. B60p *3/32*
U.S. Cl. 296—23 R **7 Claims**

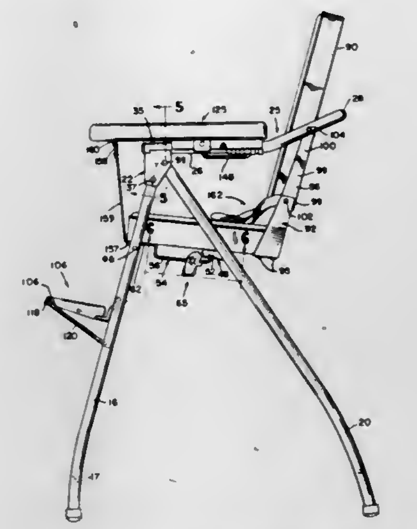


A trailer body construction for disposition upon a trailer chassis. The body construction includes a center elongated longitudinally extending horizontal flooring section secured to the associated chassis in generally transverse centered position thereon as well as a pair of elongated longitudinally extending opposite side sections pivotally secured along one pair of longitudinal edge portions to the corresponding side edge portions of the center section for swinging between horizontal positions forming side extensions of said center section and upwardly convergent positions with their free edge portions disposed at least closely adjacent each other. The body construction includes both triangular opposite end wall sections for closing the opposite ends of the body construction when the side sections are swung to upwardly convergent positions and generally rectangular end wall sections for securement between corresponding ends of the side wall sections when the latter are disposed in generally parallel upstanding relation. Also, the center section is provided with structure for supporting the bows of a camping tent and the side sections include outer corner jack assemblies for supporting the side sections in substantially coplanar relation with the center section when the trailer body construction is being utilized as the base of a camping trailer.

3,715,142
FOLDING HIGH CHAIR

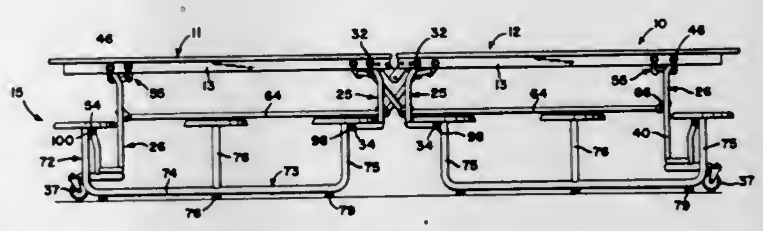
Ralph B. Lay, and Ogden R. Olsen, both of Columbus, Ind., assignors to Hamilton Cosco, Inc., Columbus, Ind.
Filed June 10, 1971, Ser. No. 151,644
Int. Cl. A47c *4/18*
U.S. Cl. 297—39 **5 Claims**

A folding high chair in which the front and rear legs are swingably interconnected to each other and to a tray support. The seat is swingably connected to the front legs on a fixed axis and to the rear legs on a sliding axis, and the back rest is swingably connected to said seat and tray support. The front and rear legs are releasably locked in an extended diverging position with the seat and back rest generally normal to each other by a locking assembly carried from the seat.



3,715,143
FOLDING TABLE AND SEAT SUPPORT STRUCTURE

Carl F. Gerken, New Castle, and Emmett R. Bales, New Manchester, both of Ind., assignors to American Standard Inc., New York, N.Y.
Filed Feb. 2, 1971, Ser. No. 111,863
Int. Cl. A47b *3/14*
U.S. Cl. 297—159 **1 Claim**

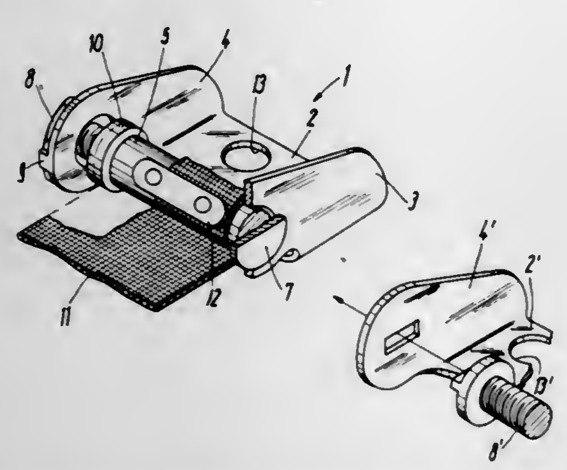


A folding table has a support structure including inner end frames and outer end frames pivotally secured near the inner and outer ends of a pair of table tops hinged together at their respective inner ends. The inner end frames are suspended above the floor, while the outer end frames carry casters for engaging the floor during folding and while folded, and both sets of frames include elbows or end portions which extend laterally outwardly from both sides of the table tops. Seating structures are pivotally mounted on each side of each table top on the lateral end portions of the inner end outer frames on corresponding sides of the table tops. Each seating structure includes a unitary member which provides longitudinal seating strength and has means for pivotally receiving the respective end portions at the inner end and outer end of the table tops. The unitary members preferably engage the floor only when the table is in the operative position, providing a total supporting function, but lift off the floor when the table is moved toward the folded position when the casters engage the floor and provide the total supporting function.

3,715,144
SAFETY BELT CONSTRUCTION

Horst Minolla, Norderstedt, Germany, assignor to Klippan GmbH, Nordestedt, Germany
Filed Sept. 16, 1970, Ser. No. 72,773
Claims priority, application Germany, Sept. 19, 1969, P 19 47 438.5
Int. Cl. A62b *35/60*
U.S. Cl. 297—386 **3 Claims**

A safety belt has an end portion and a housing mounts a structural element which is at least in part rotatable with concomitant displacement longitudinally of its axis of rotation. Deformable means, for instance a ring confined between portions of the housing and an axial end of the structural element, is provided and so associated with the structural element that it is deformed by the same when the structural element is displaced longitudinally of its axis of rotation in response to the pull upon the safety belt section exceeding a predetermined level of force.

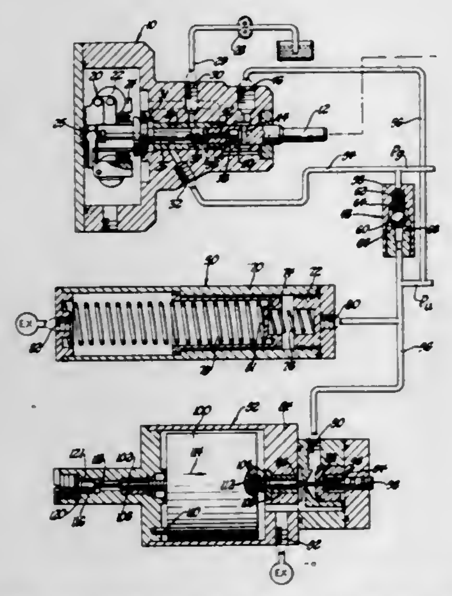


3,715,145

HYDRAULIC ANTI-LOCK BRAKE CONTROL SYSTEM

John L. Harned, Grosse Pointe Woods, and Edwin E. Stewart, Warren, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Sept. 30, 1971, Ser. No. 185,304
Int. Cl. B60t *8/12*
U.S. Cl. 303—21 F **3 Claims**



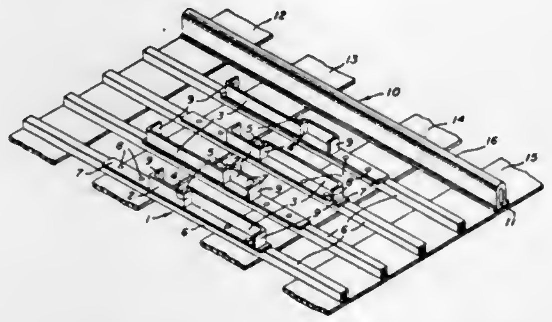
The invention utilizes a wheel speed proportional pressure generated by a transmission governor and a vehicle ground speed pressure provided by a vehicle ground speed computer and provides a hydraulic anti-lock brake system including a fluid pressure operated wheel brake, an operator actuated master cylinder, a low speed cutout valve which communicates the master cylinder pressure directly to the wheel brake at vehicle speeds below some predetermined level, a control valve which modulates the governor pressure to provide a control pressure proportional to the amount by which master cylinder pressure exceeds the brake pressure and a clutch modulator which acts at vehicle speeds above the threshold of the low speed cutout valve to provide a brake pressure proportional to the control pressure. The transmission governor is modified to receive the vehicle ground speed pressure and apply a force proportional thereto to the governor valve spool so that during wheel slip the governor pressure is a function of both wheel speed and ground speed, or, in other words, a function of the magnitude of wheel slip.

3,715,146

SNOW CLEAT AND TRACK FOR TRACKED VEHICLE

William Lauchlin Robertson, 7024 Kenosie Place, Calgary, Alberta, Canada

Filed Jan. 15, 1971, Ser. No. 106,668
Claims priority, application Canada, Jan. 19, 1970, 072495
Int. Cl. B62d *55/28*
U.S. Cl. 305—35 EB **21 Claims**



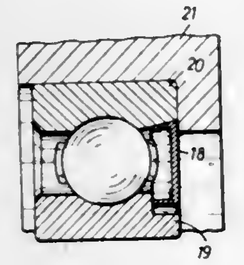
A snow cleat and a track particularly adapted for use in deep snow. A track wherein snow cleats are arranged to provide greater spacings longitudinally of the track adjacent each edge of the track than centrally thereof to increase the shear strength of the supporting snow. The snow cleat may comprise two traction blade portions of different lengths defining a traction blade which is unsymmetrically arranged lengthwise of a supporting base, and an ice cleat mounted intermediate said traction blade portions. The snow track may also comprise snow blades extending the full width of the track and separating a limited number of snow cleats having traction blades positioned in staggered relation to each other transversely of the track.

3,715,147

SEALING RING ARRANGEMENT FOR ANTI-FRICTION BEARINGS

Gunter Zahn, Dusseldorf, Germany, assignor to Ziller & Co., Dusseldorf, Germany

Division of Ser. No. 781,814, Dec. 6, 1968, Pat. No. 3,586,404. This application Sept. 2, 1970, Ser. No. 69,052
Claims priority, application Germany, Dec. 14, 1967, P 16 25 661.4
Int. Cl. F16c *33/78*
U.S. Cl. 308—187.2 **2 Claims**



A sealing ring and mounting thereof for an anti-friction bearing, which has a sealing edge for resiliently engaging one end face of one race ring of an anti-friction bearing and also has a conically shaped arm for engagement with a conical surface on either the other ring of the anti-friction bearing or a conical surface of a housing or a shaft.

3,715,148

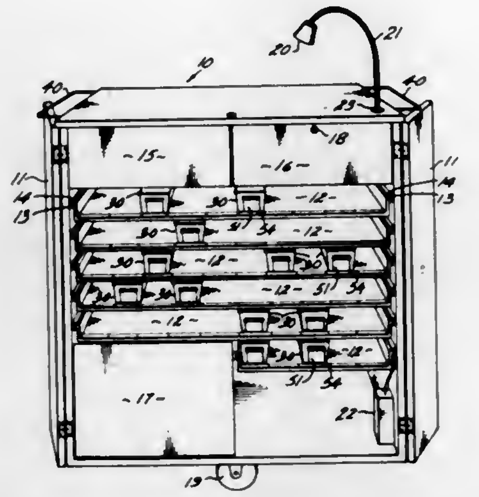
MEDICINE DISPENSING CABINET

Clifford L. Beals, 326 N. Riverside Ave., Rialto, Calif. 92310

Filed June 3, 1971, Ser. No. 149,731
Int. Cl. A47b *81/00, 91/00*
U.S. Cl. 312—209 **1 Claim**

This invention discloses a medicine dispensing cabinet which provides an efficient method of dispensing medicine to patients in a hospital or a convalescent home. The

device discloses a cabinet having a plurality of sliding drawers, a plurality of dispensing trays, each tray having a transparent, spring-biased lid, and a resilient clip-handle for carrying identification information.

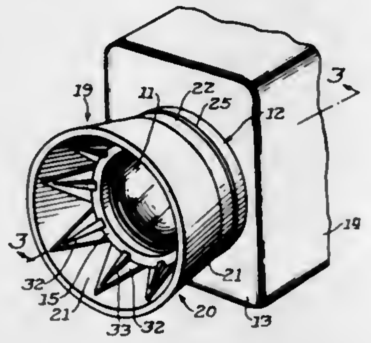


3,715,149

CONVERTIBLE SUNSHADE AND LENS CAP

Stanley R. Freeland, Glenview, Ill., assignor to Bell & Howell Company, Chicago, Ill.

Filed Apr. 16, 1971, Ser. No. 134,795
Int. Cl. G02b *23/16;* **G03b** *11/04*
U.S. Cl. 350—58 **2 Claims**



A convertible sunshade and lens cap device adapted for protecting a lens in a lens mount of an optical instrument respectively from light rays of extreme angles during use and from dust during storage. The device comprises a tubular sunshade adjustable to cause hinged, preferably integral, flap portions to pivot between open and closed orientations.

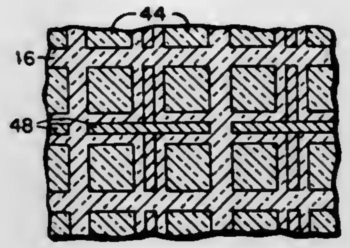
3,715,150

PHOTOCHROMIC FIBER OPTIC PLATE

Roy E. Love and Ralph A. Westwig, Corning, N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Sept. 14, 1971, Ser. No. 180,364
Int. Cl. G02b *5/16*
U.S. Cl. 350—96 B **12 Claims**

Disclosed is an optical image storage system of the type utilizing a photochromic fiber optic image storage plate and an apparatus for rapidly bleaching information stored in the storage plate. In addition to the usual multiplicity of optical fibers containing photochromic material, the image storage plate also comprises a plurality of conductive fibers disposed parallel to the optical fibers. Means such as an induction coil disposed around the image storage plate or transparent electroconductive electrodes disposed on opposite faces of the image storage plate are provided for causing current flow in the conductive fibers to generate heat therein, thereby bleaching or erasing information contained in the image storage plate.

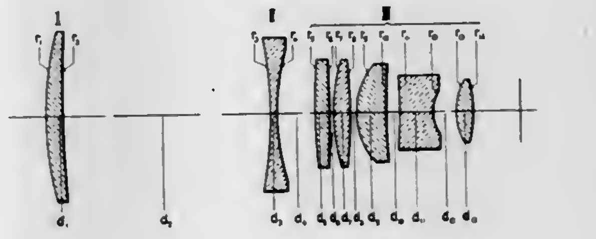


3,715,151

PANCRATIC LENS

Trude Muszumanski, and Irmgard Wendisch, both of Vienna, Austria, assignors to Karl Vockenhuber and Raimund Hauser, Vienna, Austria

Filed Sept. 8, 1970, Ser. No. 69,810
Claims priority, application Austria, Sept. 26, 1969; A 9165/69
Int. Cl. G02b *15/14*
U.S. Cl. 350—184 **2 Claims**



A positive, meniscus-shaped front lens unit has a convex front surface and a concave rear surface. The concave surface has a radius of curvature which is more than twice and less than ten times the radius of curvature of said convex surface. A single biconcave lens element is axially slidably mounted between said front lens unit and a positive rear main lens unit. The radius of curvature of the front surface of said biconcave lens element is more than twice and less than three times the radius of curvature of the rear surface of the bi-concave lens element. The biconcave lens element has an index of refraction n_{d3} and an Abbe number v_{d3} meeting the following conditions:

$$n_{d3} \leqslant 1.63$$

$$v_{d3} \leqslant 47$$

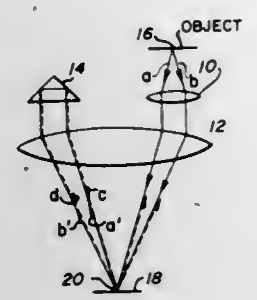
3,715,152

MULTIPLE-PASS REIMAGING OPTICAL SYSTEM

William D. Gunter, Jr., 5290 Dellwood Way, San Jose, Calif. 95118, and Richard M. Brown, 280 Easy St., Apt. 6E, Mountain View, Calif. 94040

Filed Jan. 19, 1971, Ser. No. 107,659
Int. Cl. G02b *17/08*
U.S. Cl. 350—202 **14 Claims**

An optical imaging system for enabling nonabsorbed light imaged onto a photodetective surface to be collected and reimaged one or more times onto that surface in register with the original image. The system includes an objective lens, one or more imaging lenses, one or more



retroreflectors and perhaps a prism for providing optical matching of the imaging lens focal planes to the photodetective surface.

3,715,153

SINGLE-WING LIGHT CHOPPER FOR INFRARED GAS ANALYZERS

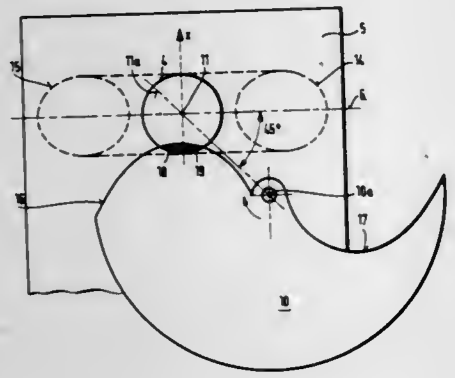
Gunter Schunck, Karlsruhe, Winfried Speeter, Herxheim, and Albert Randow, Karlsruhe, Germany, assignors to Siemens Aktiengesellschaft, Erlangen, Germany

Filed Oct. 26, 1971, Ser. No. 192,103

Claims priority, application Germany, Oct. 27, 1970, P 20 52 609.4

Int. Cl. G02f *1/30;* **G01n** *21/24;* **G01d** *5/36*

U.S. Cl. 350—273 **6 Claims**



Between a light source and the inlet opening of a beam splitter of the type associated with an infrared gas analyzer there is disposed a single-wing rotary shutter provided with a sole blocking edge and a sole opening edge and is driven by a commutatorless D.C. motor. The axis of rotation of the shutter is arranged parallel with the symmetry axis of the beam splitter and spaced from the symmetry plane thereof.

3,715,154

THREE-DIMENSIONAL PICTURE PROJECTION

Friedrich Bestenreiner, Grunwald, Germany, assignor to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

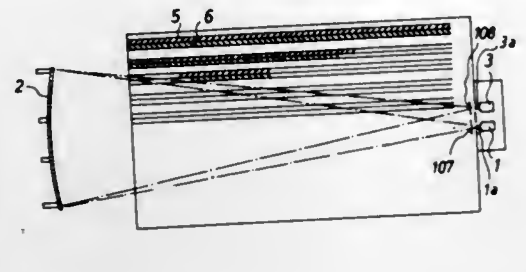
Filed Mar. 9, 1971, Ser. No. 122,449

Claims priority, application Germany, Mar. 11, 1970, P 20 11 417.4

Int. Cl. G03b *35/20*

U.S. Cl. 352—61 **14 Claims**

A projection screen for use in three-dimensional projection systems wherein two discrete projectors project spaced apart images of a scene to be viewed has a flat arrangement of discrete records of first and second viewing zones from which the screen is to be viewed by the right and left eyes of persons in the audience. The impingement of images from the first and second projectors is respectively confined onto the records of the first and second viewing zones. The arrangement of records is a set of holograms or an integram and the confining means comprises polarizing and/or color filters, rasters of lenticules, or lasers and a set of adjustable mirrors.



3,715,155

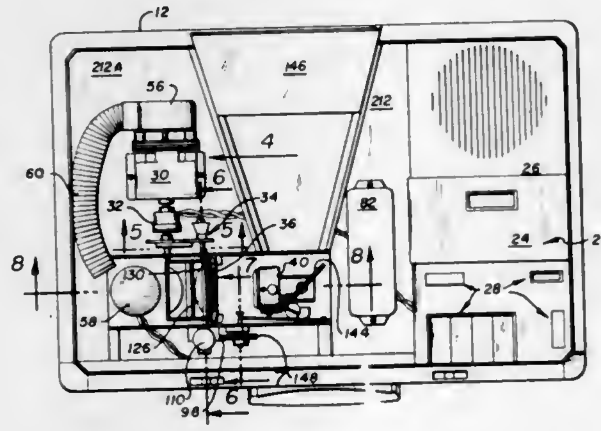
AUDIO-VISUAL DISPLAY DEVICE

Walter Daniel Grupp, Boulder, Colo., assignor to Elba Corporation, Denver, Colo.

Filed Aug. 30, 1968, Ser. No. 756,609

Int. Cl. G03b *31/00, 3/00, 21/28*

U.S. Cl. 353—15 **5 Claims**



A portable audio-visual display device characterized by a compact film cartridge employing conventional 35 mm. still camera film strip, the frames being sequentially power advanced by a signal received from an audio unit and the take-up spool also being synchronously power driven in such manner to compensate for the increase in diameter of the film convolutions on the take-up spool. Manual override of the power drive is provided for framing with a film gate or manual advance of the frames. Power operated film advance features an escapement drive which is initiated by a short duration signal received from the audio unit and a holding circuit which maintains it in operation until the film has been advanced one frame.

3,715,156

IMAGING DEVICE HAVING A PIVOTING PRESSURE PAD FOR ENGAGING AND DISENGAGING A WEB MEDIUM

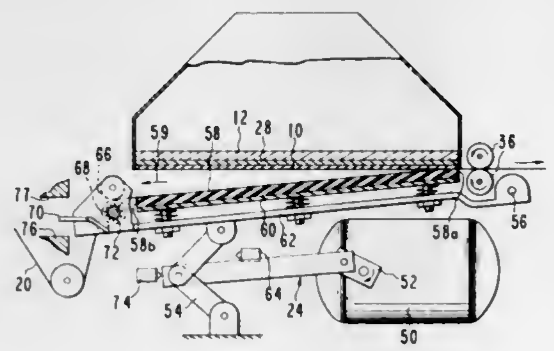
Raymond L. Levy, Palo Alto, Calif., assignor to Varian Associates, Palo Alto, Calif.

Filed March 22, 1971, Ser. No. 126,779

Int. Cl. G03g *15/00*

U.S. Cl. 355—16 **8 Claims**

The recording web in an electrophotographic apparatus is pressed into engagement with the photoconductive plate by a flexible, resilient, pivoting pressure pad. Due to the positioning of the axis of the pressure pad with respect to the plane of the photoconductive plate, the end of the pressure pad closest to the pivot axis initially contact the web. The area of engagement then increases as the pressure pad is further pivoted against the plate. This progressive engagement action smooths out wrinkles in the web and squeeges or displaces air from between the web and the plate. After full engagement is established, an exposure-imaging cycle is initiated which causes a charge image to be formed on the web. The charge image establishes electrostatic forces which further engage the web to the photoconductive plate. After exposure, the web is disengaged from the plate by pivoting the pressure pad away from the plate. The web is peeled off of the surface of the plate during this disengagement causing the area of engagement to progressively decrease as the pressure pad is pivoted. The pivoting-peeling action requires less disengagement force to overcome the electrostatic engagement force than would be required if the web were disengaged over the entire area of engagement simultaneously. Further minimization of the disengagement force is obtained because the force of disengagement established by the pivoting pressure pad is applied generally perpendicular to the plane of the web-plate engagement. The present minimal disengagement forces remain uniformly minimal throughout the disengagement cycle. Timers and limit switches are employed to automate the pressure pad pivoting, exposure-charge cycle, and web transport cycle.



3,715,157

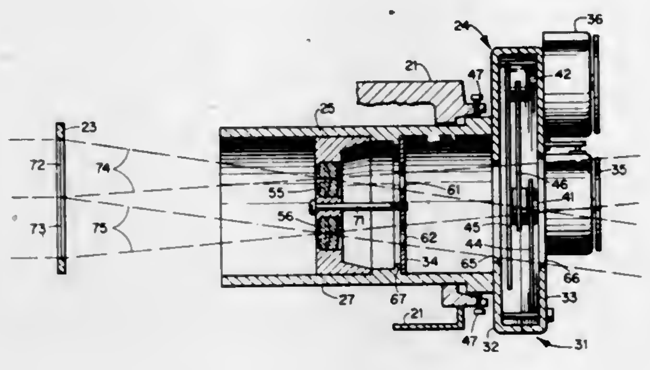
PROJECTION APPARATUS FOR MULTIPLE-SECTOR SLIDE TRANSPARENCIES

Harvey R. Worthington, Jr., Cambridge, Mass., assignor to Searle Medidata Inc., Waltham, Mass.

Filed Nov. 19, 1969, Ser. No. 878,025

Int. Cl. G03b *21/26, 21/14*

U.S. Cl. 353—25 **9 Claims**



Apparatus for selectively projecting images of one or more sectors of a multiple sector slide transparency. The apparatus, with its various embodiments, is operative to select any single sector of a particular slide for projection onto a screen and its further operative to superimpose the image of one sector of a slide upon the image of another sector of the same slide.

ERRATUM

For Class 355—16 see:
Patent No. 3,715,156

3,715,158

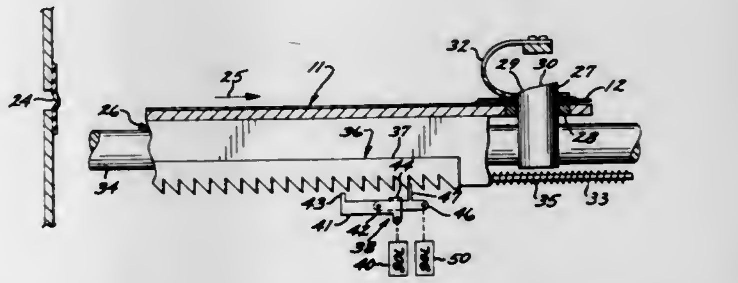
MICROFICHE CAMERA PROCESSOR

Clyde E. Le Fevre, Orange, James P. Hagan, Laguna Beach, and Ben H. Owens, Orange, Calif., assignors to Micrographic Technology Corporation, Santa Ana, Calif.

Filed Apr. 19, 1971, Ser. No. 135,180

Int. Cl. G03c *27/52*

U.S. Cl. 355—27 **5 Claims**



Apparatus for producing a microfiche using a single sheet film pack of photographic film; the film pack comprising a protective cover to prevent exposure of the film sheet to ambient light so that the film pack may therefore be handled without fear of premature exposure. The film pack is inserted into a dark chamber of the disclosed apparatus; and the protective cover is then removed. The photographic film sheet is now optically exposed to produce reduced size images of data to be recorded; an indexing arrangement being used to remove the film sheet to various locations in accordance with the desired microfiche format. When the film sheet has had its various areas exposed, it is then processed; and the disclosed apparatus delivers a dry finished microfiche in a few moments.

3,715,159

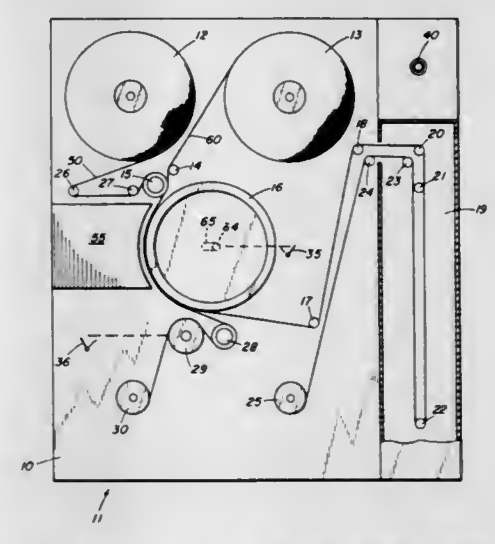
FILM DUPLICATING APPARATUS

Walter Allport, Stamford, Conn., assignor to Cutler Hammer, Inc., Milwaukee, Wis.

Filed Nov. 24, 1971, Ser. No. 201,643

Int. Cl. G03b *27/10*

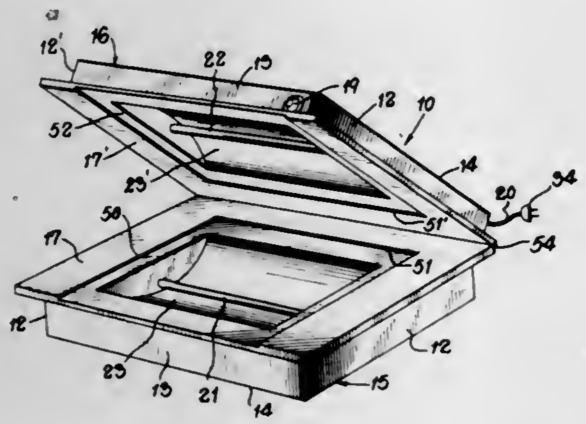
U.S. Cl. 355—110 **7 Claims**



An apparatus for duplicating photographic film of the type wherein original and copy film travel together over a printing drum and are irradiated by exposing light in a printing zone. A combination of rollers act to isolate the films in the printing zone so that film tensions outside the zone are not particularly critical. The surface of the drum is of a relatively low friction material so that the films are free to slip somewhat on the drum as is necessary to prevent relative movement as between original and copy films.

3,715,160
COPYING AND PHOTOGRAPHIC CONTACT PRINTING MACHINES

Seymour J. Fader, 377 McKinley Boulevard, Paramus, N.J.
Continuation-in-part of Ser. No. 121,385, March 5, 1971, abandoned. This application June 21, 1971, Ser. No. 155,075
Int. Cl. G03b *27/04*
U.S. Cl. 355—113 **6 Claims**

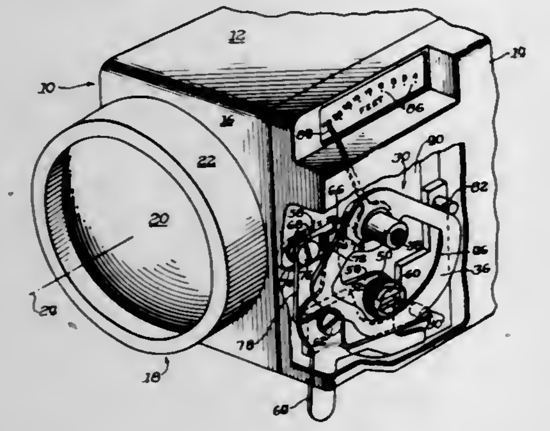


A combination copying machine and photographic contact printer having two light stations; for copy making one is used for exposing the sensitive sheet material through the original and the other is used for developing the sensitive sheet material. For photographic contact print-making one or both of the stations are used as required by the photographic transparency from which the print is to be made, the type of reproduction and the reproduction material.

A photographic contact printer having a light station. The sensitive sheet material is exposed through the negative and the light is used for exposing-developing the sensitive sheet material.

3,715,161
LENS FOCUSING MECHANISM WITH MANUAL CONTROL

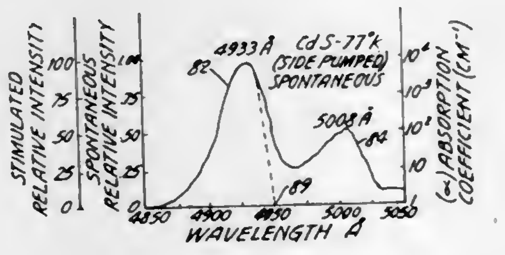
Henry J. Koeber, Deerfield, Ill., assignor to Bell & Howell Company, Chicago, Ill.
Filed May 28, 1971, Ser. No. 147,943
Int. Cl. G03b *3/00*
U.S. Cl. 356—3 **12 Claims**



A distance determining mechanism for a camera having a focusable objective lens, the mechanism including a pendulous member having a cam surface formed with fine pitched teeth with which similar teeth on a cam follower cooperate to cause adjustment of the lens to a focus condition and, after adjustment, to cause substantially positive locking of the lens in adjusted position while enabling manual focusing through actuation of an externally extending focusing control.

3,715,162
FREE EXCITON INDIRECT TRANSITION LASER

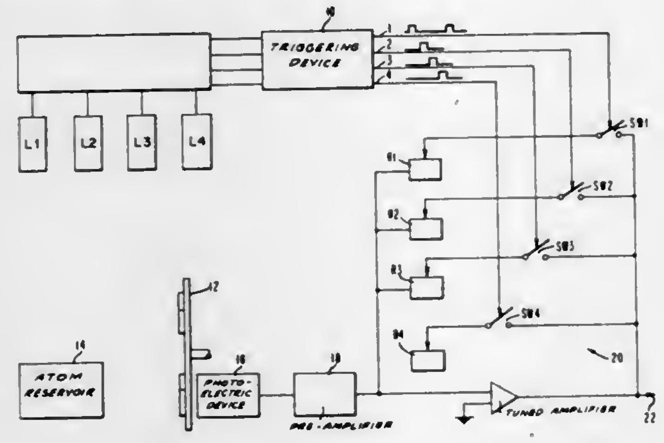
Donald A. Campbell; James R. Packard, both of St. Paul; William C. Tait, Oak Park, all of Minn., and Richard L. Weiher, Hudson Township, St. Croix County, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Continuation of Ser. No. 803,805, March 3, 1969, abandoned, which is a continuation-in-part of Ser. No. 715,799, March 25, 1965, abandoned. This application April 19, 1971, Ser. No. 135,369
Int. Cl. G03b *27/52*
U.S. Cl. 356—30 **5 Claims**



A method and apparatus for selecting a direct band gap semiconductor crystal for use as a room temperature operable laser material. The crystal is selected when its emission spectrum is characterized by a series of peaks separated in energy by the energy of one longitudinal optical phonon and when the zero intensity extrapolation point on the low energy side of the highest energy peak of the series is below the lowest energy exciton peak of its reflection spectrum by an amount equal to the energy of one longitudinal optical phonon. The emission and reflection spectra are produced at 77°K.

3,715,163
APPARATUS FOR SIMULTANEOUS MULTIELEMENT ANALYSIS BY ATOMIC FLUORESCENCE SPECTROSCOPY

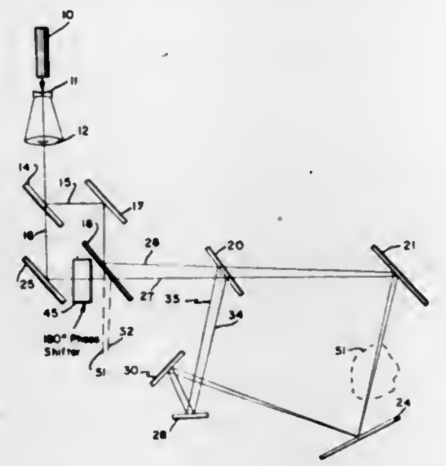
Douglas Mitchell, Tarrytown, N.Y., assignor to Technicon Instruments Corporation, Tarrytown, N.Y.
Filed Aug. 21, 1970, Ser. No. 65,822
Claims priority, application Great Britain, Oct. 25, 1969, 42,300/69
Int. Cl. G01j *3/34*; **G01n** *21/52*
U.S. Cl. 356—85 **10 Claims**



Apparatus for processing a plurality of successive electrical signals of varying magnitudes comprises an amplifier arrangement whose gain is varied in phase with the signal being then received, whereby the output is maintained within a predetermined range the amplifier arrangement is operated under its optimum load conditions. The amplifier arrangement is designed in junction with spectroscopic apparatus for effecting simultaneous multielement analysis.

3,715,164
FOUR BEAM HOLOGRAPHIC INTERFEROMETRY

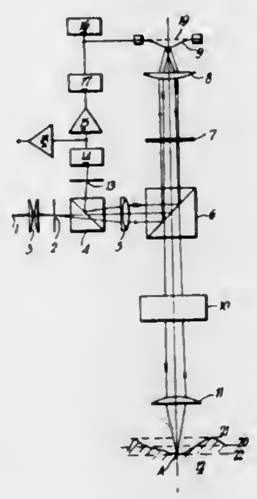
Lee O. Heflinger, Torrance, Calif., assignor to TRW Inc., Redondo Beach, Calif.
Filed Nov. 1, 1971, Ser. No. 194,425
Int. Cl. G01b *9/02*; **G02b**
U.S. Cl. 356—109 **5 Claims**



A double-exposure holographic interferometric system for visualizing small disturbances of a subject. The system utilizes two reference beams and two subject beams cast simultaneously on a recording medium in such a way that the two subject beams and the two reference beams each form a small angle with each other. For the second exposure one of the subject beams and one of the reference beams is shifted in phase by 180° with respect to its associated beam. This will create a regular holographic grating which is phase modulated by the disturbances or perturbations of the subject. Upon proper reconstruction of the hologram the phase modulations will cause brightenings of the normally dark background of the reconstructed hologram. The system has the advantage that it is relatively insensitive to errors of phase shift or to variations of the light intensity between the two exposures.

3,715,165
INVESTIGATING THE TOPOGRAPHY OF REFLECTING SURFACES

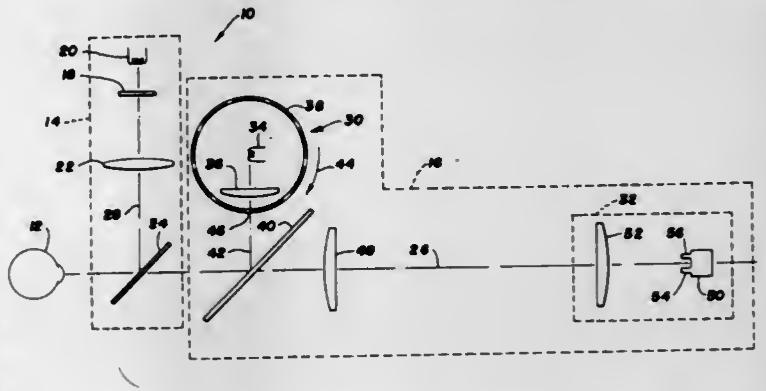
Francis Hughes Smith, York, England, assignor to Vickers Limited, Millbank, London, England
Filed June 7, 1971, Ser. No. 150,655
Claims priority, application Great Britain, June 9, 1970, 27,976/70
Int. Cl. G01b *11/30, 11/00*
U.S. Cl. 356—120 **20 Claims**



A specimen surface is investigated with an optical arrangement that brings a pencil of light to a point focus which oscillates longitudinally about the surface. In dependence upon light reflected from the surface, photoelectronic means provide an electrical signal controlling displacement of a reflecting surface of the arrangement to bring the mean position about which the focus oscillates towards coincidence with the surface.

3,715,166
APPARATUS FOR LOCATING A VARIABLE OPTICAL FOCAL POINT

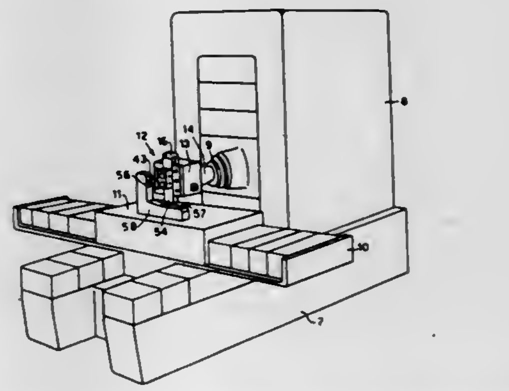
Clifford A. Leighty, West Chester, Ohio; Joseph J. Sliwkowski, Framingham, Mass., and Bernard J. Sullivan, Rochester, N.Y., assignors to Bausch & Lomb Incorporated, Rochester, N.Y.
Filed Feb. 18, 1971, Ser. No. 116,505
Int. Cl. G01b *9/00*; **A61b** *3/10*
U.S. Cl. 356—125 **19 Claims**



An apparatus employing a servo system locates the focal point of a scanned beam of light where the scanning beam has a conical locus as in an electronic retinoscope. A pair of photodetectors are spaced apart in the direction of scan and are disposed upon a movable trolley. When the beam is swept across the photodetectors, generally sinusoidal signals are generated which have a phase relationship indicative of the direction of scan of the beam across the photodetectors and, therefore, to the position of the trolley relative to the focal point of the beam. The generated signals are amplified and their peaks or zero crossings are detected to trigger two flip-flop circuit output signals which are phase compared to provide a drive signal to a servo system which through mechanical means drives the trolley toward the focal point. When the trolley is disposed at the focal point, the photodetectors are scanned simultaneously thereby giving no phase difference and, accordingly, no drive signal is generated.

3,715,167
CONTROL DEVICE FOR A BORING TOOL HOLDER OF MACHINE TOOLS

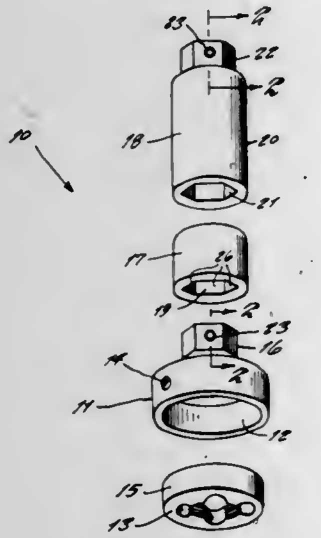
Giorgio Ollearo, 10015 Ivrea (Turin), Italy, assignor to Ing. C. Olivetti & C., S.p.A., Ivrea (Turin), Italy
Filed June 2, 1970, Ser. No. 42,727
Claims priority, application Italy, June 21, 1969, 52333 A/69
Int. Cl. B23b *29/034*
U.S. Cl. 408—149 **8 Claims**



In a machine tool comprising a spindle and means to align the spindle in a predetermined angular position about its own axis, a tool holder is adapted to be fixed to the spindle, the toolholder comprises a body engageable with the spindle and a slide radially shiftable on said body, and normally locked on said body. A single member fixed to the worktable carries two abutments at 90° to one another with one abutment parallel to said slide when said spindle is aligned, each other in two directions parallel to said abutments respectively and cooperating with said slide to unlock it and to produce a radial shifting of the slide on said body.

3,715,168
DIE STOCK (HOLDER) AND EXTENSION

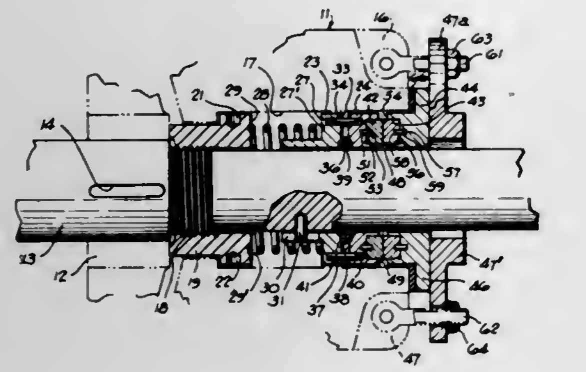
Russell P. Kuhn, 109 Tesing Circle, Bridgeport, Conn. 06606
Filed Feb. 9, 1971, Ser. No. 113,903
Int. Cl. B23b *31/10, 13/06*
U.S. Cl. 408—239 **3 Claims**



A die stock holder and extension set which includes a separate die stock for supporting a thread cutting die, the die stock being engageable either directly to a socket wrench or to an elongated extension which in turn is engaged to the socket wrench.

3,715,169
SPRING-LIQUAMATIC PRESS O-RING PLASTIC ROTO SEAL FOR ROTARY PUMP SHAFTS

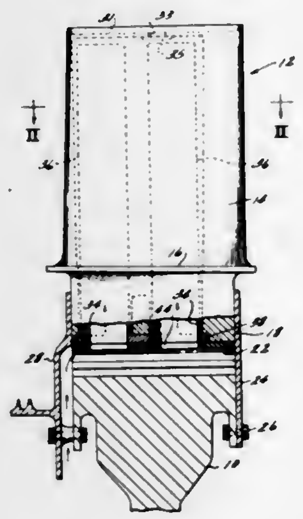
John Molis, P.O. Box 3915, Station A, Baytown, Tex.
Filed Sept. 1, 1971, Ser. No. 176,915
Int. Cl. F01d *11/08*
U.S. Cl. 415—170 **6 Claims**



A shaft seal to prevent a fluid from flowing to and along a rotary pump shaft and escaping from the interior to the exterior of a housing in which the pump shaft is journaled and from which it extends. The seal includes a pair of end bushings of which one is directly connected to the shaft and the other end bushing is mounted on the housing, and a pair of intermediate pin-connected bushings slip-fitted upon the shaft with a compression spring urging the intermediate bushings toward one another and maintaining an elastomer ring under compression therebetween to seal off flow of fluid around the shaft and between such pin-connected intermediate bushings, and a pair of opposed resilient plastic rings pin-mounted and connected on one of the intermediate bushings and the end bushing on the housing to seal off flow of fluid therebetween and from around the shaft, and a strong-back detachably mounted on the housing for holding the plastic-rings under pressure in sealing engagement with one another.

3,715,170
COOLED TURBINE BLADE

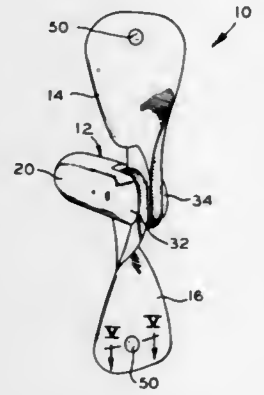
Joseph W. Savage; Henry J. Brands, and Richard H. Anderson, all of Cincinnati, Ohio, assignors to General Electric Company, Cincinnati, Ohio
Filed Dec. 11, 1970, Ser. No. 97,226
Int. Cl. F01d *5/18*
U.S. Cl. 416—97 **8 Claims**



An air-cooled turbine blade has a circular arc mounting tang generally aligned with a cambered airfoil portion. The latter is of thin-walled construction, including an integral tip wall, defining an internal cavity. A pair of inserts are inserted through radial passageways on the tang to project into this cavity. Cooling air passes to the inserts and is discharged therefrom through a multiplicity of holes to impinge the cavity walls and enhance the convection cooling thereof.

3,715,171
FOLDABLE PROPELLER

Robert E. Kettner, East Grand Rapids, Mich., assignor to Michigan Wheel Corporation, Grand Rapids, Mich.
Filed May 14, 1971, Ser. No. 143,510
Int. Cl. B63h *1/24*
U.S. Cl. 416—142 **10 Claims**



A propeller for a powered boat wherein the blades of the propeller are open through centrifugal force to propel the boat and are closed when the boat is not being powered so as to reduce drag on the boat. The blades are maintained in the closed position by operation of ceramic magnets disposed adjacent the tips of the blades.

3,715,172
UREA- AND MELAMINE- FORMALDEHYDE BRIDGING AGENTS

Ronald J. Dembowski, Calumet City, and Theodore R. Schuh, North Riverside, both of Ill., assignors to Nalco Chemical Company, Chicago, Ill.
Filed Jan. 12, 1971, Ser. No. 105,987
Int. Cl. C08c *9/16;* **C08d** *9/10;* **C08g** *37/32*
U.S. Cl. 260—3 **4 Claims**

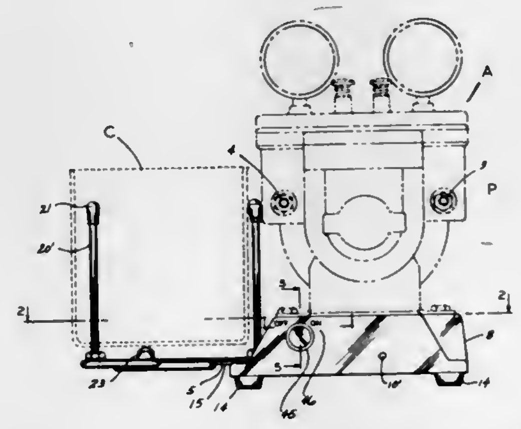
Method and composition for a dry mix utilizing a natural or synthetic rubber stock containing a non-reinforcing filler and about 0,1 to 10 phr of an aminoplast polymer optimally modified by about 5–20 molar per cent of a polyamine.

ERRATUM

For Class 416—198 see:
Patent No. 3,715,176

3,715,173
PUMP CONTROLLER

Herbert F. Froeschner, 5606 Lucas and Hunt Road, St. Louis, Mo.
Filed March 9, 1971, Ser. No. 122,438
Int. Cl. F04b *49/00*
U.S. Cl. 417—37 **8 Claims**

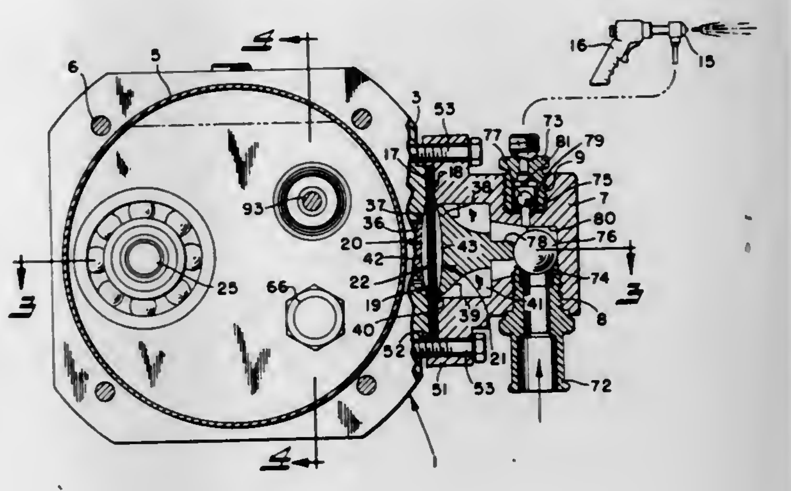


A controller for pumps used in the dispensing of liquids to a vessel for effecting discontinuance of pump operation when the vessel has received a predetermined volume of liquid comprising a pivoted arm for supporting the vessel to be filled, a pump switch having cooperating components, said arm carrying a component of said switch, means urging said arm upwardly for normally maintaining said switch in closed, pump-operating condition with said means being overcome by the combined weight of the vessel and the received predetermined volume of liquid whereby said switch will be automatically opened. Cam means are provided for preventing switch-closing swinging of said arm upon removal of the liquid-containing vessel.

3,715,174
DIAPHRAGM PUMP

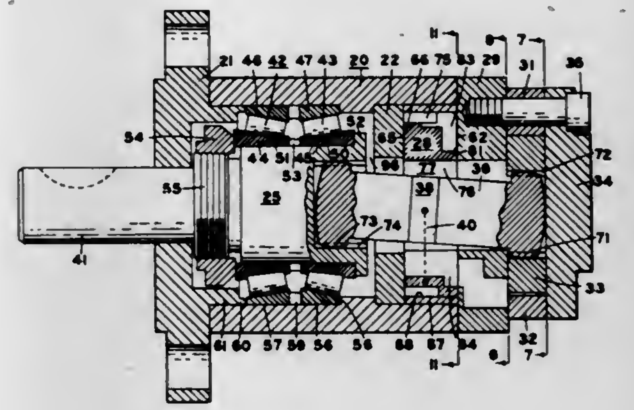
Howard C. Davis; Howard B. Pritz, both of Columbus, and Charles A. Burton, Worthington, all of Ohio, assignors to The Wooster Brush Company, Wooster, Ohio
Filed Aug. 31, 1970, Ser. No. 68,120
Int. Cl. F04b *49/08, 43/06*
U.S. Cl. 417—311 **15 Claims**

A diaphragm pump including a variable area relief valve for the working fluid which permits the pump to operate at reduced pressure when a peak load is reached during standby operation to reduce power requirements, allow the pump to run cooler, and reduce wear of parts. The walls of the pumping and working chambers are desirably shaped to conform to the natural form taken by the diaphragm during flexing for increased diaphragm life, and relatively small ring-shaped flow passages of different diameters desirably communicate with such chambers to reduce the change of diaphragm extrusion into the flow passages and diaphragm rupture. The diaphragm itself may consist of multiple unconnected layers all of the same size for increased life, and radially spaced cooperating seal ridges may be provided on the diaphragm clamping faces to prevent extrusion of the diaphragm material into the center during uniform clamping of the diaphragm around its periphery. A molded diaphragm having a built-up center portion may also be used for increased life.



3,715,175
ROTARY VALVE COMPONENT MEANS

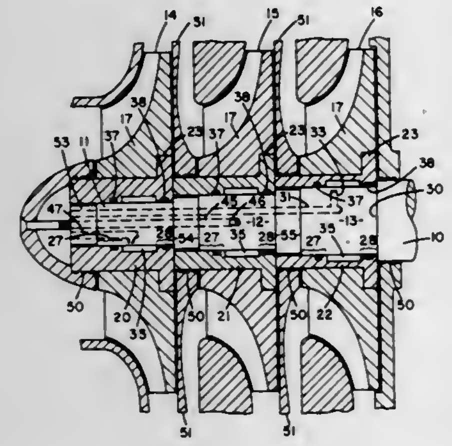
George V. Woodling, 22077 West Lake Road, Rocky River, Ohio
Continuation of Ser. No. 887,614, Dec. 23, 1969, Pat. No. 3,591,321, which is a continuation of Ser. No. 637,382, May 10, 1967, Pat. No. 3,405,603. This application Feb. 24, 1971, Ser. No. 118,312
Int. Cl. F01c *1/02;* **F03c** *3/00;* **F04c** *1/02*
U.S. Cl. 418—61 **9 Claims**



Rotary valve component means having a rotary valve face disposed to sealingly engage face wall valve means having communicating fluid port means therein to control the flow of fluid to and from fluid pressure operating means. The rotary valve component means is reversible in operation and has a hollow annular valve body for retaining fluid externally therearound and for retaining fluid internally therewithin to provide for said reversible operation. The hollow annular valve body has a valve end portion comprising an external flange body extending outwardly therefrom and an internal flange body extending inwardly therefrom. The external and internal flange bodies respectively have inside and outside flange faces. The rotary valve face includes the outside flange faces. The inside flange faces constitute fluid retaining faces to blank flow of fluid to and from said face wall valve means. The external flange body has external fluid conduction wall means communicatingly interconnecting said inside and outside external flange faces and has internal fluid conduction wall means communicatingly interconnecting said inside and outside internal flange faces. The external and internal fluid conduction means communicatingly register with the fluid port means in the face wall valve means.

3,715,176
TURBO MACHINE ROTOR STRUCTURE

Philip Kerklo, Greensburg, Pa., assignor to Carrier Corporation, Syracuse, N.Y.
Filed Sept. 1, 1971, Ser. No. 176,896
Int. Cl. F01d *5/06*
U.S. Cl. 416—198 **3 Claims**

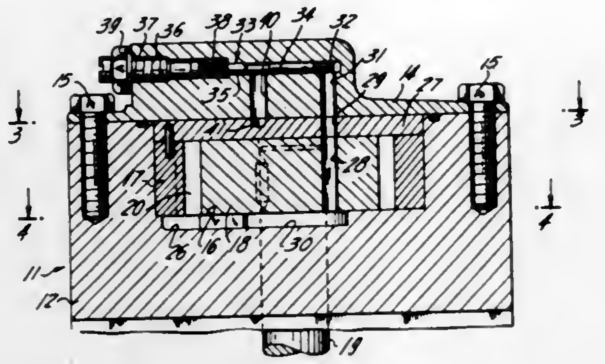


The wheel shaft of a multi-stage turbo machine is formed with a succession of adjoining areas which progressively change in diameter to provide a stepped shaft arrangement. The bores in all of the wheels are the same diameter. A bushing is fixed in the bore of each wheel. The bore in each bushing has an end portion dimensioned for an interference fit with a selected area on the shaft. The opposite end portion of the bushing bore is dimensioned for a sliding fit on the shaft area. The end portions of the bushing bore are provided with shaft seals and the medial area of the bore is formed with a recess. The shaft is formed with axially extending passages which communicate with the recesses in the respective bushings for expansion and removal thereof from the shaft.

3,715,177
FLUID METERING APPARATUS

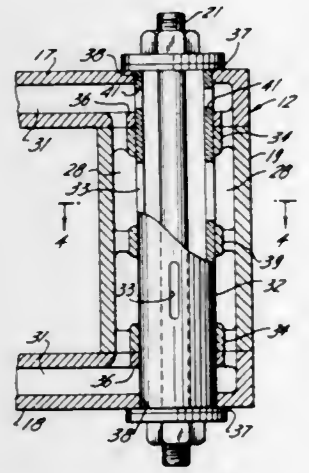
George H. Woodler, Ringwood, N.J., assignor to Curtiss-Wright Corporation, Wood-Ridge, N.J.
Filed Oct. 7, 1970, Ser. No. 78,645
Int. Cl. F04c *1/06*
U.S. Cl. 418—171 **17 Claims**

A fluid metering apparatus comprising a plurality of rotary members supported in a housing and interconnected to rotate at different angular velocities. The rotary members and the housing having passageways located to come into registry with each other and with a source of pressurized liquid in the housing and a discharge port means in the housing once in every predetermined amount of angular movement of the faster rotating member to thereby periodically communicate the source of pressurized fluid with the discharge port means and flow liquid through the latter.



3,715,178
DOWELING CONSTRUCTION FOR ROTARY ENGINE HOUSING

Charles Jones, Hillsdale, N.J., assignor to Curtiss-Wright Corporation, Wood-Ridge, N.J.
Filed Nov. 30, 1971, Ser. No. 203,279
Int. Cl. F01c *21/06;* **F04c** *29/04;* **F02b** *55/10*
U.S. Cl. 418—83 **5 Claims**

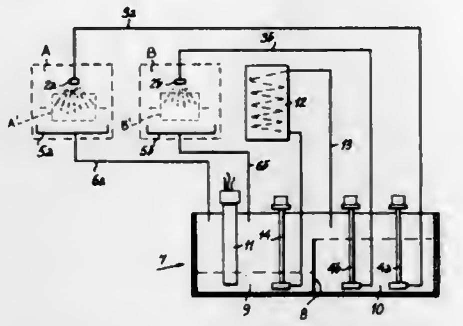


A rotary engine housing having a locating and positioning dowel structure, comprising a plurality of hollow, liquid cooled dowel members with coaxial tie bolts, the dowel members having their ends rigidly supported and being supported at other stress points generated by thermal movement and high pressure, in such a manner that deflections and distortions are obviated.

3,715,179
MOULDING APPARATUS

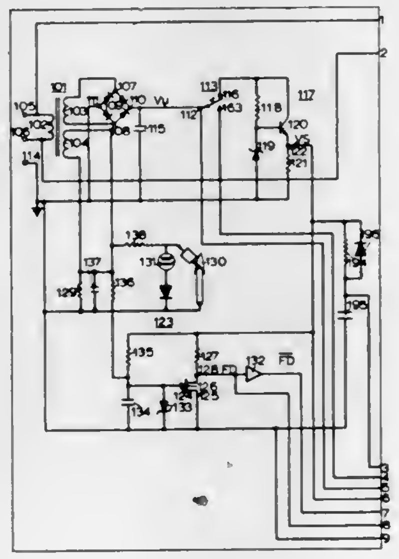
Aubrey Joseph Westbrook, Kilwinning, and Ian David MacKnight Thomson, Irvine, both of Scotland, assignors to Plastic Rotational Moulding Limited, London, England
Filed Nov. 19, 1970, Ser. No. 90,994
Claims priority, application Great Britain, Nov. 26, 1969, 57,829/69
Int. Cl. B28b *1/26*
U.S. Cl. 425—86 **5 Claims**

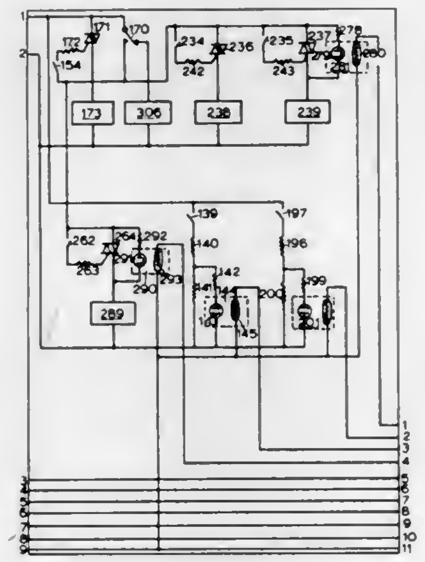
A rotational moulding apparatus comprises mould-support means, a heating chamber in which the mould-support means may be located, first and second tanks adapted to contain a liquid or liquifiable solid heating medium, first heating means for heating at least the contents of the first tank, a loop path for the heating medium leading from the first tank to a second heating means and back to the second tank, first pump means for causing heating medium to flow along the loop path, supply duct means from the second tank to spray means located in the heating chamber, return duct means leading to the first tank from catchment means in the heating chamber disposed to collect heating medium flowing from the spray means, second pump means to move heating medium from the second tank through the supply duct means to the heating chamber, and overflow means interconnecting the first and second tanks.

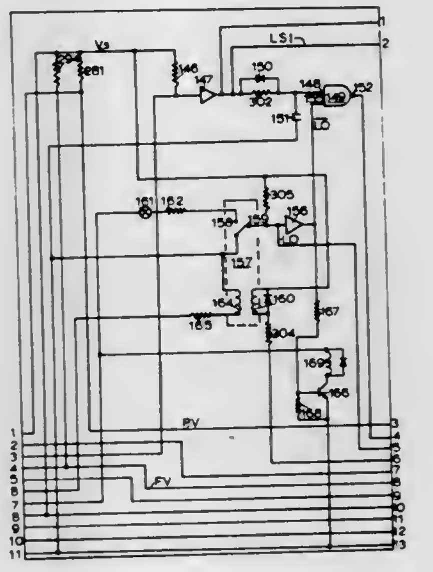


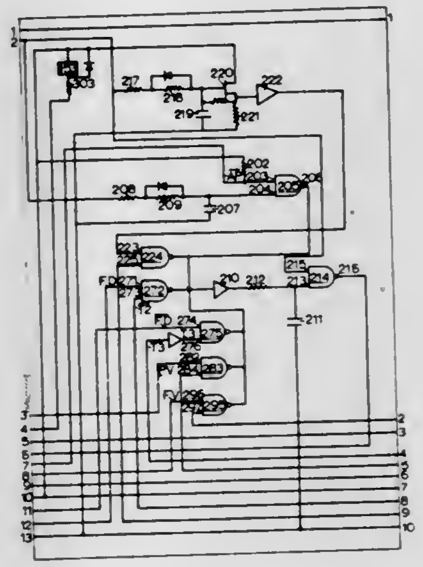
3,715,180
ELECTRONIC PROGRAMMER UNIT FOR BURNER CONTROL

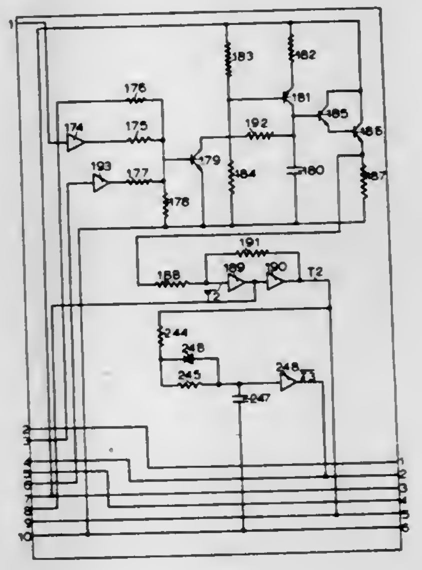
Edward Geoffrey Cordell, Somerset, England, assignor to Normalair-Garrett (Holdings) Limited, Somerset, England
Filed Feb. 8, 1971, Ser. No. 113,407
Claims priority, application Great Britain, Feb. 9, 1970, 6,079/70
Int. Cl. F23n
U.S. Cl. 431—25 **9 Claims**



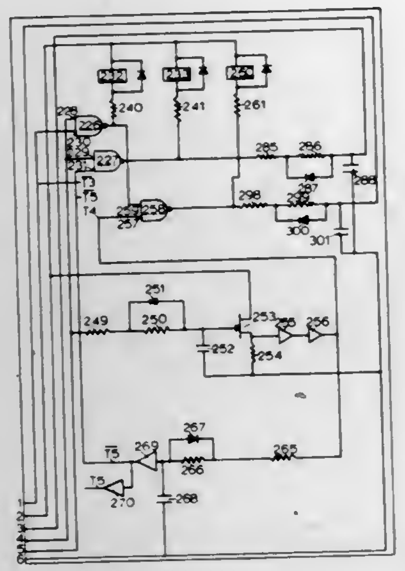








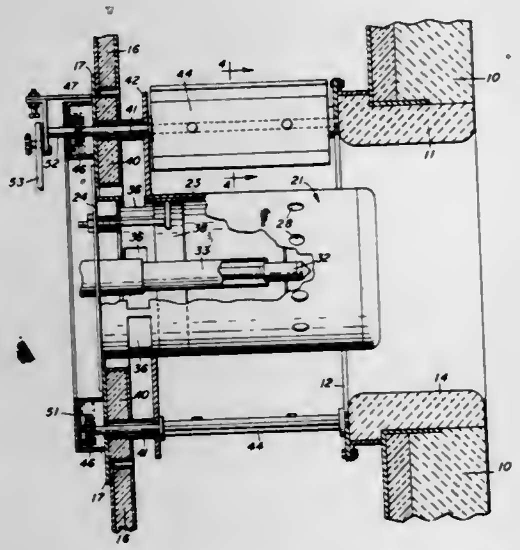
An electronic programme timer means of solid state construction, for a fuel burner, said programme timer means comprising a control switch for initiating operation, a plurality of sequencing relays, flame sensing means connected to voltage comparators, voltage ramp generator, voltage follower and level detectors with output connected to said comparators for controlling said sequencing relays, feedback means to said comparators to ensure correct switching, temperature sensing means for switching said timer means and pressure sensing means for checking operation of blower purging means.



3,715,181
FUEL BURNER ASSEMBLY

John Smith Zink, Hershel Goodnight, and Robert D. Reed, Tulsa, Okla., assignors to John Zink Company, Tulsa, Okla.

Filed Jan. 26, 1971, Ser. No. 109,834
Int. Cl. F23m *9/00*
U.S. Cl. 431—184 **4 Claims**



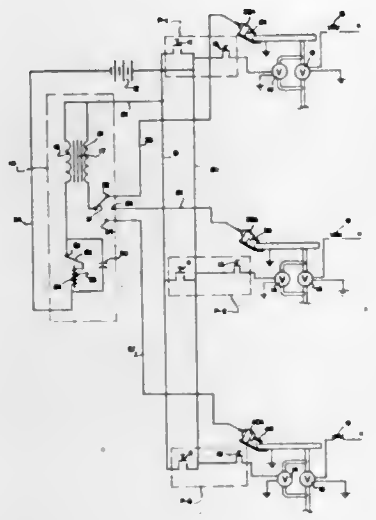
A burner assembly for the combustion of liquid fuel wherein a plurality of circumferentially spaced vanes are adjustable to control whirling movement of secondary air and an assembly designed to prevent circumferentially moving air from moving into a regenerative tile which forms a part of the assembly.

3,715,182
GAS APPLIANCE IGNITER FOR A MOBILE LIVING UNIT

John C. Ward, 5335 NE. Irving,
Portland, Oreg. 97213

Filed Oct. 18, 1971, Ser. No. 189,943
Int. Cl. F23q *3/00*
U.S. Cl. 431—264 **2 Claims**

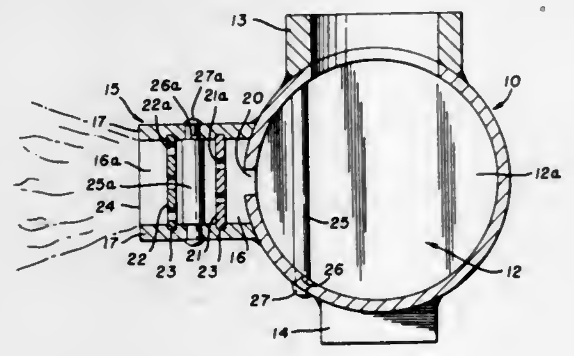
An ignition system for gas burning appliances of a mobile living unit, such appliances including stoves, furnaces, propane refrigeration units and the like. Arc-initiating electrodes are located adjacent the burners of such appliances and are in circuit with the secondary winding of an induction coil for initiating an arc across to the grounded appliance burner. The induction coil is energized remotely from the appliance location at which location a fuel by-pass control is conventionally located whereby the operator may effect simultaneous operation of the ignition system and fuel discharge from the burner. Pre-set selector means, in circuit with the coil, permits the output of the coil to be directed to the specific appliance burner being ignited.



3,715,183
GAS BURNER ESPECIALLY USEFUL FOR GLAZING GLASSWARE

Richard W. Manifold, Reynoldsburg, Ohio, assignor to Manifold & Phalor Machine Co., Reynoldsburg, Ohio

Filed June 15, 1971, Ser. No. 153,283
Int. Cl. F23d *13/12*
U.S. Cl. 431—328 **5 Claims**



A gas burner for producing a type of flame especially useful in the glazing of glassware. It comprises an elongated distribution chamber having a narrow inlet slot in its rear wall and forwardly spaced perforated baffle plates so arranged as to break up the gas introduced through the inlet slot under high pressure to prevent it from blowing out from the chamber excessively and so that a wide surface, uniform temperature flame is produced which is especially suitable for the glazing of glassware.

CHEMICAL

ERRATA

For Classes 432—122 to 432—4 see:
Patents Nos. 3,715,109 thru 3,715,111

3,715,184
METHOD OF ACTIVATING PER-COMPOUNDS AND SOLID ACTIVATED PER-COMPOUND COMPOSITIONS

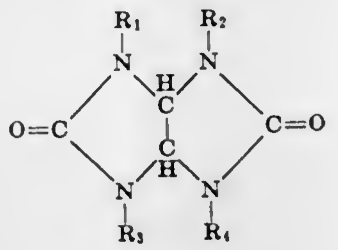
Dieter Kuhling, Monheim, Rhineland, and Hans-Joachim Heitland, Dusseldorf, both of Germany, assignors to Henkel & Cie GmbH, Dusseldorf-Holthausen, Germany

Continuation-in-part of Ser. Nos. 787,597, Dec. 27, 1968, abandoned, and Ser. No. 787,628, Dec. 27, 1968, abandoned. This application May 7, 1971, Ser. No. 141,372

Claims priority, application Germany, Dec. 30, 1967, H 64 924; Dec. 30, 1967, H 64 923

Int. Cl. D06l *3/02*
U.S. Cl. 8—111 **12 Claims**

The method of activating aqueous solutions of per-compounds utilizing an activator acylated glycoluril and solid activated compositions of solid per-compounds and an activator acylated glycoluril, said activator acylated glycoluril having the formula



wherein at least two of R_1, R_2, R_3 and R_4 are acyls of organic carboxylic acids having from two to eight carbon atoms and the remainder of R_1, R_2, R_3 and R_4 are members selected from the group consisting of hydrogen, alkyl having from one to eight carbon atoms, phenyl, phenylalkyl having from seven to eight carbon atoms and acyls of organic carboxylic acids having from two to eight carbon atoms, and novel acylated glycolurils.

3,715,185
COMPOSITIONS FOR FLAME-PROOFING CELLULOSIC MATERIALS

Joseph A. Meyers III, Springfield, and Joseph A. Cahill, Philadelphia, Pa., assignors to Atlantic Richfield Company, Philadelphia, Pa.

No Drawing. Original application Oct. 30, 1970, Ser. No. 85,815, now Patent No. 3,666,402, dated May 30, 1972. Divided and this application Dec. 30, 1971, Ser. No. 214,457

Int. Cl. D06m *13/44*
U.S. Cl. 8—194 **4 Claims**

Fire resistance and wrinkle resistance are imparted to cellulosic materials by treatment with N,N′,N″-triallyl phosphoric triamide without adversely affecting other properties of the cellulosic materials. The treating compositions and the treated article are also disclosed.

3,715,186
DRYCLEANING METHOD AND DETERGENTS THEREFOR

Athanasious P. Anninos, Cincinnati, Ohio, assignor to Emery Industries, Inc., Cincinnati, Ohio

No Drawing. Continuation of application Ser. No. 539,675, Apr. 4, 1966. This application Oct. 27, 1969, Ser. No. 871,734

Int. Cl. D06l *1/00*
U.S. Cl. 8—142 **6 Claims**

The present invention relates to a method of drycleaning fabrics, such as garments and other dry-cleanable materials, which provides improved detergency and reduced soil redeposition. The invention also relates to particular cationic surface-active agents for use in the improved method as the primary detergent and to specific combinations of such surfactants in a drycleaning system utilizing a moisturized solvent. In addition, the invention also relates to a process for the synthesis of a preferred type of surface-active agent for use in the process.

3,715,187
METHOD OF REMOVING SULPHUR DIOXIDE AND NITROGEN DIOXIDE FROM GASES

Roger F. Bartholomew, Corning, and Harmon M. Garfinkel, Horseheads, both of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed April 14, 1971, Ser. No. 134,082
Int. Cl. C01b *17/22*
U.S. Cl. 423—235 **4 Claims**

Method of removing SO_2 and NO_2 or SO_2 alone from gaseous mixtures passing the gaseous mixtures through a molten bath of sodium hydroxide and/or potassium hydroxide.

3,715,188
CHOLESTEROL ASSAY AND REAGENTS THEREFOR

Jerry W. Denney, Carmel, Ind., assignor to American Monitor Corporation, Indianapolis, Ind.

Filed April 30, 1971, Ser. No. 139,266
Int. Cl. G01n *33/16*
U.S. Cl. 23—230 B **11 Claims**

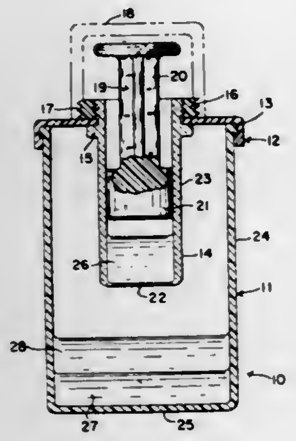
A cholesterol assay, using formamide, which achieves the simplicity of a direct test of a specimen sample, yet which also achieves a comparable specificity and accuracy of cholesterol assays involving multiple-extraction steps. The formamide destroys the cholesterol chromophore of a blank measurement, and this result may be compared with a companion cholesterol assay to eliminate the error caused by the chromophore of non-cholesterol chromogenic substances of the specimen; and the formamide also keeps the alcohol, which is used to prevent turbidity, from blocking the formation of the bilirubin portion of the non-cholesterol chromogenic substances.

3,715,189
QUALITATIVE ANALYSIS DEVICE

Sarkie Nighohossian, Baltimore, and John J. Tobin, Jr., Hyattsville, both of Md., assignors to The United States of America as represented by the Secretary of the Treasury

Filed June 15, 1970, Ser. No. 46,365
Int. Cl. G01n *1/10*; **B65d** *81/00, 79/00*
U.S. Cl. 23—259 **1 Claim**

A qualitative analysis device which allows for the performance of a qualitative analysis for cannabis material in vegetable matter which required a performed extraction step followed by a reaction step. The device has an outer container and an inner container within the outer container. The inner container has a frangible section and is also provided with a means for breaking the frangible section. The device is sealable so that the reagents may be stored within the device and be ready for use at any time.



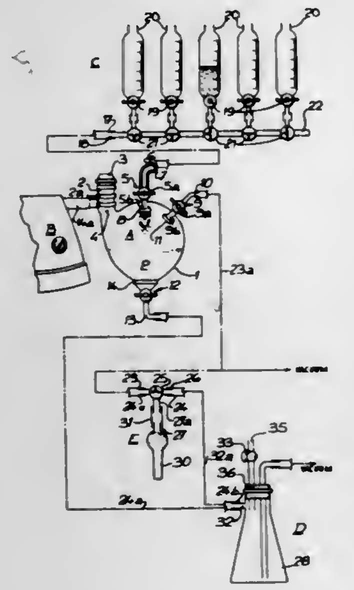
3,715,190
SYSTEM FOR THE SOLID-PHASE PEPTIDE SYNTHESIS

Won Kil Park, Sherbrooke, Quebec, and Domenico Regoli, Magog, Quebec, Canada, assignors to University de Sherbrooke, Sherbrooke, Quebec, Canada

Filed Sept. 23, 1971, Ser. No. 182,938

Int. Cl. C07c *103/52*

U.S. Cl. 23—252 R **13 Claims**



Apparatus for the solid-phase peptide synthesis which comprises a reaction vessel consisting of a flask having a side arm defining an inlet through which a polymer can be inserted into the flask. Means are provided to separately insert a solvent and a reagent inside the flask while they are distributed uniformly along the inner walls of the flask. At the bottom of the flask, there are means to remove the solvent and waste products from the flask, preferably by suction. The flask has an opening to permit an entry of air inside the flask in order to control the pressure inside the flask and to facilitate removal of solvent and waste products. The apparatus also comprises means associated with the reaction vessel to shake the latter and to cause synthesis of the peptide to take place. The solvent and reagent are contained in reservoirs which are connected to the reaction vessel at a point where the latter separately introduces solvent and reagent therein. Finally, means are provided to cleave the peptide when the synthesis is terminated.

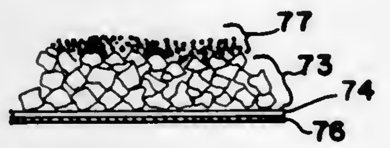
3,715,191
APPARATUS FOR MAKING WET PROCESS PHOSPHORIC ACID

William E. Rushton, South Holland; Gordon E. Seavoy, Chicago, and Woodruff A. Morey, Flossmoor, all of Ill., assignors to Whiting Corporation

Filed July 13, 1970, Ser. No. 54,438

Int. Cl. C01b *25/22;* **B01j** *1/00*

U.S. Cl. 23—260 **5 Claims**



An apparatus and method for improving the filterability of wet process phosphoric acid reaction slurry. The slurry is divided into a least two segments, one of which contains only calcium sulfate crystal particles below a predetermined size, for example, only particles below 200 mesh, ant the other segment contains the remaining larger size calcium sulfate crystal particles. The slurry segment containing the larger particles is then discharged directly onto the porous filter media, usually filter cloth, with the larger crystal particles collecting thereon. The slurry segment containing the smaller size calcium sulfate crystal particles is then deposited directly onto the larger crystal particles which have collected on the porous filter media. In this manner, the crystal fines are effectively prevented from blinding the porous filter media, thereby prolonging the life thereof without reducing the capacity or efficiency of such filter.

3,715,192
INDICATOR STRIP

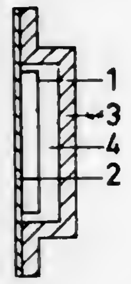
Adolf Wenz; Alfred Stein, and Dieter Schmitt, all of Darmstadt, Germany, assignors to Merck Patent Gesellschaft mit beschrankter Haftung, Darmstadt, Germany

Filed Aug. 7, 1970, Ser. No. 62,017

Claims priority, application Germany, Aug. 12, 1969, P 19 40 964.4

Int. Cl. G01n *31/22, 33/16*

U.S. Cl. 23—253 TP **24 Claims**



An indicator strip, useful in analytical chemical procedures, which comprises an impregnated capillary material having at least a partially transparent film on one side and on the other side, a film forming a hollow space which is in communication with said capillary material.

3,715,193
CATALYST SUPPORT

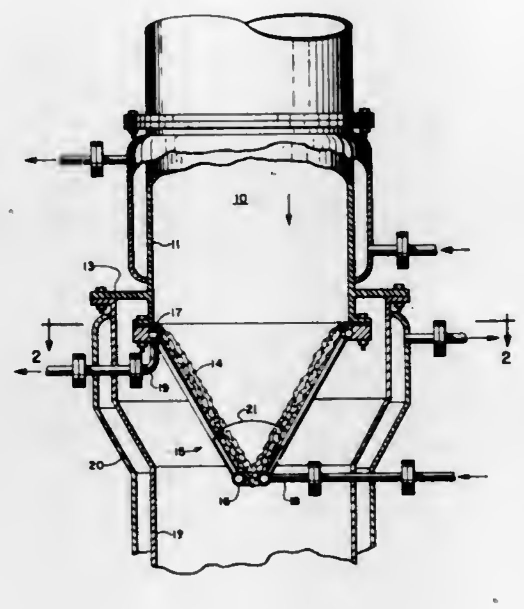
Samuel Strelzoff, 12 West 96th Street, New York, N.Y.

Filed March 1, 1971, Ser. No. 119,670

Int. Cl. B01j *9/04;* **C01b** *21/28;* **F28f** *1/00*

U.S. Cl. 23—288 R **3 Claims**

A support for a metallic gauze catalyst in a reactor for manufacturing hydrocyanic acid or nitrogen oxides is made up of a plurality of hollow tubular members disposed in a conical configuration. Heat transfer media flows within the hollow tubular members which make up the conical support to maintain a more uniform temperature of the catalyst and permit the use of less costly materials for catalyst support structures.



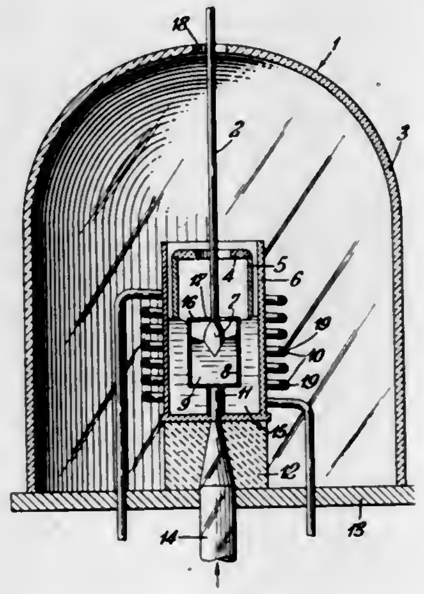
3,715,194
MELT GROWN ALUMINA CRYSTALS AND PROCESS THEREFOR

Myron N. Plooster, Boulder, Colo., assignor to Union Carbide Corporation, New York, N.Y.

Division of application Ser. No. 770,894, Oct. 22, 1968, which is a continuation of application Ser. No. 481,194, Aug. 20, 1965, which in turn is a continuation-in-part of application Ser. No. 300,178, Aug. 6, 1963, all now abandoned. This application Oct. 29, 1970, Ser. No. 85,261

Int. Cl. B01g *17/18;* **C01f** *7/02*

U.S. Cl. 23—301 SP **7 Claims**



Massive alpha alumina unicrystalline material substantially free of internal strain and crystal misorientation is provided. A process for producing such material by pulling from an alumina melt is also provided.

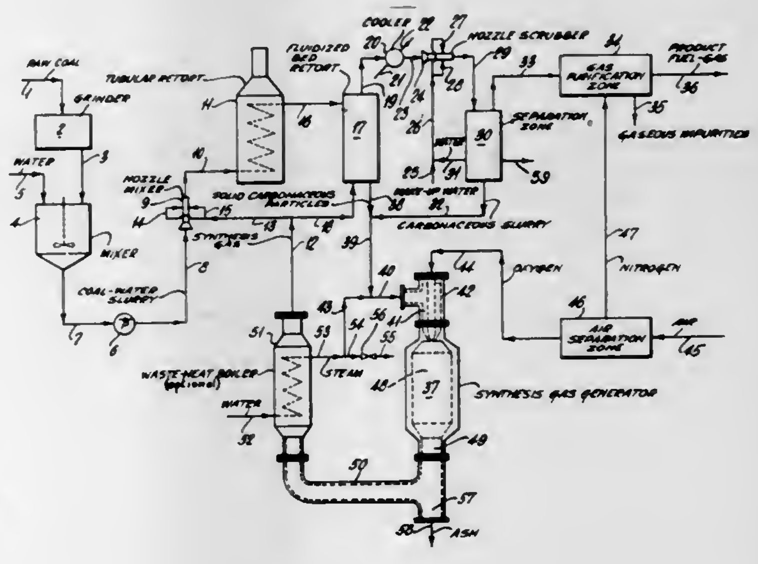
3,715,195
MULTIHYDROTORTING OF COAL

Joseph P. Tassoney, Whittier, and Warren G. Schlinger, Pasadena, Calif. (both % Texaco Inc., P.O. Box 400, Montebello, Calif. 90640)

Filed June 30, 1971, Ser. No. 158,468

Int. Cl. C07c *9/04;* **C10j** *3/46*

U.S. Cl. 48—197 R **12 Claims**



This is a noncatalytic multihydrotorting process for maximizing the conversion of coal into nonpolluting fuel gas. A pumpable coal-water slurry in admixture with a stream of synthesis gas is passed through a tubular retort where it is heated to a temperature in the range of about 600 to 1300° F. in the absence of air. The solid coal particles are fragmentized and carbonized in the tubular retort, the volatile constituents in said slurry are volatilized and simultaneously hydrogenation of the process stream takes place. The effluent from the tubular retort is then introduced into a fluidized bed retort along with a second stream of synthesis gas. Thermal decomposition of the carbonaceous materials takes place in the absence of air and the process stream is hydrogenated for a second time. Off-gas from the fluidized bed is then scrubbed and purified to produce nonpolluting fuel gas having a high heating value. Spent carbonaceous particles leaving the fluidized bed retort are introduced into a free-flow noncatalytic gas generator for conversion into preferably methane-rich synthesis gas by partial oxidation for use in the aforesaid two hydrotorting stages.

3,715,196
LOW-EXPANSION GLASS-CERAMIC CEMENTING METHOD

Max R. Montierth, Big Flats, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Sept. 2, 1970, Ser. No. 69,133

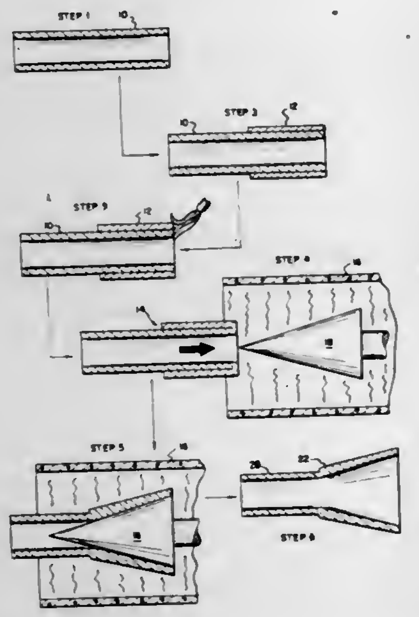
Int. Cl. C03b *29/00, 27/00*

U.S. Cl. 65—33 **5 Claims**

A cementing composition and method suitable for bonding together glass-ceramic structures comprising preparing a mixture containing a thermally devitrifiable glass and a flux containing a quantity of silica fibers, applying said mixture to the glass-ceramic components to be bonded, and thereafter heat treating the cemented structure so that the cement is cured to a glass-ceramic bond which closely matches the glass-ceramic components in microstructure and thermal properties.

3,715,197
METHOD AND PREFORM FOR RESHAPING GLASS TUBING

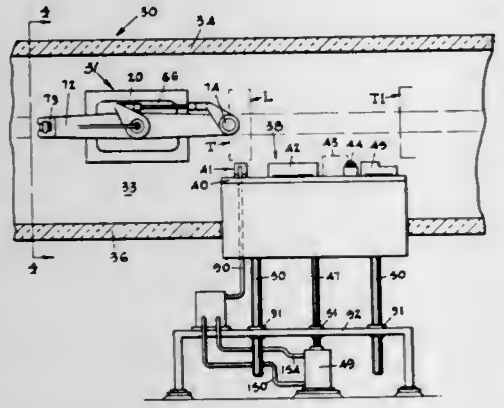
Raymond Nalepka, Farmington, Mich., assignor to The Bendix Corporation
Filed Dec. 10, 1970, Ser. No. 96,811
Int. Cl. C03b *23/08, 23/20*
U.S. Cl. 65—54 **4 Claims**



A method and preform for flaring or otherwise reshaping stock glass tubing is disclosed, in which an additional section of glass tubing is placed over the existing section of the glass tubing to be flared or reshaped and fused thereto at one end to create the preform, with conventional flaring or reshaping techniques then being applied to this preform to yield a flared or otherwise reshaped section of a relatively heavy-walled construction.

3,715,198
APPARATUS FOR PRODUCING ALL-GLASS MULTIPLE SHEET GLAZING UNITS

Lawrence C. Wheat, and Orville L. Tary, both of Toledo, Ohio, assignors to Libbey-Owens-Ford Company, Toledo, Ohio
Filed July 6, 1970, Ser. No. 52,471
Int. Cl. C03b *23/20*
U.S. Cl. 65—152 **7 Claims**



This application discloses, as part of the production of all-glass multiple sheet glazing units, the forming of a continuous edge wall around the margins of two spaced glass sheets by heating the edge portions of the sheets to a semi-plastic condition and then pressing them together by a rolling action to form an integrally sealed wall. The burners and forming rolls for this purpose are mounted on a support element which also carries a sensing or detecting device adapted to actuate control means that will produce movement of the support element and thereby locate the forming rolls at a desired working elevation relative to the edge portions of the sheets.

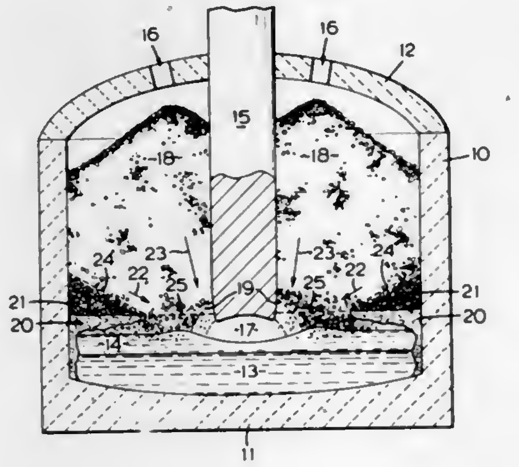
3,715,199
METHOD OF KILLING WEEDS IN RICE CROPS UTILIZING BENZYL N,N-DIALKYL-DITHIOCARBAMATES

Shigeki Wakamori and Yoshio Yoshida, Kanagawa-ken, Sanji Yamauchi, Tokyo, and Yoshio Ishii and Muneharu Goto, Kanagawa-ken, Japan, assignors to Kumiai Chemical Industry Co., Ltd., Tokyo, Japan
No Drawing. Continuation-in-part of application Ser. No. 609,323, Jan. 16, 1967. This application June 6, 1969, Ser. No. 831,247
Int. Cl. A01n *9/12*
U.S. Cl. 71—101 **4 Claims**

A method for killing weeds in crops by applying to the soil benzyl N,N-dialkyl dithiocarbamates. The compounds are particularly useful as selective herbicides in aquatic rice crops.

3,715,200
ELECTRIC ARC FURNACE OPERATION

Frederick R. Archibald, Toronto, Ontario, and Gerald G. Hatch, Islington, Ontario, Canada, assignors to Falconbridge Nickel Mines Limited, Toronto, Ontario, Canada
Filed Feb. 17, 1969, Ser. No. 799,871
Int. Cl. C21c *5/52;* **C22d** *7/04;* **H05b** *11/00*
U.S. Cl. 75—10 **6 Claims**



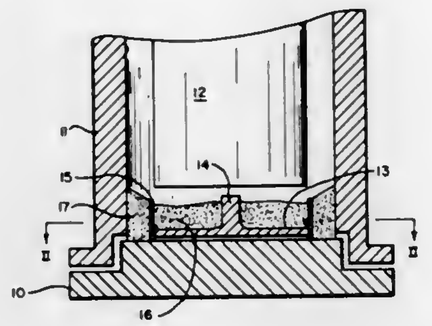
An improved method for continuous melting of particulate material in an electric arc furnace. The particles are rendered as a body free-flowing and substantially non-conductive electrically and a body thereof is established around and in contact with a vertically adjustable electrode and a high voltage arc between the electrode and a molten bath of the material thereby shielding the arc and establishing a confined zone of high temperature in contact with and around the arc. Particles are melted in contact with the arc and continually replaced by others as melting occurs thereby maintaining the body in contact with the arc and maintaining the confined high temperature zone for rapid melting therein. The distribution of power between the arc and bath is controlled to favour release of power in the arc and thereby achieve high throughput of particles per unit area of furnace hearth. The method is particularly advantageous in the recovery of ferronickel from nickeliferous ores of the oxide and silicate types.

3,715,201
APPARATUS FOR ELECTROSLAG MELTING

Rene Schlatter, Derry Township, Westmoreland County, Pa., assignor to Latrobe Steel Company
Filed Sept. 30, 1970, Ser. No. 76,761
Int. Cl. C22d *7/00;* **C22b** *9/10;* **B23k** *35/34*
U.S. Cl. 75—10 **7 Claims**

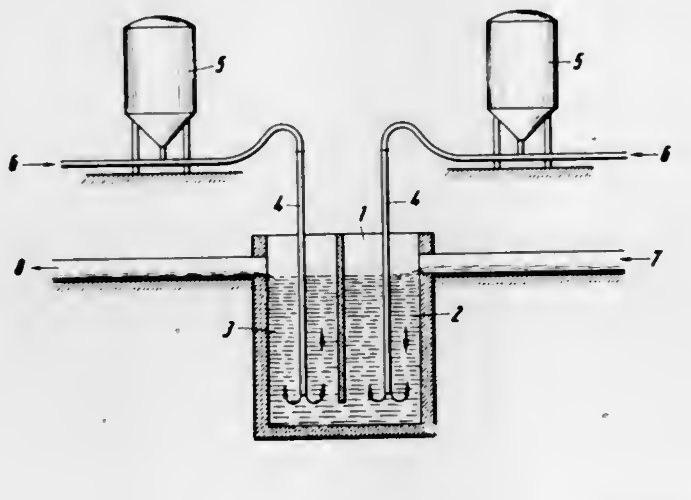
A consumable electrode electroslag apparatus and method are provided in which an ingot mold rests on a conductive

stool and an electrode to be remelted is lowered into the mold to contact and arc against a vertical ignition pin on a starting plate resting on the stool and surrounded by an exothermic flux confined within a consumable cylinder which is in turn surrounded by a mixture of a standard working flux.



3,715,202
METHOD FOR DESULPHURIZING PIG IRON

Hans Kosmider, Bremen-Lesum, and Dieter Danckert, Brankland, both of Germany, assignors to Klockner-Werke Aktiengesellschaft, Duisburg, Germany
Filed Feb. 16, 1971, Ser. No. 115,296
Claims priority, application Germany, March 6, 1970, P 20 10 585.5
Int. Cl. C21b *3/02, 11/08*
U.S. Cl. 75—58 **7 Claims**

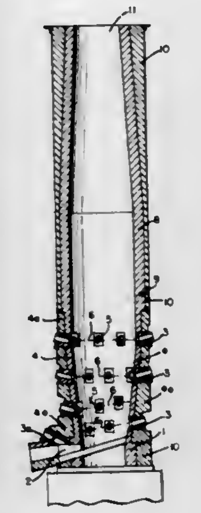


A method for the desulphurization of pig iron envisioning a continuously flowing pig iron stream having a descending flow portion in which a desulphurizer ascends in opposite flow direction.

3,715,203
MELTING OF METALS

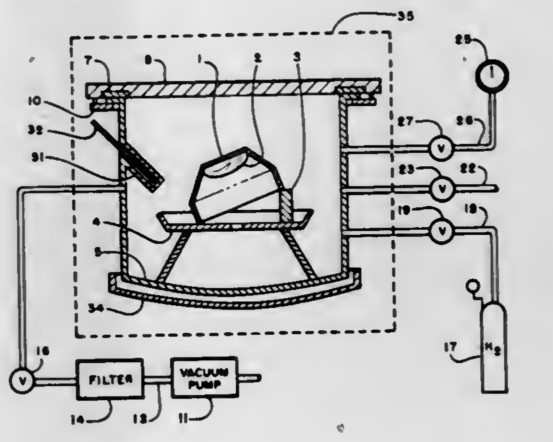
Edouard De Bie, Antwerp, Belgium, assignor to Metallurgie Hoboken-Overpelt, Brussels, Belgium
Filed Dec. 22, 1970, Ser. No. 100,758
Claims priority, application Luxembourg, Dec. 24, 1969, 60.094
Int. Cl. C22b *15/00, 15/14*
U.S. Cl. 75—76 **18 Claims**

The invention relates to a process for melting and refining copper in a vertical furnace by direct contact of copper pieces with hot gases produced by combustion of a non-solid fuel with an oxygen-containing gas ignited before coming into contact with the copper pieces, the said gas being substantially neutral, the variation around the neutral point being such that the oxygen contents shall be lower than about 0.5 percent of O_2 and the hydrogen contents shall be lower than about 0.5 percent of hydrogen, and the pressure being such that the ignited has leaving the burners shall be capable of piercing the liquid mass situated at the level of the burners.



3,715,204
SEPARATION OF PLUTONIUM AND URANIUM FROM HOLDER

Robert P. DeGrazio, Boulder, and Herbert N. Robinson, Denver, both of Colo., assignors to The United States of America as represented by the United States Atomic Energy Commission
Filed May 28, 1971, Ser. No. 147,901
Int. Cl. B22d *29/00*
U.S. Cl. 75—84.1 R **6 Claims**

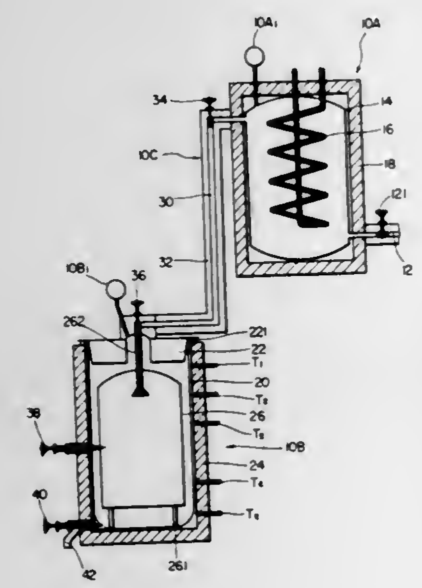


Method of separating plutonium or uranium from a holder, e.g., for facilitating removal of a plutonium or uranium piece from a crucible, by hydriding under a controlled atmosphere at 25° to 100° C.

3,715,205
METHOD FOR REDUCING CHLORIDES AND A DEVICE THEREFOR

Hiroshi Ishizuka, 19-2 Ebara 6-chome, Shinagawa-ku, Tokyo, Japan
Filed Jan. 7, 1971, Ser. No. 104,720
Claims priority, application Japan, Jan. 8, 1970, 45/2606; Jan. 10, 1970, 45/3075; Jan. 9, 1970, 45/3082; Aug. 8, 1970, 45/69495
Int. Cl. C22b *53/00*
U.S. Cl. 75—84.5 **8 Claims**

A method for reducing a metal chloride, especially for reducing a chloride of sublimable metal by using a metallic reducing agent, and a device therefor. A tank for storing the starting metal chloride is connected to a separate reducing chamber through a pipe, which tank and chamber are heated by separate heat sources, respectively. The metallic reducing agent is heated, so as to form gaseous phase thereof which gaseous phase is kept at a temperature higher than the melting point of the metal and brought into contact with the vapor of the starting metal chloride to cause the reducing reaction. The reduction is effected while measuring and controlling the flow rate of the starting metal chloride vapor to the reducing chamber.



3,715,206
HEAT RESISTING ALLOYS

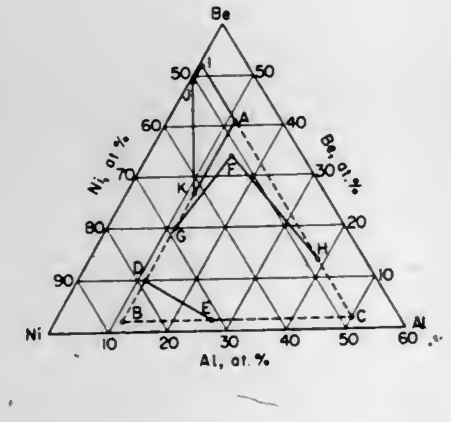
Noboru Komatsu; Takatoshi Suzuki, and Takuo Ito, all of Nagoya, Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkyusho, Aichi-ken, Japan

Filed July 29, 1970, Ser. No. 59,169

Claims priority, application Japan, Aug. 2, 1969, 45/61344; May 8, 1970, 45/39463

Int. Cl. C22c *19/00*

U.S. Cl. 75—170 **4 Claims**



The invention concerns with highly improved heat resisting Ni–Al–Be alloys.

The improvement resides in the selection of specific alloying ratios as determined by a certain specific polygonal area plotted on a triangular coordinate diagram of Ni, Al and Be, for general improvement of the high temperature antioxidation performance, high temperature strength and high temperature toughness of the alloys.

3,715,207
ELECTROSTATICALLY DEFORMABLE THERMOPLASTIC LAYER CONTAINING A 1,4-DIALKYLAMINO-9,10-ANTHRAQUINONE DYE

Roger N. Ciccarelli, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed April 13, 1971, Ser. No. 133,735

Int. Cl. G03g *5/02*

U.S. Cl. 96—1.5 **3 Claims**

A thermoplastic-deformable imaging system is provided which absorbs substantially all of the incident radiation which is not reflected from the thermoplastic-air interface of a thermoplastic deformable layer residing over an underlying photoconductive layer so as to eliminate secondary reflection from the thermoplastic-photoconductor interface. The thermoplastic deformable layer is provided with an absorbing pigment which substantially absorbs non-reflected radiation so that this radiation is not secondarily reflected.

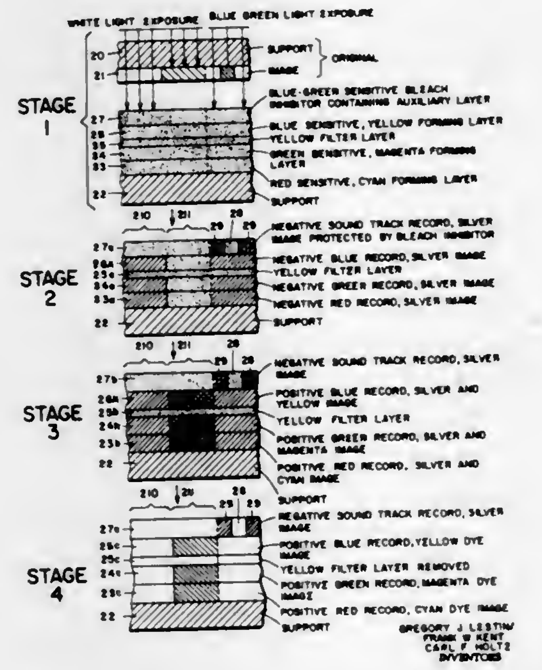
3,715,208
FILM CONTAINING BLEACH INHIBITOR AND PROCESS THEREFOR FOR PRODUCING COLOR FILM WITH SILVER SOUND RECORD

Gregory J. Lestina; Frank W. Kent, and Carl F. Holtz, all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 100,613, Dec. 22, 1970, abandoned. This application Dec. 17, 1971, Ser. No. 209,458

Int. Cl. G03c *5/44, 5/24*

U.S. Cl. 96—4 **48 Claims**


WHITE LIGHT EXPOSURE
BLUE GREEN LIGHT EXPOSURE
SUPPORT
IMAGE
ORIGINAL
STAGE 1
BLUE-GREEN SENSITIVE BLEACH INHIBITOR CONTAINING AUXILIARY LAYER
BLUE SENSITIVE, YELLOW FORMING LAYER
YELLOW FILTER LAYER
GREEN SENSITIVE, MAGENTA FORMING LAYER
RED SENSITIVE, CYAN FORMING LAYER
SUPPORT
STAGE 2
NEGATIVE SOUND TRACK RECORD, SILVER IMAGE PROTECTED BY BLEACH INHIBITOR
NEGATIVE BLUE RECORD, SILVER IMAGE
YELLOW FILTER LAYER
NEGATIVE GREEN RECORD, SILVER IMAGE
NEGATIVE RED RECORD, SILVER IMAGE
STAGE 3
NEGATIVE SOUND TRACK RECORD, SILVER IMAGE
POSITIVE BLUE RECORD, SILVER AND YELLOW IMAGE
YELLOW FILTER LAYER
POSITIVE GREEN RECORD, SILVER AND MAGENTA IMAGE
POSITIVE RED RECORD, SILVER AND CYAN IMAGE
SUPPORT
STAGE 4
NEGATIVE SOUND TRACK RECORD, SILVER IMAGE
POSITIVE BLUE RECORD, YELLOW DYE IMAGE
YELLOW FILTER LAYER REMOVED
POSITIVE GREEN RECORD, MAGENTA DYE IMAGE
POSITIVE RED RECORD, CYAN DYE IMAGE
SUPPORT
GREGORY J. LESTINA
FRANK W. KENT
CARL F. HOLTZ
INVENTORS

A novel process of producing a picture record and a silver auxiliary image or sound track record in an imagewise exposed photographic element comprising a support having coated thereon, on one surface, at least one picture recording photographic image-forming unit comprising at least one silver halide emulsion layer and an auxiliary image radiation sensitive silver halide layer which does not form an image upon image-forming exposure of the picture recording unit or units, which auxiliary layer contains a nondiffusible ballasted silver bleach inhibitor, which process comprises (A) developing silver halide in said element with a black-and-white developing agent to form a silver picture record in said picture recording unit or units and a silver auxiliary image record or sound track record in said auxiliary layer, (B) fogging and developing silver halide in the element with aromatic primary amine color developing agent in the presence of a photographic color coupler to form a picture record comprising silver and a nondiffusible dye in the picture recording unit or units and thereafter (C) removing the residual silver halide and bleachable silver remaining after steps (A) and (B) by bleaching and fixing while retaining silver in the auxiliary layer to form the silver auxiliary image or silver sound track record. Also provided are novel photographic elements of the type described above.

3,715,209
ELECTRICAL COLOR MASKING IN A PHOTO ELECTROPHORETIC IMAGING PROCESS

Robert W. Gundlach, Victor, N.Y., assignor to Xerox Corporation, Rochester, N.Y.

Filed Feb. 27, 1970, Ser. No. 15,103

Int. Cl. G03g *13/22*

U.S. Cl. 96—1.2 **7 Claims**

The densities of pigments comprising an image are altered in electrophoretic imaging systems by supressing or enhancing pigment migration in an electric field by employing in selected areas electrostatic charge to increase or decrease the field effecting migration.

3,715,210
LITHOGRAPHIC PRINTING PLATES

Leonard J. Watkinson, Leeds, and Anthony Peter Service, Selby, both of England, assignors to Howson-Algraphy Limited, London, England

Continuation-in-part of Ser. No. 742,495, July 5, 1968, abandoned. This application Feb. 19, 1971, Ser. No. 117,079

Claims priority, application Great Britain, Aug. 18, 1966, 37,135/66; Italy, Aug. 17, 1967, 38841 A/67; July 1, 1968, 38080 A/68; Norway, July 3, 1968, 3274; July 3, 1968, 2667; Sweden, July 3, 1968, 9143/68; Australia, July 4, 1968, 6416; South Africa, July 4, 1968, 4301

Int. Cl. G03f *7/02;* **G03c** *1/52, 1/64*

U.S. Cl. 96—33 **8 Claims**

A light sensitive plate comprises a support coated with a layer comprising a tannable resin and a diazo or azido compound having light decomposition products capable of tanning the resin. The tannable resin is low viscosity hydroxyethyl cellulose or a polymer of acrylamide and at least two other monomers containing up to 30 percent by weight of the other monomers. The monomers are selected so that the layer does not swell on development. The light sensitive plate is storage stable and is suitable for the production of half-tone lithographic printing plates by the deep-etch process.

3,715,211
PROCESS AND PRODUCT OF COLD SEALING AN ANODIZED ALUMINUM ARTICLE BY A PHOTO-POLYMERIZATION PROCESS

Harold J. Quaintance, Fairview Park, Ohio, assignor to Horizons Incorporated, a division of Horizons Research Incorporated

Filed Feb. 1, 1971, Ser. No. 111,648

Int. Cl. G03c *1/94;* **B32b** *15/08*

U.S. Cl. 96—35.1 **11 Claims**

A method of cold sealing an anodized aluminum article comprising photopolymerizing a cross-linked polymer in situ in the pores of the surface of the anodized layer on the article and the product produced thereby are described.

3,715,212
PHOTOCHROMIC DISPLAY AND STORAGE DEVICE AND METHOD OF OPERATION THEREOF

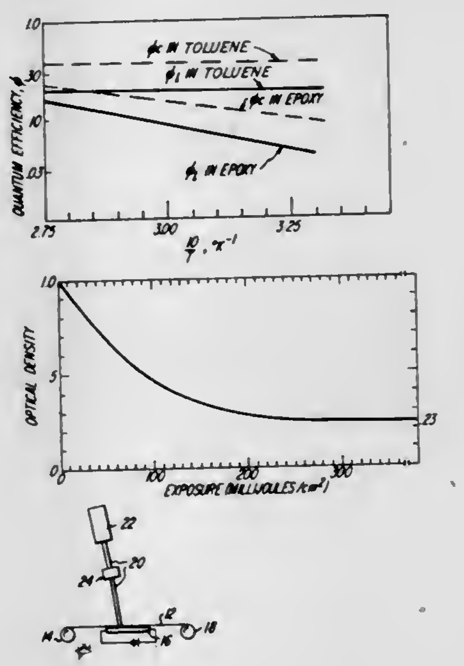
Daniel Louis Ross, Princeton, N.J., assignor to RCA Corp.

Filed Dec. 7, 1970, Ser. No. 95,578

Int. Cl. G03c *5/24, 1/72*

U.S. Cl. 96—48 **9 Claims**

A photochromic display and storage element having a relatively high photochromic efficiency at temperatures above room temperature and a relatively low photochromic efficiency at room temperature consists of a substituted thioindigo dye dissolved in a heat-cured epoxy resin having a glass transition temperature of between above room temperature and 100°C. Information is placed on the element by heating it to or above the glass transition temperature and shining light of a first wavelength (write light) on the element. The image is stored by cooling the element to room temperature. In order to read the image, light of a second wavelength (read light) is passed through the element at room temperature. The image is erased with light of this second wavelength by first heating the element to or above the glass transition temperature.



3,715,213
DIAZO-TYPE MULTICOLOR REPRODUCTION

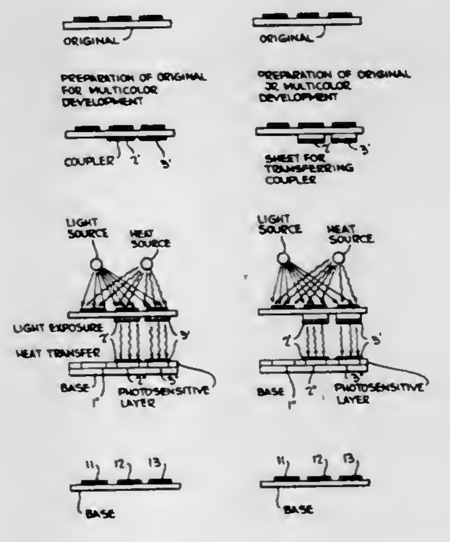
Kouzi Nihyakumen and Taizo Yokoyama, Osaka, Yasuo Ueda, Kobe, and Yasutoki Kamezawa and Tatsuo Aizawa, Osaka, Japan, assignors to Mita Industrial Company Limited, Osaka, Japan

Filed Feb. 17, 1970, Ser. No. 12,049

Claims priority, application Japan, Feb. 19, 1969, 44/11,914; Aug. 22, 1969, 44/65,980; Nov. 18, 1969, 44/91,964

Int. Cl. G03c *5/18, 1/58*

U.S. Cl. 96—49 **12 Claims**



A process for the diazo-type multicolor reproduction by which portions of a sensitive paper corresponding to predetermined portions of an original can be selectively colored to different hues by disposing a layer of thermotransferable coupler between an original and diazo-photosensitive paper followed by exposure to light and heating of the assembly. The layer of thermotransferable coupler is not applied to the entire image area of the original and the thermotransferable coupler is faster in coupling rate with the diazonium salt under the development conditions than the basic color coupler of the photosensitive paper or developing solution.

3,715,214
RAPID DEVELOPMENT PROCESS

John R. Kane, Piffard, and Harry G. Morse, Rochester, both of N.Y., assignors to Itek Corporation, Lexington, Mass.

Continuation-in-part of Ser. No. 771,325, Oct. 28, 1968, Pat. No. 3,582,341. This application May 18, 1970, Ser. No. 38,548

Int. Cl. G03c *5/30*

U.S. Cl. 96—66 HD **18 Claims**

A process and compositions for rapidly developing and fixing a high contrast, low speed photographic film such as microfilm. The first step in the process comprises contact of an exposed photographic film with an alkaline developer composition comprising (*a*) a mixture of hydroquinone and 1-phenyl-3-pyrazoli-done in a weight ratio of from 15:1 to 6:1 as the developing agent, the mixture contained in the developer composition in an amount of from 15 to 40 grams per liter; and (*b*) potassium sulfite as preservative in an amount from 60 to 120 grams per liter. Preferably, the developer composition has a pH from about 10 to 11 and contains a restrainer such as potassium bromide in an amount of from 2 to 10 grams per liter.

Following contact with the developer composition, the developed film is preferably contacted with a fixer such as one comprising from 200 to 400 grams per liter sodium thiosulfate crystals, 50 to 100 grams per liter of potassium sulfite and 100 to 200 grams per liter of ammonium thiocyanate.

The process of the invention provides rapid development of high contrast, low speed films and has, for example, a capability of developing microfilm in about 10 seconds or less. The high speed is believed to be attributable, at least in part, to the use of the above-noted combination of developing agents. Moreover, the process results in a developed negative free of a uniform red coloration or stain characteristic of films of this nature. Finally, the developer composition is highly resistant to the detrimental effects of aeration, has excellent keeping qualities and can be stored for long periods of time without noticeable deterioration.

3,715,215
SUCCESSIVE QUENCHING OF COFFEE DURING ROASTING

Theodore Thomas Balling, Danbury, Conn.; Richard J. Leonard, Wayne, N.J.; George Bernard Ponzoni, Spring Valley, N.Y.; Michael Gabriel Protomastro, Woodridge, N.J., and Arthur Stefanucci, Clifton, N.J., assignors to General Foods Corporation, White Plains, N.Y.

Filed Sept. 25, 1970, Ser. No. 75,681

Int. Cl. A23f *1/02*

U.S. Cl. 99—68 **9 Claims**

Undesirable aroma components and gases can be removed from coffee beans during roasting by intermittent additions of moisture to the coffee during roasting, in amounts ranging from 3 percent to 40 percent by weight of the beans, thereby driving out the volatiles and unexpectedly improving the flavor. This process of upgrading coffee and changing its flavor characteristics occurs within the same roaster.

3,715,216
BEVERAGE COMPOSITION

Jean-Jacques Wuhrmann, Vevey, and Elvira Cristofaro, St. Saphorin, both of Switzerland, assignors to Societe d'Assistance Technique pour Prodiuts Nestle SA, Lausanne, Switzerland

Filed Aug. 17, 1970, Ser. No. 64,658

Claims priority, application Switzerland, Sept. 5, 1969, 13483/69

Int. Cl. A23l *1/00*

U.S. Cl. 99—78 **14 Claims**

Beverage composition in the form of free flowing, granular particles comprising sugar, an edible acid and flavoring, in which the particles are agglomerated together with a binder consisting essentially of an edible fat and an edible gum. The binder composition functions as a clouding agent in the final beverage.

3,715,217
METHOD OF MAKING FREE-FLOWING FLAVORING POWDERS OF HIGH FLAVOR-CONCENTRATION AND PRODUCTS THEREOF

Edward W. Rosenbaum, Rydal, and Kurt L. Schoen, Philadelphia, Pa., assignors to David Michael & Co., Philadelphia, Pa.

No Drawing. Filed Aug. 15, 1967, Ser. No. 660,607

Int. Cl. A23l *1/26*

U.S. Cl. 99—140 R **4 Claims**

The method of making a dry, free-flowing flavoring powder (as, for instance, a vanilla powder having a flavor-concentration substantially higher than that of heretofore conventional sugar-base flavoring powders which comprises intermixing with a dry free-flowing micro-crystalline cellulose alone or with an admixture thereof with sugar and/or starch, such an amount of a concentrated flavoring liquid in relation to the amount of the micro-crystalline cellulose that the flavoring constituents contained in the amount of flavoring liquid so used will be substantially greater (of the order twice as much or more) than the flavoring constituents which can be admixed with sugar alone in the production of a conventional sugar-base dry free-flowing flavoring powder, thereafter drying such admixture by passing heated air thereover until the resultant product is friable and pulverizable, and thereafter crushing and pulverizing the resultant friable mass. The resulting dry free-flowing flavoring powder having a flavor concentration substantially higher than that of heretofore conventional sugar-base flavoring powders, and including a dry free-flowing micro-crystalline cellulose on the particles of which a concentrated flavoring liquid has been dried in situ.

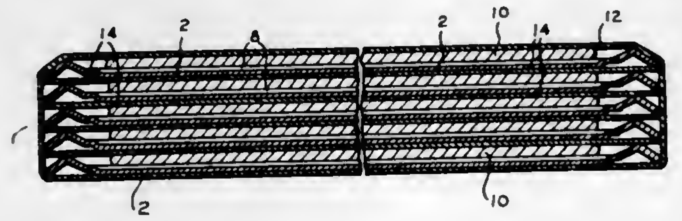
3,715,218
BACON CONTAINER

Robert L. Feely, Emmaus, Pa., assignor to Arbogast & Bastian, Inc., Allentown, Pa.

Continuation-in-part of Ser. Nos. 846,470, July 31, 1969, abandoned, and Ser. No. 846,504, July 31, 1969, abandoned. This application April 20, 1970, Ser. No. 30,183

Int. Cl. B65b *25/06*

U.S. Cl. 99—174 **1 Claim**



An open face container of bacon consisting of a tray formed of thin, non-toxic metal having a generally flat central part which is ridged to provide substantial rigidity and which is surrounded by a peripheral bead, and a layer of bacon slices on the tray within the bead, the bacon being raw or partially or fully cooked. The tray is used as the pan on which the cooking of the raw or partially cooked bacon is completed or the fully cooked bacon is warmed, and is disposable after use.

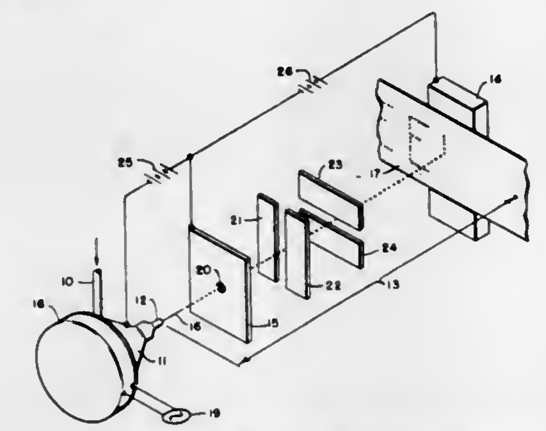
3,715,219
ELECTROSTATICALLY IMPROVEMENT IN ELECTO STATIC PRINTING

Philip F. Kurz, Columbus, Ohio, and Leonard A. Nash, Lake Forest, Ill., assignors to Teletype Corporation, Skokie, Ill.

Filed Sept. 23, 1969, Ser. No. 860,387

Int. Cl. C09d *11/00*

U.S. Cl. 106—22 **4 Claims**



An ink having a resistivity in the range of 10^6 to 10^{11} ohm-centimeters and a viscosity in a range with an upper limit of about 50 centipoises synchronously is formed into a uniform succession of ink drops in response to an alternating current. A stream of the ink drops is electrostatically drawn across and deflected in a span between the ink source and a carrier for printing thereon by drop impingement. The ink is a composition having about 3 percent by weight of a dye material and the remainder a vehicle comprised of at least one alcohol of the paraffin series which has the general formula $CH_3(CH_2)_nCH_2OH$ in which *n* is an integer between 12 and 16.

3,715,220
CERAMIC ARTICLE AND METHOD OF MAKING IT

James O. Confer, Tioga, Pa., and George D. McTaggart, Horseheads, N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed March 19, 1969, Ser. No. 808,654

Int. Cl. C03c *3/22, 3/04, 3/30*

U.S. Cl. 106—39 DV **6 Claims**

Characterized by substantially zero coefficient of thermal expansion over a general range of room temperature variations, the article consists essentially of a sintered consolidated particulate mixture of substantially equal portions of first and second materials. First material is composed mainly of SiO_2 with critical lesser amounts of Al_2O_3 and Li_2O in a mole ratio of 1.5 or less. Second material is composed mainly of SiO_2 together with critical lesser amounts of Al_2O_3, TiO_2 and Li_2O constituting at least 95 wt. percent of the material and with small amounts of required MgO and optional ZnO. Green article formed of the particulate mixture is given three-stage heat treatment at progressively higher temperatures to develop the very low thermal expansion coefficient, sintering and substantial imperviousness to water and air.

3,715,221
OPTICAL GLASS

Edgar J. Greco, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 29, 1971, Ser. No. 111,113

Int. Cl. C03c *3/12, 3/30, 3/00*

U.S. Cl. 106—47 Q **10 Claims**

An optical glass having a high index of refraction, a low dispersion, and low color, consists essentially of lanthanum oxide (La_2O_3), thorium dioxide (ThO_2), tantalum pentoxide (Ta_2O_5), boric oxide (B_2O_3), silicon dioxide (SiO_2), and germanium dioxide (GeO_2).

3,715,222
BASIC REFRACTORY

Harry L. Hieb, Pleasanton, Calif., assignor to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.

Filed Dec. 21, 1970, Ser. No. 100,532

Int. Cl. C04b *35/04*

U.S. Cl. 106—58 **12 Claims**

A fired periclase refractory of enhanced density and volume stability and good high temperature strength and thermal shock resistance is made from a batch comprising relatively coarse aggregate having 97.5 or more per cent MgO and, as matrix material, a prereacted grain containing substantial amounts of lime and silica, the ratio of lime to silica being at least sufficient to form dicalcium silicate.

3,715,223
PRODUCTION OF BASIC REFRACTORIES

Edmund S. Wright, Clearfield, Pa., assignor to Eltra Corporation, Toledo, Ohio

No Drawing. Filed Mar. 12, 1971, Ser. No. 123,814

Int. Cl. C04b *35/42*

U.S. Cl. 106—59 **4 Claims**

The production of magnesite chrome and chrome magnesite refractories is disclosed. The principal batch ingredients are from 40 to 80 parts by weight of dead burned magnesite or synthetic periclase and from 60 to 20 parts by weight of chrome ore. The magnesite or periclase and the chrome ore are suitably sized, mixed with minor batch ingredients, e.g. lime hydrate and lignin sulfate as a temporary binder, and tempered. The desired shape is then pressed from the tempered batch, and the shape is fired, e.g. to a temperature of 2500° F. or higher. Calcium nitrate is dissolved in the tempering liquid, prior to pressing of the desired shape; as a consequence of the calcium nitrate dissolved in the tempering liquid it has been found that the porosity of the final refractory is substantially reduced and as a consequence, it is believed, of the reduction in porosity, the final refractory has outstanding slag-resistance.

3,715,224
SOLUBLE AND COLLOIDAL SILICATES

Larry E. Campbell, Painted Post, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed June 12, 1970, Ser. No. 45,614

Int. Cl. C09d *1/04*

U.S. Cl. 106—74 **10 Claims**

This invention relates to the production of solutions and/or colloidal suspensions of water-soluble silicates containing certain monovalent and divalent cations which normally result in water-insoluble silicates. The process involves reacting in water a compound of the monovalent and/or divalent cations with a chelating or complexing agent exhibiting stability at a pH greater than 7 to yield a solution and/or colloidal suspension of complexed silicates. Where desired, the said solution and/or colloidal suspension can be cured to a solid body.

3,715,225
METHOD FOR FIXING OF LIQUID TONER DEVELOPED ELECTROGRAPHIC IMAGES

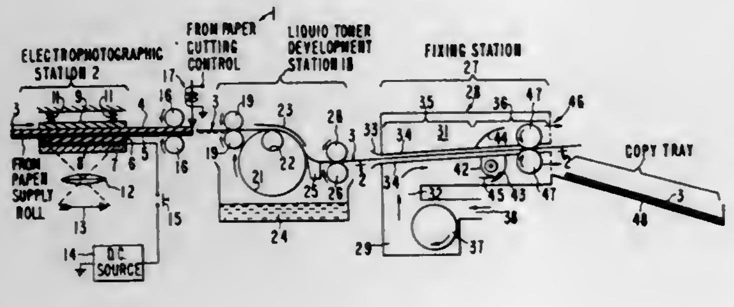
Gene F. Day, Sunnyvale, Calif., assignor to Varian Associates, Palo Alto, Calif.

Filed Apr. 5, 1971, Ser. No. 131,383

Int. Cl. B44d *1/094*

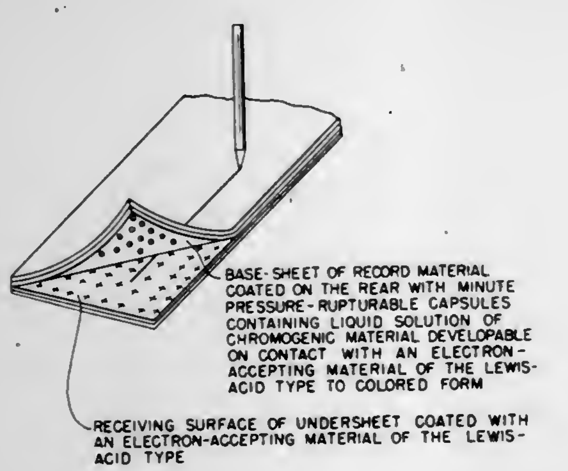
U.S. Cl. 117—21 **6 Claims**

An electrophotographic station deposits an electrostatic charge image on the charge retentive surface of an electrographic recording web, such image corresponding to an image to be printed. The charge image bearing web is fed through a liquid toner development station wherein charged electroscopic pigment particles suspended in a dielectric liquid are applied to the charge image for developing same. The developer image bearing web, while still wet with excess liquid toner, is passed into a fixing station wherein a blower blows air over the toned side of the image bearing web for drying the web by an amount such that the remanent liquid toner will not flow under the action of the air stream. The at least partially dried image bearing web is then fed through an infrared heating station for fixing the toned image. The source of infrared radiation is shielded from the air drying section of the fixing station to prevent running of the image.

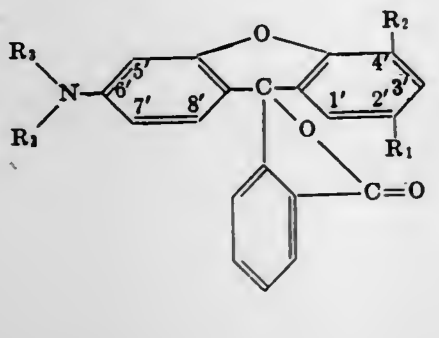


3,715,226
MARK-FORMING RECORD MATERIALS

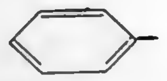
Chao-Han Lin, Dayton, Ohio, assignor to The National Cash Register Company, Dayton, Ohio
Division of Ser. No. 792,325, Jan. 21, 1969, Pat. No. 3,697,757. This application March 1, 1971, Ser. No. 119,830
Int. Cl. B41m *5/22*
U.S. Cl. 117—36.2 **19 Claims**


BASE-SHEET OF RECORD MATERIAL COATED ON THE REAR WITH MINUTE PRESSURE-RUPTURABLE CAPSULES CONTAINING LIQUID SOLUTION OF CHROMOGENIC MATERIAL DEVELOPABLE ON CONTACT WITH AN ELECTRON-ACCEPTING MATERIAL OF THE LEWIS-ACID TYPE TO COLORED FORM
RECEIVING SURFACE OF UNDERSHEET COATED WITH AN ELECTRON-ACCEPTING MATERIAL OF THE LEWIS-ACID TYPE

A chromogenic material of normally colorless form is disclosed, having a structural formula:



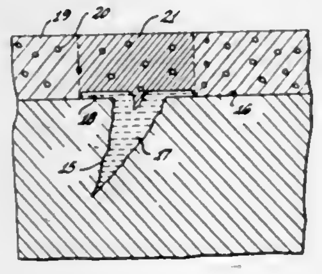
wherein R_1 represents -CO-R_4, and wherein R_4 represents hydrogen, —O—CH_3, and



R_2 represents hydrogen and alkyl radicals; and R_3 represents hydrogen and alkyl radicals having less than five carbon atoms; —said materials assuming a colored from upon reactive contact with a Lewis acid molecule. Examples include 6′-diethylamino-2′-formylfluoran; 2′-carbomethyoxy-6′-diethylaminofluoran; and 2′-benzoyl-6′-diethylamino-4′-methylfluoran.

3,715,227
INSPECTION PENETRANT DEVELOPMENT PROCESS EMPLOYING FUSIBLE WAXES

James R. Alburger, 5007 Hillard Avenue, La Canada, Calif.
Continuation-in-part of Ser. No. 799,701, Feb. 17, 1969, Pat. No. 3,607,333. This application March 23, 1971, Ser. No. 127,181
Int. Cl. B23p *7/04, 7/00*
U.S. Cl. 117—37 R **2 Claims**



An improved process of inspection penetrant development employing a high-sensitivity, high-resolving power inspection penetrant developer in which the active developing ingredient is a waxy substance which is a solid or near-solid at room temperature but which becomes fluid at slightly elevated temperatures. The waxy developer material mat be dissolved in a suitable carrier liquid, such as water or other inert volatile solvent, and is deposited on test parts by dipping, brushing or spraying, and allowing the carrier liquid to evaporate. The development process includes the step of applying heat to the test parts, during oven drying or by hearing subsequent to air-drying, whereby the waxy developer layer becomes a fluid, and carries into solution any dyed penetrant entrapments present in the surface defects. When the test parts cool to room temperature, the fluid waxy layer, which now contains developed defect indications, solidifies and prevents excessive bleeding and migration of the indications.

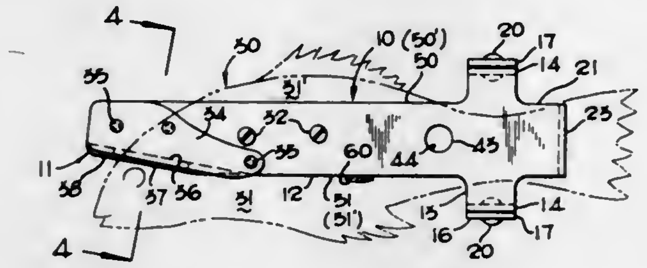
3,715,228
METHOD FOR TREATING SURFACES OF BUILDING MATERIALS

Joseph Dulat, Syrena, England, assignor to United States Borax Chemical Corporation, Los Angeles, Calif.
Filed Jan. 25, 1971, Ser. No. 109,682
Int. Cl. B44d *1/44*
U.S. Cl. 117—46 FC **6 Claims**

Building materials are treated with a flux and then heated with a high temperature flame in order to provide a decorative, durable glazed surface. Especially useful for inexpensive building materials such as low density bricks made from slag or other waste materials.

3,715,229
FISH CLEANING DEVICE

George E. Carnahan, 1007 Regent Terrace, Kirkwood, Mo.
Filed May 1, 1972, Ser. No. 249,363
Int. Cl. A22c *25/00*
U.S. Cl. 17—66 **6 Claims**



This fish cleaning device includes a pair of clamping plates hingedly attached at one end. A guillotine blade is provided at the remote end of one of the clamping plates which is adapted to make an incision in the fish head, and the clamping plates are spaced from each other at the hinge end to permit the fish to be received therethrough for accurate positioning during incision. The clamping plates are narrowed forwardly of the hinge and overlie the fish to provide guide margins for trimming the fish. Retaining prongs hold the fish in place between the clamping plates during the cutting and trimming operations.

3,715,230
DUAL TREATMENT OF ASBESTOS FIBERS

Thomas Harry Sadler, Belle Mead, N.J., assignor to Johns-Manville Corporation, New York, N.Y.
Continuation-in-part of Ser. No. 879,549, Nov. 24, 1969, abandoned. This application Feb. 12, 1971, Ser. No. 115,136
Int. Cl. B44d *1/16*
U.S. Cl. 117—70 S **10 Claims**

Treatment of asbestos fiber with a first coating of at least about 0.4 percent by weight of alkali-metal silicate solids or colloidal silica, and subsequent distribution of a non-foaming anionic dispersant on the coated fiber produces an asbestos fiber product that possesses improved filtration properties. The fiber product improves the production rate of articles from asbestos-cement slurries or pastes and eliminates the loss in strength of asbestos-cement articles that usually results from inclusion of silicate-treated fibers in the slurries or pastes.

3,715,231
STORAGE OF LIQUID HYDRAZINE ROCKET FUELS

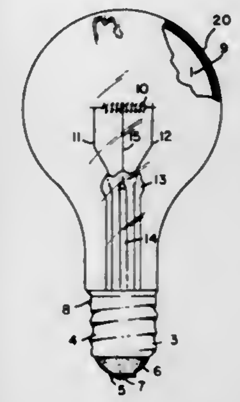
Wahling H. Ng, Rockaway; William F. Lehman, Sparta, both of N.J., and John P. Young, Gaithersburg, Md., assignors to The United States of America as represented by the Secretary of the Army
Filed May 28, 1971, Ser. No. 148,061
Int. Cl. B44d *1/02*
U.S. Cl. 117—71 M **11 Claims**

Liquid hydrazine fuels are stored in maraging steel containers for rocket systems provided with a thin protective lining of a metal of the group consisting of cadmium, silver, aluminum, nickel, tungsten, tin and alloys of tin with cadmium, nickel, and lead whereby the rate of decomposition of the fuel is greatly retarded and the fuel can be safely stored for long periods.

3,715,232
SHATTER-RESISTANT INCANDESCENT LAMP

Emery G. Audesse, Salem; Alexander Tartakoff, Beverly, and John K. Robertson, Lynn, all of Mass., assignors to GTE Sylvania Incorporated
Filed July 1, 1971, Ser. No. 158,712
Int. Cl. C03c *17/30;* **F21v** *3/04*
U.S. Cl. 117—72 **2 Claims**

An electric lamp having a glass envelope with a tacky, shatter-resistant silicone rubber coating over the envelope and a coating over that of a hard, heat resistant silicone material to resist the accumulation of dust on the tacky coating.



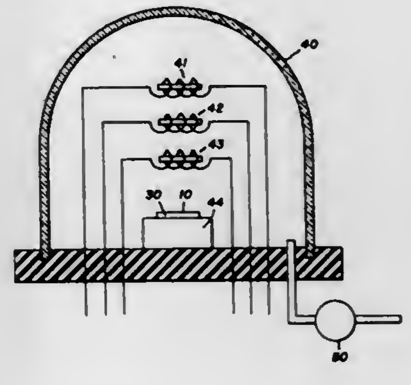
3,715,233
PROCESS FOR PREPARING FIBERGLASS PREFORMS

Jack L. Harrier, Lansing, Ill., assignor to Standard Oil Company, Chicago, Ill.
Filed Sept. 18, 1970, Ser. No. 73,663
Int. Cl. B32b *17/04*
U.S. Cl. 117—126 GB **12 Claims**

An improved process for the preparation of a polyester resin that can be solubilized in water as formed, and, when partially cured is insoluble in, but permeable to, polymerizable monomers such as styrene which comprises admixing a mixture of polycarboxyl-affording substances with a polyhydroxyl-affording substance and heating the mixture in the temperature range of 300°–450°F. until a thin sample of the material cures at 392°F. in from about 10 to about 40 seconds. The method of binding glass fibers into a mass suitable for reinforced-fiber molding purposes which comprises the steps of treating fibrous glass with the resin solubilized in water to form a resin-fiberglass composite and partially curing said composite at a temperature above about 200°F. until a water-insoluble, styrene-insoluble but styrene permeable composite is formed.

3,715,234
NON-RECTIFYING COMPOSITE CONTACT FOR SEMICONDUCTOR DEVICES

Ronald A. Stott, North Syracuse, N.Y., assignor to General Electric Company
Division of Ser. No. 746,861, July 23, 1968, abandoned. This application Dec. 28, 1970, Ser. No. 102,065
Int. Cl. B44d *1/18*
U.S. Cl. 117—217 **2 Claims**



This invention relates to an improved non-rectifying metallic contact for a semiconductor body comprising a composite structure made up of a plurality of interdiffused layers. This composite structure consists of a first layer of metallic material non-rectifyingly bonded to the surface of said body. A second layer of metallic metal surmounts said first layer to prevent the mixing of said first layer with any other layer at temperatures below the eutectic temperature of said first layer with said body. The second layer is covered by a third layer of an N-type conductivity-determining material. A fourth layer of noble metal is applied over the third layer to facilitate soldering of an external connector or support member to the contact. The multiple layers are then heated to form an interdiffused mixture of metallic layers that produce an adherent, non-rectifying, composite contact to said body.

3,715,235

PROCESS FOR THE REMOVAL OF IMPURITIES FROM TECHNICAL SUGAR SOLUTIONS

Erich Moebes, Enns, Austria, and Hans Hitzel, Frankfurt am Main, Germany, assignors to Sugar Chemical Co., Etablissement Vaduz/Furstentum, Liechtenstein

No Drawing. Filed Oct. 12, 1971, Ser. No. 188,581

Claims priority, application Austria, Oct. 16, 1970, 9,364

Int. Cl. C13d *3/14*

U.S. Cl. 127—46 A **6 Claims**

Technical sugar solution is pretreated by ion exchange with carbonate and/or bicarbonate exchangers in combination with an ammonium or weakly acidic cation exchanger in the hydrogen form. The pretreated solution or a solution obtained after removal of a portion of the sugar by crystallization from the pretreated solution is brought into ion exchange contact with a cation exchanger in the hydrogen form. The resulting solution is recycled to and passed through the carbonate and/or bicarbonate exchange employed in the pretreatment step without prior regeneration of that exchanger.

3,715,236

DESCALING METHOD FOR STEEL

Saburo Fukui; Tsunehiro Yamazaki, both of Hiroshima; Masato Yamamoto, Asa-gun; Masuichi Miyake, Saiki-gun, and Masanori Okumoto, Hiroshima, all of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 818,110, April 21, 1969, abandoned, and a continuation-in-part of Ser. No. 838,904, July 3, 1969, Pat. No. 3,617,039. This application Oct. 8, 1970, Ser. No. 79,290

Int. Cl. C23g *1/20*

U.S. Cl. 134—2 **20 Claims**

Chromium-containing steel is descaled by wetting the surface of the steel after annealing and while still hot with a mixed aqueous solution of caustic soda and/or caustic potash containing at least one alkali metal salt capable of forming caustic soda or caustic potash by hydrolysis or with an aqueous solution of two or more alkali metal salts which are capable of forming caustic soda or caustic potash by hydrolysis. The water of the solution is evaporated by the retained heat of the steel and the mixture of alkali metal salts is retained on the surface of the steel in an oxygen-containing atmosphere for a period sufficient to convert the scale components into water- or acid-soluble materials.

3,715,237

VARIABLE ELECTRIC CURRENT GENERATING DEVICE

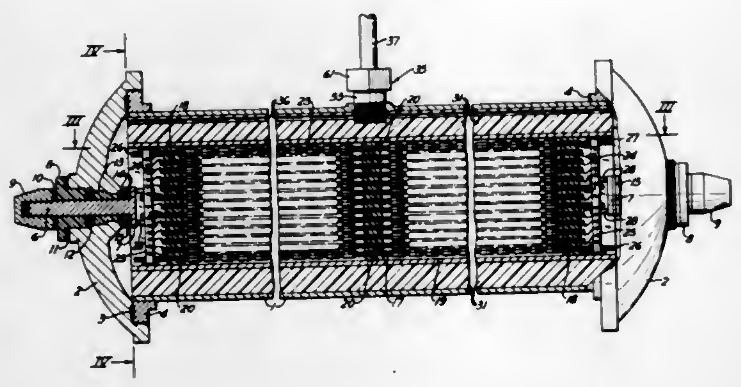
John B. Walker, 8 Earlswood Avenue, Pittsburgh, Pa.

Filed March 23, 1970, Ser. No. 21,912

Int. Cl. H01l *15/02*

U.S. Cl. 136—89 **9 Claims**

Inside a sealed case there is a photoelectric core that is sensitive to ultraviolet radiations and that is provided with a multiplicity of openings communicating with its outside. Surrounding the core and filling its openings is a radioactive self-ionized isotopic fluid that produces ultraviolet radiations which activate the core to produce electric current.



3,715,238

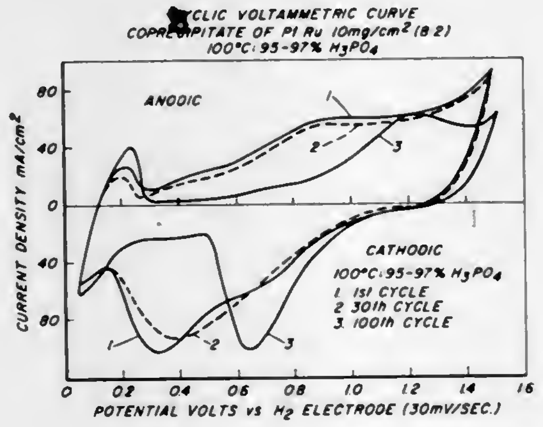
METHOD OF MAKING A POROUS CATALYTIC ELECTRODE

Jaspal Singh Mayell, Stamford, Conn., assignor to American Cyanamid Company, Stamford, Conn.

Filed Mar. 20, 1969, Ser. No. 808,890

Int. Cl. H01m *13/04*

U.S. Cl. 136—120 FC **7 Claims**



A catalytic electrode which comprises a metal catalyst such as rhodium or ruthenium and a second metal such as platinum or palladium is improved by electrolytic treatment using repeated triangular voltage sweeps. Improvement in catalytic activity of fuel electrodes is detailed.

3,715,239

ELECTROCHEMICAL CELL CLOSURE AND METHOD OF MAKING

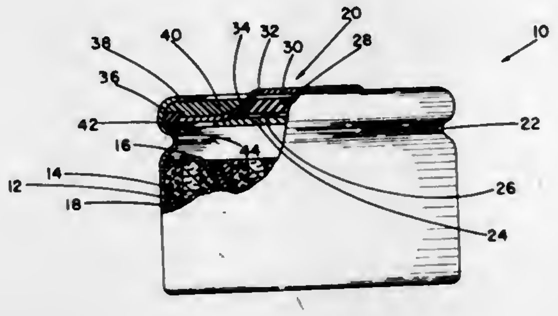
Douglas W. Walker, Littleton, Leland M. Gillman, Denver, and Robert E. Stark, Littleton, Colo., assignors to The Gates Rubber Company, Denver, Colo.

Filed Apr. 5, 1971, Ser. No. 131,236

Int. Cl. H01m *1/02*

U.S. Cl. 136—133 **14 Claims**

An electrochemical cell closure between the cell top and container is described comprising: A well formed between the upper protruding cell container mouth and upper protruding marginal portion of the cell top; a dam of an insulating material interposed in sealing relation between the walls of the well; and sealing material poured into the well and held by the dam sealingly bridging the cell container and top. In one embodiment, the insulating dam is made of a compressible material which is crimped inwardly prior to flowing the sealing material into the well.



3,715,240

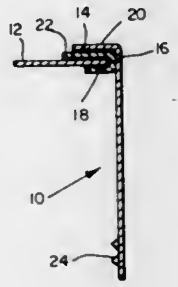
CONTACT ASSEMBLY FOR DRY CELL BATTERY

David O. Hamel, Madison, Wis., assignor to ESB Incorporated

Filed Jan. 21, 1971, Ser. No. 108,298

Int. Cl. H01m *13/10*

U.S. Cl. 136—134 P **7 Claims**



A contact assembly for connecting the terminals of a dry cell stack to the external terminals of a battery is described in which a conductive contact plate connects the top terminal of the cell stack to a first battery terminal. A connector strip non-conductively attached to the contact plate connects the bottom terminal of the stack with a second battery terminal. A method for assembling the connector assembly is also described.

3,715,241

DOPED TIN TELLURIDE BRAZING MATERIAL FOR SEMICONDUCTIVE THERMOELECTRIC GENERATOR ELEMENTS

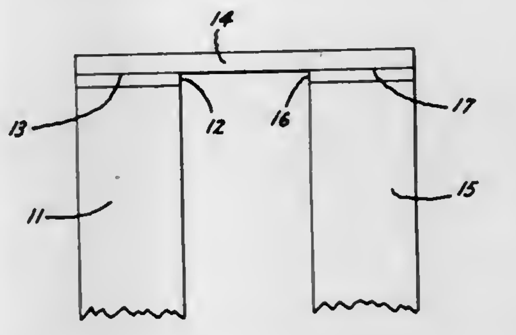
James H. Bredt, Garrett Park, Md., and Louis F. Kendall, Jr., Scotia, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Oct. 10, 1968, Ser. No. 766,634

Int. Cl. H01v *1/04*

U.S. Cl. 136—237 **5 Claims**

It has been found that when semiconductive lead telluride thermoelectric generator elements are brazed to iron clad stainless steel bridging members by stoichiometric tin telluride, there was a gradual degradation of the electrical properties during the life of the generator. It is believed that this is the result of migration of the doping elements from the lead telluride into the tin telluride by solid state diffusion. Therefore, p-type lead telluride has been brazed with sodium doped tin telluride and n-type lead telluride has been brazed with iodine doped tin telluride.



3,715,242

METHODS OF MANUFACTURING SEMICONDUCTOR DEVICES

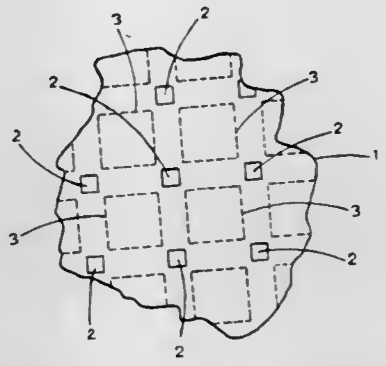
Peter James Daniel, Redhill, England, assignor to U.S. Philips Corporation

Filed Dec. 21, 1970, Ser. No. 100,152

Claims priority, application Great Britain, Dec. 17, 1969, 61,517/69

Int. Cl. H01l *7/00;* **G01n** *21/30*

U.S. Cl. 148—1.5 **18 Claims**



A method of manufacturing a semiconductor device in which a process is effected at a semiconductor surface with the aid of an electron beam. A reference marker of a metal or metal based layer is provided at the semiconductor surface, the secondary electron emission pattern of the marker being used for registration purposes. The reference marker remains substantially inert and adheres to the surface during the process. Where two or more processes are effected at the semiconductor surface, each with the aid of an electron beam, the metal or metal based layer reference marker provides for accurate alignment at each process. The electron beam may be used for the selective exposure of an electron sensitive resist layer or for the selective electron bombardment of a layer of an organic silicon compound which yields an adherent oxide layer pattern on the semiconductor surface and may be used as a mask against impurity diffusion.

3,715,243

SUPERCONDUCTORS

Anthony Robert King Clayton, Sutton Coldfield, and Anthony Clifford Barber, Lichfield, England, assignors to Imperial Metal Industries (Kynoch) Limited, Birmingham, England

No Drawing. Filed Apr. 27, 1967, Ser. No. 634,072

Claims priority, application Great Britain, May 4, 1966, 19,756/66

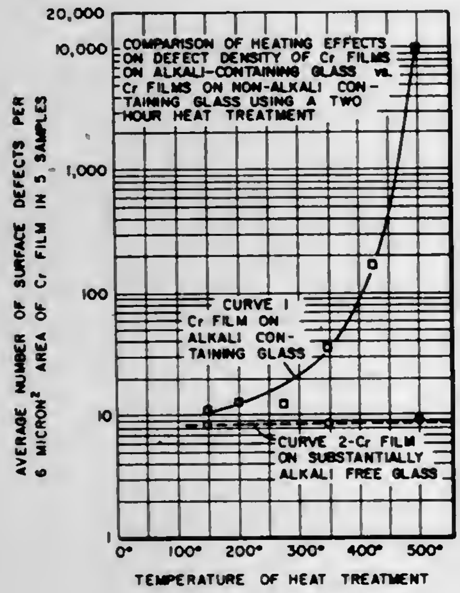
Int. Cl. C22f *1/18*

U.S. Cl. 148—11.5 R **11 Claims**

A method of making a superconductor comprises cold reduction of at least 10%, heat-treating 100° C.–500° C., at least one further cold reduction of at least 5%, and heat-treating 100° C.–500° C.

3,715,244
CHROMIUM FILM MICROCIRCUIT MASK

Raymond E. Szupillo, Big Flats, N.Y., assignor to Corning Glass Works, Corning, N.Y.
Division of Ser. No. 775,860, Nov. 14, 1968, Pat. No. 3,647,566. This application Aug. 26, 1971, Ser. No. 175,138
Int. Cl. B44d *1/02*
U.S. Cl. 148—31.5 **4 Claims**



Improved chromium film glass based articles having a low incidence of film surface defects, and highly hardened extremely scratch and wear resistant quality. The method includes the use of a substantially alkali-free glass substrate upon which is formed a chromium film, after which the composite so formed is heat treated to obtain the desired film hardness and electromagnetic energy reflective quality.

3,715,245
SELECTIVE LIQUID PHASE EPITAXIAL GROWTH PROCESS

Allen M. Barnett, and Simeon V. Galginaitis, both of Schenectady, N.Y., assignors to General Electric Company
Filed Feb. 17, 1971, Ser. No. 116,125
Int. Cl. H01l *7/00*
U.S. Cl. 148—171 **4 Claims**

A process for selectively growing semiconductor material, particularly Group III-V semiconductor compounds, on semi-insulating substrates with uniform dissolution and regrowth in selected regions is disclosed. The fabrication of substantially planar monolithic semiconductor devices in a semi-insulating substrate and, in particular, light-emitting devices are also disclosed.

3,715,246
PROPELLANTS DERIVED FROM CROSSLINKING OF POLYBUTADIENE ELASTOMERS

David C. Sayles, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army
Filed May 12, 1970, Ser. No. 48,618
Int. Cl. C06b *11/00*
U.S. Cl. 149—19 **8 Claims**

Composite propellant compositions are disclosed which contain binders formed from polybutadiene prepolymers cross-linked by siloxane compounds. The crosslinking by siloxanes to produce propellant binders eliminates the need for end-capping polybutadiene to introduce functional groups through which crosslinking can be effected. The pertinent siloxane compounds contain two silicon hydride bonds of the types present in: 1,1,3,3-tetramethyldisiloxane, $(CH_3)_2H\cdot SiO\cdot SiH(CH_3)_2$; 1,1,1 - 3,5,7,7,7-octamethyltetrasiloxane, $(CH_3)_3\cdot O\cdot Si(H\cdot CH_3)\cdot O\cdot Si(H\cdot CH_3)\cdot O\cdot Si(CH_3)_3$. The prepolymers are crosslinked in a composite propellant composition to produce the propellant binder for the composition. When the crosslinking technique is used in a propellant production process which additionally employs hydroxyl-terminated polybutadiene in combination with a polyisocyanate, a propellant binder with improved mechanical properties and improved stability is produced.

3,715,247
WATER-IN-OIL EMULSION EXPLOSIVE CONTAINING ENTRAPPED GAS

Charles G. Wade, Lehighton, Pa., assignor to ICI America Inc., Wilmington, Del.
Filed Sept. 3, 1970, Ser. No. 69,433
Int. Cl. C06b *1/04*
U.S. Cl. 149—21 **16 Claims**

A water-in-oil emulsion explosive composition comprising a carbonaceous fuel, an inorganic oxidizer, a detonation sensitizer, water, an emulsifier, and a gas. The detonation catalyst is an inorganic metal compound of atomic number 13 or greater, other than Groups Ia and IIa and other than dioxides. The detonation sensitizer greatly enhances the sensitivity of the compositions so that they are cap-sensitive, the preferred compositions being cap-sensitive in a 1-inch diameter cartridge.

3,715,248
CASTABLE METALLIC ILLUMINANT FUEL CONTAINING NITROCELLULOSE PLASTICIZED BINDER

Jacob M. Swotinsky, Morris Plains; Stephen Newman, Newton, and Olindo A. Colitti, Parsippany, all of N.J., assignors to The United States of America as represented by the Secretary of the Army
Filed Dec. 15, 1970, Ser. No. 98,448
Int. Cl. C06b *9/00, 15/00*
U.S. Cl. 149—39 **6 Claims**

A castable illuminant containing a particulate mixture of fuel and oxidizer held together by an energetic plastisol type binder.

A process of preparing devices containing the aforesaid composition wherein such ingredients are distributed into a viscous mass, poured directly into an end-item container, and thermally cured in a state ready for use as an illuminating device.

3,715,249
ETCHING Si_3N_4

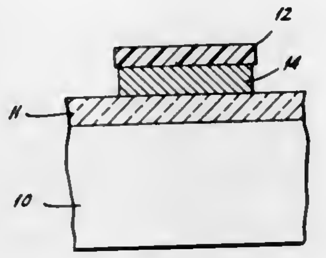
Peter Theodore Panousis, New Providence, N.J., and Herbert Atkin Waggener, Allentown, Pa., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.
No Drawing. Filed Sept. 3, 1971, Ser. No. 177,840
Int. Cl. H01l *7/50*
U.S. Cl. 156—17 **3 Claims**

The specification describes a process for etching silicon nitride in the presence of silicon. It has been found that silicon, especially when highly doped, is attacked by the normal phosphoric acid etchant for Si_3N_4. The addition of H_2SO_4 to the phosphoric acid prevents the attack of silicon.

3,715,250
ALUMINUM ETCHING SOLUTION

Leonard F. Altman, Philadelphia, and Marcus Sharp, Lansdale, both of Pa., assignors to General Instrument Corporation, Newark, N.J.
Filed March 29, 1971, Ser. No. 128,896
Int. Cl. C23g *1/22*
U.S. Cl. 156—22 **7 Claims**

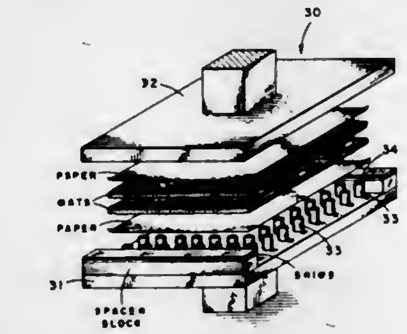
An etching bath, useful in the fabrication of hybrid thin film and silicon monolithic semiconductor devices, for removing aluminum film which is unprotected by an overlying photoresist. The bath includes the conventional combination of phosphoric, nitric, and acetic acids, to which is added about



2¼ grams of sucrose per 100 ml of etch solution. Addition of the sucrose substantially reduces undercutting and improves resistance to over-etching.

3,715,251
LAMINATED NON-WOVEN SHEET

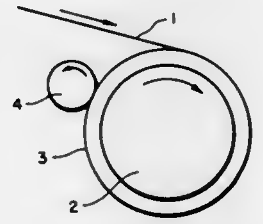
James S. Prentice, Baytown, Tex., assignor to Esso Research and Engineering Company, Linden, N.J.
Filed Oct. 9, 1969, Ser. No. 864,994
Int. Cl. B32b *17/12, 31/04*
U.S. Cl. 156—62.8 **11 Claims**



A laminated non-woven sheet is made from non-woven mats of melt-blown thermoplastic polymer fibers. The non-woven sheets may be produced by either point welding or using adhesives to laminate at least one non-woven mat having a high strip tensile strength to at least one non-woven mat having a high tear resistance so that the sheets have both high strip tensile strength and high tear resistance.

3,715,252
METHOD AND APPARATUS FOR FORMING FILAMENT-WOUND ARTICLES

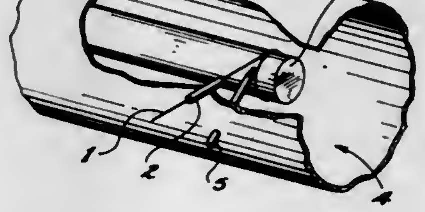
Geoffrey Fairbairn, Cambridge, England, assignor to Ciba-Geigy AG, Basel, Switzerland
Filed Aug. 25, 1971, Ser. No. 174,891
Claims priority, application Great Britain, Aug. 27, 1970, 41,372/70
Int. Cl. B31c *13/00;* **B65h** *81/00;* **B05c** *11/10*
U.S. Cl. 156—162 **11 Claims**



In making filament-wound articles from tape which comprises tows of fibers embedded in a resin, surplus resin is removed from the surface of the winding by contacting it with a hollow roller perforated on its surface, which rotates in the same direction as the winding and at the same speed as the winding, or slightly faster.

3,715,253
COMPOSITE MATERIALS

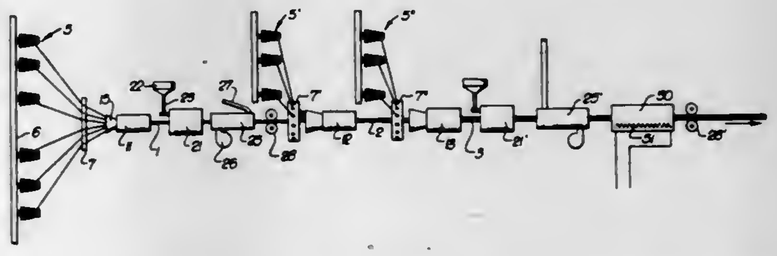
Eugene L. Olcott, Falls Church, Va., assignor to The Susquehanna Corporation
Filed Aug. 28, 1969, Ser. No. 870,948
Int. Cl. C01b *31/07;* **B29c** *25/10*
U.S. Cl. 156—175 **10 Claims**



A method for making shaped pyrolytic graphite articles which comprises progressively positioning continuous carbon strand onto a shaped form and simultaneously pyrolyzing carbonaceous gas onto the strand at about the point of positioning contact to nucleate pyrolytic graphite from the strand, progressively positioning additional strand laterally spaced from previously positioned strand and, as the additional strand is positioned, simultaneously pyrolyzing the carbonaceous gas on the additional strand at about the point of positioning contact and on the pyrolytic graphite nucleated from previously positioned strand to form a continuous pyrolytic graphite matrix interconnecting laterally shaped strands.

3,715,254
COMPOSITE FIBROUS WRITING INSTRUMENT ELEMENTS AND THEIR MANUFACTURE

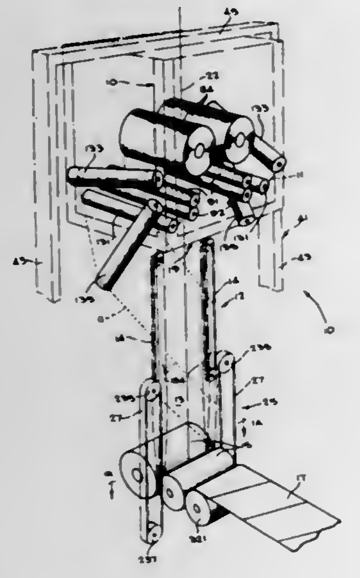
William S. Tolgyesi, Rockville, Md., assignor to The Gillette Company, Santa Monica, Calif.
Filed Feb. 25, 1971, Ser. No. 118,897
Int. Cl. B05c *8/04;* **D02g** *3/36;* **D34k** *1/00*
U.S. Cl. 156—180 **8 Claims**



A continuous process involving the compression and bonding together, induced by heat, of virtually parallel strands of filamentary material, followed by the addition of further strands of filamentary material to the exterior surface of the previously bonded strands and further compression and bonding, whereby the strength, ability to convey liquids by capillarity and other characteristics of the continuous, porous, absorbent, elongated ultimate object are controlled. Two or more sequential compression and heat-setting or bonding steps may be employed. Various fibrous or filamentary materials may be used and their properties utilized to best advantage. Strength and resistance to load may be imparted to a minute axial portion of a writing point without impairment of necessary capillary characteristics in other areas of the point. Products having such controlled characteristics for use as reservoir fillers and writing points in writing instruments and having desired capillary relationships therebetween as well as load-bearing properties. Writing instruments provided with products of this invention.

3,715,255
METHOD OF AND APPARATUS FOR BIAS LAYING WITH FLAT MANDREL

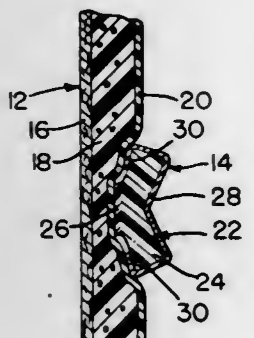
Charles A. Lee and Warren R. Furbeck, Knoxville, Tenn., assignors to International Paper Company, New York, N.Y.
Continuation-in-part of application Ser. No. 719,986, Apr. 9, 1968. This application Dec. 7, 1970, Ser. No. 95,756
Int. Cl. B65b *17/18*
U.S. Cl. 156—189 **15 Claims**



At least one web of material is spirally wound on a flat mandrel to form a tube which is transferred by means across a gap to a nip of a pair of flattening rolls. More specifically, the transfer means includes a pair of transfer belts which engage the external edges of the tube and hold the same against sagging or wracking and keep these edges moving at the same rate of travel across the gap as the tube travels on the mandrel.

3,715,256
METHOD OF MAKING AN EMBOSSED PANEL

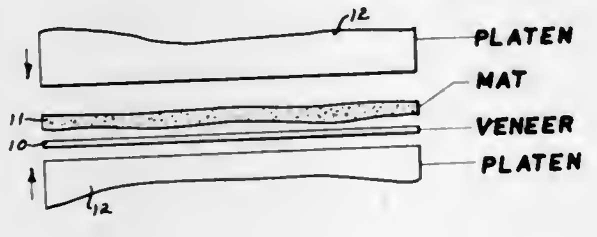
Robert E. Truesdell, Rochester, and William H. Nienstedt, Detroit, both of Mich., assignors to Allied Chemical Corporation, New York, N.Y.
Division of Ser. No. 530,931, March 1, 1966, Pat. No. 3,471,355. This application Sept. 8, 1969, Ser. No. 855,813
Int. Cl. B29c *19/00*
U.S. Cl. 156—244 **12 Claims**



A method of making an embossed panel including dual extruding a molding strip in the form of a composite duplex structure having a plastic support member with a first heat sealable plastic layer fused thereto and disposing a second heat sealable plastic layer onto a panel backing member. The first and second heat sealable layers are disposed adjacent one another and are heat sealed and fused together to conjoin the molding strip to the second heat sealable layer such that the support member projects from the panel.

3,715,257
METHOD FOR PRODUCING A FLAT PARTICLE-FACED PLYWOOD PANEL

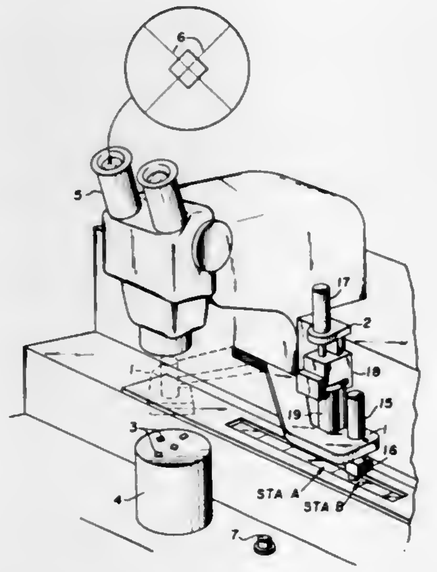
Jack W. Dunaway; Michael W. Woodland, and Bernard H. Johnson, all of Lewiston, Idaho, assignors to Potlatch Forests, Inc., San Francisco, Calif.
Filed Feb. 26, 1971, Ser. No. 119,188
Int. Cl. B27d *1/00*
U.S. Cl. 156—299 **10 Claims**



A method for minimizing warpage of a plywood assembly having a bonded face of wood particle board or similar material. This is accomplished by curing the particle board layer on a single sheet of veneer, which consequently is used in place of a conventional face veneer in a plywood layup.

3,715,258
INTEGRATED CIRCUIT DIE BONDING APPARATUS

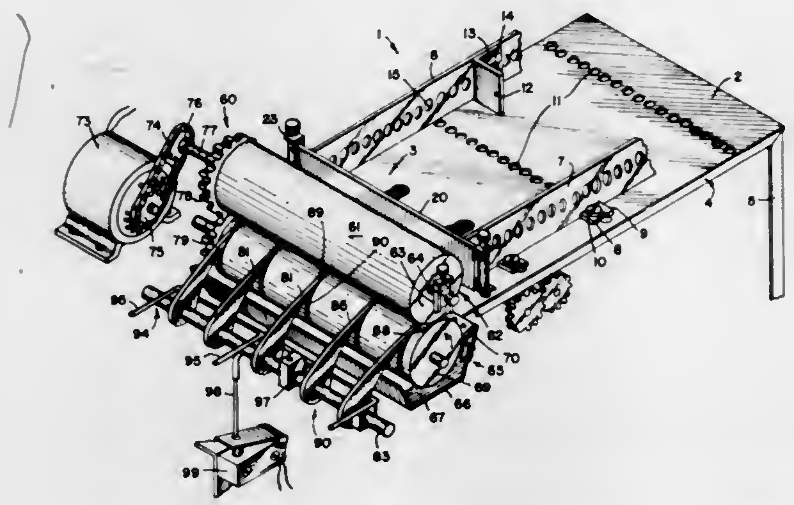
Jeffrey B. Cunnane, Yonkers, N.Y., assignor to H. S. Bancroft Corporation, Cherry Hill, N.J.
Filed Mar. 23, 1971, Ser. No. 127,201
Int. Cl. B32b *31/20;* **C09j** *5/06*
U.S. Cl. 156—356 **8 Claims**



An apparatus for semi-automatically bonding integrated circuit dies to lead frames comprising adhesive dispensing means, die aligning means, die transport means and lead frame indexing means. In an operating cycle a metered drop of conductive adhesive is placed on a lead frame in a lead frame strip. The operator then microscopically aligns an integrated circuit die to a desired position and utilizes a vacuum arm to pick up the die and place it on the adhesive. Simultaneously adhesive is placed on the next lead frame which is then indexed into the operative position.

3,715,259
MEANS FOR APPLYING GLUE TO ARTICLES

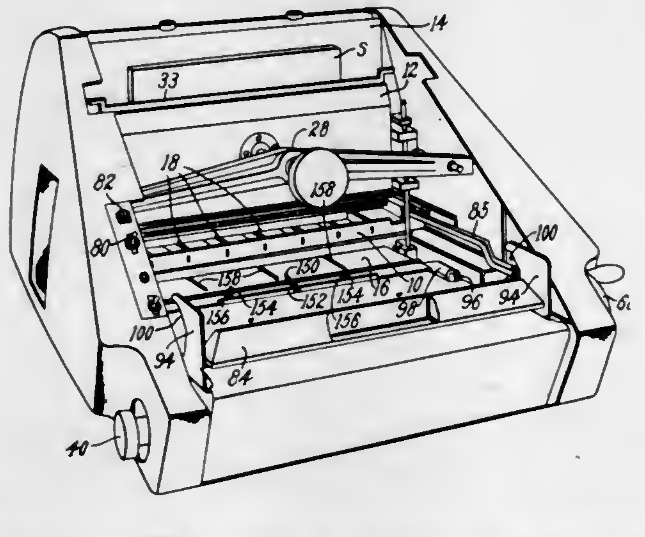
Frank Gordon, 5 Carol Road, Marblehead, Mass. 02112
Continuation of abandoned application Ser. No. 808,750, Mar. 20, 1969. This application July 15, 1971, Ser. No. 163,029
Int. Cl. B32b *31/00*
U.S. Cl. 156—363 **4 Claims**



A machine for successively applying adhesive to sequentially fed articles, bottom fed from a stack, in which the feed of the articles to the adhesive applying means is automatically stopped when an article to which adhesive has already been applied has reached a receiving means and has not been removed by an operator.

3,715,260
APPARATUS FOR BINDING SHEETS

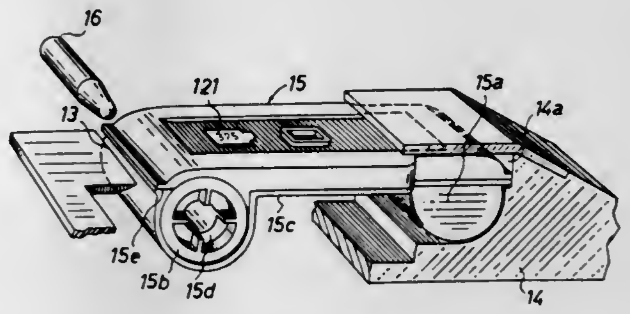
Peter L. Dornemann, Needham; Milton R. Radcliff, Marblehead; Albert E. Newton, Beverly, and Samuel E. Eaton, Jr., Hingham, all of Mass., assignors to USM Corporation, Boston, Mass.
Filed Dec. 17, 1970, Ser. No. 99,002
Int. Cl. B32b *3/02*
U.S. Cl. 156—477 B **7 Claims**



Apparatus for binding a stack of sheets in which the stack is aligned on an edge to be bound and clamped in the aligned position with the edge exposed for binding. A binding tape has thermoactive adhesive arranged on one exposed side in a pattern of discrete deposits. The tape and edge are then simultaneously heated until the adhesive flows in a fluid state from the discrete deposits to cover the tape. The adhesive on the tape is then pressed against the exposed edge of the stack and wiped around stack sides adjacent the edge to bind the stack of sheets.

3,715,261
APPARATUS FOR OPENING AND MARKING THE CONTENTS OF FILM CASSETTES

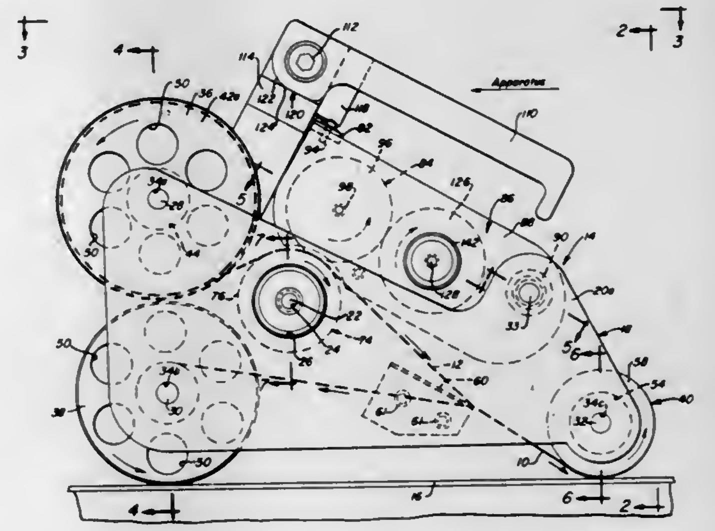
Fridolin Hennig; Hans-Jurgen Kellner; Klaus Potz, and Christian Gotze, all of Munich, Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany
Division of Ser. No. 792,288, Jan. 21, 1969, Pat. No. 3,580,443. This application Jan. 29, 1971, Ser. No. 111,032
Claims priority, application Germany, Jan. 19, 1968, P 16 22 303.3; Sept. 14, 1968, P 17 97 336.3
Int. Cl. B32b *31/10, 31/20*
U.S. Cl. 156—552 **6 Claims**



Apparatus for opening plastic housings of film cassettes has a support which can hold a housing in a predetermined position, a tool having a cutting edge which is movable against and penetrates into the housing to produce therein a crack, a mechanism for thereupon moving the tool with reference to the housing or vice versa so that the crack is propagated until the housing is sufficiently opened to permit withdrawal of the reel which carries exposed film, and an applicator for applying an identifying marker to a predetermined portion of film on the withdrawn reel.

3,715,262
APPARATUS FOR PRINTING AND DISPENSING LABELS

Calvin E. Kelley, Franklin, Pa., assignor to United States Steel Corporation
Filed Feb. 22, 1971, Ser. No. 117,601
Int. Cl. B44c *1/24*
U.S. Cl. 156—541 **29 Claims**



An apparatus for and method of dispensing labels and a printing device for and method of printing such labels are disclosed.

3,715,263
HEAT-SENSITIVE STENCIL SHEET

Keishi Kubo, Yokohama, Kiyoshi Sakai, Tokyo, Takashi Sato, Urawa, and Itaru Nakamura, Yokohama, Japan, assignors to Ricoh Co., Ltd., Tokyo, Japan
No Drawing. Filed Nov. 13, 1970, Ser. No. 89,453
Claims priority, application Japan, Nov. 14, 1969, 44/91,269
Int. Cl. B44f *1/10*
U.S. Cl. 161—33 **10 Claims**

A heat-sensitive stencil sheet comprising:

(a) A thin porous support having a thermoplastic resin film bonded to one surface thereof with an adhesive containing a heat-sensitive component which undergoes a visible color change at a temperature of from about 80° C. to 180° C. together with at least one heat-fusible compound which is a metallic salt of a fatty acid containing from about 10 to 22 carbon atoms and forms a transparent melt at a temperature of from about 50° C. to 150° C.; or

(b) A thin porous support having a thermoplastic film bonded to one surface thereof with an adhesive, said film being coated with a mixture containing a heat-sensitive component which undergoes a visible color change at a temperature of from about 80° C. to 180° C. together with at least one heat-fusible compound which is a metallic salt of a fatty acid containing from about 10 to 22 carbon atoms and forms a transparent melt at a temperature of from about 50° C. to 150° C.

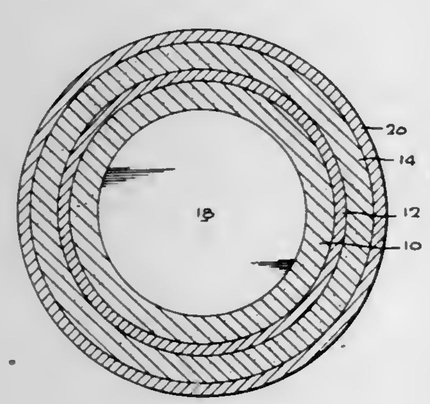
3,715,264
DECORATIVE WALL COVERING

Arthur Burton, Denton, England, assignor to Imperial Chemical Industries, Limited, London, England
Filed Feb. 22, 1971, Ser. No. 117,700
Int. Cl. B32b *5/02, 27/10, 27/30, 29/02*
U.S. Cl. 161—82 **5 Claims**

A decorative wall covering comprising a paper sheet having a decorative surface which has a continuous coating of a polymeric material thereon, the paper sheet being laminated on its other surface to an open weave fabric whereby the tendency of the covering to curl on wetting with a water-based adhesive is reduced.

3,715,265
COMPOSITE THERMAL INSULATION

Robert D. Allen, and Wayne M. Lysher, both of Richland, Wash., assignors to McDonnell Douglas Corporation, Santa Monica, Calif.
Filed Sept. 3, 1969, Ser. No. 854,932
Int. Cl. B32b *1/08, 5/16, 15/16*
U.S. Cl. 161—125 **16 Claims**



Composite thermal insulation comprising layers of particulate material including materials having low conductivity above 1,000°C, e.g. amorphous carbon black, and materials having low conductivity below 1,000°C, e.g. zirconia, disposed alternately with one or more layers of metal sheet, e.g. tantalum foil. The first and last layers are comprised of particulate material.

3,715,266
WIRE REINFORCED RUBBER PRODUCT

Michael E. Winters, Dallas, Tex., and Wyong S. Han, Roseville, Mich., assignors to Uniroyal Inc., Detroit, Mich.
Filed Aug. 25, 1971, Ser. No. 174,985
Int. Cl. B29h *17/28*
U.S. Cl. 161—140 **9 Claims**

In a steel wire reinforced rubber tire or other metal reinforced rubber containing product, a technique of utilizing special adhesive component materials in the rubber to achieve unexpectedly strong adherence between the contacting surfaces of the reinforcing metal and the rubber.

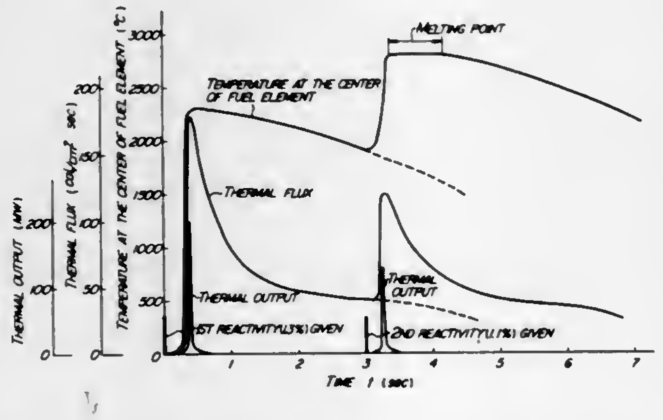
3,715,267
HEAT-SENSITIVE STENCIL SHEET

Keishi Kubo, Yokohama; Kiyoshi Sakai, Tokyo, and Takashi Sato, Urawa, all of Japan, assignors to Ricoh Co., Ltd., Tokyo, Japan
Filed Sept. 25, 1970, Ser. No. 75,725
Claims priority, application Japan, Oct. 8, 1969, 44/80503
Int. Cl. B32b *27/10, 27/30;* **B41n** *1/24*
U.S. Cl. 161—165 **6 Claims**

A heat-sensitive stencil sheet comprising a porous supporting sheet and a thermoplastic resin film which is bonded to one surface of the supporting sheet with an adhesive containing at least one metal salt of a higher fatty acid having from 10 to 22 carbon atoms.

3,715,268
DELIGNIFICATION OF LIGNOCELLULOSIC MATERIALS WITH A SOLUTION OF NITROGEN DIOXIDE IN ALIPHATIC HYDROCARBON SOLVENT

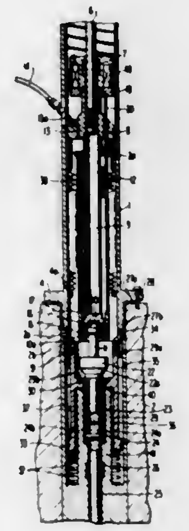
Frederick Bender and Louis-Philippe Clermont, Ottawa, Ontario, and Alan Warren Bowden, Prince Rupert, Canada
Filed Oct. 22, 1970, Ser. No. 81,990
Claims priority, application Canada, Oct. 24, 1969, 65,758
Int. Cl. D21c *3/16, 3/20*
U.S. Cl. 162—72 **11 Claims**



The invention relates to the delignification of cellulosic materials which are, in a first step, subjected to the action of nitrogen dioxide in an aliphatic hydrocarbon solvent to produce reaction products of nitrogen dioxide and the noncarbohydrate components. After separation of the unused NO_2 reagent and residual solvent, the treated materials are extracted with a weak alkaline solution to remove the lignin rendered soluble by the first step.

3,715,269
CONTROL ROD DRIVE UNITS FOR NUCLEAR REACTORS

Franz Mehren, Porz-Urbach, Germany, assignor to Interatom Internationale Atomreaktorbau GmbH, Bensberg/Cologne, Germany
Filed May 21, 1969, Ser. No. 826,308
Int. Cl. G21c *7/08*
U.S. Cl. 176—36 R **9 Claims**



A control rod drive unit for use with nuclear reactors having a motor for effecting movement of a drive rod coupled to the control rod between positions corresponding to full insertion and full withdrawal of the control rod with respect to the reactor. There is also provided a seal for providing a gas tight sealing between the drive rod and the cover of the nuclear reactor with the motor connected to the drive rod, and a further seal for sealing the drive rod to the reactor operative upon the means for disconnecting the motor from the drive rod, and a further means for partially disengaging the first seal from the reactor cover.

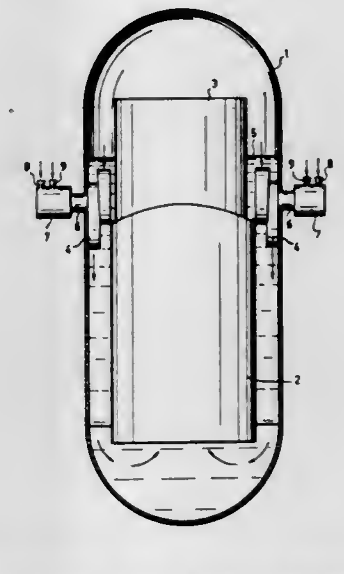
3,715,270
NUCLEAR REACTORS

George Oliver Jackson, Timperley, England, assignor to United Kingdom Atomic Energy Authority, London, England
Filed Jan. 13, 1969, Ser. No. 790,779
Claims priority, application Great Britain, Jan. 30, 1968, 4,847/68; Feb. 21, 1968, 8,535/68
Int. Cl. G21c *9/00, 15/00*
U.S. Cl. 176—38 **6 Claims**

A large power-producing nuclear reactor of the liquid metal cooled fast breeder type with its coolant circuitry submerged in a liquid metal pool in a vault, has an enclosed core and coolant circuit loops communicating with the core enclosure at opposed ends, the core enclosure also containing radial neutron shielding and one end neutron shielding and being constituted by an open-topped vessel whose top is closed by a lid which incorporates a part of neutron shielding for the other end, the remaining part of said other end neutron shielding being constituted by the vault roof or a part thereof. The vessel lid is preferably connected to a co-axial rotatable part of said vault roof for rotation and outward axial movement therewith. The reactor tank preferably has a minimum width in the region where the core is disposed so as to provide hold-down structure with minimum span.

3,715,271
BOILING WATER REACTOR PLANT

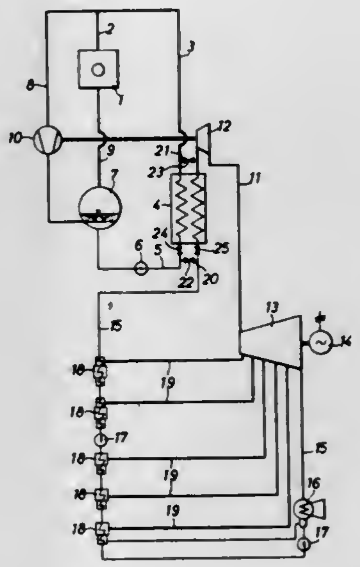
Dusan Florjancic, Winterthur, Switzerland, assignor to Sulzer Brothers Ltd., Winterthur, Switzerland
Filed June 28, 1971, Ser. No. 157,437
Claims priority, application Switzerland, July 1, 1970, 9961/70
Int. Cl. G21c *15/24*
U.S. Cl. 176—54 **13 Claims**



The socket serves as an inlet for feed water and as a housing for the turbine shaft which drives the pump. The socket includes a duct which delivers feed water directly into the water chamber as well as a duct for feeding the water discharged from the turbine into the water chamber via the pump.

3,715,272
METHOD OF OPERATING A NUCLEAR REACTOR FACILITY WITH A STEAM COOLED FAST BREEDER REACTOR AS THE HEAT SOURCE

Ludolf Ritz, Karlsruhe-Waldstadt, Germany, assignor to Gesellschaft fur Kernforschung m.b.H., Karlsruhe, Germany
Filed April 16, 1970, Ser. No. 29,232
Claims priority, application Germany, April 16, 1969, P 19 19 278.0
Int. Cl. G21b *1/02*
U.S. Cl. 176—60 **4 Claims**



A method of operating a nuclear reactor facility in which a primary and a secondary cooling cycle are coupled together by means of a heat exchanger, with the primary cooling cycle containing a steam cooled fast breeder reactor and the secondary cooling cycle containing a working unit operated on steam which is generated and superheated in the heat exchanger. A fraction of the steam is superheated in the reactor to complete condensation in the heat exchanger, and the thus produced condensate is mixed with the other fraction of the steam superheated in the reactor to produce live steam which is recycled into the reactor. The coolant for the primary cycle is either entirely or predominantly D_2O. The desuperheating and condensation of the primary coolant in the heat exchanger is performed at a pressure level slightly higher than that of the secondary coolant.

3,715,273

NUCLEAR FUEL ELEMENT CONTAINING SINTERED URANIUM DIOXIDE FUEL WITH A FINE PARTICULATE DISPERSION OF AN OXIDE ADDITIVE THEREIN, AND METHOD OF MAKING SAME

Frank Rigby, Blackpool, and John Brian Ainscough, Fulwood, England, assignors to United Kingdom Atomic Energy Authority, London, England
No Drawing. Filed Dec. 8, 1969, Ser. No. 883,315
Claims priority, application Great Britain, Dec. 16, 1968, 59,814/68
Int. Cl. G21c *3/06*
U.S. Cl. 176—67 **11 Claims**

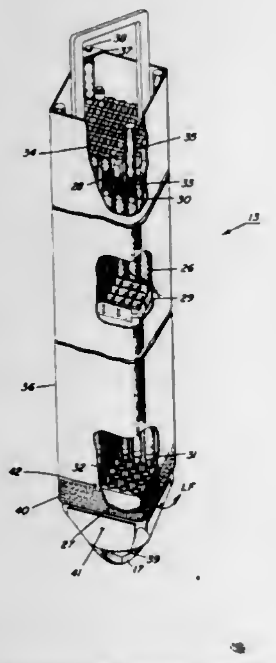
Sintered uranium dioxide containing an additive of for example magnesium oxide or aluminum oxide, the additive being dispersed in fine particulate form within the grains of uranium dioxide.

A method is also disclosed for preparing such a material in which the uranium dioxide containing the additive is sintered in an oxidising atmosphere, for example 0 to 50% hydrogen in carbon dioxide to convert the material to a hyperstoichiometric uranium dioxide in which the additive is soluble. The material is then heated in a reducing atmosphere for example of hydrogen to convert the material to stoichiometric uranium dioxide in which the additive is insoluble whereby the additive is released from solution in the material dispersed in fine particulate form within the grains of the uranium dioxide.

3,715,274

NUCLEAR FUEL ASSEMBLY WITH REINFORCED FLOW CHANNEL

Dominic A. Venier; Bart A. Smith, and James L. Lass, all of San Jose, Calif., assignors to General Electric Company
Filed Aug. 15, 1969, Ser. No. 850,486
Int. Cl. G21c *3/34*
U.S. Cl. 176—78 **9 Claims**

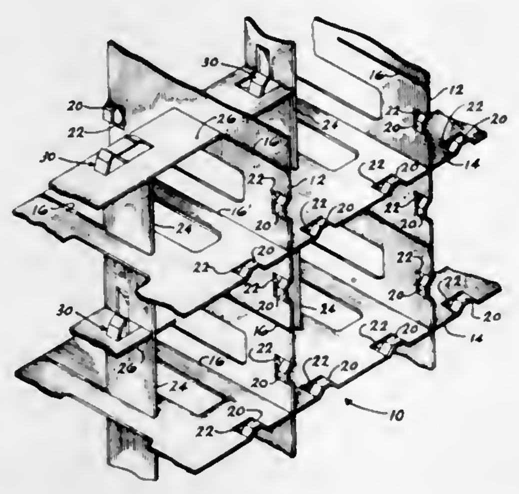


A nuclear fuel assembly wherein the lower portion of the flow channel is reinforced or stiffened in the region of its interface with the lower tie plate for improved control of bypass flow of coolant into the spaces between the fuel assemblies of a nuclear reactor.

3,715,275

BIMETALLIC SPACER GRID ARRANGEMENT

Donald M. Krawiec, Thompsonville, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.
Filed March 2, 1970, Ser. No. 15,510
Int. Cl. G21c *3/34*
U.S. Cl. 176—78 **3 Claims**



A bimetallic spacer grid arrangement for fuel element support in nuclear reactors. A matrix of spacer elements formed from a first material having characteristic low neutron capture cross section has nested therewithin a matrix of spring elements formed of a second material having better stress relaxation properties than said first material. The spring elements consist of an interconnected series of strips of the second material having integral tab-like projections protruding laterally therefrom at selected points so as to serve as fuel element biasing members.

3,715,276

ENZYMATIC METHOD FOR MANUFACTURE OF FRUCTOSE FROM GLUCOSE

Yoshiyuki Takasaki, and Akira Kamibayashi, both of Chiba, Japan, assignors to Agency of Industrial Science & Technology Govermental, Tokyo, Japan
Filed Oct. 23, 1970, Ser. No. 83,168
Claims priority, application Japan, Oct. 25, 1969, 44/85605; Oct. 25, 1969, 44/85606
Int. Cl. C13k *9/00*
U.S. Cl. 195—31 F **8 Claims**

In an enzymatic reaction for isomerizing glucose into fructose with a glucose isomerase, a method is provided for converting glucose into fructose which is characterized by using calcium carbonate, magnesium carbonate an anion-exchange resin or an amphoteric-ion exchange resin as a pH regulator.

3,715,277

PREPARATION OF FIBERS CONTAINING FIBERS

Dino S. Dinelli, Via Ramiro Fabiani 1, Donato Milanese, Italy, and Franco Cognigni, Via Villafranco 10, Cesano Maderno, Italy
No Drawing. Filed June 26, 1969, Ser. No. 836,883
Claims priority, application Italy, June 26, 1968, 18,226/68; May 8, 1969, 16,551/69
Int. Cl. C07g *7/02*
U.S. Cl. 195—63 **16 Claims**

Filaments of polymeric material are disclosed which contain discrete cells wherein droplets of enzymatic maaterial are contained so that the enzymatic material is protected against loss of enzymatic activity and is prevented from escaping from the filaments but is permitted to exert a high degree of enzymatic activity in the presence of a substrate. A process for producing such filaments is also described which comprises mixing an enzymatic preparation with a liquid phase comprising a solution of a synthetic polymer, extruding the liquid phase through the orifices of a spinneret and then solidifying the polymer by removing the solvent therefrom.

3,715,278

SILICEOUS MATERIALS HAVING ENZYME-POLYMER PRODUCT ATTACHED TO SURFACE THEREOF

Robert E. Miller, Ballwin, Missouri, assignor to Monsanto Company, St. Louis Missouri
Filed Feb. 11, 1970, Ser. No. 10,655
Int. Cl. C07g *7/02*
U.S. Cl. 195—63 **8 Claims**

Enzyme-polymer products are covalently bound to siliceous materials by siliation of the siliceous material to provide functional groups which react with functional groups in the polymer-enzyme molecule. Alternatively, the polymer is first reacted with the reactive groups of the organosilated siliceous material and the enzyme subsequently reacted with the product of this reaction. The product in either case is an insoluble enzymatically-active siliceous material in which the enzyme is covalently bound to the polymer molecule which is in turn covalently bound to the surface of the organosilated siliceous material.

3,715,279

RECOVERY OF PROTEASE VALUES FROM FERMENTATION BROTHS

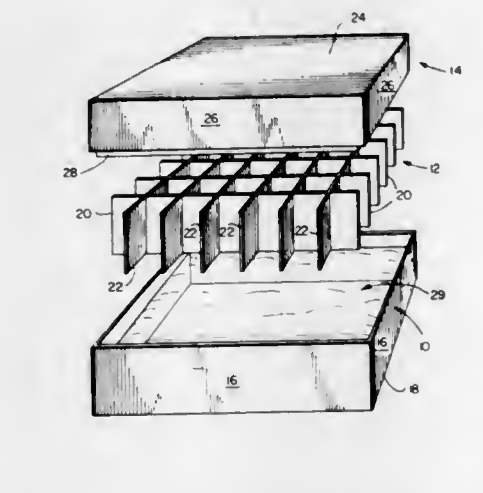
Hiroyuki Suzuki; Gosaburo Shionoya; Yoshihisa Suzuki, all of Kanagawa, and Tsuneo Hirahara, Tokyo, all of Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan
Continuation-in-part of Ser. No. 35,258, May 6, 1970, abandoned. This application Sept. 25, 1970, Ser. No. 75,672
Claims priority, application Japan, May 22, 1969, 44/39715
Int. Cl. C07g *7/028*
U.S. Cl. 195—68 **8 Claims**

Protease values can be recovered from aqueous solutions of the same, including fermentation broths, by precipitation with isopropanol in the presence of sodium or potassium sulfate. The sulfate bearing coprecipitate is granular and directly suitable for use in detergent compositions.

3,715,280

MINI-TEST DISH

John J. Farmer, III, Bethesda, Md., assignor to the United States of America as represented by the Secretary of the Department of Health, Education and Welfare
Filed July 14, 1970, Ser. No. 54,738
Int. Cl. C12k *1/00*
U.S. Cl. 195—103.5 **4 Claims**



A method and apparatus for multiple test cultures having an open-topped container and a cover forming a dust-proof enclosure therewith. The container is partly filled with a culture supporting medium and a dividing member is inserted therein to divide the medium into plural open-topped test areas of equal volume. Cultures are then introduced into the various test areas to provide simultaneous multiple tests in the same support medium.

3,715,281

TRANSGROW

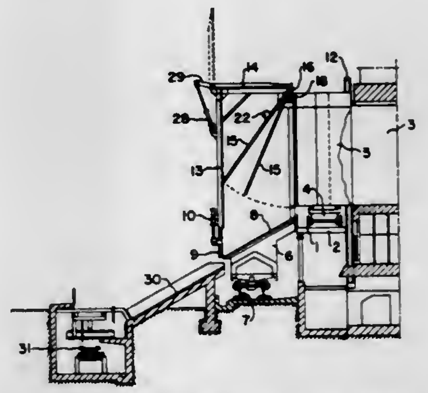
John E. Martin, Jr., and Arzell Lester, both of Atlanta, Ga., assignors to The United States of America as represented by the Secretary of the Department of Health, Education and Welfare
Filed Oct. 23, 1970, Ser. No. 83,169
Int. Cl. C12k *1/00;* **C12b** *3/00*
U.S. Cl. 195—104 **3 Claims**

An improved transport vehicle for *N. gonorroheae* and *N. meningitidis* utilizing under a 10% CO_2 blanket, a growth medium which utilizes as essential components an improved hard agar concentration of about 2.0–2.5 percent twinned with about 0.25 percent dextrose. A diamino benzyl pyrimidine to selectively screen out *Proteus* may be added.

3,715,282

COKE CAR WITH FUME-COLLECTING HOOD

Erich E. Pries, Bochum, Karl Errgang, Bochum-Langendreer, and Friedrich-Wilhelm Drebes, Bochum-Dahlhausen, Germany, assignors to Dr. C. Otto & Comp. G.m.b.H., Bochum, Germany
Filed Mar. 22, 1971, Ser. No. 126,832
Claims priority, application Germany, Mar. 23, 1970, P 20 13 848.1
Int. Cl. C10b *27/00*
U.S. Cl. 202—263 **8 Claims**



A tubular coke guide is disposed between the front of a battery of coke ovens and a car that receives coke discharged from the ovens through the guide. Above the car there is a fume-collecting hood, the side of which adjacent the coke guide is formed from a plurality of plates pivotally suspended from their upper ends on a horizontal axis in edge-to-edge relation. As the car is moved along the battery of ovens, each plate in succession, as it comes opposite the outlet of the coke guide, is swung inwardly to permit coke to be discharged from the guide into the car. The fume that is produced in the hood by the coke is drawn out by an exhaust system and rendered non-polluting before it is delivered to the atmosphere.

3,715,283

PROCESS FOR DISTILLING BENZYL CHLORIDE OR MIXTURES CONTAINING BENZYL CHLORIDE

Walter Bockmann, Krefeld-Uerdingen, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany
Filed Dec. 22, 1970, Ser. No. 100,847
Int. Cl. B01d *3/34;* **C07c** *25/14*
U.S. Cl. 203—6 **5 Claims**

The invention relates to an improved process for distilling benzyl chloride or mixtures containing benzyl chloride, which is carried out in the presence of a lactam, appropriately in an amount of between about 0.01 and about 1 percent by weight.

3,715,284

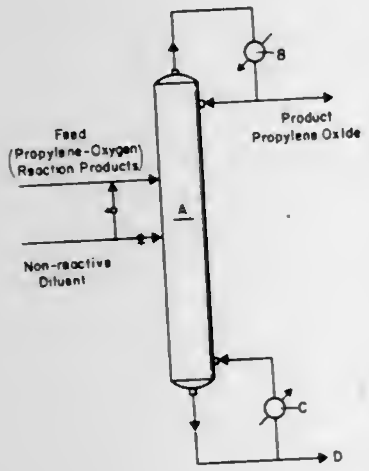
RECOVERY OF PROPYLENE OXIDE FROM CONTAMINANTS BY DISTILLATION IN THE PRESENCE OF ACETONE OR ACETONE-METHANOL MIXTURES

Simon Pierce Burns, Austin, and Henry Edmund Hartman, Conroe, both of Tex., assignors to Jefferson Chemical Company, Inc., Houston, Tex.

Filed Sept. 16, 1970, Ser. No. 73,218

Int. Cl. C07d *1/08*; **B01d** *3/34*

U.S. Cl. 203—56 **4 Claims**



Propylene oxide may be efficiently separated from contaminants present in the propylene/oxygen reaction effluent by adding a liquid boiling between 35°C and 100°C, which is not reactive with propylene oxide, to the reaction effluent and distilling propylene oxide from the resulting mixture. Propylene oxide is useful for the production of petroleum demulsifiers, surface active materials, urethane polyols and propylene glycols.

3,715,285

PROCESS OF ELECTRODEPOSITING MAGNETIC METAL LAYER ON ELECTRICALLY CONDUCTIVE SUBSTRATE

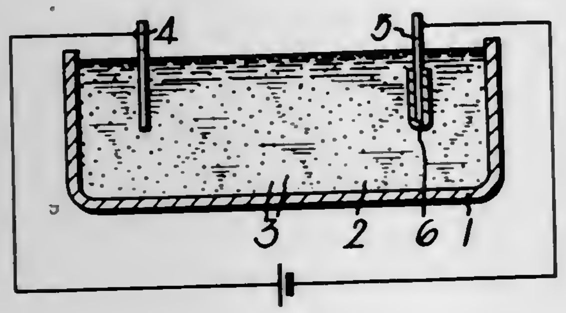
Noriyuki Tsuchiya, and Katsutoshi Amari, both of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed July 27, 1970, Ser. No. 58,594

Claims priority, application Japan, July 28, 1969, 44/59486

Int. Cl. C23b *7/02, 7/00*; **G11b** *5/42*

U.S. Cl. 204—12 **7 Claims**



A process of electrodepositing a magnetic metal layer on an electrically conductive substrate in an electrolytic cell containing one salt of the magnetic metal and a fine ferrite powder. The electrodeposited magnetic metal layer formed on the substrate of the cathode contains a fine ferrite powder dispersed therein.

3,715,286

ELECTROREFINED NICKEL OF CONTROLLED SIZE

Burton Bower Knapp, Allendale, N.J., assignor to The International Nickel Company, Inc., New York, N.Y.

Division of Ser. No. 683,801, Nov. 17, 1967, Pat. No. 3,577,330, which is a continuation-in-part of Ser. No. 338,309, Jan. 17, 1964, abandoned. This application March 11, 1971, Ser. No. 123,436

Int. Cl. C23b *7/02*; **C22d** *1/14*; **B01k** *1/00*

U.S. Cl. 204—12 **1 Claim**

An improved process for producing electrorefined nickel cathode material of controlled dimension and substantial thickness wherein the nickel is deposited upon a substantially flat, permanent metal cathode mandrel such as stainless steel, and having conductive islands of controlled size defined on the surface thereof, e.g., by the use of interconnecting lines of nonconductive resist, from a nickel electrorefining catholyte containing controlled amounts of sulfur dioxide and a leveling agent to facilitate adherence of the electrodeposited nickel upon the mandrel surface by controlling the stress level therein to a tensile value not exceeding about 6,000 pounds per square inch and thereafter stripping the nickel deposit from the mandrel to recover electrodeposited nickel in sizes corresponding to the original areas of the conductive islands and to recover the mandrel in a condition suitable for further plating.

3,715,287

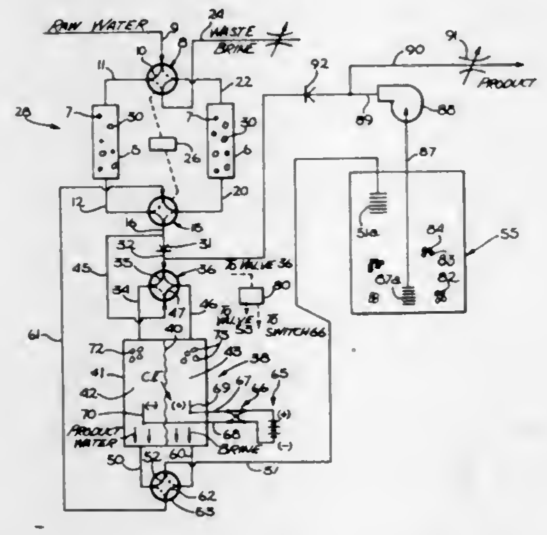
ION EXCHANGE DEMINERALIZING SYSTEM

Allan M. Johnson, Reseda, Calif., assignor to CCI Aerospace Corporation, Van Nuys, Calif.

Filed Jan. 21, 1971, Ser. No. 108,305

Int. Cl. B01d *15/04, 15/06*

U.S. Cl. 204—301 **4 Claims**



A preconditioner which is used for treating raw water before utilization in a water treatment or utilization process and which receives the concentrated waste water returning from the process. The preconditioner has two tanks which can contain either a permeable, strong acid cation exchanger or a permeable, weak acid resin or both. The tanks are connected in a push-pull arrangement, i.e., one tank receives the incoming raw water and the waste water leaves through the other tank. The strong acid cation exchanger in a preconditioner serves to presoften the water and the weak base anion exchanger in a preconditioner serves to add acid to the incoming water. The high salinity return water from the treatment or utilization process is discharged through the other tank to regenerate the preconditioner substance.

A storage tank-salinity buffer combination receives the product water from a demineralizing unit and the tank contains a mixture of anion and cation responsive materials and a weak base material. The mixture of anion and cation responsive materials serves to soften the product during high demand periods and the weak base serves to remove acid during the same periods. During the off supply periods, the weak base releases acid to help regenerate both the preconditioner and cation responsive storage material and the mixture of cation and anion responsive materials releases salt to the product water which is then removed. The preconditioner and storage tank-salinity buffer combination can be utilized with different types of demineralization units.

3,715,288

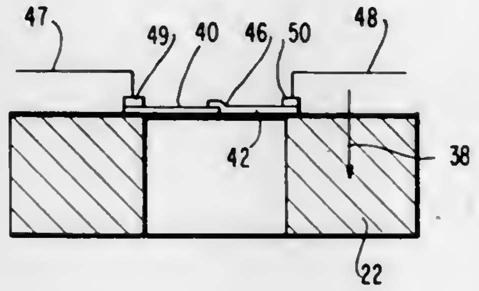
METHOD OF FABRICATING FILM-TYPE SENSING STRUCTURES

Ojars Risgin, Grass Lake, Mich., assignor to Sensors, Inc.

Filed Nov. 10, 1970, Ser. No. 88,369

Int. Cl. C23b *9/02*; **C23f** *17/00*; **C23b** *3/10*

U.S. Cl. 204—38 A **19 Claims**



A unique film-type, radiation sensing structure and method of manufacture in which a high strength, electrically insulating, thin, support film having low heat capacity and low heat conductivity is formed so as to be unitary with a backing material by selective anodizing of an aluminum blank and etching away aluminum backing. The thin film can be heated to permit the type of vapor deposition which makes practicable use of semi-conductor radiation sensing materials e.g. to form a hot junction of a thermocouple. A novel conically shaped cavity film support provides ideal absorber structure.

3,715,289

BRIGHTENER COMPOSITION FOR ACID COPPER ELECTROPLATING BATHS

Richard P. Cope, Jr., New City, N.Y., assignor to Stauffer Chemical Company, New York, N.Y.

Filed Feb. 8, 1971, Ser. No. 113,602

Int. Cl. C23b *5/18*

U.S. Cl. 204—52 R **4 Claims**

There is disclosed a novel brightener composition for aqueous, acid copper electroplating baths comprising a combination of an ethylene oxide adduct of 2,4,7,9-tetramethyl-5-decyne-4,7-diol; disodium 2,7-dihydroxy-4,5-dithiaoctane-1,8-disulfonate monohydrate; and, 2-mercaptopyridine. The use of this brightener composition if found to provide bright, leveled ductile copper deposits from an acid copper electrolyte.

3,715,290

METHOD AND APPARATUS FOR PREPARATION OF ALUMINIUM COAGULATING AGENT

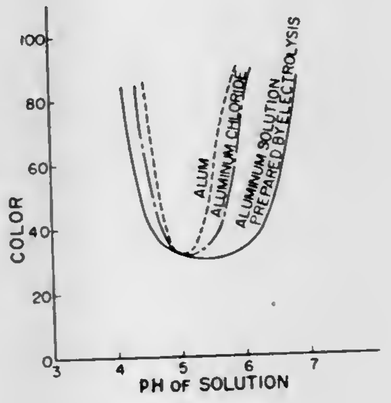
Zenzo Yokozeki, and Takeshi Hatta, both of Yokohama-shi, Japan, assignors to Kurita Water Industries Ltd., Osaka-shi, Japan

Filed Nov. 25, 1969, Ser. No. 879,741

Claims priority, application Japan, Sept. 11, 1969, 44/72134; Sept. 11, 1969, 44/72135; Sept. 16, 1969, 44/73351; Sept. 17, 1969, 44/87695

Int. Cl. B01k *1/00*

U.S. Cl. 204—96 **5 Claims**



A coagulating agent for use in water treatment is prepared by subjecting a solution to electrolysis between electrodes, at least one of which consists of aluminum as the anode. The solution contains a strongly electrolytic salt and a strong acid, in which aluminum dissolves by electrolysis.

3,715,291

METHOD OF RECOVERING SILVER FROM WASTE SILVER SOLUTIONS

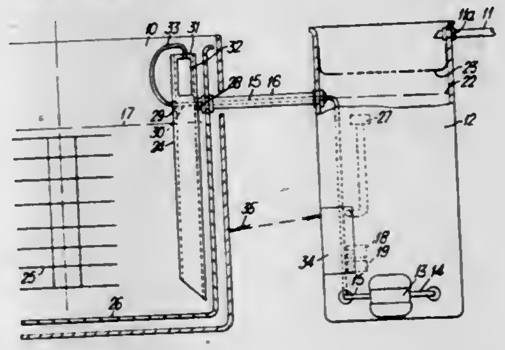
James Sydney Bentley, London, England, assignor to Photographic Silver Recovery Limited, London, England

Filed Sept. 9, 1970, Ser. No. 70,644

Claims priority, application Great Britain, Sept. 11, 1969, 44,978/69; April 16, 1970, 18,288/70

Int. Cl. C22d *1/12*; **B01r** *3/00*

U.S. Cl. 204—109 **9 Claims**



The recover of silver from waste silver solutions, especially spent photographic processing liquids, is effected with a silver recovery machine, such as a rotating cathode machine, and an auxiliary tank installed immediately upstream of the silver recovery machine to receive the silver waste solution from film processing equipment or other source. A metering pump delivers the waste solution from the auxiliary tank to the silver recovery machine, the pump being started and stopped in dependence upon changes in the level of the waste solution in the auxiliary tank. The silver recovery machine is arranged to operate only while the metering pump is running, this operation being at a constant current setting.

3,715,292
METHOD FOR DEOXIDIZING AND DESCALING FERROUS METALS

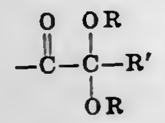
Theophil J. Wieczorek, West Haven, Conn., assignor to Enthone Inc., West Haven, Conn.
Division of Ser. No. 816,089, April 14, 1969, Pat. No. 3,666,667. This application Sept. 8, 1971, Ser. No. 178,836
Int. Cl. C23b *1/04*
U.S. Cl. 204—145 R **7 Claims**

The electrolytic removal of oxides of iron, such as rust and/or scale, from the surfaces of ferrous metals is materially accelerated by incorporating a minor amount of elemental sulfur into the alkaline cyanide-free aqueous electrolyte also containing a complexing agent capable of complexing iron ions into soluble form, and an alkaline material, and having a pH of above 10. Concentrate compositions adapted to be mixed together with water to form the electrolyte are also embodied within the invention.

3,715,293
ACETOPHENONE-TYPE PHOTOSENSITIZERS FOR RADIATION CURABLE COATINGS

Michael Ray Sandner, and Claiborn Lee Osborn, both of Charleston, W. Va., assignors to Union Carbide Corporation, New York, N.Y.
Filed Dec. 17, 1971, Ser. No. 209,066
Int. Cl. C08d *1/00*; **C08f** *1/16*
U.S. Cl. 204—159.14 **4 Claims**

Acetophenone compounds have been found useful as photosensitizers in radiation curable coating compositions. The novel photosensitizers of this invention contain the structural group



$$-\overset{\overset{\displaystyle O}{\|}}{C}-\underset{\underset{\displaystyle OR}{|}}{\overset{\overset{\displaystyle OR}{|}}{C}}-R'$$

in which R is an alkyl or aryl group and R′ is hydrogen, alkyl, aryl, or cycloalkyl.

3,715,294
PHOTOCHEMICAL PROCESS

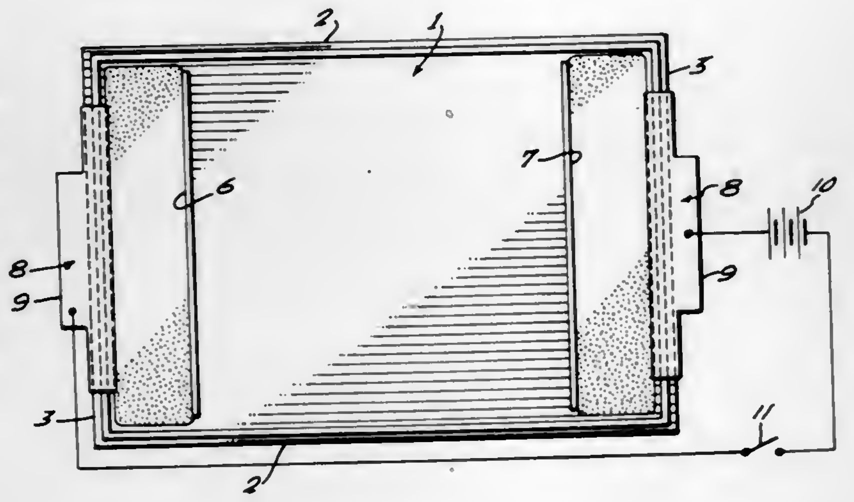
George L. Browell, Mount Lebanon Township, Allegheny County, and Leon W. Wilson, Jr., Monroeville, both of Pa., assignors to United States Steel Corporation, Pittsburgh, Pa.
Filed Aug. 10, 1970, Ser. No. 62,720
Int. Cl. C07c *25/04*; **B01j** *1/10*; **B01l** *11/00*
U.S. Cl. 204—163 R **5 Claims**

An acidified aqueous solution of copper sulfate is used as a combination coolant-ultraviolet light filter in a process for the photochlorination of alkyl-aryl compounds.

3,715,295
DISPOSABLE ELECTROPHORESIS UNIT

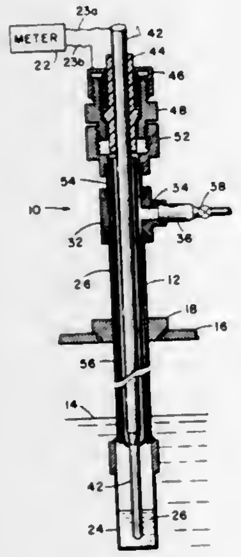
Paul M. Tocci, Miami, Fla., assignor to TLC Corporation, Miami, Fla.
Filed Sept. 2, 1971, Ser. No. 177,284
Int. Cl. B01k *5/00*
U.S. Cl. 204—180 G **10 Claims**

This invention relates to an expendable electrophoresis test unit for particle separation in a buffered system using direct current. The buffer is in semi-solid form which can be prepackaged with the unit, or dispensed from a tube at the time of use. The semi-solid buffer is prepared by mixing a liquid buffer solution with a thickening agent, preferably fumed silica. The unit itself is made of inexpensive disposable materials.



3,715,296
ELECTROCHEMICAL CARBON ACTIVITY METER

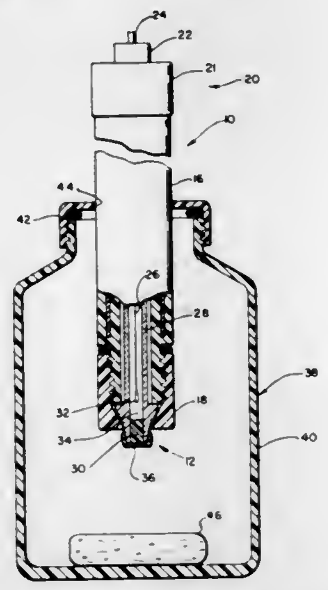
Francis J. Salzano, Patchogue, N.Y., Michael R. Hobdell, Gloucestershire, England, and Bertram Minushkin, Smithtown, Walter Kalinowski, Brookhaven, and Leonard Newman, Smithtown, N.Y., assignors to the United States of America as represented by the United States Atomic Energy Commission
Filed May 6, 1970, Ser. No. 35,099
Int. Cl. G01n *27/30*
U.S. Cl. 204—195 R **4 Claims**



An electrochemical cell for measuring the chemical activity and concentration of carbon present in a sodium system. The cell consists of an electrode immersed in an electrolyte of Na_2CO_3 and Li_2CO_3 contained within a thin iron wall cup which is placed within the sodium. The amount of voltage generated is related to the carbon content of the sodium and the ability of sodium to carburize or decarburize various steels.

3,715,297
METHOD AND MEANS FOR EXTENDING LIFE OF ION SENSING ELECTRODE

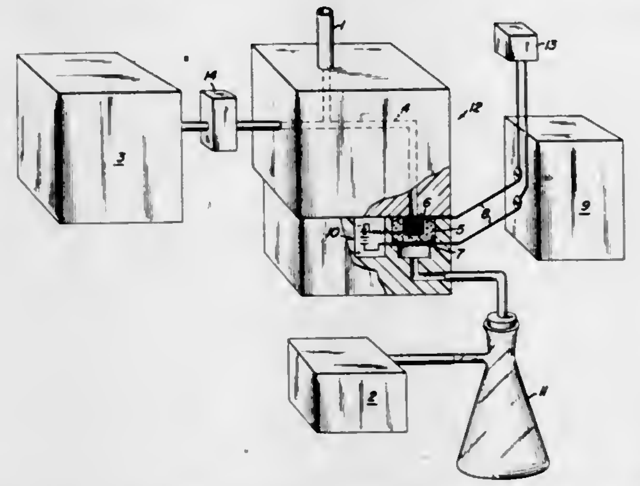
Richard E. Cosgrove, Los Angeles; Irwin H. Krull, and Charles A. Mask, both of Garden Grove, all of Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.
Filed July 20, 1970, Ser. No. 56,509
Int. Cl. G01n *27/46*
U.S. Cl. 204—195 M **32 Claims**



Method and means for extending the useful life of an electrode utilized for measuring the ion concentration or activity of solutions. The electrode embodies an ion sensitive barrier containing a macrocyclic compound, mineral oil, preferably an aromatic component, and a sufficient amount of a compound lipid to render the barrier substantially solid. The life of the electrode is extended by subjecting the ion sensitive barrier, during storage or non-use of the electrode, to the vapors of an aromatic component, preferably a phenylether.

3,715,298
AIR POLLUTION MONITORING SYSTEM

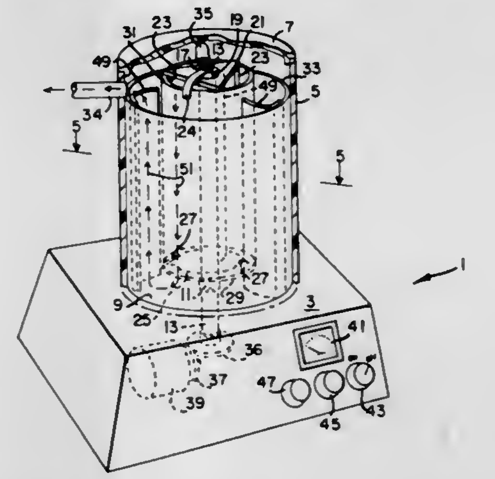
Louis H. Goodson, Kansas City; William B. Jacobs, Independence, both of Mo., and Andrew W. Davis, Baltimore, Md., assignors to The United States of America as represented by the Secretary of the Army
Filed Dec. 22, 1970, Ser. No. 100,741
Int. Cl. G01n *27/28*
U.S. Cl. 204—195 B **11 Claims**



A system and method for continuous monitoring of an airstream for the presence of pollutants therein by effective absorbtion of the pollutants in an absorbing solution by creating turbulent flow of the airstream and the absorbing solution prior to passing the absorbing solution containing the pollutants to an electrochemical cell whereby any electrical change produced in the electrodes of the electrochemical cell denotes the presence of pollutants; any electrical change being proclaimed by conventional means.

3,715,299
ELECTROPLATING APPARATUS INCLUDING MEANS TO DISTURB THE BOUNDARY LAYER ADJACENT A MOVING ELECTRODE

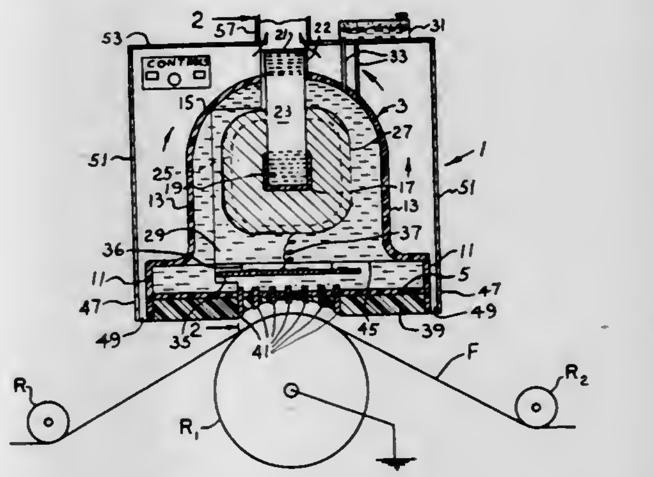
Ralph Anderson, Saratoga, and Rodney B. Beyer, Sunnyvale, both of Calif., assignors to Future Systems, Inc., Los Gatos, Calif.
Filed Oct. 12, 1970, Ser. No. 79,827
Int. Cl. C23b *5/68*
U.S. Cl. 204—212 **8 Claims**



Apparatus for transfer of mass, e.g. metallic ions to or from a relatively stationary body from or into a moving fluid. Means are included for continuously disturbing the fluid about the surface of the body to discourage the establishment of a steady state boundary layer of the fluid.

3,715,300
ELECTRICAL DISCHARGE APPARATUS

Ralph L. Williams, 3609 Manhattan, Maplewood, Mo. 63143
Filed Sept. 10, 1971, Ser. No. 179,454
Int. Cl. B01k *1/00*
U.S. Cl. 204—312 **14 Claims**



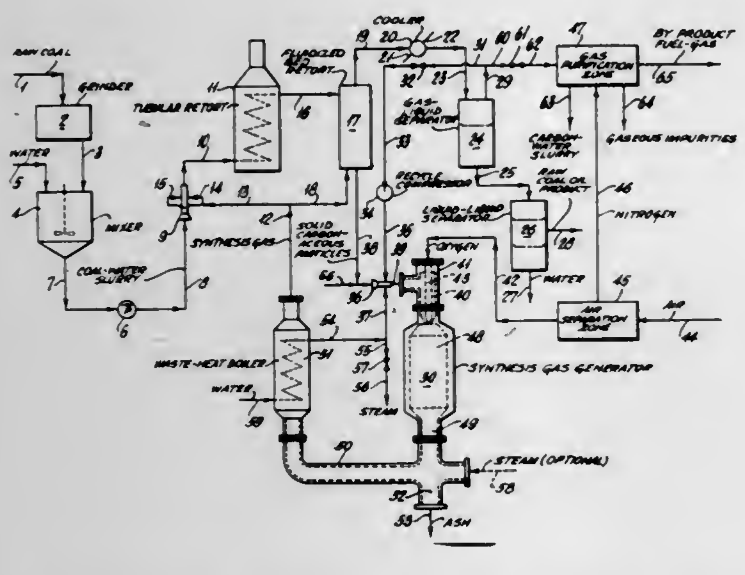
Electrical discharge apparatus includes an electrode, a housing of dielectric material enclosing the electrode and a transformer having its secondary winding connected to the electrode. The housing is filled with a high strength dielectric fluid such as oil. To enable the secondary winding to utilize the insulating properties of the dielectric fluid in the housing, and at the same time providing adequate cooling for the transformer core and primary winding and to facilitate changing frequency by changing the core and primary winding, the housing wall structure has a tubular portion going through the housing and one leg of the laminated core passes through the tubular wall, with the remainder of the core outside the housing, and the secondary winding is wound on the tubular wall portion within the housing, while the primary winding is wound on an end of the tubular wall portion projecting from the housing. The housing includes a faceplate of dielectric material, spaced from the electrode and including a plurality of parallel conductive bars embedded in the material each with both of its edges exposed on respectively opposite sides of the faceplate, to insure dispersal of the charge produced on the electrode.

3,715,301
MULTI-HYDROTORTING OF COAL

Joseph P. Tassoney, Whittier, and Warren G. Schlinger, Pasadena, Calif., assignors to Texaco Inc., New York, N.Y.

Filed June 30, 1971, Ser. No. 158,348
Int. Cl. C10g *9/02*

U.S. Cl. 208—8 **8 Claims**



A noncatalytic multi-hydrotorting process for maximizing the conversion of coal into coal oil. A pumpable coal-water slurry in admixture with a stream of synthesis gas is passed through a tubular retort where it is heated to a temperature in the range of about 600 to 950° F. in the absence of air. The solid coal particles are fragmentized and carbonized in the tubular retort, the volatile constituents in said slurry are volatilized and simultaneously hydrogenation of the process stream takes place. The effluent from the tubular retort is then introduced into a fluidized bed retort along with a second stream of synthesis gas. Thermal decomposition of the carbonaceous materials takes place in the absence of air and the process stream is hydrogenated for a second time. The process stream leaving the fluidized bed retort is cooled to condense out and separate water and raw coal-oil in a gas-liquid separation zone. A portion of the off-gas from the gas-liquid separator may be scrubbed and purified to produce nonpolluting fuel gas having a high heating value. Spent carbonaceous particles leaving the fluidized bed retort and optionally a portion of the off-gas from the gas-liquid separator are introduced into a free-flow noncatalytic gas generator for conversion into preferably hydrogen-rich synthesis gas by partial oxidation for use in the aforesaid two hydrotorting stages.

3,715,302
REFRIGERATION OIL COMPOSITION HAVING WIDE BOILING RANGE

Ivor W. Mills, and John J. Melchiore, Marcus Hook, Pa., assignors to Sun Oil Company, Philadelphia, Pa.

Filed Aug. 12, 1970, Ser. No. 63,303
Int. Cl. C10g *41/00*

U.S. Cl. 208—14 **9 Claims**

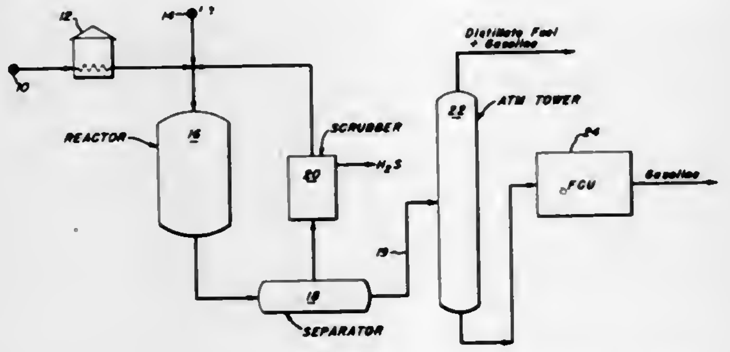
A wide boiling range e.g., for a given VGC) refrigeration oil, having good chemical and thermal stability and good miscibility with fluorinated hydrocarbon refrigerants, comprises a blend of from 50–75 volume percent of hydrorefined naphthenic oil component and 50–25 volume percent of solvent refined and dewaxed paraffinic oil component. Preferably, the hydrorefined naphthenic oil component (which can be a blend of two or more hydrorefined oils) has an SUS viscosity at 100° F. in the range of 75–750 SUS and the paraffinic oil component (which can be a blend) is chosen so that the resulting naphthenic paraffinic blend has a viscosity at 100° F. in the range of 100–500 SUS (preferably 125–300 SUS, typically 150–250 SUS) and has a maximum natural floc point of −35° F. Preferably the blend contains less than 10 ppm (more preferably less than 5) of basic nitrogen and contains in the range of 15–35 weight percent aromatics.

3,715,303
HYDROTREATMENT OF FOSSIL FUELS

Arnold N. Wennerberg, Chicago, and Alvin W. Frazier, Chicago Heights, Ill., assignors to Standard Oil Company, Chicago, Ill.

Filed May 18, 1971, Ser. No. 144,472
Int. Cl. C10g *13/06, 37/06;* **B01j** *11/06*

U.S. Cl. 208—112 **12 Claims**



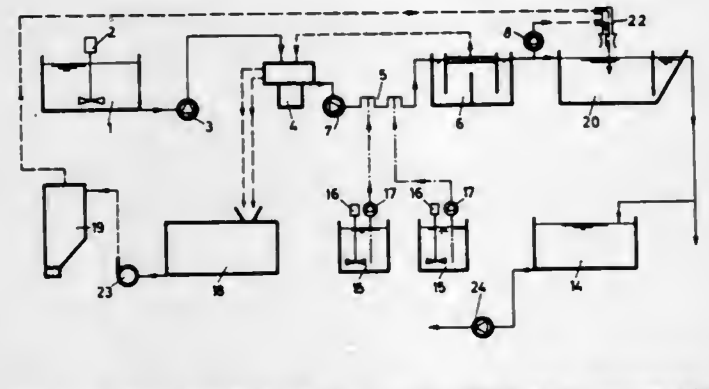
A fossil fuel including polynuclear aromatics is hydrotreated at elevated temperatures and pressures and in the presence of hydrogen by contacting said fuel with a catalyst comprising activated carbon and an alkali metal component or an alkaline earth metal component or both.

3,715,304
METHOD OF CONTROLLING THE TEMPERATURE IN A SEWAGE TREATMENT SYSTEM, AND APPARATUS THEREFOR

Hans-Peter Karl Hefermehl, 1803 Chardonne, Chalet des Roches, Switzerland

Filed Jan. 11, 1971, Ser. No. 105,476
Claims priority, application Switzerland, Jan. 13, 1970, 367/70
Int. Cl. C02c *1/02*

U.S. Cl. 210—3 **10 Claims**



Method and apparatus for controlling the temperature in a biological breakdown system, such as sewage treatment, wherein hot gas and/or steam is added to the system to maintain the proper temperature.

3,715,305
PROCESS FOR INCREASING SEDIMENTATION RATE OF HETEROGENEOUS COLLOIDAL SUSPENSION SYSTEMS

Joseph J. Carnes, Stamford; James H. Green, and John H. Heller, both of Wilton, all of Conn., assignors to The New England Institute, Inc., Ridgefield, Conn.

Filed Jan. 22, 1971, Ser. No. 109,038
Int. Cl. B01d *17/00*

U.S. Cl. 210—19 **9 Claims**

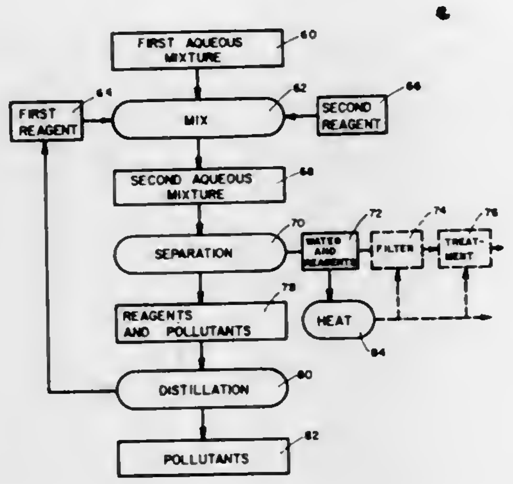
A process for increasing the sedimentation rate of heterogeneous colloidal suspension systems comprises the step of subjecting the system to an electromagnetic field in the radio frequency range.

3,715,306
PROCESS FOR SEPARATING WATER FROM POLLUTANTS IN WATER

Michael W. Mar, 2316 20th Ave. S., Seattle, Wash. 98144

Filed Jan. 4, 1971, Ser. No. 103,649
Int. Cl. B01d *11/00*

U.S. Cl. 210—21 **38 Claims**



The industrial processes produce many waste products. These waste products are often discharged into water and are carried away as pollutants in the water. These pollutants may be harmful to the water supplies and the animal life and plant life living in the water.

I have developed a method using a heterocyclic compound containing nitrogen and a solvent selected from the group consisting of an aromatic halogen compound and an aliphatic halogen compound to extract the pollutant from an aqueous mixture of water and pollutants.

This method produces a water which is substantially free of pollutants and may be discharged into a stream, a lake of fresh water, or a body of soft water, without fear of harming the plant life and the animal life in the body of water.

Further, with this method, the pollutants may be reused in the industrial process or may be used as a preservative or as an insecticide or may be collected and discharged in a special refuse region.

3,715,307
TREATMENT OF WATER USED IN HEAT TRANSFER EQUIPMENT

Dwight Johnson, Minneapolis, and William G. Mizuno, St. Paul, Minn., assignors to Economics Laboratory, Inc.

No Drawing. Filed June 24, 1971, Ser. No. 156,530
Int. Cl. C02b *5/06*

U.S. Cl. 210—58 **4 Claims**

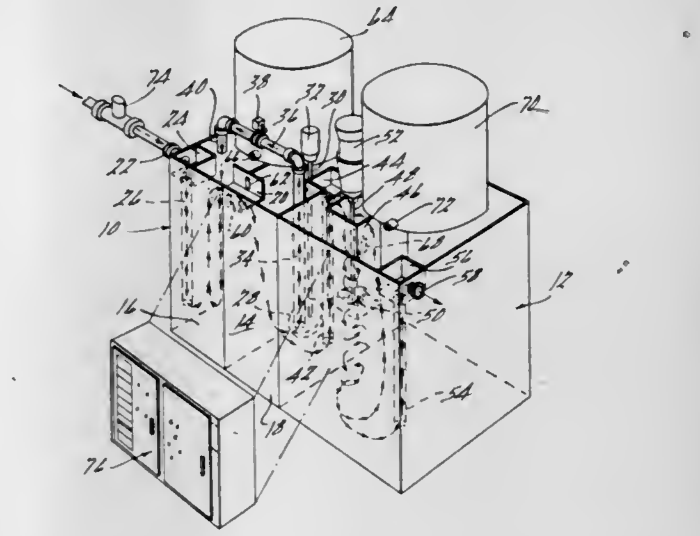
Maleic anhydride copolymers (e.g., copolymerized with vinyl acetate) are used in additive amounts in water (e.g., sea water) to reduce maintenance problems associated with the use of such water in heat transfer equipment (e.g., evaporators).

3,715,308
APPARATUS AND PROCESS FOR TREATING TOXIC WASTE MATERIALS

Andrew N. Sulfaro, Sterling Heights, and Alfred H. Stein, Southfield, both of Mich., assignors to Oxy Metal Finishing Corporation, Warren, Mich.

Filed June 4, 1971, Ser. No. 149,964
Int. Cl. C02c *5/02*

U.S. Cl. 210—60 **10 Claims**



An apparatus and method for continuously treating and destroying toxic constituents in effluent waste streams from metal finishing processes such as aqueous rinse solutions containing dissolved hexavalent chromium and cyanide compounds present in concentrations which are lethal to marine ecology. The apparatus and process provide for a two-stage treatment of such waste streams which are continuously recirculated in each stage and their chemical characteristics are continuously monitored and adjusted so as to assure optimum conditions for promoting the desired chemical reactions for effecting a destruction of the toxic constituents and assuring that the effluent continuously discharged from the treating apparatus is devoid of any harmful constituents.

3,715,309
PROCESS FOR DETOXICATING WASTE WATERS CHARGED WITH ORGANIC CYANIDE IMPURITIES

Jean-Pierre Zumbrunn, Lyon, France, assignor to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude, Paris, France

No Drawing. Filed Sept. 17, 1970, Ser. No. 73,227
Claims priority, application France, Jan. 29, 1970, 7003085
Int. Cl. C02b *1/34*

U.S. Cl. 210—63 **13 Claims**

A process for detoxicating waste waters which contain organic cyanide impurities, particularly nitriles consists in rapid degradation of the nitriles into amides and then into salts of organic acids by treatment with hydrogen peroxide in alkali medium, and the per compounds.

This process, which has the advantage of saturating the effluents with oxygen, permits the total purification to a residual content lower than 0.5 p.p.m. of any effluent coming from chemical synthesis plants, such as the factories for the production of plastic materials or synthetic fibers, and containing organic nitriles.

3,715,310

FIRE-RETARDANT COMPOSITIONS

Edward Peter Butcher, Birmingham, England, assignor to Bakelite Xylonite Limited, London, England

Filed July 17, 1968, Ser. No. 745,388

Int. Cl. C09k *3/28*

U.S. Cl. 252—8.1 **3 Claims**

A fire-retardant composition comprising (a) a halogen-substituted aromatic hydroxy compound and (b) a phosphorus- or antimony-containing compound, for instance, a bromophenol and an aromatic phosphate, is especially well suited for incorporation, conveniently in a resin varnish, into laminates.

The resulting laminates are particularly useful for electrical applications.

3,715,311

HYDROCARBON FUEL AND LUBRICATING OIL SOLUTIONS OF TRIALKYL PHOSPHITE-LONG CHAIN ALKENYLSUCCINIC ANHYDRIDE REACTION PRODUCT

William T. Brannen, West Lake, Ohio, assignor to Standard Oil Company, Chicago, Ill.

No Drawing. Original application May 8, 1969, Ser. No. 823,176. Divided and this application June 30, 1971, Ser. No. 158,635

Int. Cl. C10m *1/46*

U.S. Cl. 252—49.8 **5 Claims**

Trialkyl phosphites, e.g. tributyl phosphite, are reacted with alkenyl hydrocarbon-substituted succinic anhydrides, in which the alkenyl hydrocarbon contains at least 30 carbon atoms, to obtain reaction products which are useful as additives in hydrocarbon fuels and in lubricating oils.

3,715,312

PRODUCT

Ford C. Teeter, Palos Heights, Ill.; David B. Sheldahl, Griffith, Ind., and Carle W. Highberg, Newark, N.J., assignors to Atlantic Richfield Company, New York, N.Y. and Super Cut Inc., Chicago, Ill.

Continuation-in-part of Ser. No. 798,472, Aug. 16, 1968, abandoned, which is a division of Ser. No. 480,492, Aug. 17, 1965, Pat. No. 3,453,784. This application Aug. 26, 1970, Ser. No. 67,291

Int. Cl. C10m *3/20, 3/02*

U.S. Cl. 252—49.5 **8 Claims**

Emulsifiable compositions are obtained consisting essentially of defined amounts of a long chain fatty acid partial ester of hexitol anhydride, a polyoxyethylene derivative of hexital anhydride partial long chain fatty acid ester, an alkylaryl polyether alcohol having a short polyether chain, and normally liquid oil of lubricating viscosity. These emulsifiable compositions can also contain minor amounts of lard oil and a light petroleum fraction, such as kerosene. A small amount of the emulsifiable composition, such as about 1 to 4 weight percent, is dispersed in water and forms a stable emulsion which is useful as a lubricant in grinding of glass with a diamond grinding surface. These new compositions are characterized by the ability to form and maintain oil-in-water emulsions which are stable for extended periods of time under severe conditions of use and increase diamond life, with small, economical amounts of lubricant being consumed. Other advantages are that the lubricating compositions of this invention require less spindle power with less pressure to obtain the same glass surface finish.

3,715,313

TRACTION TRANSMISSION CONTAINING LUBRICANT COMPRISING GEM-STRUCTURED POLAR COMPOUND

Marcus W. Haseltine, Jr., Brookhaven, and Gary L. Driscoll, Boothwyn, Pa., assignors to Sun Oil Company of Pennsylvania, Philadelphia, Pa.

Filed May 17, 1971, Ser. No. 144,165

Int. Cl. C10m *1/20*

U.S. Cl. 252—52 **10 Claims**

Polar compounds containing a gem-structured hydrocarbon "backbone" are useful as traction fluids or as components of traction fluids. For example, compositions, useful as additives to lubricants (e.g., components of traction fluids), are produced by ozonolysis of polyolefins, particularly of polyisobutylene oligimers containing at least one pair of maximally crowded geminal methyl groups. For example, ozonolysis of the novel polyisobutylenes can produce oxygenated derivatives (ketones, esters, acids, aldehydes, alcohols, etc.) which are useful as components of traction fluids. One such alcohol is 1,1,3,3,5,5,7,7-octamethyl-1-octanol. Other compounds are 4,4,6,6,8,8-hexamethyl - 2 - nonanone and 2,2,6,6,8,8-hexamethyl-4-nonanone. Blends of the ketones or of mixtures of the acids and ketones with a base oil (e.g., paraffinic lube, naphthenic lube, a hydrogenated naphthenic or paraffinic lube, polyolefins or hydrogenated polyolefins) are especially useful as traction fluids or as a lubricant for a friction drive or a limited slip differential.

3,715,314

SCOURING CLEANSER COMPOSITION

Arthur Stanley Morgenstern, Wyoming, Ohio, assignor to The Proctor & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 130,859, April 2, 1971, abandoned. This application May 25, 1972, Ser. No. 256,684

Int. Cl. C11d *7/54*

U.S. Cl. 252—95 **12 Claims**

An abrasive scouring cleanser composition consisting essentially of a water-insoluble siliceous abrasive material; an alkali metal carbonate; a water-soluble organic detergent; and calcium oxide or hydroxide. Compositions exhibiting desirable cleansing and scouring properties and effective in the removal of smears or deposits of soft metals such as aluminum or porcelain or ceramic surfaces are described.

3,715,315

BIS-(PHENOXYPHENYL) CARBONATES

Walter Traber, Riehen, and Anton G. Weiss, Basel, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 747,792, July 26, 1968, Pat. No. 3,592,837. This application Dec. 30, 1970, Ser. No. 102,992

Int. Cl. C11d *3/48*

U.S. Cl. 252—106 **12 Claims**

Detergents containing as an anti-bacterial additive, a bis-(phenoxyphenyl) carbonate which is unsubstituted or substituted in one or several of its benzene rings by halogen, lower alkyl or trifluoromethyl.

3,715,316

REACTOR SAFETY SPRAY SOLUTION BASE-BORATE

Benadetto A. Soldano, Oak Ridge, Tenn., assignor to The United States of America as represented by the United States Atomic Energy Commission

Filed Jan. 28, 1971, Ser. No. 110,765

Int. Cl. B01d *47/106*

U.S. Cl. 252—188 **2 Claims**

A nuclear reactor safety spray solution comprising an aqueous basic borate solution containing up to 1 volume percent

---

sodium thiosulfate and an effective quantity of a metal salt which enhances the reaction rate of said solution with an organic iodide such as methyl iodide in contact with said solution, in comparison to the reaction rate between said iodide in contact with a solution which does not contain a rate-accelerating concentration of said salt.

3,715,317

SOLVENT EXTRACTION PROCESS FOR PRODUCING LOW-NITRATE AND LARGE-CRYSTAL-SIZE PuO_2 SOLS

Milton H. Lloyd and Othar K. Tallent, Oak Ridge, and Rex E. Leuze, Lenoir City, Tenn., assignors to the United States of America as represented by the United States Atomic Energy Commission

No Drawing. Filed June 2, 1971, Ser. No. 149,357

Int. Cl. C01g *56/00*

U.S. Cl. 252—301.1 S **7 Claims**

Low-nitrate plutonia sols having a NO_3/Pu mole ratio in the range 0.1 to 0.4 with average crystallite diameters of 30 to 80 A. can be produced when a sol is prepared by solvent extraction of a plutonium nitrate seeded with a plutonia sol. When the seeded sol is taken to dryness and heated for 10 to 120 minutes at a temperature in the range 190–230° C., nitrate removal occurs with conconitant crystallite growth.

3,715,318

FLUIDIZED BED PRODUCTION OF URANIUM MONOCARBIDE AND URANIUM MONOCARBIDE-URANIUM ALUMINIDE MIXTURES

George W. Hogg, Idaho Falls, Idaho, assignor to the United States of America as represented by the United States Atomic Energy Commission

No Drawing. Filed Jan. 28, 1971, Ser. No. 110,760

Int. Cl. C09k *3/00*

U.S. Cl. 252—301.1 R **8 Claims**

Uranium-dioxide-coated aluminum particles in a fluidized bed can be converted to particles of substantially pure uranium monocarbide or particles with a composition comprising a mixture of uranium monocarbide and uranium aluminide by fluidizing the bed with a mixture of carbon tetrachloride and chlorine in varying percentages with argon gas for 1 to 2 hours at a temperature of 320° C. and subsequently fluidizing the bed with argon alone for 1 to 2 hours at a temperature of 800° C.

3,715,319

AGENT FOR THE DISPELLING OF FOG AND PROCESS FOR THEIR PREPARATION

Rudolf Kuhne, Frankfurt am Main; Helmut Diery, Kelkheim, Taunus, and Siegbert Rittner, Frankfurt am Main, all of Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt/Main, Germany

Filed April 6, 1971, Ser. No. 131,806

Claims priority, application Germany, April 8, 1970, P 20 16 705.9

Int. Cl. B01d *17/00*

U.S. Cl. 252—319 **14 Claims**

Water-soluble condensation products of phenols and formaldehyde or compounds being capable of splitting off formaldehyde are useful as fog-dispelling agents.

3,715,320

REDUCTION OF NITRATE ION CONCENTRATION BY FORMALDEHYDE TREATMENT IN THE RECOVERY OF OXIDATION CATALYST METALS

Samuel B. Jeffries, Bay City, Tex., assignor to Celanese Corporation, New York, N.Y.

Filed Feb. 11, 1971, Ser. No. 114,726

Int. Cl. C22b *59/00;* **B01j** *11/02*

U.S. Cl. 423—24 **8 Claims**

An aqueous nitric acid solution such as is derived from an adipic acid process and containing catalyst metal ions is reacted with formaldehyde to remove a substantial portion of the nitrate ions present prior to passing the aqueous nitric acid solution through an ion exchange zone wherein the metals are removed.

3,715,321

CHROMIUM OXIDE POLYMERIZATION CATALYST

Bertalan Horvath, Southern London, England, assignor to Phillips Petroleum Company

No Drawing. Filed Apr. 23, 1969, Ser. No. 818,806

Int. Cl. B01j *11/78*

U.S. Cl. 252—441 **5 Claims**

Additives are provided to a chromic oxide catalyst system used for olefin polymerization which affect the course of reaction and/or the nature of the polymer produced, the additives being compounds of the metals of Group II–A and Group III–B of the Periodic Table.

3,715,322

EXHAUST GAS CATALYST

Shigehiko Kobayashi, Tokyo; Kazuhide Miyazaki, Tokyo, and Michiaki Yamamoto, Tokyo, all of Japan, assignors to Mitsui Mining & Smelting Co., Ltd., Tokyo, Japan

Filed July 28, 1970, Ser. No. 59,012

Claims priority, application Japan, Jan. 10, 1970, 45/3093; May 4, 1970, 45/38109; May 4, 1970, 45/38110; May 4, 1970, 45/38111; May 4, 1970, 45/38112

Int. Cl. B01j *11/40, 11/06*

U.S. Cl. 252—454 **10 Claims**

A catalyst comprising manganese oxides and lead oxides is effective in oxidizing and purifying the exhaust gases containing carbon monoxide and is possessed of combustion facilitating effect, and further, a catalyst comprising said manganese oxides and lead oxides together with an oxide of alkali earth elements, transition elements, rare earth elements or such substance as silicon dioxide, aluminum oxide, or such metals as aluminum, copper and iron is extremely effective in oxidizing and purifying the exhaust gas containing carbon monoxide.

3,715,323

NITRATION OF AROMATIC RING-CONTAINING COMPOSITIONS

James V. Crivello, Mechanicville, N.Y., assignor to General Electric Company

No Drawing. Original application Oct. 23, 1969, Ser. No. 868,917, now Patent No. 3,634,520. Divided and this application Feb. 25, 1971, Ser. No. 119,006

Int. Cl. C08f *7/10, 7/04;* **C08g** *20/38*

U.S. Cl. 260—47 ET **9 Claims**

Certain aromatic organic compositions containing benzenoid-substituted hydrogen are readily nitrated by treatment with a mixture comprising a perfluoro saturated aliphatic acid anhydride of from 4 to 8 carbon atoms and a nitrating agent of either metal nitrates or ammonium nitrate.

3,715,324
NOVEL CLEANING COMPOSITION

Barry T. Hynes, Nicherson Lane, West Chatham, Mass. 02669; and George S. Krall, 24 Fairview St.; and Michael G. Krall, 45 Rockwood Road, both of Hingham, Mass. 02043

No Drawing. Continuation-in-part of abandoned application Ser. No. 779,618, Nov. 27, 1968. This application Oct. 18, 1971, Ser. No. 190,393

Int. Cl. C11d *3/075, 3/36*

U.S. Cl. 252—529 **8 Claims**

A novel cleaning composition useful for removing grease and/or carbon from stoves, grilles, cooking utensils and the like. The composition comprises an aqueous or substantially aqueous mixture of sodium hydroxide, a dimethyl polysiloxane, tetrasodium pyrophosphate, a polyethylene oxide mono and/or dihydrogen phosphate ester, a nonyl phenol polyethylene glycol ether and triethanol amine.

3,715,325
INSOLUBLE POLYMERIC DIAZONIUM SALT CHROMOGEN

Gianni Linoli, Lecco, and Enzo Sergio Mannucci, Siena, Italy, assignors to Miles Laboratories, Inc., Elkhart, Ind.

No Drawing. Continuation-in-part of applications Ser. No. 559,754, June 23, 1966, and Ser. No. 774,490, Nov. 8, 1968. This application Oct. 2, 1970, Ser. No. 77,742

Int. Cl. C08f *27/08*

U.S. Cl. 260—2.2 R **7 Claims**

A novel insoluble polymeric diazonium salt chromogen consisting of a diazotized aromatic polyamine bound by an amide linkage to a cation exchange resin can be prepared by reacting a cation exchange resin containing carboxylic acid groups or salts of such carboxylic acid groups with a halogenating agent to convert some of the resin carboxylic acid groups or salts of such acid groups to acyl halide groups, reacting the resulting acyl halide groups with an aromatic polyamine to form a resin containing amide linkages and free aromatic amino groups, and then diazotizing the free aromatic amino groups. The resulting insoluble chromogen can be used to detect coupling compounds by forming colored reaction products with such coupling compounds. This chromogen can also be used to detect enzyme activity wherein the enzyme catalyzes a reaction with a suitable substrate to release a coupling compound which will form a colored reaction product with the insoluble chromogen.

3,715,326
USING MONOISOCYANATES TO PREPARE MICROPOROUS POLYURETHANES

Harro Traubel, Leverkusen, and Harald Oertel, Odenthal-Globrusch, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Continuation-in-part of Ser. No. 696,096, Jan. 8, 1968, abandoned. This application Dec. 4, 1970, Ser. No. 95,345

Claims priority, application Germany, Jan. 10, 1967, P 16 94 127.8

Int. Cl. C08g *22/44, 22/20*

U.S. Cl. 260—2.5 AY **5 Claims**

Microporous foils and films are prepared from solutions of a polyurethane or polyurethane urea polymer in a strong polar solvent, the polymer having film forming properties and a molecular weight of at least 10,000 by mixing with the solution from 2 to 200 percent by weight based on the weight of the polymer of (1) and alkyl isocyanate or (2) a polar aliphatic compound having a melting point greater than 35° C. and at least one alkyl or alkylene substituent containing two to 24 carbon atoms, the aliphatic compound being a carboxylic acid amide, a urethane, a urea or a semicarbazide, shaping the solvent solution into a foil or film, removing the solvent and drying the film or foil at a temperature below the softening point of the polyurethane or polyurethane urea polymer.

3,715,327
WATER RESISTANT AND WATER REPELLENT PAINT COMPOSITIONS CONTAINING A LATEX OF A VINYL ESTER POLYMER

Leo Felt, 49 Daventry Court, Johannesburg, Republic of South Africa

Filed May 20, 1971, Ser. No. 145,523

Int. Cl. C09d *3/74*

U.S. Cl. 260—17 R **1 Claim**

A water resisting and water repelling paint comprising an aqueous emulsion containing a synthetic latex of a vinyl ester homopolymer or copolymer and as an additive thereto, a product resulting from the thermal interaction of:

a. 0.5 to 15 parts by weight of ethyl cellulose,
b. 0.5 to 20 parts by weight of fatty acid containing 10 to 24 carbon atoms, for example, stearine,
c. 0.25 to 15 parts by weight of mono-, di- or trialkylamine or alkanolamine, for example, triethanolamine, or morpholine,
d. 0.5 to 150 parts by weight of an oil selected from the group of a drying and semi-drying vegetable oil, and mixtures, thereof,
e. 0.5 to 50 parts by weight of a compound selected from the group of phthalic acid ester, benzoic acid ester, phosphoric acid ester, chlorinated diphenyl, substituted diphenyl and mixtures thereof, and/or
f. 0.5 to 50 parts by weight of a compound selected from the group of epoxidized triglyceride ester, epoxidized aliphatic alcohol ester of unsaturated fatty acids having a molecular weight of 300 to 5,000 and mixtures thereof,
g. 0.5 to 50 parts by weight of a compound selected from the group of calcium stearate, magnesium stearate, aluminum stearate and mixtures thereof, and/or
h. 0.5 to 50 parts by weight of mineral oil, specific gravity of 0.85 to 0.95 and boiling point of 185° to 285° C.

3,715,328
COBALT II HALIDE HYDRAZINE COMPLEXES

Christian H. Stapfer, Newton, Pa., and Richard W. D'Andrea, New Hope, both of Pa., assignors to Carlisle Chemical Works, Inc., Reading, Ohio

Division of Ser. No. 26,161, April 6, 1970, Pat. No. 3,689,616. This application Sept. 16, 1971, Ser. No. 181,213

Int. Cl. C08f *21/04;* **C08g** *17/16;* **C09d** *3/68*

U.S. Cl. 260—22 CA **24 Claims**

Cobalt (II) halide trihydrazinates of the formula

$$[\mathrm{Co(II)}\,(\mathrm{R{-}NH{-}NH_2})_3]\mathrm{X}_2$$

are prepared as well as Cobalt (II) halide tris(hydrazine hydrochloride) complexes of the formula

$$[\mathrm{Co(II)}\,(\mathrm{N_2H_4\cdot HX})_3]\mathrm{X}_2$$

where R is H, alkyl, aryl, haloaryl and X is halogen. The compounds are useful as driers for alkyd resins and to accelerate the oxidative polymerization of olefinic polymer systems, particularly unsaturated polyesters, in conjunction with organic peroxides and as promoters for ketone aldol condensation. Known Co II complexes of the formula $[\mathrm{Co(II)}\,(\mathrm{R{-}NH{-}NH_2})_2]\mathrm{X}_2$ also have these same uses.

3,715,329
HEAT VULCANIZABLE POLYSILOXANE COMPOSITIONS CONTAINING ASBESTOS

Frank J. Glaister, Ballston Spa, N.Y., assignor to General Electric Company, Waterford, N.Y.

Filed April 15, 1971, Ser. No. 134,438

Int. Cl. C08g *51/10, 31/02*

U.S. Cl. 260—37 SB **9 Claims**

A heat vulcanizable silicone rubber composition comprising 5 to 94.47 percent by weight of an organopolysiloxane polymer, 5 to 75 percent by weight of an asbestos filter, and 0.25 to 10 percent by weight of an acrylic ester. The composition also includes a silica filler; a peroxide curing catalyst and a process aid. The preferred acrylic ester are methyl acrylate and trimethylolpropanethimethacrylate.

3,715,330
SELF-THERMOSET UNSATURATED POLYESTERS AND METHOD FOR PREPARATION THEREOF

Sumitaka Nogami, Saitama; Shizuko Saito, and Tooru Okada, both of Tokyo, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 10, 1971, Ser. No. 141,943

Claims priority, application Japan, May 20, 1970, 45/42366

Int. Cl. C08f *11/02*

U.S. Cl. 260—40 R **40 Claims**

A stable self-thermoset unsaturated polyester resin having at least one terminal norbornene radical, is provided. The resin is characterized by excellent mechanical properties, making it useful as a component of coating compositions and fiber reinforced polyesters.

3,715,331
MONOMER SOLUBLE X-RAY OPAQUE METHACRYLATE PARTICLES

Eugene J. Molnar, La Grange, Ill., assignor to Coe Laboratories

No Drawing. Filed May 1, 1970, Ser. No. 33,863

Int. Cl. C08f *45/04;* **A61k** *5/02*

U.S. Cl. 260—41 B **3 Claims**

Fine granular methacrylate particles in bead form have aliphatic halides distributed through the beads to provide an X-ray opaque material. The beads are prepared by dissolving the aliphatic halide in a liquid alkyl ester methacrylate and conducting a suspension polymerization of the monomer. Such X-ray opaque beads are surface tinted with colored heavy metal compounds to provide desired colors and to improve radiopacity. These polymers are advantageously soluble in liquid methyl metacrylate monomer so that articles may be molded therefrom.

3,715,332
RUBBER STOCK COMPOSITION FOR BONDING TO TEXTILE REINFORCEMENT CONTAINING A PHENOL-FORMALDEHYDE PRECURSOR WHEREIN THE FORMALDEHYDE PRECURSOR CONSISTS OF A LINEAR POLYOXYMETHYLENE

Helmut Junkermann, Frankfurt, and Erhard Klotzer, Hanau, both of Germany, assignors to Deutsche Gold-und Silber-Scheideanstalt vormals Roessler, Frankfurt am Main, Germany

Filed Oct. 30, 1970, Ser. No. 85,773

Int. Cl. C08d *9/10, 13/16*

U.S. Cl. 260—41.5 R **16 Claims**

A vulcanizable rubber stock composition adapted for firm bonding to a textile reinforcement during vulcanization comprises a natural or synthetic rubber compound, a filler, a phenol or amine and a formaldehyde precursor suited to form a resin with the phenol or amine during vulcanization and consisting of a linear polyoxymethylene of the formula

$$\mathrm{HO}\cdot(\mathrm{CH_2O})_n\cdot\mathrm{H}$$

wherein *n* indicates the average degree of condensation (chain length of the formaldehyde units) and is between 100 and 1,000.

The linear polyoxymethylenes are formed by subjecting paraformaldehyde of an average chain length in excess of 30 and up to 100 or, if below 30, a mixture of formaldehyde with a finely ground solid acid to tempering at an elevated temperature.

3,715,333
POLYVINYLCHLORIDE STABILIZATION WITH MIXTURES OF TIN SALTS

William A. Larkin, Morristown, N.J., assignor to M & T Chemicals Inc., New York, N.Y.

Filed Nov. 13, 1969, Ser. No. 876,599

Int. Cl. C08f *45/62*

U.S. Cl. 260—45.75 R **6 Claims**

This invention relates to stabilizing compositions; to the process for preparing a novel halogen-containing polymer; and to polymers stabilized against the deteriorative effect of heat which comprises a vinyl chloride or vinylidene chloride homopolymer or copolymer and a stabilizing amount of: as a first stabilizer an organotin halide exhibiting the formula $\mathrm{RS}n\mathrm{X}_3$ wherein R is a hydrocarbon and X is halogen and as a second stabilizer a sulfur-containing organotin compound exhibiting two direct carbon to tin bonds and two direct sulfur to tin bonds.

3,715,334
PLATINUM-VINYLSILOXANES

Bruce D. Karstedt, Scotia, N.Y., assignor to General Electric Company, Waterford, N.Y.

Continuation of Ser. No. 834,580, March 19, 1969, abandoned, which is a division of Ser. No. 152,476, Aug. 14, 1968, abandoned, which is a continuation-in-part of Ser. Nos. 598,148, Dec. 1, 1966, abandoned, and Ser. No. 598,216, Dec. 1, 1966, abandoned. This application Nov. 27, 1970, Ser. No. 93,435

Int. Cl. C08f *11/04*

U.S. Cl. 260—46.5 UA **7 Claims**

Hydrosilation catalysts are provided in the form of platinum-vinylsiloxanes which are substantially free of chemically combined halogen. The platinum-vinylsiloxanes can be made by effecting removal of chemically combined halogen from a platinum halide-vinylsiloxane reaction product. The platinum-vinylsiloxanes can be employed as hydrosilation catalysts to make curable organopolysiloxane compositions.

3,715,335
LINEAR POLYESTER BACKBONE QUATERNARY AMMONIUM POLYELECTROLYTES

Robert Bacskai, Kensington, Calif., assignor to Chevron Research Company, San Francisco, Calif.

No Drawing. Continuation-in-part of application Ser. No. 23,029, Mar. 26, 1970. This application Mar. 4, 1971, Ser. No. 121,184

Int. Cl. C08g *17/14*

U.S. Cl. 260—75 N **4 Claims**

Cationic polyelectrolytes having a linear polyester backbone with attached side chains containing quaternary ammonium epoxide groups and optional hydroxyl or primary amine groups.

3,715,336
COPOLYMERS OF VINYL AMINE AND VINYL ALCOHOL AS FLOCCULANTS

Robert M. Nowak; James T. K. Woo, and Dietrich H. Heinert, all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jan. 7, 1971, Ser. No. 104,814

Int. Cl. C08g *22/04*

U.S. Cl. 260—77.5 BB **6 Claims**

Vinyl amine/vinyl alcohol copolymers prepared by hydrolysis of vinyl carbamate/vinyl acetate copolymers serve as effective flocculants in the clarification of aqueous suspensions of finely divided inorganic solids.

3,715,337

PREPARATION OF POLY(ISOCYANURATE-URETHANES) USING TRITHIOCARBONATES AS CATALYSTS

Michael George Allen, Hudson, Wis., and George Van Dyke Tiers, St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed June 1, 1971, Ser. No. 148,938

Int. Cl. C08g *22/40*; **C07c** *154/00*

U.S. Cl. 260—77.5 NC **9 Claims**

Polyisocyanates are trimerized, polymerized, or reacted with polyols in the presence of a trithiocarbonate salt catalyst, such as sodium ethyltrithiocarbonate, to produce polyisocyanurates, or poly(isocyanurate-urethanes).

3,715,338

SEALING COMPOSITIONS FROM POLYKETIMINES ON POLYENAMINES

Hans-Georg Schmelzer, New Martinsville, W. Va.; Hermann Gruber, Leverkusen, Germany; Eberthart Degener, Leverkusen, Germany, and Kuno Wagner, Leverkusen, Germany, assignors to Farbenfabriken Bayer Aktiengesselschaft, Leverkusen, Germany

Continuation of Ser. No. 772,816, Nov. 1, 1968, abandoned. This application July 9, 1971, Ser. No. 161,352

Claims priority, application Germany, Nov. 4, 1967, P 17 19 121.8

Int. Cl. C08g *22/32*

U.S. Cl. 260—77.5 AM **7 Claims**

A sealing composition, capable of hardening in the presence of water, is comprised of a polycondensation or polymerization product having a molecular weight of from about 500 to about 10,000 and at least two carbamic acid aryl ester groups and a polyfunctional ketimine or enamine.

3,715,339

CHELATION POLYMER FROM NITRILO COMPOUND AND ETHYLENEIMINE COMPOUND

Norman B. Rainer, Richmond, Va., assignor to Seekay Chemical Co., Inc., New York, N.Y.

Continuation-in-part of Ser. No. 721,585, April 16, 1968, Pat. No. 3,580,891. This application Dec. 9, 1970, Ser. No. 96,671

Int. Cl. C08g *20/06*

U.S. Cl. 260—78 A **8 Claims**

A water-insoluble polymer is produced by reacting, under amide-forming conditions, a nitrilo compound selected from the group consisting of nitrilotriacetic acid, salts of nitrilotriacetic acid, and lower alkyl esters and amides of nitrilotriacetic acid, with a water soluble ethylene imine compound comprised of at least 80 percent by weight of recurring units of the formula $—NHCH_2CH_2—$. The water-insoluble polymer has the ability to absorb polyvalent metal ions from dilute aqueous solutions.

3,715,340

PROCESS FOR PREPARING POLYAMIDES

Arnold B. Finestone, Woodcliff Lake, N.J., and Willard M. Sims, Leominster, Mass., assignors to Foster Grant Co. Inc., Leominster, Mass.

No Drawing. Continuation-in-part of application Ser. No. 878,212, Nov. 19, 1969. This application Aug. 19, 1971, Ser. No. 173,328

Int. Cl. C08g *20/18*

U.S. Cl. 260—78 L **11 Claims**

A method of preventing the formation of gel in polyamides prepared from aminocarboxylic acids or lactams comprising adding to the corresponding monomer prior to its polymerization about 0.025 to 0.5 mole, per 100 moles of monomer, of an alkyl ammonium aromatic acid salt or an alkylene bis ammonium aromatic acid salt.

3,715,341

MODIFICATION OF CARBOXYL GROUP CONTAINING POLYMER WITH AZIRIDINYL SUBSTITUTED UNSATURATED LONG CHAIN ACYCLIC HYDROCARBONS

Heinz Uelzmann, Cuyahoga Falls, Ohio, assignor to The General Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 683,137, Nov. 15, 1967, Pat. No. 3,573,278. This application Jan. 19, 1971, Ser. No. 107,697

Int. Cl. C08f *27/08, 27/00*; **C08d** *5/02*

U.S. Cl. 260—78.4 D **5 Claims**

Unsaturated, long chain, acyclic hydrocarbons having one or two aziridinyl substituents are prepared by reaction of an alkylenimino and a long chain alkatriene in the presence of an alkali metal or equivalent catalyst. The resulting aziridinyl products, e.g., the ethylenimine adduct of allocimene, contain at least three reactive groups, i.e., a combination of two aziridinyl groups and one olefinic unsaturation or one aziridinyl group and two olefinic unsaturations.

3,715,342

RADIATION-CONVERTIBLE NORBORNENE POLYMERS

Henry Octave Colomb, Jr., and David John Trecker, both of South Charleston, W. Va., assignors to Union Carbide Corporation, New York, N.Y.

Division of Ser. No. 804,279, March 4, 1969, Pat. No. 3,554,886, which is a continuation-in-part of Ser. No. 697,635, Jan. 15, 1968, abandoned. This application Sept. 15, 1970, Ser. No. 72,543

Int. Cl. C08f *15/40*

U.S. Cl. 260—80.81 **1 Claim**

Polymers containing a norbornenyl group are readily cross-linked by irradiation to produce insoluble products. The cross-linked products are useful as coatings on wood, metal, etc., as self-supporting films, wire insulation, for the treatment of fabrics to render them more durable and crease resistant, as well as in the many known areas in which synthetic polymers are employed such as the production of molded and extruded shaped articles.

3,715,343

POLYMERS OF VINYL AMINIMIDES

Robert C. Slagel, Pittsburgh, Pa., and Billy M. Culbertson, Burnsville, Minn., assignors to Ashland Oil, Inc., Houston, Tex.

Continuation-in-part of Ser. No. 24,948, March 20, 1980, Pat. No. 3,664,990, which is a division of Ser. No. 636,273, May 5, 1967, Pat. No. 3,527,802. This application Aug. 11, 1971, Ser. No. 170,989

Int. Cl. C08f *3/84, 15/02*

U.S. Cl. 260—88.1 PN **7 Claims**

Linear addition of polymers having pendant quaternized aminimide groups are provided by homo- or copolymerizing a quaternary derivative of a N,N-disubstituted acid hydrazide wherein the acyl moiety is acrylyl, methacrylyl, or crotonyl. The quaternized aminimide groups of such polymers are neutralized and then converted to isocyanate groups. Polyurethane and polyurea cross-links can be prepared from the resultant polyisocyanates having utility in molding, surface coating, adhesive and the like applications.

3,715,344

REGULAR LINEAR HEAD-TO-TAIL POLYMERIZATES OF CERTAIN UNSATURATED HYDROCARBONS AND FILAMENTS COMPRISING SAID POLYMERIZATES

Giulio Natta, Piero Pino, and Giorgio Mazzanti, Milan, Italy, assignors to Montecatini Edison S.p.A., Milan, Italy

No Drawing. Filed June 8, 1955, Ser. No. 514,099

Claims priority, application Italy, June 8, 1954, 24,227/54; July 27, 1954, 25,109/54

Int. Cl. C08f *3/10*

U.S. Cl. 260—93.7 **4 Claims**

1. Normally solid polypropylene, consisting essentially of recurring propylene units, having a substantial crystalline polypropylene content.

3,715,345

GLUCAGON SEPARATION PROCESS

Milton R. Smith, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Aug. 3, 1970, Ser. No. 60,617

Int. Cl. C07c *103/52*; **C07g** *7/00*

U.S. Cl. 260—112.5 **3 Claims**

Glucagon is separated from insulin by using a sulfonated macroreticular styrene-divinylbenzene copolymer resin.

3,715,346

PROCESS FOR THE PREPARATION OF LINCOMYCIN COMPOUNDS

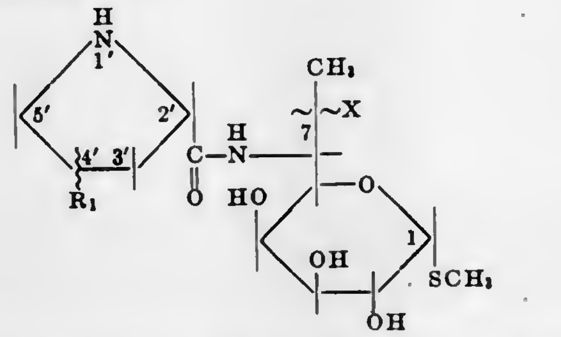
Barney J. Magerlein, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 796,558, Feb. 4, 1969, Pat. No. 3,634,043. This application Nov. 18, 1970, Ser. No. 90,846

Int. Cl. C07c *47/18*

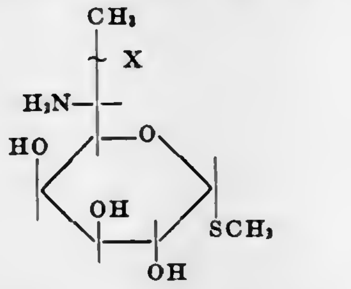
U.S. Cl. 260—210 R **6 Claims**

A simplified process for obtaining active lincomycin compounds of the formula



I

wherein R_1 is an alkyl of four to seven carbon atoms, inclusive, and wherein X is selected from the group consisting of 7(R)-hydroxy and 7(S)-chloro, consists of two steps: (1) condensing a 1-carbobenzoxy-4-alkylproline (all four isomers) wherein the alkyl group has four to seven carbon atoms, inclusive, and a methyl thiolincosaminide (III) of the formula:



III

wherein X is defined as herein described above, in water or acetone-water solution; separating the soluble from the insoluble fraction; and (2) removing the protective carbobenzoxy group by hydrogenolysis, separately from each fraction; to obtain an active trans-L and cis-L-lincomycin compound of the formula I above, and separately an analogous trans-D and cis-D-lincomycin product.

3,715,347

PROCESS FOR ACETYLATION

Douglas O. Spry, Indianapolis, and Ian G. Wright, Greenwood, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Nov. 6, 1970, Ser. No. 87,634

Int. Cl. C07d *99/16, 99/24*

U.S. Cl. 260—239.1 **4 Claims**

6-Aminopenicillanic acid, 3-acetoxymethyl-7-amino-Δ^3-cephem-4-carboxylic acid and 3-methyl-7-amino-Δ^3-cephem-4-car-boxylic acid and esters thereof are reacted with ketene in an aqueous or inert non-aqueous solvent at a temperature between about 5° and about 35° C. to provide the corresponding acetamido derivatives in superior yields. 6-Acetamidopenicillanic acid, 3-acetoxymethyl-7-acetamido-Δ^3-cephem-4-carboxylic acid, 3-methyl-7-acetamido-Δ^3-cephem-4-carboxylic acid and the esters thereof are useful intermediates for the preparation of cephalosporin antibiotics.

3,715,348

SPIRO AZIRIDINE-ETHENOANTHRACENE COMPOUNDS

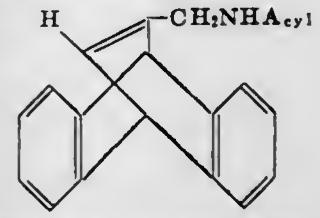
Charles Ferdinand Huebner, Chatham, N.J., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed June 19, 1970, Ser. No. 47,906

Int. Cl. C07c *87/28, 103/34*; **C07d** *23/02*

U.S. Cl. 260—239 E **4 Claims**

Process for the preparation of 11-N-acylaminomethyl-9,10-ethenoanthracenes of the formula



which are antidepressants, by pyrolytic isomerization of the corresponding 11-spiro-attached N-acylaziridines.

3,715,349

17-HYDROXY-7α-MERCAPTO-3-OXO-17α-PREGN-4-ENE-21-CARBOXYLIC ACID γ-LACTONE

Paul B. Sollman, Wilmette, Ill., assignor to G. D. Searle & Co., Chicago, Ill.

No Drawing. Filed Sept. 30, 1971, Ser. No. 185,366

Int. Cl. C07c *173/00*

U.S. Cl. 260—239.57 **1 Claim**

Preparation and the diuretic utility of the captioned compound are disclosed.

3,715,350

NOVEL METHOD FOR THE PREPARATION OF 2α,3α-EPITHIO-α-STEROIDS

Yoshio Hamashima, Kyoto, Japan, assignor to Shionogi & Co., Ltd., Osaka, Japan

No Drawing. Filed Apr. 9, 1971, Ser. No. 130,856

Int. Cl. C07c *173/10*

U.S. Cl. 260—239.5 **28 Claims**

Hormonal 2α,3α-epithio-5α-steroids are prepared by a novel method comprising (i) a new process which consists of treating a 3-halo- or acyloxy-5α-steroid with a basic acid-eliminating reagent to give a corresponding Δ^2-5α-steroid; (ii) another new process consisting of a first step in which a Δ^2-5α-steroid is treated with a sulfur halide compound to give a 3β- or 2β-halo-5α-steroid-2α- or 3α-polysulfide, and a second step in which the product of the first step is treated with reducing and dehalogenating reagents to obtain the objective 2α,3α-epithio-5α-steroids.

3,715,351

CYANINE DYES CONTAINING A CYCLOPENTANONE NUCLEUS

Leslie G. S. Brooker, and Arthur Fumia, Jr., both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 656,647, July 28, 1967, abandoned. This application Feb. 24, 1970, Ser. No. 17,003

Int. Cl. C09b *23/02*

U.S. Cl. 260—240.4 **8 Claims**

Novel cyanine dyes containing a cyclopentanone nucleus in the methine chain are prepared by the acid hydrolysis of cyanine enamine derivatives. These cyanine dyes are spectral sensitizers for photographic silver halide emulsions. A number of the new dyes extend the sensitivity of photographic silver halide emulsions into the red and near infra-red regions of the spectrum.

3,715,352

2-BENZYL-1,4-DIMETHYL-5-HYDROXYMETHYL-2,5-EPIDITHIAPIPERAZINE-3,6-DIONE AND 2-BENZYL-1,4-DIMETHYL-5-HYDROXYMETHYL-2,5-EPITRITHIAPIPERAZINE-3,6-DIONE USEFUL AS ANTI-FUNGAL AGENTS

Robert Larry De Vault, Libertyville, Ill., assignor to Abbott Laboratories, Chicago, Ill.

Filed Dec. 21, 1970, Ser. No. 100,438
Int. Cl. C07d *93/06, 93/36*

U.S. Cl. 260—243 R **3 Claims**

2-Benzyl-1,4-dimethyl-5-hydroxymethyl-2,5-epidithiapiperazine-3,6-dione and 2-benzyl-1,4-dimethyl-5-hydroxymethyl-2,5-epitrithiapiperazine-3,6-dione useful as antifungal agents.

3,715,353

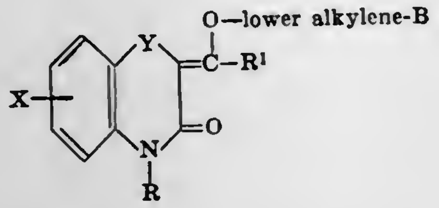
(AMINOALKOXY-BENZYLIDENE)-2H-BENZOTHIAZINE-3(4H)-ONES AND RELATED COMPOUNDS

John Krapcho, Somerset, N.J., assignor to E. R. Squibb & Sons, Inc., New York, N.Y.

Filed Oct. 12, 1970, Ser. No. 80,196
Int. Cl. C07d *93/12*

U.S. Cl. 260—243 R **11 Claims**

Compounds of the following formula and their salts are antidepressants:



R is lower alkyl, cycloalkyl-lower alkyl or aralkyl; R^1 is a mono- or bicyclic radical selected from the group consisting of X^1-phenyl, lower alkylenedioxyphenyl, pyridyl, furyl, naphthyl or thienyl; X is hydrogen, halogen, lower alkyl, trifluoromethyl, lower alkoxy, hydroxy, lower alkylthio, nitro, amino or lower alkanoylamino; X^1 is hydrogen, halogen, trifluoromethyl, lower alkyl, lower alkoxy, hydroxy, lower alkylthio, amino, lower alkanoylamino or mono- or di-lower alkylamino; Y is —O—, —S—, —SO— or $-SO_2-$; and B is a basic nitrogen containing radical.

3,715,354

OXOISOINDOLES

Karl Schoen, Kew Gardens, and Irwin J. Pachter, Woodbury, N.Y., assignors to Endo Laboratories Inc., Garden City, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 664,942, Sept. 1, 1967. This application Oct. 4, 1968, Ser. No. 765,010

Int. Cl. C07d *87/38*

U.S. Cl. 260—247.5 B **8 Claims**

5-aminomethyl- and 5-(substituted-amino)methyl-4,5,6,7-tetrahydrooxoisoindoles and the acid addition salts thereof are prepared by quaternizing 5-(dimethylamino)methyl- or 5-piperidinomethyl-4,5,6,7-tetrahydrooxoisoindoles, and reacting the quaternary salts either with a base and an amine, or alternatively, with an amine only. Compounds of the indicated types are useful as tranquilizers, antidepressants and analgetics.

3,715,355

N-(MORPHOLINO CARBONYL) 1-LOWER ALKYL-5-NITRO-IMIDAZOLE-2-CARBOXAMIDES

David W. Henry, Menlo Park, Calif.; Dale R. Hoff, and Arthur A. Patchett, Cranford, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 800,405, Feb. 19, 1969, Pat. No. 3,632,817. This application Feb. 12, 1971, Ser. No. 115,130
Int. Cl. C07d *87/42*

U.S. Cl. 260—247.2 A **3 Claims**

Nitroimidazolyl ureas and carbamates having antiprotozoal activity prepared by reaction of 1-loweralkyl-5-nitroimidazole-2-carboxamide with oxalyl halide and then with an appropriate alcohol or amine. The product compounds are useful as parasiticides.

3,715,356

1-PHENYL-6-AZACYTOSINES AS COCCIDIOSTATS

Max W. Miller, Stonington, Conn., assignor to Pfizer Inc., New York, N.Y.

Filed Feb. 19, 1971, Ser. No. 117,055
Int. Cl. C07d *55/10*

U.S. Cl. 260—249.5 **4 Claims**

Substituted 1-phenyl-6-azacytosines are effective in the control and treatment of coccidiosis.

3,715,357

N-OXIDES OF BENZYLPYRIMIDINES

Gerald Rey-Bellet, Basel; Daniel Ernest Schwartz, Pfeffingen, and Roland Reiner, Basel, all of Switzerland, assignors to Hoffmann-La Roche, Inc., Nutley, N.J.

Filed June 4, 1970, Ser. No. 43,607

Claims priority, application Switzerland, June 12, 1969, 8970/69

Int. Cl. C07d *51/42*

U.S. Cl. 260—256.4 N **11 Claims**

Antibacterially active N-oxides of 2,4-diamino-benzylpyrimidines are described.

3,715,358

METHOD OF TREATING INFLAMMATION

Bruce E. Witzel, Westfield, Conrad P. Dorn, Jr., Plainfield, and Tsung-Ying Shen, Westfield, N.J., assignors to Merck & Co., Inc., Rahway, N.J.

No Drawing. Application Mar. 5, 1970, Ser. No. 16,954, which is a continuation-in-part of abandoned application Ser. No. 687,101, Dec. 1, 1967. Divided and this application May 13, 1971, Ser. No. 143,173

Int. Cl. A61u *27/00*

U.S. Cl. 260—263 **4 Claims**

Inflammation in patients can be advantageously treated by administration of 3- or 4-phenylpyridones with or without substituents on the various rings, or alternatively using 3- or 4-phenyl-2-alkoxy.

3,715,359

HYDROXYLATED ACRONYCINE

Hugh R. Sullivan, Indianapolis, Ind., and Ruth E. Billings, Minneapolis, Minn., assignors to Eli Lilly and Company, Indianapolis, Ind.

No Drawing. Continuation-in-part of application Ser. No. 841,155, July 11, 1969. This application July 2, 1971, Ser. No. 159,563

Int. Cl. C07d *37/16*

U.S. Cl. 260—279 R **7 Claims**

Hydroxylated derivatives of acronycine, useful as antimicrobial agents.

3,715,360

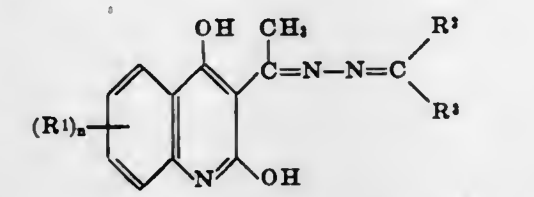
DYES OF THE 2,4-DIHYDROXYQUINOLINE SERIES

Manfred Gaeng, Bobenheim-Roxheim, and Peter Dimroth, Ludwigshafen, both of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen/Rhine, Germany

Filed Feb. 19, 1971, Ser. No. 117,086
Int. Cl. C07d *33/50*

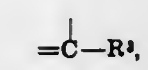
U.S. Cl. 260—288 R **7 Claims**

New dyes having the formula:



(I)

in which R^1 denotes a hydrogen atom, a halogen atom or a nitro group, *n* denotes the integer 1 or 2, R^2 denotes a hydrogen atom, an unsubstituted or substituted alkyl group having one to three carbon atoms, an aromatic radical or, together with



$$=\overset{|}{C}-R^3,$$

denotes a five-membered or six-membered carbocyclic or heterocyclic ring which may contain substituents and condensed rings, and R^3 may also denote an unsubstituted or substituted alkyl group having one to three carbon atoms or an aliphatic, aromatic or heterocyclic radical which may be attached by way of —CO—.

The dyes are pigment dyes.

3,715,361

ACYL DERIVATIVES OF 10-METHOXYIBOGAMINE

Joseph William Epstein, Monroe, and Leon Goldman, Nanuet, N.Y., assignors to American Cyanamid Company, Stamford, Conn.

No Drawing. Filed Oct. 8, 1971, Ser. No. 187,895
Int. Cl. C07d *43/38*

U.S. Cl. 260—293.53 **4 Claims**

This disclosure describes compounds of the class of acyl derivatives of 10-methoxyibogamine useful as analgetic and anti-inflammatory agents.

3,715,362

TETRACYCLIC AZIRIDINE AND METHOD FOR ITS PREPARATION

Samuel J. Dominianni, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Aug. 17, 1970, Ser. No. 64,569
Int. Cl. C07d *39/00*

U.S. Cl. 260—293.54 **2 Claims**

A novel tetracyclic aziridine and a method for its preparation are provided.

3,715,363

CERTAIN 2-ALIPHATIC-THIOBENZOTHIAZOLES

John D. Diekman, Menlo Park, Calif., assignor to Zoecon Corporation, Palo Alto, Calif.

No Drawing. Filed July 20, 1971, Ser. No. 164,438
Int. Cl. C07d *91/48*

U.S. Cl. 260—306 **12 Claims**

Novel 2-aliphatic-thiobenzothiazoles prepared by the alkylation of 2-mercaptobenzothiazole which are useful for the control of insects.

3,715,364

NITROIMIDAZOLE CARBOXAMIDES

Dale R. Hoff, Basking Ridge, N.J., assignor to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 567,365, July 25, 1966, abandoned, which is a continuation-in-part of Ser. No. 300,629, Aug. 7, 1963, abandoned. This application Dec. 28, 1970, Ser. No. 102,193
Int. Cl. C07d *49/36*

U.S. Cl. 260—309 **7 Claims**

1-Substituted-5-nitroimidazole-2-carboxamides are prepared from a 1-substituted-5-nitroimidazole-2-carboxylic acid or acid chloride or from a 1-substituted-5-nitroimidazole-2-carboxylic acid γ-lactone by reaction with an amine. The 1-substituted-5-nitroimidazole-2-carboxamides are useful in the treatment of histomoniasis and trichomoniasis.

3,715,365

IMIDAZOLE SYNTHESIS

Heinz Schulze, Austin, Tex., assignor to Jefferson Chemical Company, Inc., Houston, Tex.

Filed Feb. 8, 1971, Ser. No. 113,684
Int. Cl. C07d *49/36*

U.S. Cl. 260—309 **6 Claims**

An improved process for preparing imidazoles by contacting glyoxal or methyl substituted derivatives thereof, formaldehyde, and an ammonium salt of an acid having an ionization constant greater than 1×10^{-3}.

3,715,366

DIARYLIMIDAZO [2,1-A]ISOINDOLES

William J. Houlihan, Mountain Lakes, N.J., assignor to Sander-Wander, Inc., Hanover, N.J.

Filed March 17, 1971, Ser. No. 125,336
Int. Cl. C07d *49/36*

U.S. Cl. 260—309 **2 Claims**

Diarylimidazo 2,1-a isoindoles, e.g., 5-(p-chlorophenyl)-5-phenyl-5H-imidazo 2,1-a isoindoles, are prepared by acid rearrangement of 2-($2'$-imidazolyl)-α,α-diaryl substituted benzyl alcohols and are useful as anti-microbials.

3,715,367

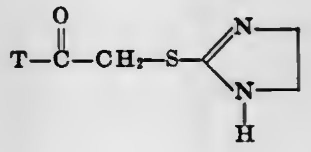
SUBSTITUTED 2 -(2-IMIDAZOLIN-2-YLTHIO)ACETOPHENONES

Halbert C. White, Indianapolis, Ind.; Stanley J. Strycker, and Don V. Wysong, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed March 1, 1971, Ser. No. 119,824
Int. Cl. C07d *49/34*

U.S. Cl. 260—309.6 **6 Claims**

This invention provides substituted compounds corresponding to the formula:



wherein

T represents 2-hydroxy-5-methylphenyl, 4-acetamidophenyl, 4-fluorophenyl, 3,4-dichlorophenyl, 3,4-difluorophenyl or 3-trifluoromethylphenyl and their pharmaceutically-acceptable salts, useful as anorectics and as intermediates in the preparation of corresponding bicyclic imidazo-thiazole compounds having antidepressant activity.

3,715,368

SULFONYL SUBSTITUTED TERPOLYMER FUEL DETERGENTS

Enver Mehmedbasich, El Cerrito, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 813,389, March 4, 1969, abandoned, which is a division of Ser. No. 603,787, Dec. 22, 1966, Pat. No. 3,405,952. This application Feb. 16, 1970, Ser. No. 11,778

Int. Cl. C07d *27/10*

U.S. Cl. 260—326.5 SM **6 Claims**

Terpolymer compositions of relatively low molecular weight having aliphatic 1-olefins of from about eight to 30 carbon atoms, N-substituted maleimides and olefins having a sulfone interrupted chain. The compositions find use as detergents in fuels.

3,715,369

2(3-PHENYL-3-HYDROXYPROPYL 1-2 AMINO) ETHYL-THIENYL-(3)-KETONE

Klaus Posselt, Westerwaldstrasse 46A, Bergen-Enkheim, Germany, and Kurt Thiele, Beethovenstrasse 6, Frankfurt am Main, Germany

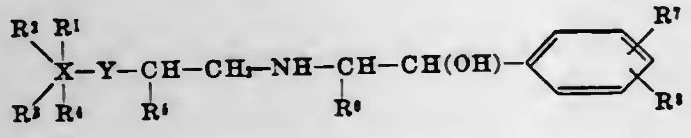
No Drawing. Continuation-in-part of application Ser. No. 693,138, Dec. 26, 1967. This application Mar. 27, 1970, Ser. No. 23,455

Claims priority, application Germany, Dec. 30, 1966, D 51,910, D 51,911

Int. Cl. C07d *63/10*

U.S. Cl. 260—332.3 C **1 Claim**

Compounds of the formula


(I)

their salts and quaternary ammonium compounds, as well as their optically active isomers or diastereomers wherein R^1 to R^4 represent hydrogen, halogen, lower alkyl, aralkyl, phenyl, hydroxyl, lower alkoxy, nitro or lower carboalkoxy, R^5 and R^6 are hydrogen or methyl, R^7 and R^8 are hydrogen, halogen or lower alkoxy, X is a heterocyclic ring system, mono- or condensed bicyclic, with 1–4 hetero atoms, in which the individual rings have 5 to 6 members and can also contain 1 or more carbonyl groups, Y is —CO— or —CH(OH)—. These compounds have pharmacological activity in that they increase the coronary blood flow by simultaneously causing dilation of the coronaries and an increase in contraction strength.

3,715,370

XANTHENYL KETONE CONTAINING ORGANOSILICON MATERIALS

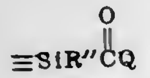
Edward V. Wilkus, Monroe, Conn., and Abe Berger, Schenectady, N.Y., assignors to General Electric Company

Division of Ser. No. 724,300, Feb. 2, 1968, Pat. No. 3,544,595. This application July 20, 1970, Ser. No. 56,632

Int. Cl. C07d *5/16, 7/42, 63/12*

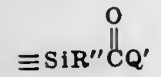
U.S. Cl. 260—335 **2 Claims**

One class of organosilicon materials are provided having chemically combined



$$\equiv SiR''\overset{O}{\overset{\|}{C}}Q$$

units, where R'' is a divalent hydrocarbon radical and Q is a radical selected from aryloxyaryl, arylthioaryl, arylsulfonylaryl, and certain heteroaromatic radicals. In addition, organosilicon polymers and copolymers are provided having chemically combined



$$\equiv SiR''\overset{O}{\overset{\|}{C}}Q'$$

units, where Q' is a radical selected from Q radicals, monovalent aromatic hydrocarbon radicals and halogenated monovalent aromatic hydrocarbon radicals. The monomers and polymers can be employed as perfume oil bases, in cosmetics and as fluids in the manufacture of elastomers and resins.

3,715,371

ADHESION PROMOTING AGENTS

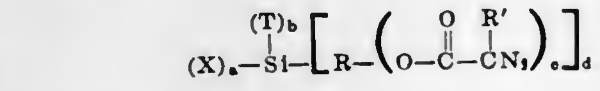
J. Brent Thomson, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.

Division of Ser. No. 862,531, Sept. 30, 1969, which is a continuation-in-part of Ser. No. 789,974, Dec. 31, 1968. This application Nov. 16, 1971, Ser. No. 199,386

Int. Cl. C07d *117/00, 103/02*

U.S. Cl. 260—349 **2 Claims**

Disclosed are nitrogen containing silane compounds of the formula



$$(X)_a-\overset{(T)_b}{\overset{|}{Si}}-\left[R-\left(O-\overset{O}{\overset{\|}{C}}-\overset{R'}{\overset{|}{C}}N_3\right)_c\right]_d$$

where R is an organic radical, X is selected from halo, hydroxy, alkoxy, aryloxy, organo oxycarbonyl, azido, amino, and amide radicals; T is selected from alkyl, cycloalkyl, aryl, alkaryl, and aralkyl radicals; *a* is an integer from 1 to 3; *b* is an integer from 0 to 2; *c* is an integer from 1 to 10; *d* is an integer from 1 to 3; and *a+b+d* equals 4; where R' is selected from hydrogen, alkyl, cycloalkyl, aryl and —COOR'' radicals; where R'' is selected from alkyl, cycloalkyl, and aryl radicals.

3,715,372

DERIVATIVES OF ANTIBIOTIC X-537A

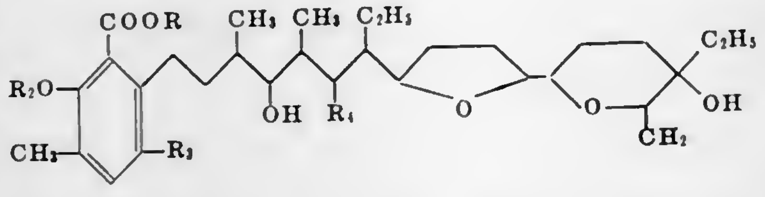
Arthur Stempel, Teaneck, and John Westley, Passaic, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Aug. 18, 1969, Ser. No. 851,044

Int. Cl. A23k *1/17;* **A61k** *21/00;* **C07d** *7/100*

U.S. Cl. 260—345.8 **13 Claims**

Compound of the formula



where R_1 is hydrogen, lower alkyl, phenyl, or phenyl substituted by halogen, nitro or lower alkyl; R_2 is hydrogen; lower alkyl; lower alkanoyl; benzoyl; benzoyl substituted by halogen, nitro or lower alkyl; or

R_3 is hydrogen, halogen; nitro, amino, loweralkylamido or lower alkylamino; R_4 is —OH, = O or = NOH which compound is useful as a coccidiostatic agent and as an anti-bacterial agent.

3,715,373

PREPARATION OF 1,4-DIAMINO-2-ALKOXY (PHENOXY)-ANTHRAQUINONES

David Arthur Andrews, Upper Montclair, N.J., assignor to Toms River Chemical Corporation, Toms River, N.J.

Continuation-in-part of Ser. No. 730,639, May 20, 1968, abandoned. This application Jan. 21, 1970, Ser. No. 4,738

Int. Cl. C09b *1/54*

U.S. Cl. 260—380 **10 Claims**

1,4-diamino-2-alkoxy (or phenoxy) anthraquinones are prepared by heating an acyl-substituted 1,4-diamino-2-haloanthraquinone in the presence of an alkali alkoxide (or phenoxide) in a solvent. The products formed are valuable dyestuffs.

3,715,374

24,25-DIHYDROXYCHOLECALCIFEROL

Hector F. De Luca, Madison, Wis., assignor to the Wisconsin Alumni Research Foundation, Madison, Wis.

No Drawing. Continuation-in-part of application Ser. No. 157,020, June 25, 1971. This application May 5, 1972, Ser. No. 250,661

Int. Cl. C07c *171/10*

U.S. Cl. 260—397.2 **1 Claim**

24,25-dihydroxycholecalciferol and methods for preparing same. 24,25-dihydroxycholecalciferol is characterized by antirachitic activity and by its ability to induce bone mobilization.

3,715,375

NEW DIPHENYL SULFONES

Tsung-Ying Shen, Westfield; William V. Ruyle, Scotch Plains; Michael W. Fordice, Clark, and Norman P. Jensen, Watchung, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Sept. 17, 1970, Ser. No. 73,247

Int. Cl. C07c *147/06*

U.S. Cl. 260—397.6 **1 Claim**

New substituted diphenyl sulfones useful in reducing mortality and decreasing lesion incidence of poultry exposed to Marek's disease are disclosed.

3,715,376

NOVEL PROCESS FOR THE PREPARATION OF 17a-HYDROXY-PREGNA-1,4,9(11)-TRIENE-3,20-DIONE

Joseph Elks, London N.W. 11, England, assignor to Glaxo Laboratories, Greenford, England

Filed May 25, 1970, Ser. No. 40,422

Int. Cl. C07c *169/32*

U.S. Cl. 260—397.45 **3 Claims**

This invention relates to a novel intermediate in the synthesis of steroids having hormonal activity and to processes for its preparation and further conversion.

3,715,377

PREPARATION OF ORGANOSILICONE ESTERS

George R. Siciliano, Ballston Lake, N.Y., assignor to General Electric Company

Filed Dec. 16, 1971, Ser. No. 208,908

Int. Cl. C07f *7/08*

U.S. Cl. 260—448.2 E **17 Claims**

A process for forming an organosilicone ester which comprises reacting a carboxysilicone and an alcohol in the presence of a sorbent-acid catalyst system.

3,715,378

FLUORINATED PEROXY POLYETHER COPOLYMERS AND METHOD FOR PREPARING THEM FROM TETRAFLUOROETHYLENE

Dario Sianesi and Adolfo Pasetti, Milan, and Giorgio Belardinelli, Modena, Italy, assignors to Montecatini Edison S.p.A., Milan, Italy

No Drawing. Filed Feb. 2, 1968, Ser. No. 702,533

Claims priority, application Italy, Feb. 9, 1967, 12,460/67

Int. Cl. C07c *51/58, 59/22*

U.S. Cl. 260—463 **7 Claims**

Fluorinated linear polyethers of the general formula

$$A—O—(C_2F_4—O—)_P—(CF_2—O—)_Q—(O)_R—B$$

wherein C_2F_4 represents a perfluoroalkylene unit derived from the opening of a double bond of a molecule of tetradom distribution along the polyether chain; —(O)— represents an oxygen atom having a random distribution along the polymer chain and linked in the peroxidic form to the different oxyperfluoroalkylene units; A and B may be the same or different and each is a radical selected from the group consisting of CF_3—, —COF, and —CF_2—COF; P and Q are each from 1 to 199, R is from 0 to 199, the sum of $P+Q$ is between 2 and 200, the ratio Q/P is befluoroethylene; the two perfluoroalkylene units have a rantween 0.1 and 10, the ratio R/P is between 0 and 1, and the ratio $R/(P+Q+1)$ is between 0 and 0.8. Also includes derivatives of such polyethers, as by hydrolysis, esterification, salt formation, amidation, dehydration of the amide to a nitrile, and decarboxylation. Method of preparing polyethers by photochemical reaction of molecular oxygen with a solution of perfluoroethylene. These peroxy-polyethers can be used as hydraulic fluids, heat exchange liquids, lubricants and as plasticizers.

3,715,379

PROCESS FOR THE MANUFACTURE OF ORTHOCHLOROBENZALMALONONITRILE

Walter L. Berry, Jr., Yardley, Pa.; Dan P. Nisonger, and Preston S. Craig, both of St. Simons Island, Ga., assignors to Thiokol Chemical Corporation, Bristol, Pa.

Continuation-in-part of Ser. No. 691,192, Dec. 18, 1967, abandoned. This application Feb. 3, 1970, Ser. No. 8,388

Int. Cl. C07c *121/70*

U.S. Cl. 260—465 G **6 Claims**

A process for preparing orthochlorobenzalmalononitrile, useful as a chemical riot control agent, directly from the solventless reaction of neat orthochlorobenzaldehyde and malononitrile, in the presence of an organic or inorganic catalyst.

3,715,380

ALKYL-N-ALKYL-CHLOROPHENOXYTHIOACETIMIDATES

Edmund J. Rumanowski, Dover, N.J., assignor to Allied Chemical Corporation, New York, N.Y.

Division of Ser. No. 839,078, July 3, 1969, Pat. No. 3,647,413. This application Sept. 23, 1971, Ser. No. 183,247

Int. Cl. C07c *119/20*

U.S. Cl. 260—453 R **3 Claims**

Alkyl-N-alkyl-chlorophenoxythioacetimidates are prepared by reacting N-alkyl-di- or trichlorophenoxythioacetamide with alkyl iodide in the presence of sodium alcoholate. The compounds are useful as herbicides.

3,715,381

POLYISOCYANATE COMPOSITIONS STABILIZED AGAINST DISCOLORATION

Richard G. Spaunburgh, Elma, and John B. Hino, Cheektowaga, N.Y., assignors to Allied Chemical Corporation, New York, N.Y.

No Drawing. Filed June 11, 1969, Ser. No. 832,420

Int. Cl. C07c *119/04*

U.S. Cl. 260—453 P **7 Claims**

Organic polyisocyanate compositions are stabilized against discoloration by having incorporated therein from about 0.0001 to 0.003 percent by weight of 2,6-di-tert-butyl-p-cresol as stabilizer therefor.

3,715,382

N-ACYL-α-HYDRAZINO-β-(PHENYL) PROPIONITRILES

Sandor Karady, Elizabeth; Seemon H. Pines, Murray Hill; Manuel G. Ly, New Brunswick, and Meyer Sletzinger, North Plainfield, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Feb. 5, 1970, Ser. No. 9,052

Int. Cl. C07c *101/72, 103/28, 121/78*

U.S. Cl. 260—465 D **5 Claims**

Diastereomers of N-acyl α-hydrazino-β-(substituted or unsubstituted phenyl) propionitriles which can be separated and hydrolyzed to give compounds useful as decarboxylase inhibitors.

3,715,383

PURIFICATION OF TETRABROMOPHTHALIC ANHYDRIDE

Hans Eberhard Praetzel, Schuberstrasse 3, Bensberg-Frankenforst; Ernst Neukirchen, Vorsterstrasse 75, Cologne-Kalk, and Herbert Jenkner, Deutz-Kalker-Str. 66, Cologne-Deutz all of Germany

Filed Jan. 29, 1970, Ser. No. 6,934

Claims priority, application Germany, Jan. 30, 1969, P 19 04 646.9; Jan. 31, 1969, P 19 04 537.5

Int. Cl. C07c *69/82*

U.S. Cl. 260—475 PR **10 Claims**

A process for removing sulfate ions from crude tetrabromophthalic anhydride by dissolving it in an alcohol and then contacting the resultant solution with an anion exchanger.

3,715,384

PESTICIDAL ESTERS OF 2,6-DINITRO-4-ALKYL PHENOLS

Max Pianka, 67 Sandpit Lane, St. Albans, Hertfordshire, and John Duncan Edwards, 60 Reginald Street, Luton, Bedfordshire, both of England

Continuation of Ser. No. 707,880, Feb. 23, 1968, abandoned, which is a continuation of Ser. No. 476,706, Aug. 2, 1965, abandoned. This application Aug. 27, 1970, Ser. No. 67,583

Int. Cl. C07c *69/24, 69/52, 69/78*

U.S. Cl. 260—479 R **13 Claims**

Fungicidal compounds useful for the control of plant mildews are 4-alkyl-2,6-dinitrophenyl esters wherein the 4-alkyl group is selected from 1-ethyl-n-hexyl, 1-n-propyl-n-hexyl, 1-n-butyl-n-hexyl, 1-n-pentyl-n-hexyl, 1-ethyl-n-pentyl, 1-n-propyl-n-pentyl, 1-n-butyl-n-pentyl and 1-n-propyl-n-butyl.

3,715,385

PROCESS FOR THE PREPARATION OF N-VINYL CARBAMIC ACID ESTERS

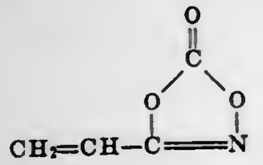
Larry G. Wolgemuth, Cherry Hill, N.J., and William H. Fritock, Aston, Pa., assignors to Atlantic Richfied Company, New York, N.Y.

Filed Aug. 17, 1970, Ser. No. 64,594

Int. Cl. C07c *125/06*

U.S. Cl. 260—482 C **8 Claims**

An improved process for preparing certain N-vinyl carbamic acid esters which comprises condensing at temperatures of about 95 to 150°C., acrylonitrile carbonate of the formula:



with methanol or ethanol to obtain an N-vinyl carbamic acid ester. The condensation-rearrangement reaction is effected in the presence of an inert organic solvent which boils above 100°C. at atmospheric pressure, such as bis[2-(2 methoxyethoxy)ethyl]ethane. The condensation-rearrangement reaction can be carried out in the presence of a soluble, combination metal catalyst such as a sodium alkoxytin catalyst. The reaction can also be carried out in the presence of a free radical inhibitor such as m-dinitrobenzene.

3,715,386

AMINIUM AND DIIMONIUM SALTS USED AS POLYMERIZATION INHIBITORS OF ACRYLATES AND CARBONATES

Allan Ellis Sherr, Warren, N.J., assignor to American Cyanamid Company, Stamford, Conn.

No Drawing. Filed May 15, 1970, Ser. No. 37,867

Int. Cl. C07c *69/54*

U.S. Cl. 260—486 R **8 Claims**

A method of inhibiting the polymerization of methacrylate monomers and diallyl diglycol carbonate by the addition thereto of various aminium and diimonium salts and the products produced thereby are disclosed.

3,715,387

FLUOROALKYLENE ALCOHOLS AND ESTERS

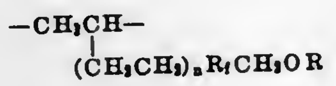
Ogden R. Pierce, and Yung Ki Kim, both of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Division of Ser. No. 874,411, Nov. 5, 1969, Pat. No. 3,681,418. This application Nov. 24, 1971, Ser. No. 202,032

Int. Cl. C07c *33/10, 69/14*

U.S. Cl. 260—488 H **3 Claims**

Fluorocompounds of the formula $CH{=}CH_2(CH_2CH_2)_n R_fCH_2OR$ in which R_f is a perfluoroalkylene radical of no more than 18 carbon atoms and R is a hydrogen atom or acyl radical. These monomers can be polymerized with a free radical catalyst to give



$$\begin{array}{l} -CH_2CH- \\ \qquad | \\ \qquad (CH_2CH_2)_nR_fCH_2OR \end{array}$$

or the compounds can be reacted with $\equiv$SiH to give the corresponding substituted silicon atom.

3,715,388

PROCESS FOR PREPARING GLYCOL ESTERS FROM ETHYLENE AND PROPYLENE

Jon R. Valbert, New York, N.Y., assignor to Halcon International, Inc.

Filed March 1, 1971, Ser. No. 119,969

Int. Cl. C07c *69/16*

U.S. Cl. 260—497 R **13 Claims**

Vicinal esters of ethylene glycol and propylene glycol are prepared by continuously reacting ethylene or propylene with molecular oxygen and monobasic carboxylic acids within an oxidation zone containing a liquid phase reaction medium. Selectivity of this liquid phase reaction is improved, without adverse effect upon reaction rate, by maintaining the concentration of the olefin within the liquid phase reaction medium at a level less than about 0.8 wt. percent.

3,715,389

PROCESS FOR PREPARING GLYCOL ESTERS FROM OLEFINICALLY UNSATURATED COMPOUNDS

Robert Hoch, Brooklyn, N.Y., and John Kollar, Wyckoff, N.J., assignors to Halcon International, Inc.

Filed March 1, 1971, Ser. No. 120,018

Int. Cl. C07c *69/16*

U.S. Cl. 260—497 R **20 Claims**

Esters of vicinal glycols are prepared by reacting olefinically unsaturated compounds with molecular oxygen and monobasic carboxylic acids in the presence of a liquid phase reaction medium within an oxidation zone. The reaction is

conducted in the presence of a variable valence metal cation and bromine, chlorine, a bromine-containing compound or a chlorine-containing compound. In this process a vapor stream comprising unreacted oxygen and unreacted olefinically unsaturated compound is withdrawn from the oxidation zone and recycled at least in part to the oxidation zone. Rate of formation of the desired glycol esters can be increased by maintaining specified amounts of a third component or mixture of components in the vapor recycled to the reaction system while concurrently maintaining oxygen partial pressure within a specified range.

3,715,390

PROMOTION OF THE OXIDATION OF MONONUCLEAR AROMATIC COMPOUNDS

Louis J. Croce, Seabrook, Tex., and Bruno J. Barone, Houston, Tex., assignors to Petro-Tex Chemical Corporation, Houston, Tex.

Division of Ser. No. 755,775, Aug. 28, 1968. This application June 2, 1971, Ser. No. 149,383

Int. Cl. C07c *51/26, 63/02*

U.S. Cl. 260—523 A **5 Claims**

A process for the oxidation of mononuclear aromatic compounds having at least one oxidizable group selected from methyl, hydroxymethyl, and aldehyde, at moderate temperatures, and in the presence of oxygen, cobaltous or cobaltic ions, and an effective amount of a specified substituted acid function.

3,715,391

PROMOTION OF THE OXIDATION OF MONONUCLEAR AROMATIC COMPOUNDS

Bruno J. Barone, Houston, Tex., and Louis J. Croce, Seabrook, Tex., assignors to Petro-Tex Chemical Corporation, Houston, Tex.

Division of Ser. No. 755,775, Aug. 28, 1968. This application May 2, 1971, Ser. No. 149,323

Int. Cl. C07c *51/26, 63/02*

U.S. Cl. 260—523 A **5 Claims**

A process for the oxidation of mononuclear aromatic compounds having at least one oxidizable group selected from methyl, hydroxymethyl, and aldehyde, at moderate temperatures, and in the presence of oxygen, cobaltous or cobaltic ions, and an effective amount of a specified substituted acid function.

3,715,392

PRODUCTION OF DINEO-DICARBOXYLIC ACIDS

Bertram Yeomans, Hessle, England, assignor to BP Chemicals Limited, London, England

Filed Jan. 16, 1970, Ser. No. 3,535

Claims priority, application Great Britain, Feb. 20, 1969, 7,056/69

Int. Cl. C07c *51/00*

U.S. Cl. 260—537 R **6 Claims**

Di - neo acids are produced by treating an anhydride of a mono-carboxylic acid, which anhydride contains at least one carbon atom bearing a tertiary hydrogen atom separated from the neo acid group by at least two carbon atoms, with strong acid.

3,715,393

METHOD OF PREPARING SODIUM NITRILOTRIACETATE

Giuseppe Ribaldone, Gallarate, and Salvatore Gafa, Ferrara, both of Italy, assignors to Montecatini Edison S.p.A., Milan, Italy

Filed May 15, 1970, Ser. No. 37,817

Claims priority, application Italy, May 20, 1969, 17018 A/69

Int. Cl. C07c *99/10*

U.S. Cl. 260—534 E **3 Claims**

Preparation of $N(CH_2COONa)_3$ in crystalline form by hydrolyzing $N(CH_2CN)_3$ in the presence of NaOH. Involves suspending $N(CH_2CN)_3$ in recycled mother liquor, adding aqueous NaOH to the suspension, partially hydrolyzing at about 65° to 75°C., further hydrolyzing at about 70° to 90°C. to form $N(CH_2COONa)_3$, separating $N(CH_2COONa)_3$ from the mother liquor, and recycling the mother liquor.

3,715,394

PROCESS FOR THE PREPARATION OF LACTIC ACID

Jacques Boichard, Bernard Pierre Brossard, Michel Louis Marie Joseph Gay, and Raymond Marc Clement Janin, Lyon, France, assignors to Rhone-Poulenc S.A., Paris, France

Filed Nov. 25, 1966, Ser. No. 597,079

Claims priority, application France, Dec. 1, 1965, 40,514

Int. Cl. C07c *59/08*

U.S. Cl. 260—535 R **14 Claims**

Lactic acid is made by oxidizing propylene with nitric acid and/or nitrogen peroxide and hydrolysing the product with water.

3,715,395

SUBSTITUTED THIOBENZANILIDES

Helmut Mrozik, Matawan, and Dale R. Hoff, Basking Ridge, N.J., assignors to Merck & Co., Inc., Rahway, N.J.

No Drawing. Continuation-in-part of application Ser. No. 656,031, July 26, 1967. This application Sept. 11, 1970, Ser. No. 71,417

Int. Cl. C07c *153/05*

U.S. Cl. 260—551 S **1 Claim**

2-hydroxy thiobenzanilides having an aromatic ring linked to the aniline moiety by oxygen or sulfur are disclosed as are processes for the preparation of novel 2-hydroxy thiobenzanilides from the corresponding salicylanilides. Anthelmintic compositions useful in the treatment of parasitic diseases containing a substituted 2-hydroxy thiobenzanilide as an active ingredient are also disclosed.

3,715,396

N-AMINO-BENZAMIDINES

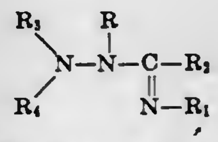
Victor Bandurco, Huntington Station; Bill Elpern, White Plains, and James R. Shroff, Bronx, all of N.Y., assignors to USV Pharmaceutical Corporation

Filed Nov. 4, 1969, Ser. No. 874,083

Int. Cl. C07c *123/00*

U.S. Cl. 260—564 R **5 Claims**

Compounds of the formula



wherein R is hydrogen, alkyl, acyl, phenyl-lower alkyl, carbamoyl, benzoyl, R_1 is lower alkyl, pyridyl, naphthyl, or cycloalkyl, R_2 is phenyl or substituted phenyl, and R_3 and R_4 are hydrogen, lower alkyl, phenyl or phenyl-lower alkyl, or taken together are alkylene, possess anti-inflammatory activity.

3,715,397

PROCESS FOR PREPARING PARA-AMINOPHENOL

Paul N. Rylander, Newark; Irene M. Karpenko, Irvington, and George R. Pond, Newark, all of N.J., assignors to Engelhard Minerals & Chemicals Corporation

Filed April 16, 1970, Ser. No. 29,054

Int. Cl. C07c *91/44*

U.S. Cl. 260—575 **1 Claim**

In an improved process for preparing aromatic hydroxyamines by the selective hydrogenation of aromatic nitro compounds and rearrangement in the presence of a platinum group metal catalyst and dilute sulfuric acid, the hydrogenation is carried out in the presence of dimethylsulfoxide.

3,715,398
PROCESS FOR RECRYSTALLIZING DIAMINOTRINITROBENZENE

Martin H. Kaufman, China Lake, Calif., assignor to the United States of America as represented by the Secretary of the Navy
No Drawing. Filed Oct. 20, 1960, Ser. No. 63,934
Int. Cl. C07c *85/16*
U.S. Cl. 260—582 **3 Claims**

1. A process for effecting the recrystallization of diaminotrinitrobenzene comprising the steps of dissolving diaminotrinitrobenzene in dimethyl sulfoxide at steam bath temperature, cooling the reaction mixture to about 10° C. until precipitation is almost complete, filtering, washing the precipitate with a solvent selected from the group consisting of ethanol, methanol and acetone to destroy the complex, and drying at room temperature.

3,715,399
2,2,4,4-TETRAKIS(DIFLUOROAMINO)PENTANE PROCESS

Royland D. Shoults, Arab, Ala., assignor to The United States of America as represented by the Secretary of the Army
Filed Nov. 12, 1968, Ser. No. 775,999
Int. Cl. C07c *85/04*
U.S. Cl. 260—583 NH **2 Claims**

2,2,4,4-Tetrakis(difluoramino)pentane and a process for its preparation. This novel composition of matter is a high energy compound for sue as a plasticizer and/or oxidizer in propellant compositions. A practical process of synthesis of this compound has been developed. This process involves the interaction of 2,4-pentanedione and difluoroamine in the presence of 30 percent fuming sulfuric acid. This process is applicable to other 1,3-dicarbonyl compounds, monocarbonyl compounds in general, diacetates, acetals and enol phosphates.

3,715,400
SYNTHESIS OF HYDROXYCYCLOPENTEN-1-ONES

Richard Wightman Kierstead, North Caldwell, and Ronald Andrew Lemahieu, Bloomfield, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.
Division of Ser. No. 706,657, Feb. 19, 1968, Pat. No. 3,484,489, which is a continuation-in-part of Ser. No. 649,441, June 26, 1967, abandoned. This application May 9, 1969, Ser. No. 823,498
Int. Cl. C07c *49/36*
U.S. Cl. 260—586 R **5 Claims**

This invention relates to a process for the preparation of 2-alkenyl-4-hydroxy-3-methyl-2-cyclopenten-1-ones from a 2-alkenyl or 2-alkynyl-3-methyl-2-cyclopenten-1-one and intermediates therein.

3,715,401
PROCESS FOR PRODUCING 3-HYDROXYALKYL ETHERS

Siegfried H. Schroeter, Schenectady, N.Y., assignor to General Electric Company
Continuation-in-part of Ser. No. 732,852, May 29, 1968, abandoned. This application May 1, 1970, Ser. No. 33,903
Int. Cl. C07c *41/00*
U.S. Cl. 260—611 R **6 Claims**

Alkyl ethers having 3-hydroxy substitution are produced by the reaction of a mixture of 2-hydrocarbonoxyoxetanes and 3-hydrocarbonoxyoxetanes with a Grignard reagent at temperatures below 100°C. The 3-hydroxy substituted alkyl ethers are useful as solvents in lacquers, and for chemical reactions, as plasticizers and as starting materials for the preparation of polyoxyalkylene ethers by base catalyzed addition of propylene oxide and ethylene oxide. The polyoxyalkylene ethers are useful as lubricants, surfactants, etc.

3,715,402
REMOVAL OF CATALYSTS FROM POLYOLS

Joseph F. Louvar, Lincoln Park, and Newlin S. Nichols, Dearborn, Mich., assignors to BASF Wyandotte Corporation, Wayne, Mich.
No Drawing. Filed Aug. 8, 1969, Ser. No. 848,740
Int. Cl. C07c *41/12*
U.S. Cl. 260—613 B **7 Claims**

A method for removing water-soluble impurities from water-insoluble polyethers which comprises providing a mixture of water, polyether, a solvent in which the polyether is soluble, and an acid. The solvent employed is substantially immiscible in water, has a density substantially different from water and is relatively inert with respect to the polyether and water, whereby a polyether-solvent solution is formed which is substantially immiscible in water. The solvent is employed in an amount sufficient to adjust the density differential between the polyether-solvent solution and water to at least about 0.03 gram per milliliter. The amount of the acid is sufficient to adjust the pH of the mixture to a value not greater than about 8.0. The polyether-solvent solution is then separated from the water by a suitable method such as electrostatic coalescence or subjection to centrifugal force. A stream of water containing dissolved therein the water-soluble impurities and a stream of polyether-solvent solution are separately recovered after the separation, followed by separating the solvent from the polyether-solvent solution.

3,715,403
SEPARATION OF ALPHA-NAPHTHOL

Joost Manassen, David Vofsi, and Michael Martan, Rehovot, Israel, assignors to Yeda Research and Development Co., Ltd., Rehovot, Israel
No Drawing. Filed Dec. 19, 1968, Ser. No. 785,349
Claims priority, application Israel, Dec. 19, 1967, 29,164
Int. Cl. C07c *37/44*
U.S. Cl. 260—621 A **7 Claims**

A process for the separation and recovery of α-naphthol from mixtures thereof with α-tetralone, which comprises extracting such mixtures with an aqueous ammonia or lower alkylamine first extractant and a low boiling aliphatic hydrocarbon second extractant. The α-naphthol is substantially recovered in the aqueous nitrogen compound extractant-containing phase, and may suitably be separated therefrom by evaporation of the low boiling solvent. The separation may suitably be carried out employing countercurrent extraction techniques.

3,715,404
PROCESS FOR SELECTIVE HYDROGENATION

Herbert Lindlar, Reinach, and Robert Dubuis, Morges, both of Switzerland, assignors to Hoffmann-La Roche, Inc., Nutley, N.J.
Continuation-in-part of Ser. No. 380,038, July 2, 1964, abandoned. This application Sept. 19, 1968, Ser. No. 760,980
Claims priority, application Switzerland, June 3, 1964, 7260/64
Int. Cl. C07c *33/02, 35/02, 57/02*
U.S. Cl. 260—642 **8 Claims**

A process for selective hydrogenation of unsaturated organic compounds having at least four carbon atoms by carrying out said hydrogenation in a liquid phase in the presence of an organic sulfur compound utilizing a partially deactivated palladium catalyst.

3,715,405
PROCESS FOR SELECTIVE HYDROGENATION OF HIGHLY UNSATURATED COMPOUNDS

Akira Misono, and Ikuei Ogata, both of Tokyo, Japan, assignors to Nippon Oil Company Limited, Tokyo, Japan
Continuation-in-part of Ser. No. 772,416, Oct. 31, 1968, abandoned. This application Dec. 22, 1970, Ser. No. 100,844
Claims priority, application Japan, Nov. 6, 1967, 42/70924
Int. Cl. C07c *5/14, 5/16*
U.S. Cl. 260—666 A **4 Claims**

A process for the selective hydrogenation of cyclododecatriene to produce cyclododecene in the presence of hydrogen at a temperature from 100° to 300°C using,as a catalyst, a cobalt complex compound having three ligands of carbon monoxide and one ligand of phosphine per one atom of cobalt.

3,715,406
PROCESS FOR PRODUCING SYM-OCTAHYDROANTHRACENE FROM SYM-OCTAHYDROPHENANTHREN

Ronald D. Bushick, Markus Hook, Pa., assignor to Sun Oil Company, Philadelphia, Pa.
Continuation of Ser. No. 590,225, Oct. 28, 1966, Pat. No. 3,396,203. This application Aug. 2, 1968, Ser. No. 750,432
Int. Cl. C07c *15/28*
U.S. Cl. 260—668 F **1 Claim**

Sym-octahydroanthracene (s-OHA) is produced from sym-octahydrophenanthrene (s-OHP) by a process comprising contacting s-OHP with a solid phase silica-alumina catalyst for a period of time sufficient to isomerize the s-OHP to s-OHA. The s-OHA can be recovered from the reaction mixture and then be converted to anthracene by catalytic dehydrogenation.

3,715,407
CHLORINATION OF KETONIC ACETYL GROUPS

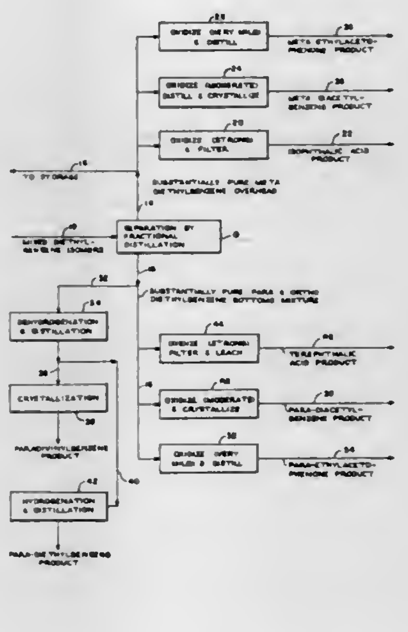
Howard M. Relles, Saratoga, N.Y., assignor to General Electric Company
Continuation-in-part of Ser. No. 67,211, Aug. 26, 1970, abandoned. This application March 1, 1971, Ser. No. 119,839
Int. Cl. C07c *15/04*
U.S. Cl. 260—668 R **18 Claims**

R_3PCl_2 converts the carbonyl group of ketones to chlorine containing groups which, combined with dehydrochlorination methods, provides a new synthetic route for the production of acetylenic compounds useful for making polymers. The R_3PO produced in the reaction is reconverted to R_3PCl_2 by reaction with phosgene thus providing an economical process for converting ketones to chlorine derivatives and from thence to acetylenic derivatives. Each R is C_{1-20} alkyl, phenyl, lower alkylphenyl, halophenyl, phenoxyphenyl or naphthyl.

3,715,408
SEPARATION OF DIETHYLBENZENE ISOMERS BY DISTILLATION AND DEHYDROGENATION

Rene Paul Brown; Birt Allison, Jr., both of Big Spring, Tex., and Pierre Marie Joseph Ghislain de Radzitzky D'Ostrowick, Brussels, Belgium, assignors to Cosden Oil & Chemical Company, Big Spring, Tex.
Division of Ser. No. 543,377, April 18, 1966, Pat. No. 3,539,623. This application Jan. 30, 1970, Ser. No. 7,023
Int. Cl. B01d *3/10;* **C07c** *7/04*
U.S. Cl. 260—669 A **13 Claims**

Mixed isomeric diethylbenzenes are separated into pure isomers by first distilling the mixture to separate an overhead concentrate of most of the meta isomer and the mixed para and ortho bottoms are then dehydrogenated and finally separated into substantially pure ortho and para isomers.


TO STORAGE
SUBSTANTIALLY PURE META DIETHYLBENZENE OVERHEAD
SEPARATION BY FRACTIONAL DISTILLATION
SUBSTANTIALLY PURE PARA & ORTHO DIETHYLBENZENE BOTTOMS MIXTURE
DEHYDROGENATION & DISTILLATION
CRYSTALLIZATION
HYDROGENATION & DISTILLATION
TEREPHTHALIC ACID PRODUCT

3,715,409
HYDROCARBON SEPARATION

Donald B. Broughton, Evanston, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.
Filed Mar. 8, 1971, Ser. No. 122,072
Int. Cl. C07c *7/12*
U.S. Cl. 260—674 SA **16 Claims**

An improved process for the separation of hydrocarbons from a feed stock which process comprises the adsorption of a selected feed component followed by the desorption of a selected feed component from a solid adsorbent through the use of a desorbent material. The adsorption is performed in adsorption zone while the desorption is performed in a desorption zone. The adsorption zone and desorption zones are separated by a purification zone in which the adsorbed component of the feed stock is effectively purified and allowed to become more concentrated on the adsorbent as it enters the desorption zone. The improvement of the process comprises the use of a buffer zone which is represented by a quantity of adsorbent material located between an adsorption zone and a desorption zone and which allows raffinate material which normally would be withdrawn from an adsorption zone to be partially diverted and passed into the buffer zone to displace desorbent material in that zone which displaced desorbent material passes into a desorption zone. The improvement allows the prevent of contamination of the extract product by raffinate components and also allows the more efficient use of desorbent by reducing the absolute quantity of desorbent needed for a given separation at given feed rates.

3,715,410
CONVERSION OF CYCLIC OLEFINS TO ACYCLIC POLYENES

Gardner C. Ray and Donald L. Crain, Bartlesville, Okla., assignors to Phillips Petroleum Company
No Drawing. Continuation of application Ser. No. 529,230, Feb. 23, 1966. This application June 20, 1969, Ser. No. 845,596
Int. Cl. C07c *3/20*
U.S. Cl. 260—680 R **23 Claims**

Cyclic olefins are converted to acyclic polyenes by reaction with acyclic olefins in the presence of an olefin disproportionation catalyst.

3,715,411
PREPARATION OF NITRILE/SILICONE RUBBER

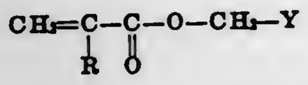
John Day and David Kenneth Thomas, Farnham, England, assignors to Minister of Aviation Supply in Her Britannic Majesty's Government of United Kingdom of Great Britain and Northern Ireland, London, England
No Drawing. Filed Jan. 27, 1971, Ser. No. 110,277
Claims priority, application Great Britain, Feb. 4, 1970, 5,357/70
Int. Cl. C08g *47/10;* **C08f** *29/56*
U.S. Cl. 260—827 **7 Claims**

A process for the production of a nitrile/silicone specialty rubber which includes compounding a nitrile rubber which is a copolymer of butadiene and acrylonitrile containing 20 to 30 moles percent of acrylonitrile with a silicone rubber selected from fluorovinylsilicone, alkylsilicone, and methylvinylsilicone rubbers together with an amount of curing agent for said rubbers sufficient to effect the cure thereof, and conventional fillers and then curing the compounded nitrile/silicone rubber composition. Particularly useful compositions are obtained by compounding and curing 3,3,3-trifluoropropylmethylvinylsilicone with a medium nitrile rubber which is a copolymer of butadiene and acrylonitrile containing 25–30 moles percent of acrylonitrile, or by compounding and curing a nitrile rubber with a methyl vinylsilicone rubber which includes 0.15 to 0.56 mole percent of vinyl groups. Advantageously, the curing agent is an organic peroxide curing agent and a preferred curing agent is 2,5-dimethyl-2,5-ditertiarybutylperoxyhexane.

3,715,412
STABILIZED POLYURETHANE ELASTOMER COMPOSITION

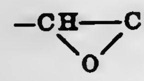
Yasuji Nakahara and Kiyoshi Ichikawa, both of 100 Kawanarijima, and Kunio Kondo, 174 Miyajima, all of Fujishi, Shizuokaken, Japan
No Drawing. Filed Mar. 3, 1971, Ser. No. 128,630
Int. Cl. C08g *45/14*
U.S. Cl. 260—835 **6 Claims**

The invention provides a polymeric composition having an intrinsic viscosity of 0.05–1.2, which gives a stabilized polyurethane elastomer composition having an excellent whiteness-retainability by mixing with or coating upon a polyurethane elastomer prepared from a substantially linear polymer having terminal hydroxy groups and a molecular weight of 600 to 5000, an organic diisocyanate and a bifunctional chain extender having active hydrogen atoms, said polymeric composition comprises a vinyl polymer of a monomer of the formula:

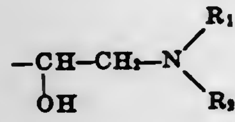


$$CH_2{=}\underset{\displaystyle R}{\underset{|}{C}}-\underset{\displaystyle O}{\underset{\|}{C}}-O-CH_2-Y$$

wherein R is hydrogen or lower alkyl and Y is a member selected from the group consisting of:



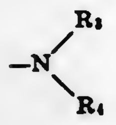
(I)



$$-\underset{\displaystyle OH}{\underset{|}{CH}}-CH_2-N\begin{matrix} R_1 \\ R_2 \end{matrix}$$

(II)

wherein R_1 and R_2 are individually alkyl group having 1–20 carbon atoms; substituted alkyl group having 1–20 total carbon atoms wherein substituent may contain O, N or S atom; cycloalkyl having 3–20 carbon atoms; substituted cycloalkyl having 3–20 total carbon atoms wherein substituent may contain O, N or S atom; aromatic group of 1 to 2 rings, having 6–20 total carbon atoms wherein said ring or rings may have 1 to 3 substituents selected from the group consisting of halo, alkyl and hydroxy groups; 5- to 6-membered heterocyclic radical wherein said ring may have substituent selected from the group consisting of halo, phenoxy, alkyl-substituted phenoxy, hydroxy-substituted phenoxy, phenylthio, alkyl-substituted phenylthio, hydroxy-substituted phenylthio, alkoxy and alkylthio or



$$-N\begin{matrix} R_3 \\ R_4 \end{matrix}$$

wherein R_3 and R_4 have the same meaning as R_1 and R_2 but must not be hydrogen, further R_1 and R_2 can collectively form 5- to 6-membered ring wherein said ring may contain S, O or N, alkyl or halogen substituent, and one of R_1 and R_2 can be a hydrogen atom; at least 5% of the Y groups being II.

3,715,413
VINYL CHLORIDE-PROPYLENE COPOLYMER GRAFTED WITH BUTADIENE, α-METHACRYLONITRILE AND OPTIONALLY STYRENE

Joseph K. Hoffman, Glen Gardner, N.J., assignor to Air Reduction Company, Incorporated, New York, N.Y.
Filed Dec. 28, 1970, Ser. No. 102,206
Int. Cl. C08f *15/00*
U.S. Cl. 260—878 R **5 Claims**

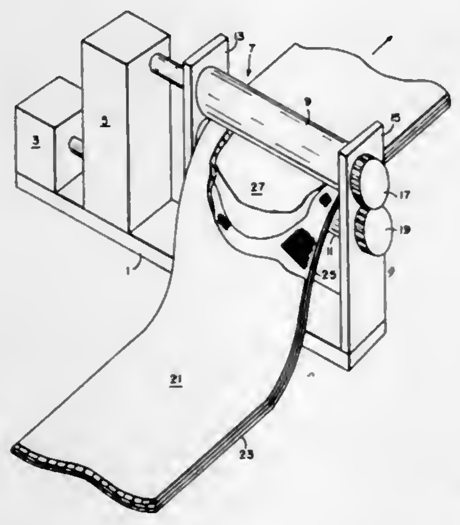
A substantially clear resin having good impact and processability is prepared by graft polymerizing vinyl chloride-propylene copolymers with butadiene-1,3 or isoprene or mixtures thereof, alpha-methacrylonitrile or acrylonitrile and optionally a small amount of styrene and/or methyl methacrylate.

ERRATUM

For Class 260—3 see:
Patent No. 3,715,172

3,715,414
METHOD FOR PRODUCTION OF COMPOSITE AND MODIFIED DOUBLE BASE REINFORCED CARPET ROLL GRAIN

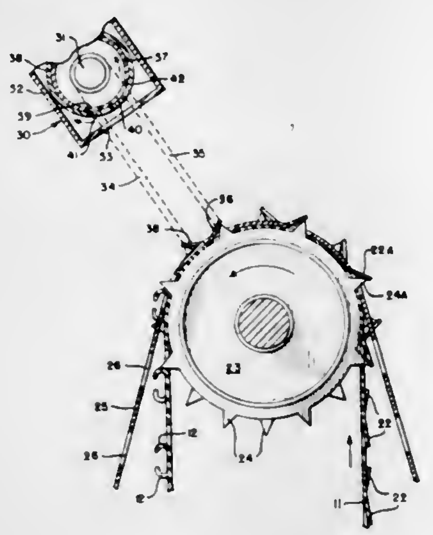
Seiford F. Schultz, Huntsville, and Andrew B. Nix, both of Guntersville, Ala., assignors to The United States of America as represented by the Secretary of the Army
Filed Jan. 4, 1971, Ser. No. 103,550
Int. Cl. C06b *21/02*
U.S. Cl. 264—3 R **5 Claims**



A method of producing a reinforced carpet roll grain propellant by the steps including placing a reinforcement material such as fiberglass between sheets of plastic, inserting these three layers into spaced apart rollers, placing the desired propellant composition onto the reinforced material, and then feeding the layers of plastic and reinforced material with the propellant thereon through said rollers to produce a carpet roll that has a predetermined thickness of propellant on opposite sides of the reinforced material. By this method, a propellant is made that is reinforced and flexible so that it can be rolled into a carpet roll.

3,715,415
METHOD FOR THE MANUFACTURE OF A SEPARABLE FASTENER

George H. Erb, Cuttingsville, Vt., assignor to American Velcro Inc., Manchester, N.H.
Division of Ser. No. 751,831, Aug. 12, 1968, Pat. No. 3,546,754. This application Nov. 6, 1970, Ser. No. 87,438
Int. Cl. B29c *23/00*
U.S. Cl. 204—25 **8 Claims**

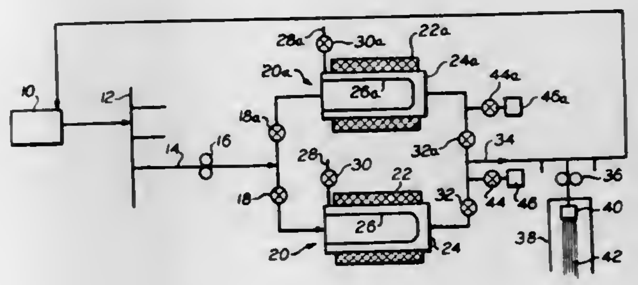


A hook member is formed from non-woven sheet material for use in a separable fastening device of the type having two complementary members each provided with an engaging surface having thereon a very large number of hooking elements of the hook and loop type; the members are joined by pressing the engaging surfaces together with a large number of hooks and loops becoming inter-engaged whereupon they become resistant to separation by forces generally parallel to the interface plane of the surfaces and are readily separable by peeling forces applied substantially normal to the plane. The hooks in the hook member are formed from portions of the non-woven sheet displaced out of the plane thereof into a generally upright position by the steps of displacing the portions of the sheet material, and deflecting and heat treating these portions to form the hooks.

3,715,416
FILTER START-UP IN DRY SPINNING ACRYLONITRILE COPOLYMER

Kenneth C. Campbell, Rock Hill, S.C., and Robert R. Rhinehart, Jr., Charlotte, N.C., assignors to Celanese Corporation, New York, N.Y.
Filed June 14, 1971, Ser. No. 152,939
Int. Cl. B28b *7/04;* **D01d** *1/10*
U.S. Cl. 264—39 **9 Claims**

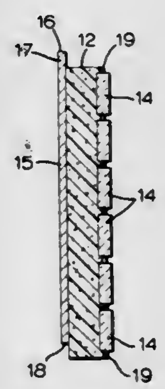
In dry spinning a heated solution of an acrylonitrile polymer in acetonitrile:water after passage through an apparatus comprising at least one filter, the improvement in the process of resuming flow of solution through said filter after interruption which comprises: positioning said filter in the path of flow of said solution from said supply to the spinnerette without establishing communication therebetween, filling said filter with solvent for said polymer, establishing a predetermined superatmospheric pressure-responsive normally closed outlet for solvent in said filter, either prior to or after filling said filter with solvent, heating it approximately to the temperature of said solution during filtration, establishing communication



between said supply and said filter whereby the superatmospheric pressure builds up in said filter and bleeding solvent and solution out through said outlet, continuing to bleed solution through said outlet for a period of time sufficient to reestablish equilibrium conditions with said supply, and establishing communication between said filter and said spinnerette, whereby dry spinning is resumed.

3,715,417
METHOD OF FABRICATING A BUILDING PANEL CONTAINING CELLULAR POLYURETHANE

Kenneth W. Pope, Kitchener, Ontario, Canada, assignor to Du Pont of Canada Limited, Montreal, Quebec, Canada
Filed Aug. 31, 1967, Ser. No. 664,752
Claims priority, application Great Britain, Sept. 2, 1966, 39,434/66
Int. Cl. B29d *27/00*
U.S. Cl. 264—45 **7 Claims**

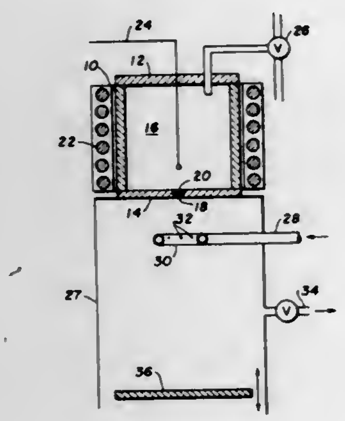


A prefabricated building panel having a layer of cellular plastic such as polyurethane foam, to one face of which are bonded brick-like facing elements spaced from one another. A granular material, such as sand, is adhered to and embedded in the cellular plastic between the facing elements to give the appearance of mortar between the facing elements.

3,715,418
LOW VISCOSITY MELT SPINNING PROCESS

Wilbur J. Privott, Jr., and Robert E. Cunningham, Raleigh, N.C., assignors to Monsanto Company, St. Louis, Mo.
Continuation-in-part of application Ser. No. 599,539, Dec. 6, 1966. This application Oct. 2, 1969, Ser. No. 863,266
Int. Cl. B28b *3/20;* **B22d** *11/00*
U.S. Cl. 214—82 **10 Claims**

Fiber lengths are formed from an inorganic molten material having a melt viscosity-melt surface tension ratio of not greater than one. The fibers are obtained by extruding a free falling stream from the melt film-stabilizing the stream against the effects of surface tension pending solidification, and decelerating the solidified stream at a selected point intermediate of a first point (D_0) upstream



of which attending stream deceleration causes attainment of a non-fibrous mass, and a second point (D_a) upstream of which attending stream deceleration causes disruptions in the solidified stream continuity, D_0 being upstream from D_a.

3,715,419

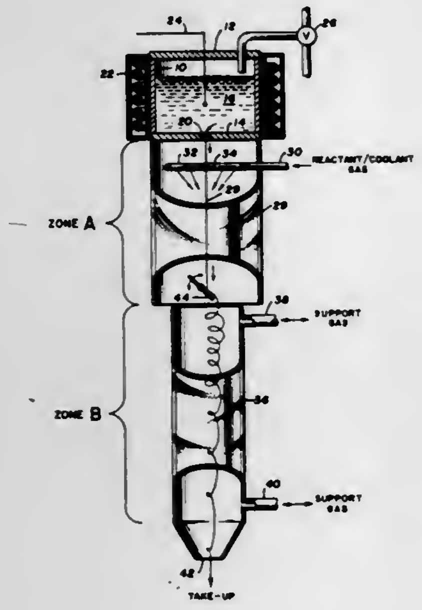
DRAG STABILIZED LOW VISCOSITY MELT SPINNING PROCESS

Wilbur J. Privott, Jr., and Robert E. Cunningham, Raleigh, N.C., assignors to Monsanto Company, St. Louis, Mo.

Continuation-in-part of application Ser. No. 680,898, Nov. 6, 1967. This application Oct. 27, 1969, Ser. No. 870,646

Int. Cl. B28b *3/20;* **B22d** *11/00*

U.S. Cl. 264—82 **7 Claims**



An improved stabilization process for forming filaments from streaming low viscosity melt materials by simultaneously preventing disruptions in the fragile, incompletely solidified portion of the stream due to the drag interaction between the stabilized stream and surrounding gaseous atmosphere and utilizing the drag to form a helical-like configuration in the solidified portion of the stream which permits applying sufficient tension thereto to enable filament take-up.

3,715,420

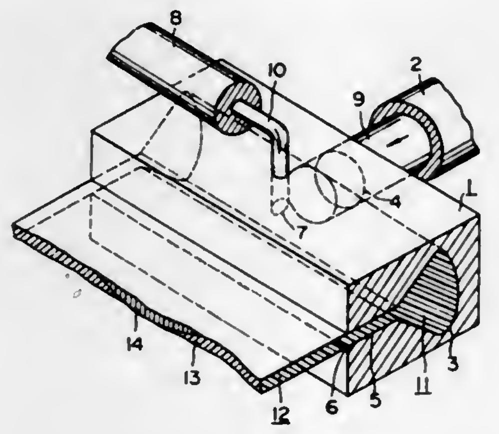
PROCESS FOR PRODUCING A THERMOPLASTIC RESIN SHEET HAVING A COLOR BAND

Hiroshi Kiyono, Higashiyama-ku, Kyoto; Junichi Nakashima; Yasuyuki Fujisaki, both of Koga-gun, Shiga-ken; Yukio Ishigaki, Otsu-shi, Shiga-ken, and Gen Endo, Kusatsu-shi, Shiga-ken, all of Japan, assignors to Sekisui Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed July 17, 1970, Ser. No. 55,763

Int. Cl. B29f *3/12;* **B32b** *17/06*

U.S. Cl. 264—171 **3 Claims**



A process is disclosed for producing a thermoplastic resin sheet having a band of color by feeding a molten thermoplastic resin by an extruder into a sheet-forming flat die having a manifold and extruding said molten resin from an extrusion opening of said flat die, while forcing a stream of a colored molten thermoplastic resin through at least one injection port opened into the manifold of the flat die into a main stream of the molten resin extruded from the extruder and fed to the manifold, associating the main stream of the molten thermoplastic resin and the stream of the colored molten thermoplastic resin within the manifold while the main stream is flowing in the extrusion and widthwise directions in said manifold, and extruding the associated streams from the extrusion opening of said flat die.

3,715,421

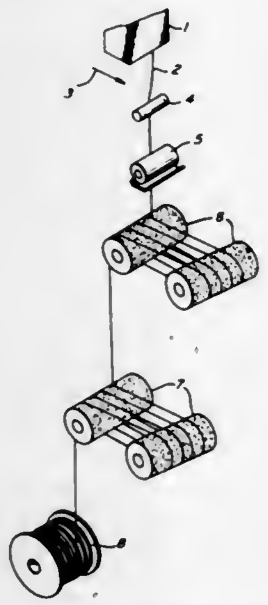
PROCESS FOR THE PREPARATION OF POLYETHYLENE TEREPHTHALATE FILAMENTS

Horst G. Martin, Zug; Bernhard Glutz, and Hans Linz, both of Lucerne, all of Switzerland, assignors to Societe de la Viscose Suisse, Emmenbruche, Switzerland

Filed April 15, 1970, Ser. No. 28,821

Int. Cl. B29f *3/00;* **D01d** *5/08, 5/12*

U.S. Cl. 264—130 **13 Claims**



A continuous spin-draw process is disclosed for preparing highly drawn polyethylene terephthalate filaments drawn at

speeds greater than 1,800 meters per minute using only one heated draw roll system without the use of any other heating device. Feed and draw rolls are provided with a surface roughness which allows a slipping of the filaments along a number of turns before they leave the feed rolls and after they arrive at the draw rolls. The filaments are partially drawn at the lower temperature of the feed rolls, drawing continues between the feed and draw rolls, and is completed at the higher temperature of the draw rolls with a total draw ratio between 5 and 8.

3,715,422

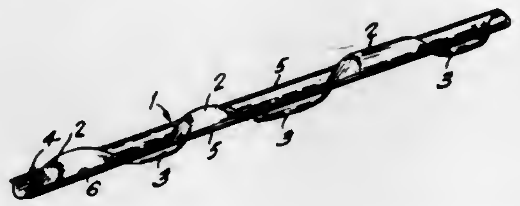
PROCESS FOR PRODUCING CRINKLED PLASTIC RIBBON

Sohinder Nath Chopra, Hawkesbury, Quebec, and Hilaire Marcel Turmel, Drummondville, Quebec, both of Canada, assignors to Chemical Limited, Montreal, Quebec, Canada

Division of Ser. No. 815,044, April 10, 1969, and a continuation-in-part of Ser. No. 558,120, June 16, 1966, abandoned. This application May 18, 1970, Ser. No. 48,752

Int. Cl. D01d *5/22*

U.S. Cl. 264—168 **11 Claims**



The present invention relates to a process for making a flat-extruded yarn or ribbon of melt-extrudable thermoplastic material having a characteristic surface configuration, and to a method and apparatus for producing such yarn or ribbon.

3,715,423

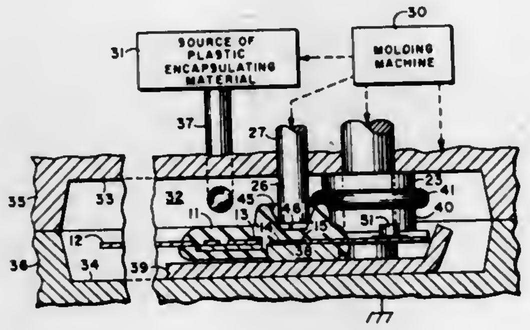
PLASTIC ENCAPSULATION OF SEMICONDUCTOR DEVICES

Thomas A. Dunn, Mesa, Ariz., assignor to Motorola, Inc., Franklin Park, Ill.

Continuation of Ser. No. 761,074, Sept. 20, 1968, abandoned. This application Jan. 25, 1971, Ser. No. 109,602

Int. Cl. B29d *3/00*

U.S. Cl. 264—250 **3 Claims**



A first plastic encapsulated subassembly has a cup-shaped recess with the sides of the cup having a taper of about 30° and a heat sink opposite the cup. The assembly is placed in a cavity of a mold with a second heat sink in contact with the subassembly heat sink and resting on one face of the mold cavity. A mold pin is inserted into the cup-shaped recess, forcing the subassembly, using a precalculated and controlled deformation of the cup, heat sink and the one mold face together such that the later injected plastic encapsulating material does not flow therebetween to provide a good thermal path from the subassembly heat sink to an outer face of the completed plastic encapsulated assembly.

ERRATUM

For Class 423—235 see:
Patent No. 3,715,187

3,715,424

PROCESS OF SEPARATING YTTRIUM AND LANTHANUM THROUGH LUTETIUM FROM MIXTURES OF SUCH ELEMENTS

Ekkehard Greinacher, Ahornstr. 41, Essen; Werner Fischer, Appelstr. 18, and Martin Dahne, Callinstr. 46, both of Hannover, all of Germany

Continuation of Ser. No. 768,737, Oct. 18, 1968, abandoned. This application June 3, 1971, Ser. No. 149,757

Claims priority, application Austria, Nov. 8, 1967, A 10063/67

Int. Cl. C22b *59/00*

U.S. Cl. 423—21 **2 Claims**

Process of separating at least two of the elements yttrium and lanthanum through lutetium from a mixture of such elements by distributing the thiocyanates of the elements between an aqueous phase and an organic solvent phase. The concentration of the elements in the aqueous phase is at least 1.5 gram-atoms per liter, but preferably between 2 gram-atoms per liter and the saturation limit. The thiocyanate concentration in the aqueous phase is between 0.01 – 3 mole per liter.

3,715,425

PROCESS FOR THE MANUFACTURE OF CHROME CHEMICALS

Thomas R. Morgan; William W. Low, both of Syracuse; Christian A. Wamser, Camillus, and Charles P. Bruen, Fayetteville, all of N.Y., assignors to Allied Chemical Corporation, New York, N.Y.

Filed Oct. 19, 1970, Ser. No. 82,024

Int. Cl. C01g *37/14*

U.S. Cl. 423—61 **20 Claims**

Chrome chemicals such as chromic acid (CrO_3) and alkali metal chromates and bichromates are prepared by a process which avoids the formation and treatment of "brown muds" which includes the processing steps of reacting an alkali metal bisulfate solution substantially free of trivalent chromium values with an aqueous solution of an alkaline roasted chrome ore mixture containing dissolved chrome ore values to convert the roasted mixture's chrome ore values at least in part to an alkali metal bichromate and separating said bichromate values. The alkali metal bichromate values may be reacted with a sulfuric acid to produce chromic acid. Also covered by the present invention is the removal of the chloride impurity from the bichromate values.

3,715,426

CONTINUOUS PROCESS FOR SCRUBBING H2S FROM A GAS STREAM AND SELECTIVELY PRODUCING ELEMENTAL SULFUR USING FOUR RECYCLE WATER STREAMS

Robert J. J. Hamblin, Des Plaines, Ill., assignors to Univeral Oil Products Company, Des Plaines, Ill.

Continuation-in-part of Ser. No. 773,211, Nov. 4, 1968, Pat. No. 3,627,465. This application July 30, 1971, Ser. No. 167,735

Int. Cl. C01b *17/06*

U.S. Cl. 423—234 **18 Claims**

H_2S is removed from a gas stream and sulfur is selectively produced by the steps of: (1) sequentially scrubbing the gas with a first recycle water stream containing NH_4OH and then with a second recycle water stream which is substantially NH_4OH-free to produce a treated gas stream, which is reduced in H_2S content and is substantially free of NH_3, and a rich absorbent stream containing NH_4HS; (2) catalytically reacting a portion of the rich absorbent stream and a third recycle water stream containing NH_4HS and NH_4OH with a first air stream to produce a liquid stream containing ammonium polysulfide and a gas stream containing NH_3, H_2S, H_2O and N_2; (3) catalytically reacting the liquid stream from step (2) and a fourth recycle water stream containing ammonium polysulfide with a second air stream to form a substantially sulfide-free water stream containing NH_4OH and $(NH_4)_2S_2O_3$, a gas stream containing NH_3, H_2O and N_2 and a liquid sulfur stream; (4) recovering a portion of the water stream from step (3) as at least a portion of the first recycle water stream and passing same to step (1); (5) stripping NH_3 from another portion of the water stream formed in step (3) to make a sulfide- and ammonia-free water stream containing $(NH_4)_2S_2O_3$; (6) passing a portion of the water stream from step (5) to step (1) as the second recycle water stream; (7) reacting another portion of the water stream from step (5) and another portion of the rich absorbent stream to form the fourth recycle water stream and passing same to step (3); and (8) scrubbing NH_3 and H_2S from the gas streams produced in steps (2) and (3) to form the third recycle water stream and passing same to step (2).

ERRATUM

For Class 423—24 see:
Patent No. 3,715,320

3,715,427

STABILIZED ERYTHROCYTES AND METHODS THEREFOR

Arthur Atsunobu Hirata, Waukegan, Ill., assignor to Abbott Laboratories, North Chicago, Ill.

Continuation-in-part of Ser. No. 760,052, Sept. 16, 1968, abandoned, which is a continuation-in-part of Ser. No. 682,550, Nov. 13, 1967, abandoned. This application Dec. 24, 1970, Ser. No. 101,442

Int. Cl. A01n *1/00;* **G01n** *31/00, 33/16*

U.S. Cl. 424—3 9 Claims

A method for obtaining an improved, stabilized aldehyde-treated erythrocyte preparation having an increased hemagglutination titer. The erythrocytes are stabilized by sequential exposure to dilute solutions of pyruvic aldehyde and formaldehyde, subjected to a freeze-thaw cycle, and stored at a temperature of −20°C. or below.

3,715,428

HAIR SPRAY UNIT CONTAINING A SOLUTION OF A POLYMERIC QUATERNARY CELLULOSE ETHER SALT

Alan R. Quasius, Arlington Heights, and Paul J. Shiman, Chicago, Ill., assignors to The Gillette Company, Boston, Mass.

No Drawing. Filed Nov. 4, 1970, Ser. No. 86,980

Int. Cl. A61k *7/00, 9/00*

U.S. Cl. 424—47 **3 Claims**

A hair spray unit containing propellant and a solution in a volatile liquid solvent of a polymeric quaternary cellulose ether salt.

3,715,429

DEFORMATION OF HAIR WITH THIOUREA DIOXIDE AND ACTIVATING AGENT THEREFOR

Robert Amon, Deceased, late of London, England, by Joy Mary Amon, administratrix, 711 N. Circular Road, and Julian Jacob Tobin, joint administrator, 223 Regent St., both of London, England

No Drawing. Continuation-in-part of application Ser. No. 634,861, May 1, 1967. This application Nov. 24, 1969, Ser. No. 879,545

Claims priority, application Great Britain, May 2, 1966, 19,256/66

Int. Cl. A61k *7/10*

U.S. Cl. 424—71 **11 Claims**

A composition based on thiourea dioxide and incorporating activating agents therefor suitable for the preparation of a substantially neutral aqueous solution for use in the treatment of hair.

3,715,430

PURIFIED OXYGEN GAS CONTAINING OZONE AND HIGHER OXYGEN POLYMERS

Edmond J. Ryan, 2322 SW. 13th St., Miami, Fla.

Continuation of application Ser. No. 438,793, Mar. 10, 1965, which is a division of application Ser. No. 26,376, May 2, 1960, both now abandoned, which in turn is a division of application Ser. No. 493,656, Mar. 11, 1955, now Patent No. 2,937,983, and a continuation-in-part of application Ser. No. 762,199, Sept. 17, 1958, now Patent No. 3,063,904. This application Aug. 4, 1969, Ser. No. 849,588

Int. Cl. A61k *27/00*

U.S. Cl. 424—127 **1 Claim**

A therapeutically active oxygen gas consisting of oxygen purified of its normal contaminants such as moisture and carbon dioxide as well as any contaminating components that may be derived from ultra-violet light generating apparatus, the purified oxygen gas being exposed to ultra-violet light in a narrow wave length sufficient to generate about 5 to 500 parts per million of ozone and higher polymeric forms of oxygen.

3,715,431

PARASITICIDE FOR ANIMALS

Yasushi Yusa, Yokohama-shi, Naotoshi Akai, Kokubunji-shi, Shinichi Kondo, Yokohama-shi, Kimio Satoh, Kawasaki-shi, and Yasuharu Sekizawa, Tokyo, Japan, assignors to Meiji Seika Kaisha, Ltd., Tokyo, Japan

No Drawing. Filed July 7, 1967, Ser. No. 651,713

Claims priority, application Japan, July 8, 1966, 41/44,178; Mar. 10, 1967, 42/14,717

Int. Cl. A61k *21/00*

U.S. Cl. 424—181 **5 Claims**

Parasiticide for animals which is mixed in a fodder and contains as an active ingredient a new antibiotic destomycin A which is produced by cultivation of *Streptomyces rimofaciens* deposited under ATCC No. 21066.

3,715,432

SUBMICRON AQUEOUS AEROSOLS CONTAINING LECITHIN

Edward W. Merrill, Cambridge, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Division of Ser. No. 823,972, May 12, 1969, Pat. No. 3,594,476. This application Jan. 22, 1971, Ser. No. 109,058

Int. Cl. A61j *3/02;* **A61k** *13/00*

U.S. Cl. 424—199 3 Claims

Aerosols of aqueous particles of submicron diameter which are stable against evaporation and suitable to be readily transmitted to the alveoli of the lung by inspiration, may be prepared from aqueous lecithin dispersions nebulized, as by an ultrasonic nebulizer, at temperatures greater than 25° C. Lecithin aerosols thus prepared are useful for the treatment of lung disorders, and may optionally contain other therapeutic agents such as antibiotics.

3,715,433

GROWTH PROMOTION IN SWINE

Jacob Christopher Bauernfeind, Upper Montclair, and Milan Mitrovic, Nutley, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed June 2, 1969, Ser. No. 829,763

Int. Cl. A61k *27/00*

U.S. Cl. 424—229 4 Claims

Compositions and methods for promoting the growth and increasing the feed efficiency of swine, comprising orally administering to the swine a composition comprising either (a) 1-methyl-2-isopropyl-5-nitroimidazole, (b) sulfa compound potentiated with a 2,4-diamino-5-[2′,4′,5′-trisubstituted-benzyl] pyrimidine or (c) a mixture of (a) and (b). The method comprises feeding the swine a ration containing a sufficient amount of (a), (b) or (c) to achieve the desired effect, e.g., from about 10 grams to about 250 grams per ton, i.e., about 0.0011 part to about 0.0275 part per 100 parts by weight of feed.

3,715,434

IODOPEPTIDE ANTICOAGULANTS

Thomas J. Mende, Miami, Fla., assignor to Research Corporation, New York, N.Y.

Filed April 7, 1970, Ser. No. 26,425

Int. Cl. A61k *27/10*

U.S. Cl. 424—177 2 Claims

Peptides, when iodinated, exhibit very strong anticoagulant activity.

3,715,435

PHENYLAZOALKENOATE FUNGICIDAL COMPOSITIONS

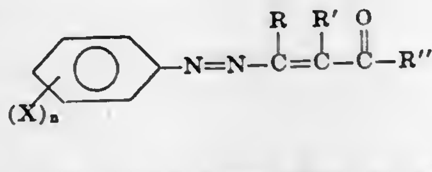
Wayne N. Harnish, Medina; Robert E. Sticker, Middleport, and Glen A. Carls, Williamsville, all of N.Y., assignors to FMC Corporation, New York, N.Y.

Filed Aug. 21, 1970, Ser. No. 66,106

Int. Cl. A01n *9/20*

U.S. Cl. 424—226 16 Claims

As new fungicidal compositions, substituted phenylazoalkenoates of the general formula



wherein R is hydrogen or lower alkyl, R′ is hydrogen or chlorine; R″ forms an ester or an amide; X is an electronegative substituent such as nitro, cyano, methylsulfonyl, carboxyl, or COOM where M is a metal cation; *n* is 1 or 2; and the substituents X may be the same or different when *n* is 2, and are in the ortho or para positions on the ring. The preparation and physical and fungicidal properties of preferred members of this class are described in detail.

3,715,436

FORMIMIDO-ESTERS AND PESTICIDAL PREPARATIONS CONTAINING THEM

Stefan Janiak, Binningen, and Volker Dittrich, Basel, Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

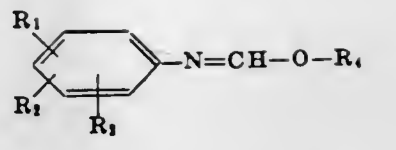
No Drawing. Original application Mar. 25, 1968, Ser. No. 715,494. Divided and this application Dec. 9, 1970, Ser. No. 96,589

Claims priority, application Switzerland, Mar. 28, 1967, 4,317/67

Int. Cl. A01n *9/20, 9/24*

U.S. Cl. 424—304 **3 Claims**

The invention relates to new formimido-ester of the general formula



of which the substituents R_1 to R_4 are defined in the disclosure, and their use is pesticides, especially for combating insects, arachnoids and nematodes.

3,715,437

METHOD OF ACHIEVING AN ANTIPEPTIC ACTION IN ANIMALS WITH BIMETALLIC COMPOUNDS

Alfred Halpern, 11 Hampton Court, Great Neck, N.Y. 11020, and Ernest J. Sasmor, 245 Rumsey Road, Yonkers, N.Y. 10705

Original application Sept. 25, 1967, Ser. No. 674,051, now Patent No. 3,501,575. Divided and this application July 7, 1969, Ser. No. 872,783

Int. Cl. A61k *27/00*

U.S. Cl. 424—317 **1 Claim**

The method of achieving an antipeptic action in an animal which comprises the step of administering a compound of the formula, XAlOH2R, wherein X may be the magnesium or calcium ion and R is either the gluconic, glucuronic or galacturonic acid radical.

3,715,438

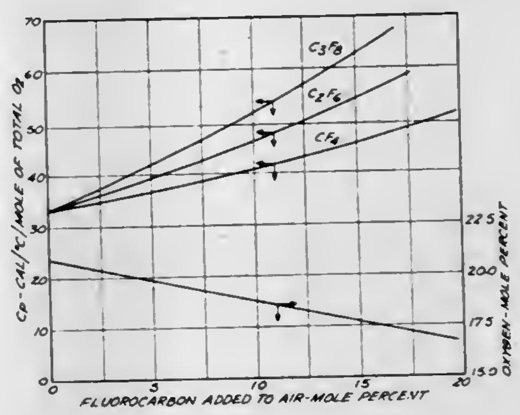
HABITABLE COMBUSTION-SUPPRESSANT ATMOSPHERE COMPRISING AIR, A PERFLUOROALKANE AND OPTIONALLY MAKE-UP OXYGEN

Clayton M. Huggett, Burke, Va., assignor to The Susquehanna Corporation, Fairfax County, Va.

Filed July 22, 1970, Ser. No. 57,255

Int. Cl. A61k *13/00, 27/00*

U.S. Cl. 424—366 **18 Claims**



Habitable atmospheres which do not sustain combustion and which are capable of sustaining mammalian life, consisting essentially of air, a perfluoroalkane gas, which is carbon tetrafluoride (CF_4), hexafluoroethane (C_2F_6), octafluoropropane (C_3F_8), or mixtures thereof, and make-up oxygen, as required, to provide, together with the oxygen present in the air, sufficient total oxygen to sustain mammalian life.

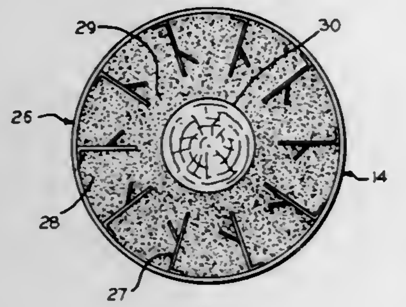
A method for preventing and controlling fire in enclosed air-containing, mammalian-habitable compartments comprising introducing CF_4, C_2F_6, C_3F_8, or mixtures thereof, and additional make-up oxygen as required.

ELECTRICAL

3,715,439

ELECTRIC SMELTING FURNACE ELECTRODE HAVING A WOODEN CORE

John A. Persson, Gibsonia, Pa., assignor to Pennsylvania Engineering Corporation
Filed Aug. 27, 1971, Ser. No. 175,496
Int. Cl. H05b *7/06*
U.S. Cl. 13—18 **7 Claims**

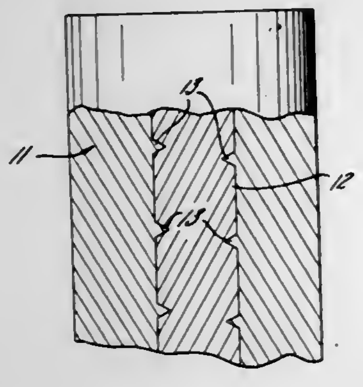


One or more wooden logs are introduced into the central region of smelting furnace electrodes as they are being formed of paste to produce an electrode that has a non-conductive center and an outer conducting sheath of baked and hardened carbonaceous material.

3,715,440

ELECTRIC ARC STABILIZATION IN ELECTRIC ARC MELTING USING CARBON ELECTRODES

Alfred Gordon Evans Robiette, Nechells, Birmingham 7, England, assignor to Foseco International Limited
Division of Ser. No. 791,505, Jan. 5, 1969, abandoned, which is a continuation-in-part of Ser. No. 573,867, Aug. 23, 1966, Pat. No. 3,461,339. This application April 1, 1971, Ser. No. 130,431
Claims priority, application Great Britain, Oct. 1, 1968, 46,525/68
Int. Cl. H05b *7/06*
U.S. Cl. 13—18 **14 Claims**



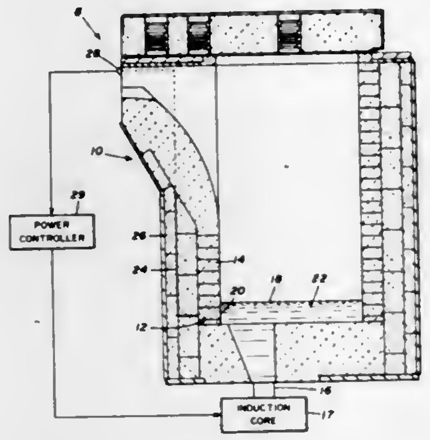
Arc furnace electrodes consist of an outer shell of carbon and an inner core consisting of a carbonaceous filler, a promoter material, e.g., an alkali metal oxide, carbonate or halide, and a carbonaceous binder such as pitch or tar.

3,715,441

INDUCTION FURNACE WITH THERMOCOUPLE ASSEMBLY

Henry F. Collins, 917 Alamo, Garland, Tex.
Filed July 26, 1971, Ser. No. 166,009
Int. Cl. F27d *21/04;* **H05b** *5/00*
U.S. Cl. 13—26 **5 Claims**

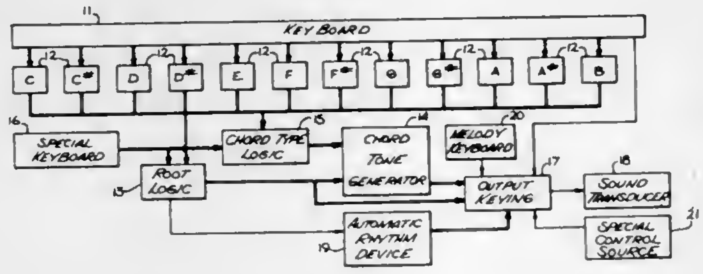
An induction furnace for melting metal has a built-in thermocouple assembly for continuously measuring the temperature of the molten metal. A power controller then adjusts the power to the furnace to maintain a predetermined temperature. The thermocouple assembly includes a refractory substrate which forms a portion of the furnace lining partially coated with thin strips of two thermoelectric materials so as to form a thermocouple junction. The refractory substrate and the strips of thermoelectric materials are covered with a protective layer of the same refractory material as the substrate. Electrical leads are attached to the assembly and are in contact with the strips of thermoelectric material. An alternative embodiment utilizes a similarly constructed thermocouple which is immersed in the molten material for intermittent measurements.



3,715,442

CHORD TONE GENERATOR CONTROL SYSTEM

Alfred B. Freeman, 20418 Seaboard Road, Malibu, Calif.
Filed Dec. 15, 1970, Ser. No. 98,384
Int. Cl. G10h *1/00*
U.S. Cl. 84—1.01 **25 Claims**

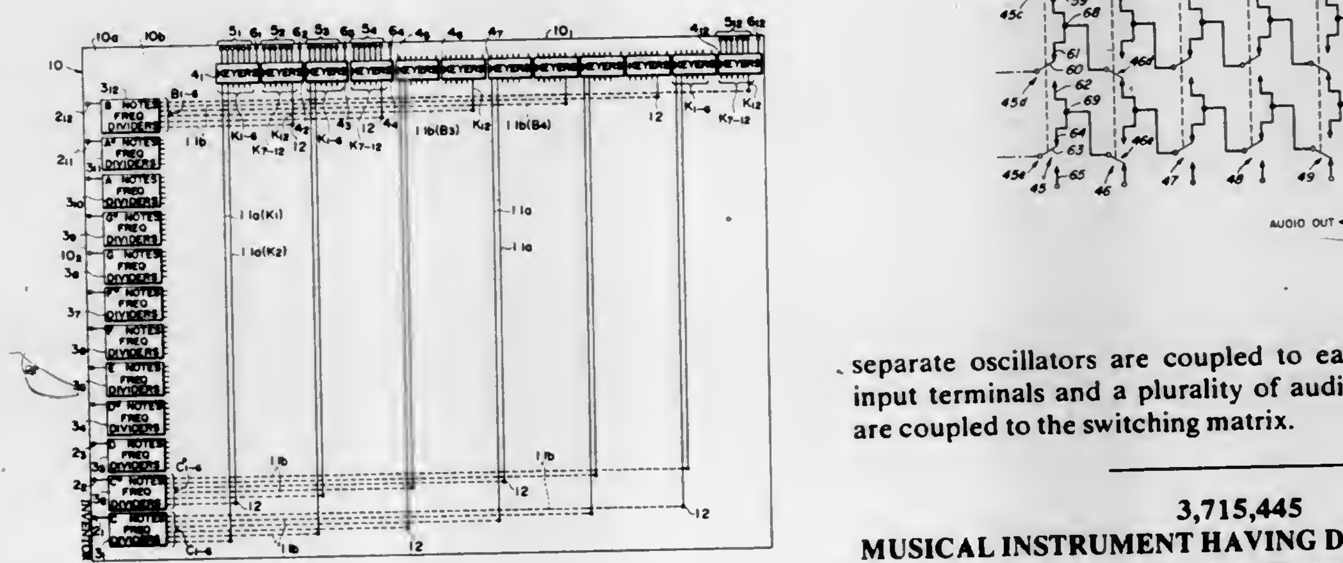


Apparatus for playing chords and bass which has a chord tone generator tuned for different root notes by logic devices sensing the playing keys actuated and controlled for different chord types by other logic devices responsive to the first logic devices and actuated playing keys. Specially controlled keyers respond to the root note and the highest pitch playing key actuated to sound sets of outputs in pitch locations according to selected relations that include close and open harmony and direct correspondence. The keyers further pass outputs within a given pitch range to a modulator driven by an automatic rhythm device to sound them in rhythmic patterns. The automatic rhythm device further controls the sounding of other outputs one at a time in a bass register. Special controls are also used to tune for root, control for type, and select pitch locations for sounding.

3,715,443

WIRING SYSTEM BETWEEN SOUND SOURCE CIRCUITS AND KEYER CIRCUITS IN AN ELECTRONIC MUSICAL INSTRUMENT

Kazukiyo Ishimura, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan
Filed Nov. 30, 1971, Ser. No. 203,232
Claims priority, application Japan, Dec. 3, 1970, 45/111040; Dec. 3, 1970, 45/107123
Int. Cl. G10h *1/00*
U.S. Cl. 84—1.01 **3 Claims**



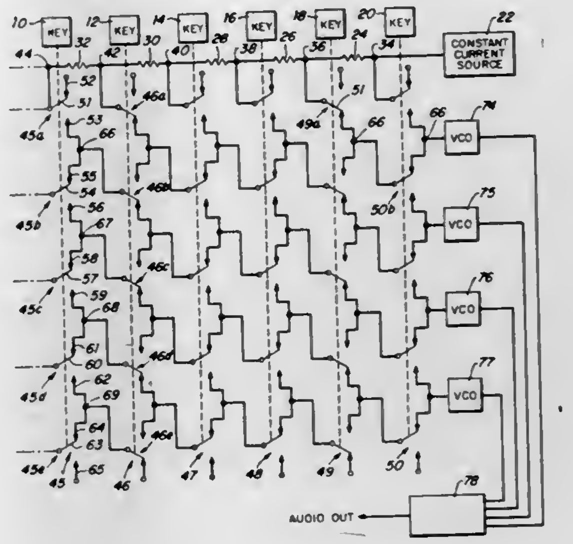
The wiring system of this invention is for connecting a number of integrated sound source circuits with the corresponding number of integrated keyer circuits in an electronic musical instrument, and is realized on a single piece of a rectangular wiring substrate. More particularly, the wiring system is characterized in that the sound source circuits are sequentially arranged along one arbitrary side of the rectangular wiring substrate while the keyer circuits are sequentially arranged along the second side of the substrate adjacent to said first side; that conductive members corresponding, in number, to the output terminals of the sound source circuits are extended on one surface of the substrate, from the output terminals toward the side facing said first side; that conductive members corresponding, in number, to the input terminals of the keyer circuits are extended, on the other surface of the substrate, from the input terminals toward the side facing said second side up to the points where the conductive members from the output terminals are terminated on the one side of the substrate; and that at those points the conductive members on both surfaces of the substrate are, respectively, connected by coupling means.

3,715,444

SWITCHING SYSTEM FOR KEYBOARD

Alan R. Pearlman, Newton Highlands, Mass., assignor to Tonus, Inc., Newton, Mass.
Filed Jan. 4, 1971, Ser. No. 103,493
Int. Cl. G10h *1/00*
U.S. Cl. 84—1.01 **1 Claim**

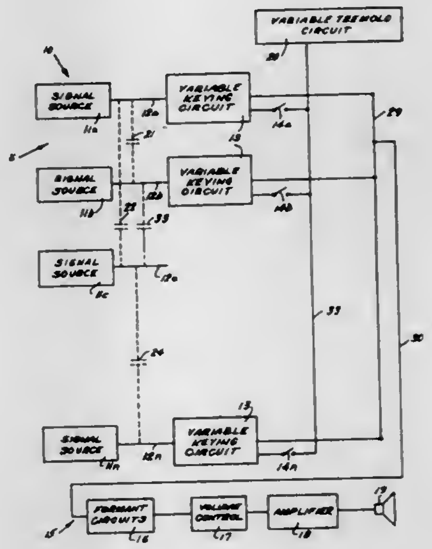
A priority switching system for use with a keyboard of an electronic musical instrument comprising a plurality of input terminals having corresponding voltages applied thereto, a switching matrix including a plurality of linear switch arrays with each array responsive to operation of a corresponding key, and a multiplicity of voltage controlled oscillators coupled to the switching matrix. In the switching system the voltage controlled oscillators and the input terminals are selectively interconnected by the switching matrix on a priority basis so that the uppermost key, for example, is assigned to a first voltage controlled oscillator, and the next key, which need not be the next adjacent key, is assigned to a second voltage controlled oscillator, etc. In another embodiment, separate oscillators are coupled to each of the plurality of input terminals and a plurality of audio processing channels are coupled to the switching matrix.



3,715,445

MUSICAL INSTRUMENT HAVING DC-KEYING CIRCUIT

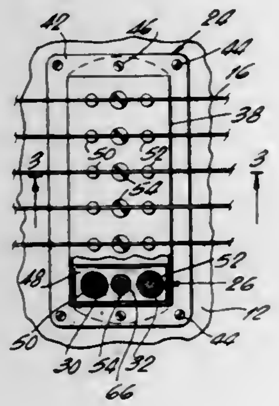
Alberto E. Kniepkamp, Chicago, Ill., assignor to Chicago Musical Instrument Co., Lincolnwood, Ill.
Filed April 30, 1971, Ser. No. 138,880
Int. Cl. G10h *1/04*
U.S. Cl. 84—1.13 **13 Claims**



A musical instrument, such as an electronic organ, includes normally constantly running tone-signal sources which are coupled by key-operated switches to a transducer for converting the tone-signals into audible sounds by means of a DC-keying potential. The waveform of the tone signal comprises pulses which are modulated in shape by the DC-keying circuit as follows: at the onset or attack of the tone, the amplitudes of successive pulses are unidirectionally increased and the duration of said successive pulses are simultaneously unidirectionally decreased from a predetermined duration or duty cycle to a substantially shorter duration or duty cycle, while the reverse takes place at the decay of the tone. There is no modulation of frequency. By this circuit, the harmonic content of the tone-signal is varied in such a manner as to electronically closely simulate certain voices as brass, in a particularly realistic manner.

3,715,446
MAGNETIC PICKUP FOR STRINGED MUSICAL INSTRUMENTS

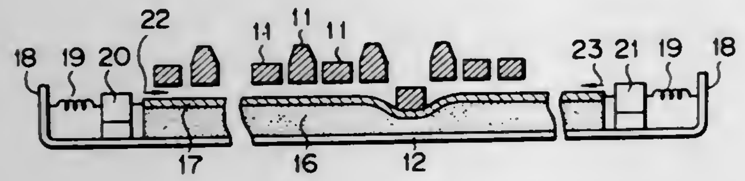
Frank Joseph Kosinski, Hauppauge, N.Y., assignor to Gulf & Western Industries, Inc., New York, N.Y.
Filed June 22, 1971, Ser. No. 155,528
Int. Cl. G10h *3/00*
U.S. Cl. 84—1.15 **8 Claims**



A magnetic pickup for stringed musical instruments has a balanced coil assembly for each string. Each assembly includes a bar magnet supporting a pair of pole pieces, each pole piece having a separate coil wound thereon. Each coil assembly is provided with an adjustment device for individually balancing the output of each string.

3,715,447
ELECTRONIC MUSICAL INSTRUMENT WITH A KEYBOARD DEVICE CAPABLE OF PRODUCING SPECIAL MUSICAL EFFECTS UPON KEY DEPRESSION

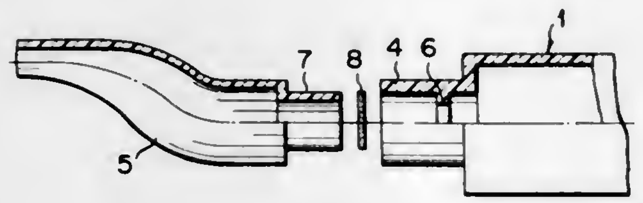
Junji Ohno, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu-shi, Shizuoka-ken, Japan
Filed May 13, 1971, Ser. No. 143,032
Int. Cl. G10h *1/02*
U.S. Cl. 84—1.24 **19 Claims**



In an electronic musical instrument, a keyboard device comprises a flexible and substantially non-extensible tape elastically supported on a keyboard frame below playing keys, and a first and a second detectors at both ends of the tape to generate electrical signals each having an amplitude corresponding to the amount of displacement of each tape end. The electric signals from the first and second detectors are supplied to a signal adder and a signal substractor, the adder giving out signals when the both tape ends move inward and the substractor giving out signals when one tape end moves inward and the other end outward. The output from the adder is supplied to a volume control circuit, while the output from the substractor is supplied to a vibrato effect producing circuit. On this instrument, a downward depression of the key produces an expression control effect, and a lateral movement of the key produces a vibrator effect.

3,715,448
KEYBOARD TYPE WIND MUSICAL INSTRUMENT HAVING REMOVABLE MOUTHPIECE SECURING REMOVABLE AIR FILTER

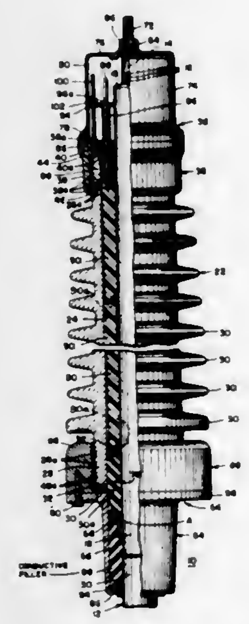
Masaji Itoh, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu-shi, Japan
Filed July 12, 1971, Ser. No. 161,640
Claims priority, application Japan, July 15, 1970, 45/61503
Int. Cl. G10d *11/00*
U.S. Cl. 84—375 **10 Claims**



A keyboard type wind musical instrument wherein an air flow through a mouthpiece vibrates reeds to produce tones upon key operation. A filter is interposed between a projection in the connecting tube of an instrument body and the mouthpiece which is removably inserted into the connecting tube to prevent intrusion of foreign materials other than air into the instrument body during performance. The projection may be in the mouthpiece, in which case the connecting tube is detachably inserted into the mouthpiece.

3,715,449
FLUID FILLED HIGH VOLTAGE CABLE TERMINAL APPARATUS

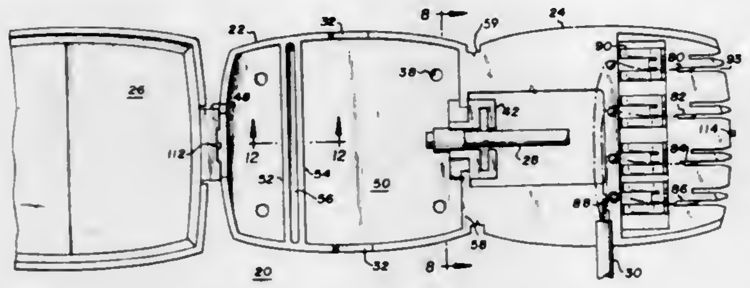
Francis V. Cunningham, Western Springs, and Cyril V. Miller, Arlington Heights, both of Ill., assignors to Joslyn Mfg., and Supply Co., Chicago, Ill.
Continuation of Ser. No. 790,815, Jan. 13, 1969, abandoned. This application April 1, 1971, Ser. No. 130,425
Int. Cl. H02g *15/22*
U.S. Cl. 174—11 BH **10 Claims**



A terminal apparatus for use with insulated power cable comprising a rigid housing having an elongated bore for receiving a terminal end portion of the cable, and an elastomeric sealing means at one end of the bore. The sealing means extends into the bore from said one end towards the opposite end for a distance substantially less than the length of the bore, and the remaining portion of the bore is filled with dielectric insulating fluid and a load bearing insulation system that maintains the sealing means in air-free sealing engagement between the bore and the cable regardless of service temperature variations.

3,715,450
JUNCTION BOX

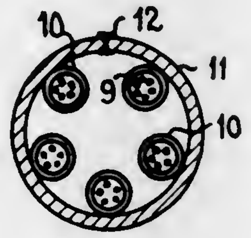
Harold W. Martin, Warren, N.J., assignor to Thomas & Betts Corporation, Elizabeth, N.J.
Filed March 21, 1972, Ser. No. 236,689
Int. Cl. H01r *13/46*
U.S. Cl. 174—59 **10 Claims**



A junction box for the termination tapping or splicing or electrical conductors is formed of three interleaved portions; a cover portion, an intermediate portion and a base portion. Mounted upon one surface of the intermediate portion are a plurality of conductor connectors each capable of receiving electrical conductors without piercing the insulation thereon and making electrical contact therewith. Such connectors are provisioned for receiving and making electrical contact with additional electrical conductors having terminal thereon such as to provide a conductive path between conductors within the insulation piercing portion and that created by a terminal. Straining relief means are provided adjacent the free ends of the conductors place in the insulating piercing portion of the connectors for holding and aligning such conductors prior to, during, and after the insulation piercing operation has taken place. Additional straining relief devices may be provided adjacent the entry to the conductor connectors so that unwanted removal of the conductors from such connectors may not be made.

3,715,451
SUPERCONDUCTOR STRUCTURE, AND METHOD OF MAKING THE SAME

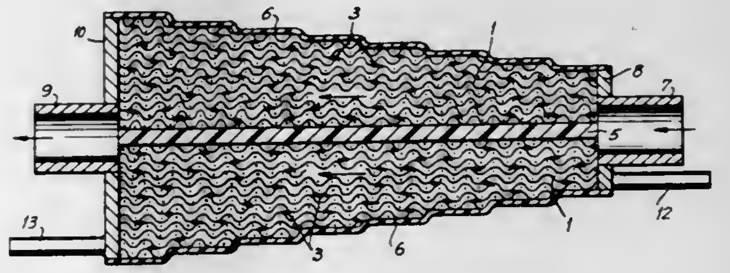
Alfred Paul Hammer, 107 Avenue Victor Hugo, Paris 16 eme; Alexis Charles Entz, 16, Aliee du Haras, 92 Vaucresson, and Claude Levaire, 12, Place St. Momble, 02 Chauny, all of France
Division of Ser. No. 861,910, Sept. 29, 1969, Pat. No. 3,626,585. This application Sept. 14, 1971, Ser. No. 180,463
Int. Cl. H01b *7/34*
U.S. Cl. 174—15 C **5 Claims**



An elongated metallic tube has secured therein, with substantial line contact, a sheathed filamentary superconductor, having an outside diameter much less than the inside diameter of the tube; preferably the sheath metal and the metal of the tube are the same (for example copper, aluminum, or alloys thereof). According to the method, a long band is provided along the length of which the superconductor is first bonded, for example by welding, or fusing of the sheath metal to the band; thereafter, the band is folded and formed into the tube, the lateral edges of the band being seamed together to form a fluid tight seal for example by welding, cold flowing or the like.

3,715,452
POROUS FLUID COOLED ELECTRICAL CONDUCTORS

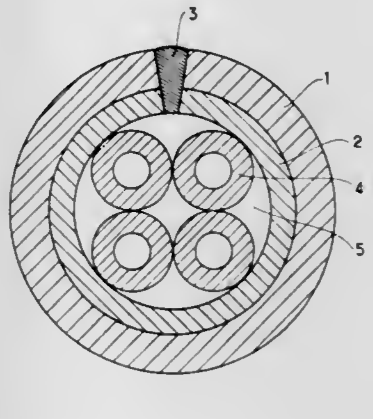
Hugh M. Long, Tonawanda, N.Y., assignor to Union Carbide Corporation, New York, N.Y.
Division of Ser. No. 875,326, Nov. 10, 1969, Pat. No. 3,636,620. This application Jan. 21, 1972, Ser. No. 219,714
Int. Cl. H01b *7/34, 5/00*
U.S. Cl. 174—15 C **8 Claims**



Fluid cooled, high current capacity electrical conductors manufactured by spirally rolling or winding porous metal sheet into a desired shape.

3,715,453
CRYOGENIC CONNECTION ENCLOSURE

Marcel Aupoix, Paris, and Francois Moisson-Franckhauser, Bretigny-sur-Orge, both of France, assignors to Compagnie Generale d'Electricite, Paris, France
Filed April 20, 1972, Ser. No. 246,018
Claims priority, application France, April 28, 1971, 7115182
Int. Cl. H01b *7/34;* **H01v** *11/00*
U.S. Cl. 174—15 C **4 Claims**



Cold enclosure having a tubular shape, surrounding the conductors of a cryogenic connection, consisting of two layers of composite material, joined together by a metallic connection, an outer cover made of an iron and nickel alloy in which the proportion of nickel comprises between thirty and forty per cent, and an inner layer of copper or aluminum, this inner layer preventing the generating of alternating induced fields in the outer cover, which is magnetic.

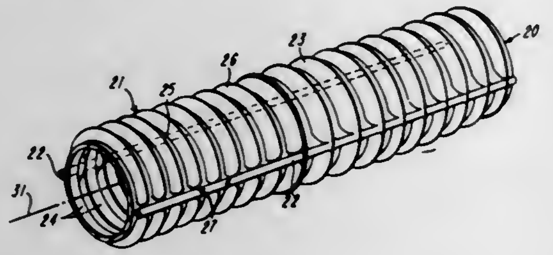
3,715,454
HOSE CONSTRUCTION

Donald L. Kleykamp, Springboro, Ohio, assignor to Dayco Corporation, Dayton, Ohio

Filed Jan. 3, 1972, Ser. No. 214,810

Int. Cl. F16l *11/12, 11/10;* **A47l** *9/24*

U.S. Cl. 174—47 **22 Claims**



An elongated differential fluid pressure formed flexible hose is provided and has an inner portion defined by a plurality of spaced tubular segments interconnected by a plurality of integral convolutions which extend outwardly from the segments. The convolutions have a plurality of recesses therein arranged in aligned relation to define at least one groove which extends the full length of the hose. A flexible hose-reinforcing member is arranged in each groove and attached to the hose along its full length.

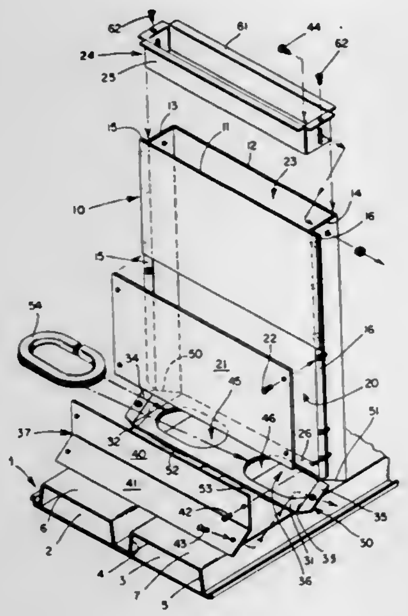
3,715,455
CELL TO CABINET CONNECTOR

John P. Casto, Vienna, W. Va., assignor to Textron Inc., Providence, R.I.

Filed March 16, 1972, Ser. No. 235,265

Int. Cl. H02g *3/04*

U.S. Cl. 174—48 **3 Claims**



A cell-to-cabinet connector comprising a vertical riser and an outwardly extending foot section which enhances cable pulling capabilities together with removable access plates, one for installation and the other for cable connection.

3,715,456
JOINTING CLIPS FOR INSULATED ELECTRIC WIRES

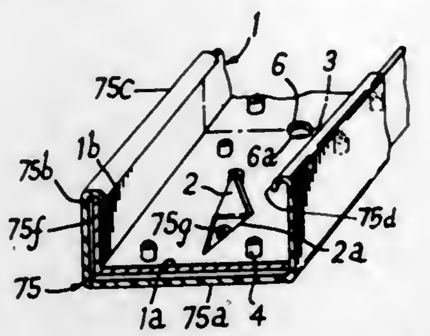
Arthur M. Faulkner, Ilford, England, assignor to The Plessey Company Limited, Ilford, Essex, England

Continuation of Ser. No. 27,514, April 13, 1970, abandoned, which is a continuation-in-part of Ser. No. 732,602, May 28, 1968, Pat. No. 3,517,804. This application Oct. 29, 1971, Ser. No. 193,916

Int. Cl. H01r *5/10*

U.S. Cl. 174—84 C **5 Claims**

Channel-type wire-piercing jointing clips are inserted with a close fit in an extruded channel of resilient insulating material whose flanges are doubled-back inwardly in U-formation at their free edges so that the metal clips can be inserted by being pressed into the insulating channel from its open side until the doubled-back edge portions of the insulating snap into position over the free edges of the channel-type metal clip, which they then retain against lifting out while being themselves retained against separation of the insulating wall portions after crimping.



3,715,457
TWO PIECE FLAT CABLE CONNECTOR

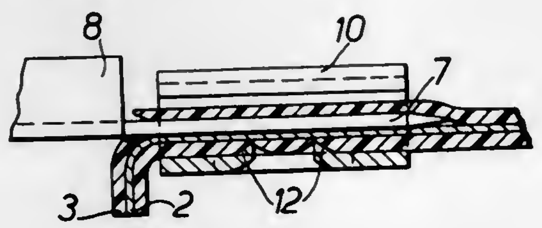
Wladimiro Teagno, and Luigi Campari, both of Turin, Italy, assignors to AMP Incorporated, Harrisburg, Pa.

Filed June 9, 1971, Ser. No. 151,404

Claims priority, application Italy, June 30, 1970, 26773 A/70

Int. Cl. H01r *5/00*

U.S. Cl. 174—88 R **1 Claim**



A bipartite connector for a flat cable conductor comprises a first element having a lance portion and an electrical contact portion; a second element of generally channel-shaped cross-section comprising a base and two side walls, an integral tongue being struck from the base into the channel. To form a connection, the lance portion of the first element is caused to penetrate the top surface insulation of a flat conductor to contact the conductor longitudinally of the cable and the edges of the side walls of the second element are then caused to pierce the insulation lands laterally of the flat conductor and to be bent inwardly to contact the lance portion of the first element and clamp the lance portion and the flat conductor between the edges and the base.

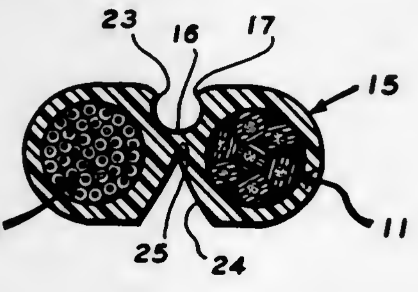
3,715,458
ELECTRICAL CABLE STRUCTURE

Lowell D. Bayes, and Robert B. Cole, both of Richmond, Ind., assignors to Belden Corporation, Chicago, Ill.

Filed Nov. 1, 1971, Ser. No. 194,743

Int. Cl. H01b *7/04*

U.S. Cl. 174—113 R **3 Claims**



An electrical cable structure is described in which two separate cables are enclosed within a single extruded jacket. The jacket includes a recess extending along its outer surface equidistant from and parallel with the first and second cables. The recess is of a configuration to form a retainer for a further cable inserted in the recess.

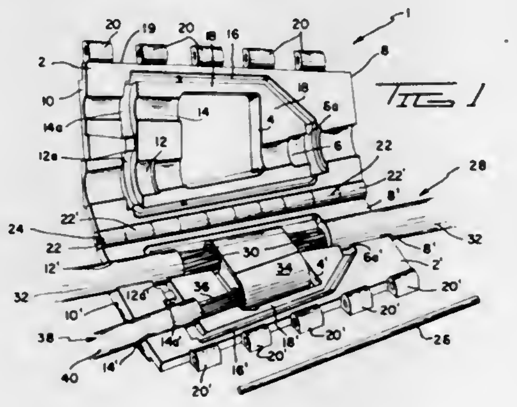
3,715,459
CABLE COUPLING COVERING AND MOISTURE BARRIER

Norman Edwin Hoffman, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed July 15, 1971, Ser. No. 162,808

Int. Cl. H02g *15/08*

U.S. Cl. 174—138 F **1 Claim**



A two-piece hinged plastic covering forming an enclosure for a cable coupling. At least two cable ends protrude through the covering into the enclosure. The covering includes an interior channel encircling the coupling with additional portions of the channel diametrically encircling each moisture impervious sheath provided over each cable. An inlet is provided in the covering and in communication with the channel to allow injection of a flowable curable sealant which completely fills the channel to provide a continuous encircling band of moisture impervious material completely encircling the coupling and the moisture impervious sheaths on the protruding portions of the cables. The sealant may include a mild etchant such as acetic acid for partially softening and roughening the covering material and the moisture impervious sheaths of the protruding cable ends. The covering is of two-piece construction latched together by a rod inserted between aligned eye portions respectively connected to the cover portions. Accordingly, no specialized tooling is needed for latching the cover plate pieces together. Additionally, the sealant material may be introduced with a standard caulking gun, further eliminating the need for specialized tooling.

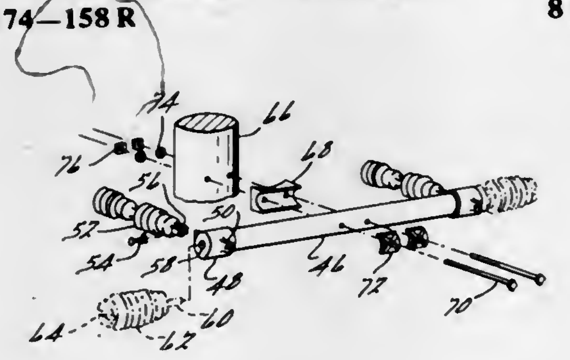
3,715,460
TUBULAR DEADEND SUPPORTS

Ernest A. Elliott, Detroit, and Randolph A. Pasen, Dearborn Heights, both of Mich., assignors to The Detroit Edison Company, Detroit, Mich.

Filed June 11, 1971, Ser. No. 152,113

Int. Cl. H01b *17/14;* **H02g** *7/20*

U.S. Cl. 174—158 R **8 Claims**



Tubular deadend supports are constructed from elongated tubular members, preferably formed of fiberglass reinforced plastic material provided adjacent their outer ends with metallic mounting members adapted to be engaged by line insulators. For heavy duty the mounting members are arranged to support the insulators extending at 90° to the tubular member. For light duty the mounting members provide for extension of the insulators beyond the end of the tubular members.

ERRATUM

For Class 174—28 see:
Patent No. 3,715,532

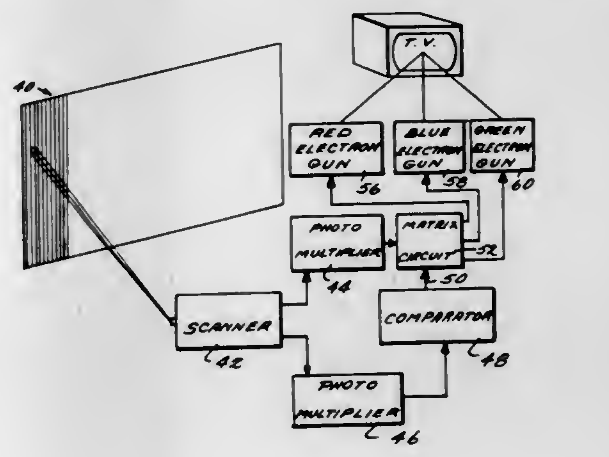
3,715,461
COLOR INFORMATION ON BLACK AND WHITE FILM

Thomas F. Hanlon, 337 Tremont Avenue, Fort Lee, N.J.

Filed Oct. 28, 1970, Ser. No. 84,570

Int. Cl. H04n *9/02*

U.S. Cl. 178—5.2 R **13 Claims**



A method and apparatus for recording and reading out programmed color information on black and white film and black and white film with such information coded thereon. In one embodiment, a line screen or filter having a number of sets of contiguous red, green and blue lines of differing width is placed atop a piece of black and white film to record a color coded image. After development, the film can be scanned and the color associated with a line being scanned ascertained and employed to operate an electron beam for producing the proper color or producing a laser beam of the proper color by the width of the scanned line.

3,715,462
METHOD AND CIRCUIT ARRANGEMENT FOR REGULATING THE AMPLITUDE OF THE COLOR SYNCHRONIZING SIGNAL

Gerhard Krause, Ebersberg/Munich, Germany, assignor to Fernseh GmbH, Darnstadt, Germany

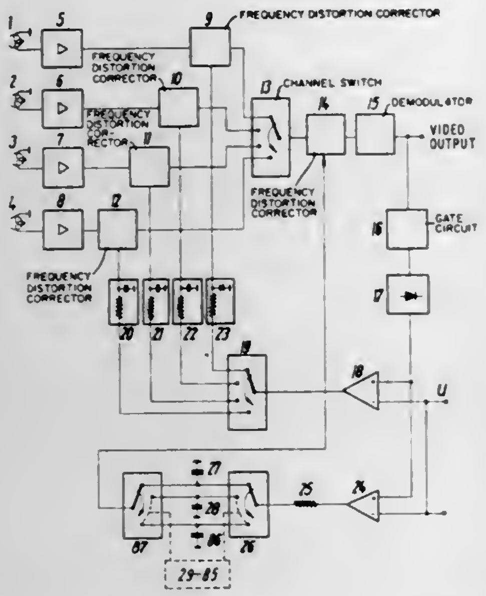
Filed Aug. 31, 1970, Ser. No. 68,259

Claims priority, application Germany, Sept. 2, 1969, P 19 44 37.8

Int. Cl. H04n *5/78*

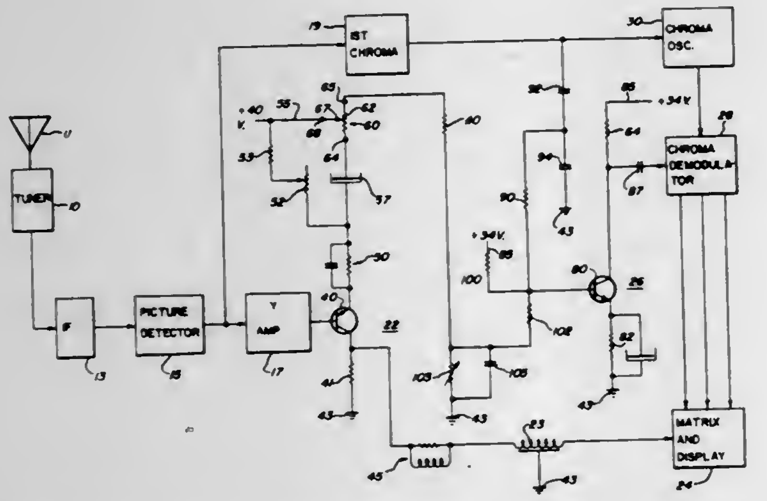
U.S. Cl. 178—5.4 CR **3 Claims**

A method for controlling the amplitude of the color synchronizing signal in color television signals taken from a record carrier, wherein amplitude deviations from the nominal value occur which exhibit a periodically recurring component, wherein there is derived from the color synchronizing signal a control voltage corresponding to the deviation of the amplitude of the color synchronizing signal from the nominal value, such control voltage being delivered through a low pass filter, and at the same time, in respect of each of those lines for which the periodically recurring component of the deviations is substantially equal, the control voltage is averaged over a plurality of periods of the periodically recurring component, and the mean values thus obtained, and the control voltage delivered through the low pass filter is used to influence the frequency response of the taken off color television signals in the sense of reducing the deviations in the amplitude of the color synchronizing signal from the nominal value.



3,715,463
TRACKING CONTROL CIRCUITS USING A COMMON POTENTIOMETER

Lester Tucker Matzek, Lombard, Ill., assignor to Warwick Electronics Inc.
Filed March 18, 1971, Ser. No. 125,564
Int. Cl. H04n *9/12*
U.S. Cl. 178—5.4 MC 9 Claims

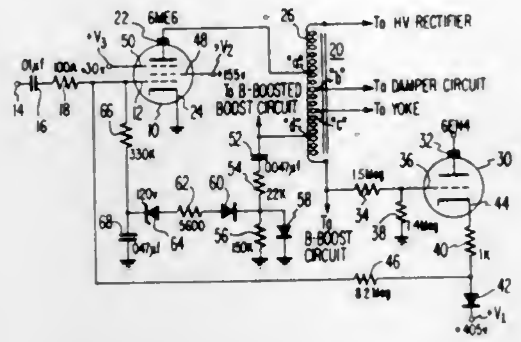


Simultaneously tracking chroma and contrast controls in a color television receiver use a common potentiometer having a wiper connected to a source of reference potential. One end of the potentiometer resistor is AC coupled to a luminance amplifier, and the other end is directly coupled to a DC bias circuit for a chroma amplifier. As the wiper is adjusted, the contrast of the luminance signal and the chroma level change in corresponding directions.

3,715,464
HIGH VOLTAGE HOLD-DOWN CIRCUIT

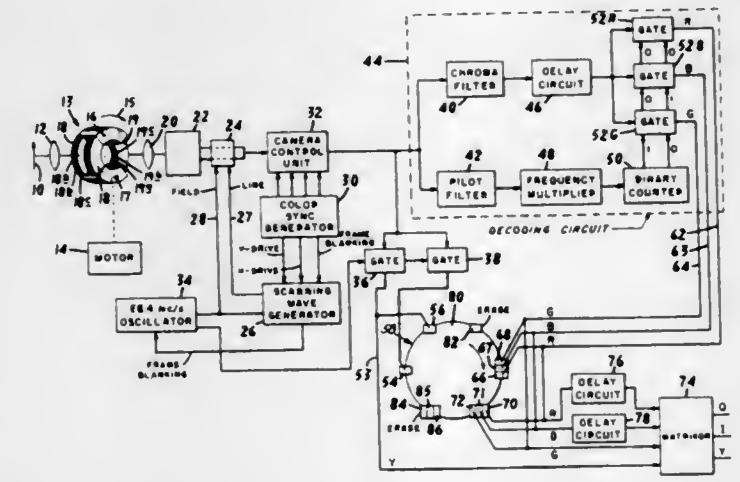
Gene Karl Sendelweck, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.
Filed May 28, 1971, Ser. No. 147,876
Int. Cl. H04n *9/16; 5/68*
U.S. Cl. 178—5.4 R 5 Claims

Loss of high voltage regulation in a television receiver can cause an increase in the ultor voltage developed for its picture tube and an increase in the possibility of X-radiation. The described circuit senses the loss of such regulation by detecting a voltage pulse developed in the flyback transformer and by changing the bias on the horizontal output tube, in response, so as to form a closed-loop feedback system which maintains normal high voltage operation whenever such regulator circuit failure occurs.



3,715,465
APPARATUS FOR DEVELOPING SIMULTANEOUS COLOR TELEVISION SIGNALS INCLUDING A STRIPED COLOR FILTER CONSTRUCTED TO GENERATE A PILOT SIGNAL FOR COMPONENT VIDEO SIGNAL SEPARATION

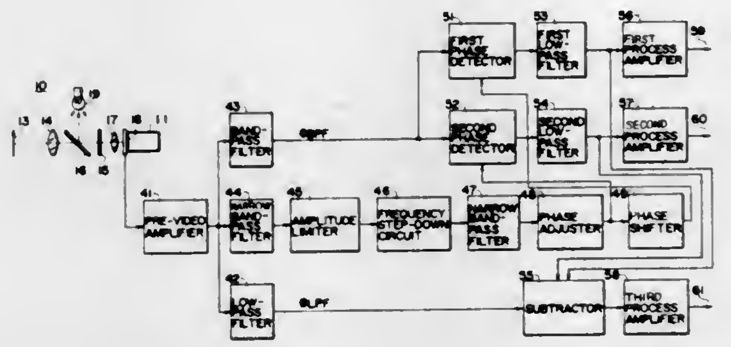
Renville H. McMann, Jr., 27 Whitney Avenue, New Canaan, Conn.
Continuation-in-part of Ser. No. 829,038, May 29, 1969, abandoned. This application April 23, 1971, Ser. No. 136,895
Int. Cl. H04n *9/06*
U.S. Cl. 178—5.4 ST 16 Claims



As described herein, a chrominance television signal containing separable color component portions, together with a square wave pilot signal, and a luminance signal are developed either successively by a singular scanning device operating in conjunction with a suitable optical filtering arrangement or simultaneously by a pair of scanning devices also operating in conjunction with a suitable optical filtering arrangement. The pilot signal is separated from the color component portions of the chrominance television signal and then employed to separate the color component portions. Where the chrominance signal and the luminance signal are developed successively, the separated color component portions and the luminance signal are alternately delayed for selected periods of time to align in time the luminance signal and the color component portions. Thereafter, the luminance signal and the color component portions of the chrominance signal are combined to produce conventional NTSC luminance and chrominance signals.

3,715,466
COLOR TELEVISION CAMERA EQUIPMENT

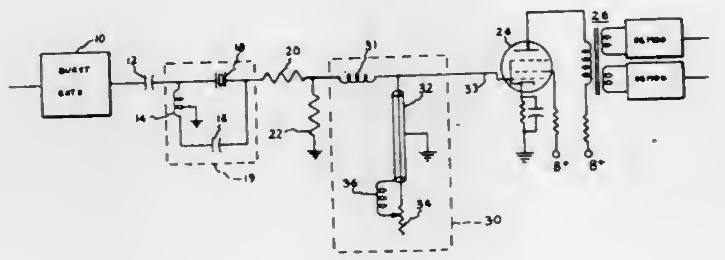
Yoshitero Karato, Tokyo, Japan, assignor to Shiba Electric Co., Ltd., Chiyoda-ku, Tokyo, Japan
Filed Dec. 2, 1970, Ser. No. 94,324
Claims priority, application Japan, Dec. 3, 1969, 44/96480
Int. Cl. H04n *9/06*
U.S. Cl. 178—5.4 ST 10 Claims



A striped color filter assembly is used which consists of at least two striped color filter elements capable of preventing the transmission of at least one color by one filter element and another color by another filter element in light from a subject to be televised. The strips of one of the color filter elements are positioned out of phase relative to those of the other color filter substantially by one-fourth pitch. The striped color filter assembly is located between a subject and a photoelectric effect plate of an image tube. The harmonic component of one color signal component is used as the fundamental frequency of the carrier. A plurality of color signals may be obtained from the single image pick up tube.

3,715,467
TINT CONTROL FOR COLOR TELEVISION RECEIVER

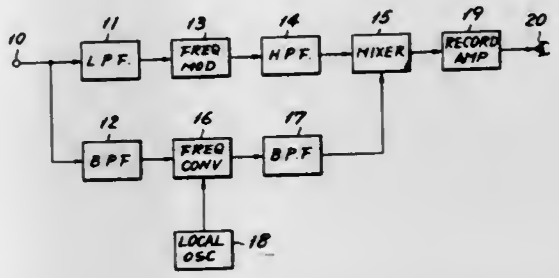
Larry Eugene Goodson, Portsmouth, Va., assignor to General Electric Company
Filed Nov. 13, 1970, Ser. No. 89,413
Int. Cl. H04n *9/12*
U.S. Cl. 178—5.4 HE 5 Claims



A phase shifting device used in conjunction with a reference oscillator providing a reference signal for demodulating chroma signals in a color television receiver. A first inductor is connected in series between a reference oscillator and an amplifier stage, and a capacitor and the series combination of a variable resistance and an inductor is connected between a point of reference potential and the intersection of the first series inductor and the amplifier means. Changes in the value of the variable resistance cause the phase of signals transmitted to the amplifier means to vary.

3,715,468
COLOR VIDEO SIGNAL RECORDING AND REPRODUCING SYSTEM

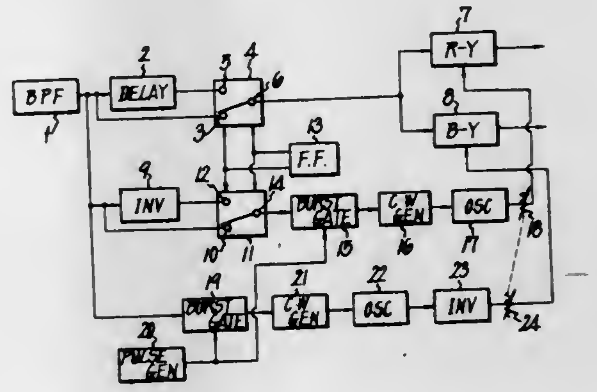
Mitsuo Fujita, Tokyo, Japan, assignor to Victor Company of Japan, Ltd., Yokohama, Japan
Continuation-in-part of Ser. No. 12,301, Feb. 18, 1970. This application Nov. 10, 1970, Ser. No. 88,350
Claims priority, application Japan, Feb. 21, 1969, 44/12554; Nov. 11, 1969, 44/89730
Int. Cl. H04n *5/76*
U.S. Cl. 178—5.4 CD 14 Claims



In a color video signal recording and reproducing system, a color video signal is separated into a luminance signal and a chrominance signal. A frequency modulated luminance signal is superimposed on a frequency converted chrominance signal. This superimposed signal is recorded on a magnetic medium and reproduced therefrom. The chrominance signal is converted into a signal having a frequency which makes beats inconspicuous. A signal, which is in opposite phase to the beats, is produced in order to eliminate the beats which are produced in the recording and reproducing processes. The opposite phase signal are added to the luminance signal on either the recording side or the reproducing side of the system.

3,715,469
COLOR TELEVISION RECEIVER

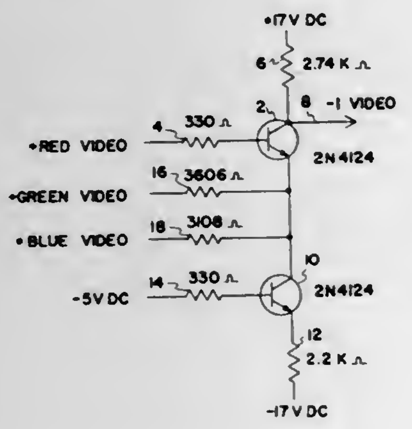
Hideshi Tamaru, Kanagawa, and Yoshio Ishigaki, Tokyo, both of Japan, assignors to Sony Corporation, Tokyo, Japan
Filed June 11, 1971, Ser. No. 152,255
Claims priority, application Japan, Nov. 17, 1970, 45/101287
Int. Cl. H04n *9/02*
U.S. Cl. 178—5.4 P 22 Claims



A decoding system for PAL television signals. One line of chrominance information is applied to synchronous demodulators and, by means of a switching circuit and delay means, the same line, delayed one line interval, is again applied to the same demodulators. The reference sub-carrier generating means to be controlled by synchronizing color bursts is switched to be controlled, on alternate lines, first by direct burst signals and then by inverted burst signals so that the phase of the reference sub-carrier signal will be between the phases of the controlling signals and will reverse polarity between lines. The phase of the reference sub-carrier signal may be adjustable for hue control.

3,715,470
COLOR TELEVISION CAMERA ENCODER MATRIX WITH SUMMATION OF TWO COLOR VIDEO CURRENT SIGNALS AND A CONSTANT CURRENT SIGNAL

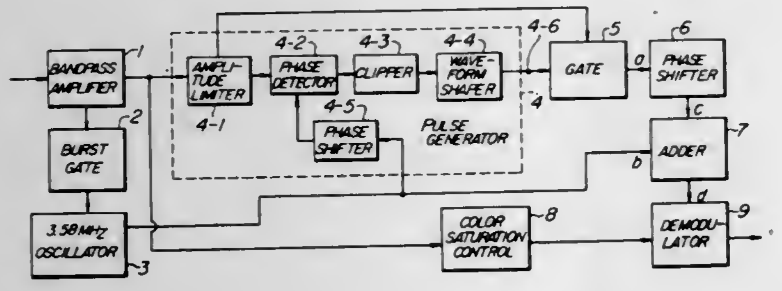
Philip V. C. Craig, Salt Lake City, Utah, assignor to Telemation Inc., Salt Lake City, Utah
Filed March 29, 1971, Ser. No. 129,076
Int. Cl. H04n *9/52*
U.S. Cl. 178—5.4 R **6 Claims**



A method and apparatus for encoding color information from the video signals of a color television camera comprising a matrix including a current summing transistor which is supplied by a constant current source and two color signals which are applied in parallel with each other and with the constant current source. The third color signal is applied to vary the bias of the summing transistor in a manner to cause variations in the currents summed from the first two color signals. Identical circuits may be employed with only minor changes for encoding to derive both the I and Q video signals.

3,715,471
COLOR TELEVISION RECEIVER

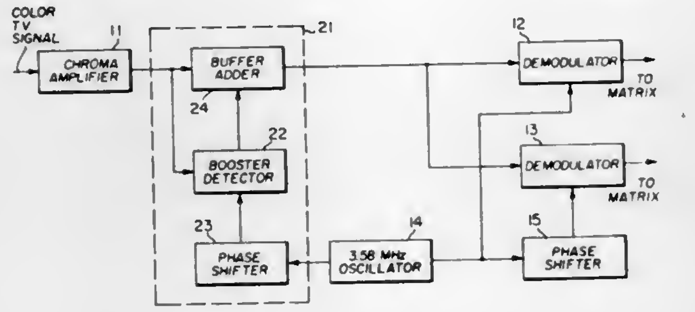
Ryuhei Nakabe, Hirakata; Seiji Fujisawa; Yasuhiro Sugihara, both of Osaka, and Norio Meki, Neyagawa, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Oct. 9, 1970, Ser. No. 79,368
Claims priority, application Japan, Oct. 15, 1969, 44/82836; Oct. 15, 1969, 44/82838; Dec. 2, 1969, 44/97412
Int. Cl. H04n *9/12*
U.S. Cl. 178—5.4 HE **5 Claims**



In a television receiver which receives color television signals including a carrier chrominance signal; in order to compensate for the out-of-phase condition of a carrier chrominance signal and errors in hue in broadcasting, transmitting and receiving systems, a pulse timed to a signal of a specified phase angle and phase width among carrier chrominance signals is generated and used as a reference signal for continuously or partially phase-shifting a 3.58 MHz continuous wave, thereby securing a specified hue of demodulated color signals.

3,715,472
COLOR EMPHASIS CIRCUIT FOR TV RECEIVERS

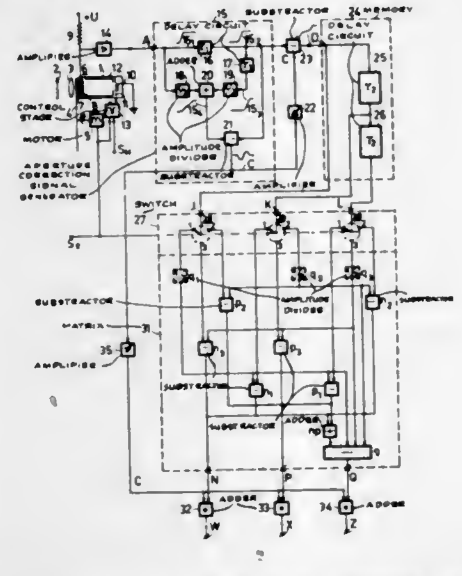
James E. McTaggart, Malibu, Calif., assignor to Teledyne, Inc., Los Angeles, Calif.
Filed Jan. 13, 1971, Ser. No. 106,096
Int. Cl. H04n *9/12*
U.S. Cl. 178—5.4 HE **5 Claims**



A circuit for enhancing a particular color in a color television receiver. A portion of the color signal is demodulated along the desired color axis, rectified and modulated with a phase controlled reference signal of like frequency. The signal so processed is added to the original color signal for normal demodulation. In a preferred version the color signal is applied through a diode to the base of a transistor having a threshold between the peak voltage appearing at the base with no color signal present and the peak voltage appearing at the base in the presence of a color signal in phase with the reference signal. The output signal of the transistor is then added back to the color signal to provide the enhanced color signal.

3,715,473
FIELD-SEQUENTIAL COLOR TELEVISION CAMERA INCLUDING A COLOR FILTER AND ONE CAMERA TUBE

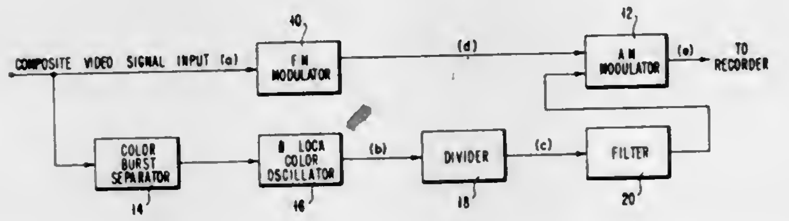
Sing Liong Tan, Emmasingel, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Filed March 22, 1971, Ser. No. 126,693
Claims priority, application Netherlands, April 18, 1970, 7005645
Int. Cl. H04n *9/06, 9/42*
U.S. Cl. 178—5.4 ST **10 Claims**



A field-sequential color television camera including one camera tube and a color filter. The camera tube is coupled to an aperture correction signal generator and a field-sequential simultaneous converter. The aperture correction signal is added to the picture signal of the camera tube in such a manner that a frequency restricted picture signal providing a poorly detailed image upon display is applied to a memory in the converter. The aperture correction signal which is field-sequential and is maintained field-sequential is added for the purpose of aperture correction to the frequency-restricted picture signals provided simultaneously by the converter.

3,715,474
COLOR VIDEO RECORDING AND PLAYBACK SYSTEM

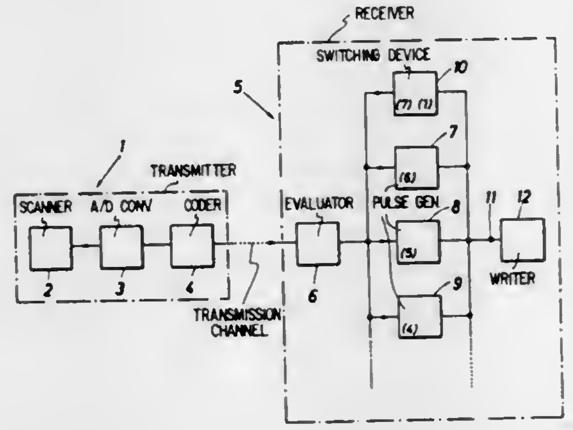
Richard W. Calfee, San Jose, and Emil Hopner, Los Gatos, both of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Dec. 26, 1967, Ser. No. 693,326
Int. Cl. H04n *9/02*
U.S. Cl. 178—5.4 CD **4 Claims**



A color video recording and playback system employs a continuous sinusoidal subharmonic of the color subcarrier signal, which is used to amplitude modulate a frequency modulated video signal during the record mode, and is retrieved during playback for synchronization and phase correction of the color signal.

3,715,475
METHOD AND APPARATUS FOR ELECTRICALLY TRANSMITTING PICTURES

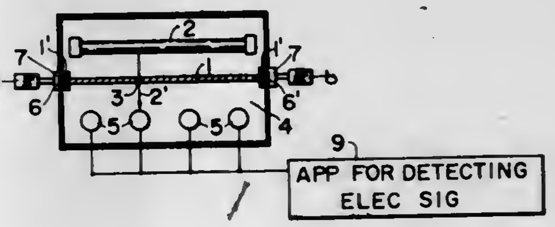
Dieter Prause, Esslingen/Neckar, and Rolf Sost, Stuttgart, both of Germany, assignors to Robert Bosch Elektronik GmbH, Berlin, Germany
Filed April 27, 1971, Ser. No. 137,757
Claims priority, application Germany, April 28, 1970, P 20 20 639.7
Int. Cl. H04n *1/02, 7/12*
U.S. Cl. 178—5 **1 Claim**



Apparatus for transmitting pictures by scanning the picture at the transmitting end to produce a voltage proportional to the brightness value of each picture element, associating the voltage for each element with a predetermined signal corresponding to the amplitude range in which that voltage lies, transmitting the predetermined signal, and, at the receiving end causing each signal to actuate a corresponding pulse sequence whose pulse duration to the pulse interval ratio is proportional to the voltage range with which its signal is associated.

3,715,476
METHOD AND APPARATUS FOR DETECTING PINHOLES ON SHEET ARTICLES

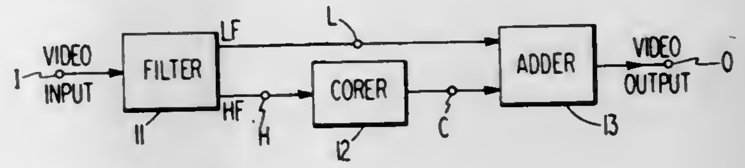
Tetsuo Watanabe, and Shinya Hashirizaki, both of Kitakyushu, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan
Filed Jan. 14, 1970, Ser. No. 2,724
Claims priority, application Japan, Jan. 16, 1969, 44/3004; Aug. 1, 1969, 44/61345
Int. Cl. H04h *7/02*
U.S. Cl. 178—6 **9 Claims**



Method and apparatus for detecting pinholes and edge cracks in such sheet articles as paper, rubber sheet and metal sheets by using such detection facilities as a television camera.

3,715,477
VIDEO SIGNAL NOISE-LIMITING APPARATUS

Charles Langdon Olson, Oaklyn; John Francis Monahan, Moorestown, and Robert Adams Dischert, Burlington, all of N.J., assignors to RCA Corporation
Filed March 11, 1971, Ser. No. 123,233
Int. Cl. H04n *9/02, 5/14*
U.S. Cl. 178—5.4 R **13 Claims**

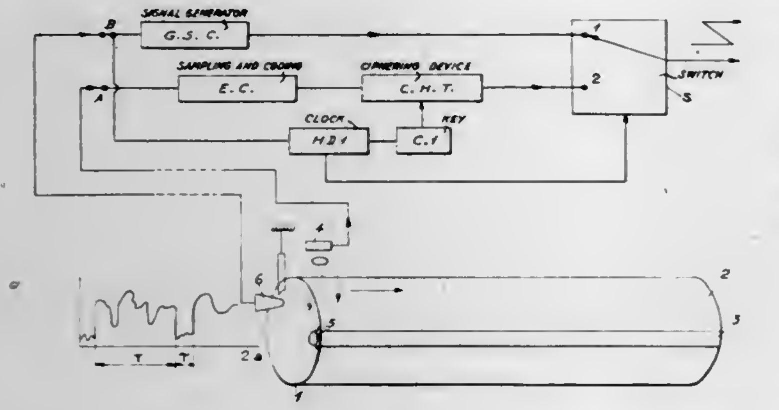


The signal is separated into high and low frequency constituents by a filter, the high frequency signal constituent is cored to remove low amplitude excursions therefrom, and the cored high frequency signal constituent is combined with the low frequency signal constituent in suitable proportions to produce a resultant signal having an improved signal-to-noise ratio. In one form of the apparatus the video signal is the luminance component. In another form the noise-limiting is applied to each of a plurality of component color signals. A composite color television video signal is noise-limited by further forms of the apparatus.

3,715,478
SECRECY FACSIMILE SYSTEM

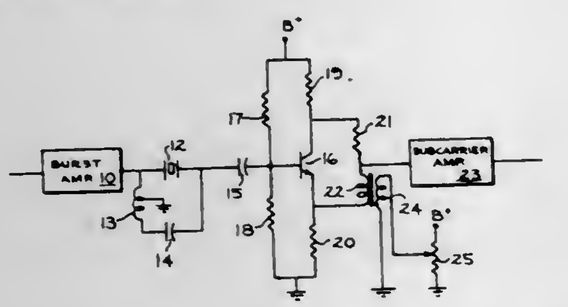
Jean-Pierre Vasseur, Paris, France, assignor to CSF-Compagnie Generale de Telegraphie Sans Fil
Continuation of Ser. No. 552,194, May 23, 1966, abandoned. This application July 31, 1970, Ser. No. 60,159
Int. Cl. H04n *1/44*
U.S. Cl. 178—5.1 **5 Claims**

A system for secret communication is intended for transmitting successive sequences of *n* information digits, each sequence being separated from the following one by predetermined synchronization digits. The information digits are ciphered before the transmission, and the synchronization



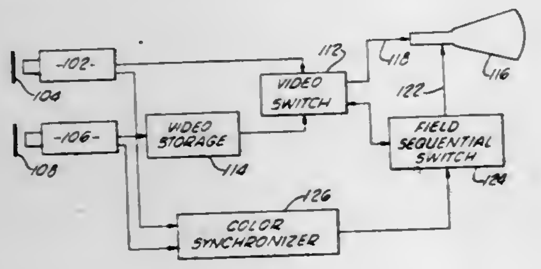
digits are transmitted in clear. The synchronization digits are used for synchronizing the ciphering at the transmission, and the deciphering at the reception.

3,715,479
TINT CONTROL CIRCUIT USING PHASE SPLITTER
R. John H. Brush, and George W. Singleback, both of Chesapeake, Va., assignors to General Electric Company
Filed April 9, 1971, Ser. No. 132,772
Int. Cl. H04n *9/44*
U.S. Cl. 178—5.4 HE **3 Claims**



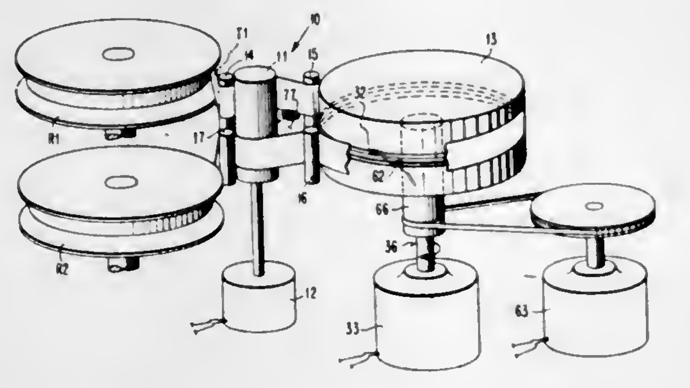
Opposed-phase 3.58 MHz subcarrier signals are applied to opposite ends of a circuit comprising the series combination of a resistor and a variable inductor. An output taken at the junction between the resistor and inductor produces a sinusoidal voltage whose magnitude remains substantially constant and whose phase may be varied by changing the value of the inductor. In a further embodiment a capacitor is connected in series with the inductor to afford a broader range of phase control.

3,715,480
MOTION DETECTION SYSTEM
Arnold M. Levine, Chatsworth, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.
Filed Sept. 29, 1969, Ser. No. 861,751
Int. Cl. H04h *7/02*
U.S. Cl. 178—6 **6 Claims**



A method and system for detecting object motion. Light emanating from a scene is filtered by a first filter and second filter and recorded by a first recording device and a second recording device, respectively. The signals from one of the recording devices is delayed with respect to the other recording device and then both signals are reproduced. At least one of the reproduced signals is again filtered and then both reproduced signals are then superimposed and a color reproduction suitable for detection by the human eye is produced. The reproducing means may be in the form of a phosphor screen which changes color as current density is changed, with each of the signals being alternately applied to the reproducing means. Alternatively, the recording device and reproducing means could be motion picture cameras and projectors or television cameras and receivers.

3,715,481
MAGNETIC RECORDING AND REPRODUCTION APPARATUS FOR SINGLE PICTURE VIDEO WITH AUDIO
Jerome D. Harr, San Jose, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.
Filed Aug. 2, 1967, Ser. No. 657,897
Int. Cl. G11b *5/50*
U.S. Cl. 178—6.6 FS **10 Claims**

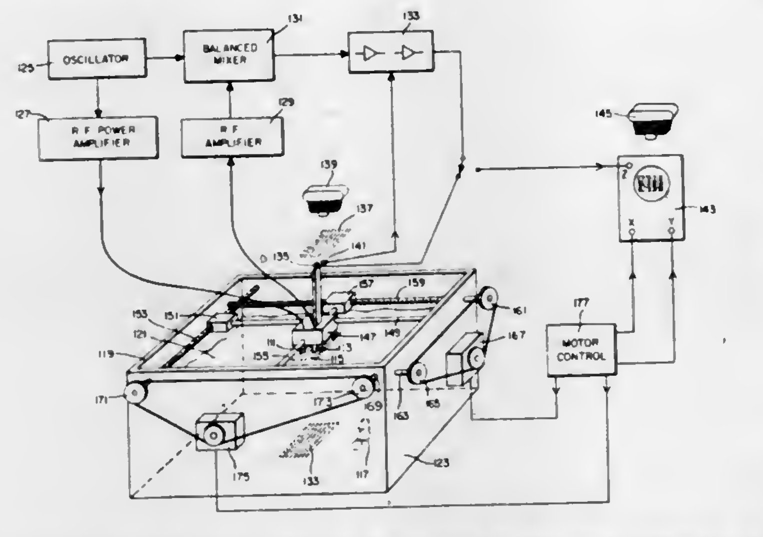


An audio and visual recorder wherein the magnetic tape is helically wound about a drum which contains a video and an audio magnetic record and playback head for recording and playing back video and audio information obliquely disposed on tracks of the tape. The head scans a first path of the tape while the tape is being held stationary to provide one frame or two fields of video information. Subsequently the audio head scans the video tape selectively and at a much slower speed. In this way, a single picture can be repetitively obtained on a first track at a first speed by the video head and the audio is recorded at a much slower speed to correspond to the single picture on the video track. After the audio track has been completed to its desired length the recording tape is moved longitudinally to a second position for recording a second video track and a second audio track. The cycle then repeats itself so that a first video track is recorded at a relatively high speed and the audio track at a much slower speed is completed.

3,715,482
HOLOGRAPHIC IMAGING BY SIMULTANEOUS SOURCE AND RECEIVER SCANNING
Kenneth A. Haines, Christchurch, New Zealand, and Bernard P. Hildebrand, Richland, Wash.
Division of Ser. No. 744,732, July 15, 1968, Pat. No. 3,632,183. This application Oct. 12, 1971, Ser. No. 188,148
Int. Cl. H04n *1/24*
U.S. Cl. 178—6.7 R **5 Claims**

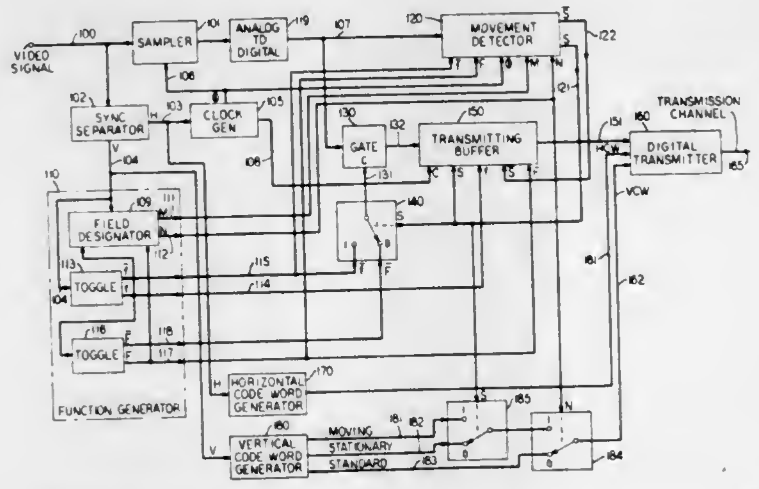
Both a radiation source and a radiation receiver are scanned relative to an object scene under investigation for obtaining holographic information as to the scene. By relating the relative movement of the source and receiver in a predetermined manner, various characteristics of the holographically reconstructed image of the object scene may be controlled. In one embodiment, the source and receiver are locked together and

scanned relative to an object scene during the construction of a hologram capable of reconstructing an image of the object scene with twice the resolution that is obtained by ordinary holographic techniques. Apparatus for carrying out this im-



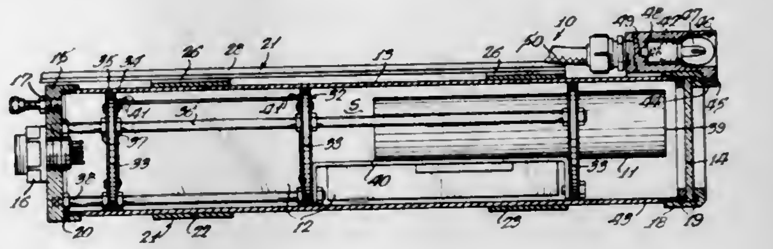
proved scanning technique is disclosed in the embodiment of ultrasonic holography wherein a hologram is constructed directly on photographic film or displayed on a cathode ray oscilloscope.

3,715,483
BANDWIDTH REDUCTION SYSTEM FOR USE WITH VIDEO SIGNALS
John Ormond Limb, New Shrewsbury, and Roger Fabian Wedgwood Pease, Holmdel, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.
Filed Dec. 11, 1970, Ser. No. 97,079
Int. Cl. H04n *7/12*
U.S. Cl. 178—6.8 **12 Claims**



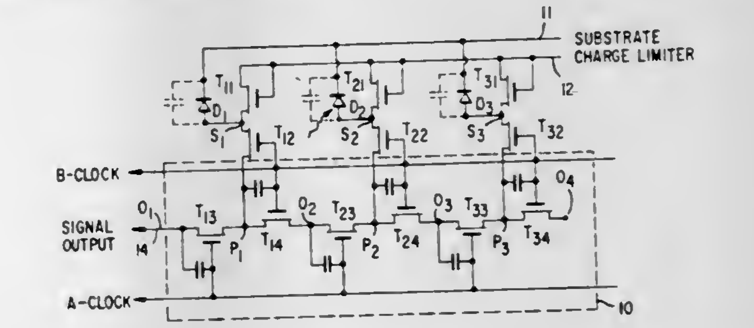
Changes in the amplitude values of the picture elements in every fourth field of an interlaced video signal are counted in order to determine whether or not movement has occurred in the picture. If movement has not occurred, alternate frames are transmitted to the receiving location. If movement has occurred, alternate fields are transmitted to the receiving location. In the receiver, when no movement is detected, the amplitude value for each picture element in the frames which have not been transmitted is reconstituted by temporally interpolating between the corresponding amplitude values for that picture element in the adjacent transmitted video frames. When movement is detected, the amplitude values for each picture element in the nontransmitted fields is established by temporally and spatially interpolating between the values for the picture elements taken from adjacent lines in the fields which precede and follow the nontransmitted picture element. To buffer the selected video information with a transmission system having a constant bit rate, the even picture elements are stored for transmission during the intervals when the frames and fields are blocked from being coupled through to the transmission channel.

3,715,484
DUCT SCANNING APPARATUS
Roy C. Latall, Des Plaines, Ill., assignor to Conco Inc.
Filed Feb. 11, 1971, Ser. No. 114,606
Int. Cl. H04n *5/26, 7/10*
U.S. Cl. 178—6.8 **9 Claims**



A duct scanning apparatus such as for use in determining leaks in a sewer pipe or the like wherein means are provided for progressively picturing the length of the inside of the duct. The picturing means may include a television vidicon pickup tube mounted within a tubular housing. The housing is preselected to be smaller in diameter than the inside of the sewer duct and means are provided for slidably carrying the housing on the duct wall so as to dispose the axis of the housing substantially below the axis of the duct. The apparatus further includes illuminating means carried on the housing for illuminating the portion of the interior of the sewer duct being pictured.

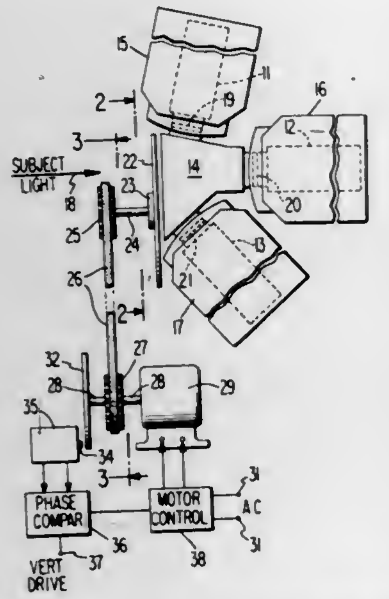
3,715,485
RADIATION SENSING AND SIGNAL TRANSFER CIRCUITS
Paul Kessler Weimer, Princeton, N.J., assignor to RCA Corporation
Filed Oct. 12, 1971, Ser. No. 188,183
Int. Cl. H04n *5/30*
U.S. Cl. 178—7.1 **12 Claims**



An array of radiation sensing elements such as photodiodes and a corresponding number of charge storage means, each associated with a different sensing element. A charge limiting circuit limits to a given level the maximum charge which may be accumulated by any storage means. The charge in a row of storage means may be transferred to an output register by concurrently: (a) disconnecting the limiting circuit from the row of storage means, (b) enabling a set of charge transfer gates between the row of storage means and the register, and (c) shifting the voltage levels at the row of storage means.

3,715,486
SHUTTERING APPARATUS FOR TELEVISION CAMERAS
Harry Gilbert Wright, Haddonfield, N.J., and Robert Adams Dischert, Burlington, N.J., assignors to RCA Corporation
Filed March 19, 1971, Ser. No. 126,081
Int. Cl. H04n *5/38*
U.S. Cl. 178—7.2 **10 Claims**

The apparatus is a generally opaque disc mounted in the camera tube light path for rotation about an axis vertically displaced from the light path and having two like, diametrically opposed and generally arcuate apertures with such configurations that different horizontal areas of the photosensitive target electrode of the tube are successively and equally exposed to light from a subject during each scanning field.



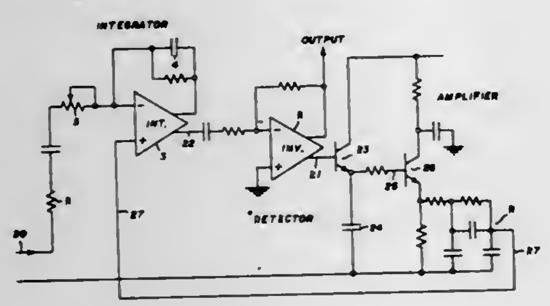
3,715,487
PARABOLA GENERATOR MOVING ERROR CORRECTOR

James E. Blake, Liverpool, N.Y., assignor to General Electric Company

Filed Oct. 29, 1971, Ser. No. 193,887

Int. Cl. H03b *1/00*

U.S. Cl. 178—7.3 R **7 Claims**



A circuit for producing a parabola waveform which comprises a differential input integrator receiving a ramp waveform at a first input and employs a feedback circuit including a peak detector connected to its second input. Any departure of the vertical rate parabola from steady-state conditions, caused by introducing a DC component into the first input, is thus detected in the form of an error voltage at the second input of the integrator, thereby cancelling out the DC component to prevent its having any effect on the output signal.

3,715,488
NOISE CANCELLATION CIRCUIT

Tadashi Takise, and Takashi Okada, both of Tokyo, Japan, assignors to Sony Corporation, Shinagawa-ku, Tokyo, Japan

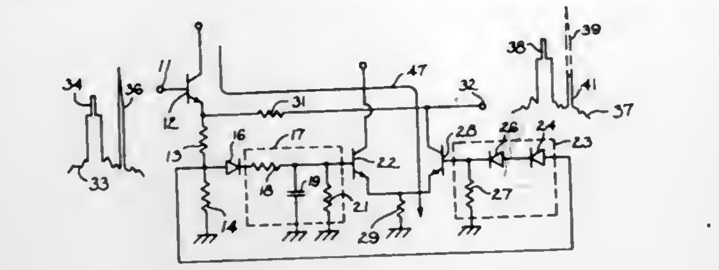
Filed April 1, 1971, Ser. No. 130,084

Claims priority, application Japan, April 3, 1970, 45/28456

Int. Cl. H04n *5/04, 5/44*

U.S. Cl. 178—7.3 S **8 Claims**

An amplifier circuit for stabilizing sync circuits and reducing noise voltage spikes that extend beyond sync signal level of a television signal. The television signal is applied through a rectifier and smoothing circuit to a differential amplifier, which includes a normally non-conductive switching element that forms part of a voltage divider for the television signal. The same signal, without rectification or smoothing, is also applied to the differential amplifier. Noise voltage peaks exceeding sync peaks cause the differential amplifier to make the switching element conduct and activate the voltage divider to divide the television signal in order to bring noise pulse peaks below the sync level.



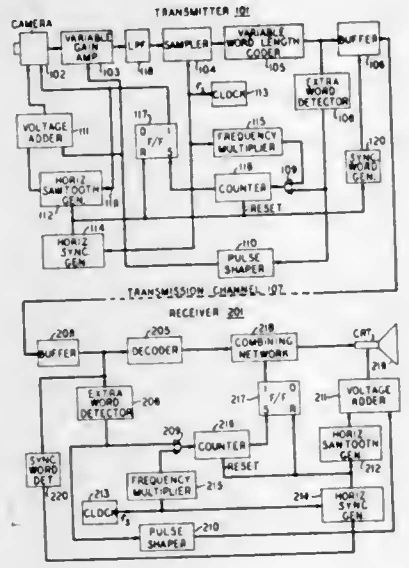
3,715,489
APPARATUS FOR PREVENTING BUFFER OVERFLOW IN VIDEO ENCODING SYSTEMS BY INCREASING THE SCANNING RATE OF A CAMERA DURING THE TIME INTERVAL OF THE ENCODING OF DIGITAL WORDS OF EXTRA LENGTH

Earl Franklin Brown, Piscataway, and William Kaminski, West Portal, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Feb. 23, 1971, Ser. No. 118,145

Int. Cl. H04n *7/12*

U.S. Cl. 178—7.1 **8 Claims**



To prevent buffer overflow from line-to-line accumulation of information in video encoding systems, a detector circuit notes the occurrence of extra words or extra digits produced by a variable word length encoder. In response to this detection, a voltage adding means incrementally alters the slope of the horizontal sweep sawtooth which, in turn, results in a temporary increase in camera scanning speed. Logic means insures that the time obtained from the active scanning region by increasing scanning speed is allocated to the blanking interval.

3,715,490
CAMERA TUBE RESIDUAL IMAGE ELIMINATION APPARATUS

Takashi Okada, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

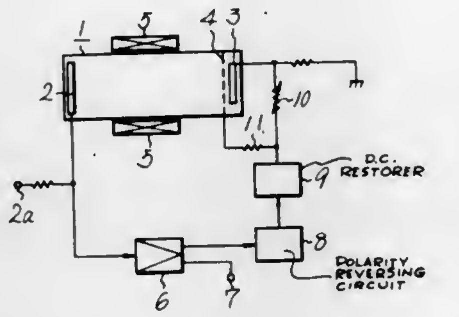
Filed May 25, 1970, Ser. No. 39,999

Claims priority, application Japan, May 31, 1969, 44/42808

Int. Cl. H04n *5/34*

U.S. Cl. 178—7.2 **12 Claims**

In color video signal generating apparatus which includes a video camera tube such as a Vidicon tube, the output signal often includes a residual image component. The residual image component appears in the picture as a ghost of the previous frame or frames. This invention provides a system for diminishing the residual image component by feeding back a portion of the output signal from the camera to the beam generating portion of the camera tube.



3,715,491
TELEVISION CAMERA TUBE COOLING ARRANGEMENTS

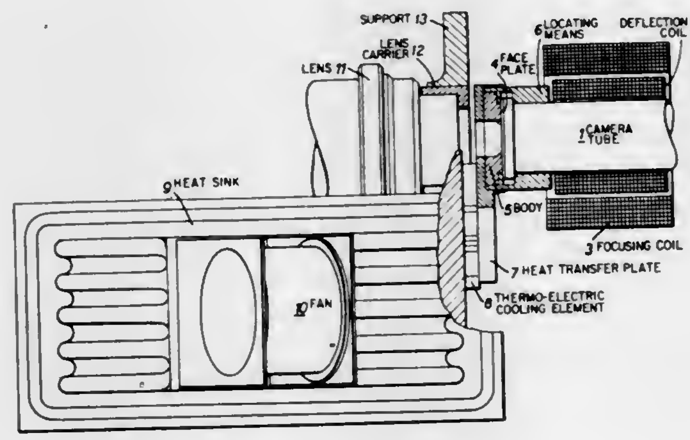
Derek James Finch, Essex, England, assignor to The Marconi Company Limited, London, England

Filed March 8, 1971, Ser. No. 121,767

Claims priority, application Great Britain, March 14, 1970, 12,396/70

Int. Cl. H04n *5/26*

U.S. Cl. 178—7.2 **8 Claims**



A camera tube cooling arrangement has a body of good thermal conductivity and low dielectric constant mounted in good thermal contact with the face plate of the camera tube and outside the image area of the camera tube. The body is cooled by a thermo-electric cooling unit which is mounted with its cold face in thermal contact with the body and its hot face in thermal contact with a finned heat sink.

3,715,492
HIGH VOLTAGE PROTECTION CIRCUIT

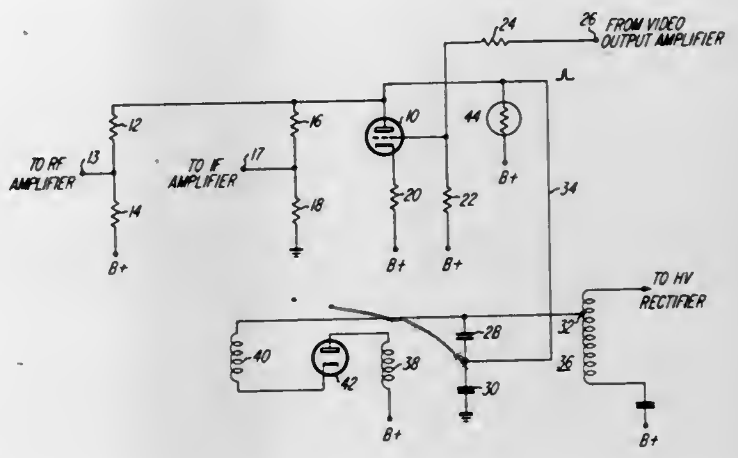
William Vincent Fitzgerald, Jr., Indianapolis, Ind., assignor to RCA Corporation

Filed May 18, 9171, Ser. No. 144,458

Int. Cl. H04n *5/68*

U.S. Cl. 178—7.3 R **5 Claims**

A voltage dependent resistor is cooperatively coupled with a keyed automatic gain control device to provide control signals sufficient to bias off the radio and intermediate frequency amplifier stages of a television receiver when the amplitude of the keying pulse reflects an open-circuiting of a horizontal retrace capacitor which raises the developed high voltage to an excessive level.



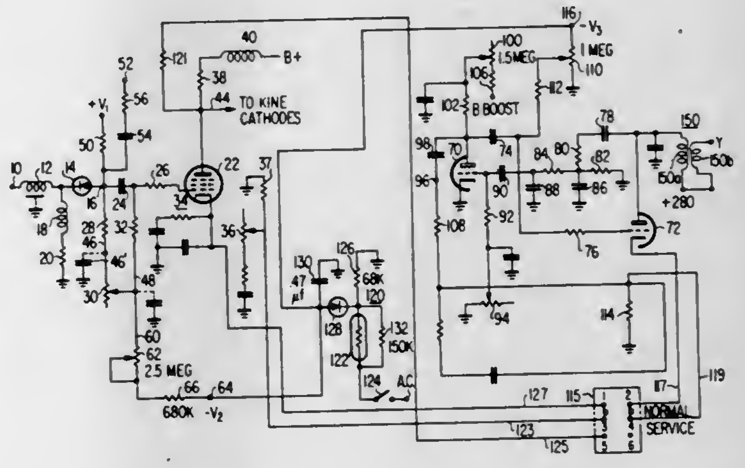
3,715,493
SERVICE SWITCH ARRANGEMENT FOR IMPROVED INTERLACE PERFORMANCE

John Kenneth Allen, Indianapolis, Ind., assignor to RCA Corporation

Filed Oct. 12, 1971, Ser. No. 187,987

Int. Cl. H04n *5/44, 9/12*

U.S. Cl. 178—7.3 R **4 Claims**



A set-up switch, employed in making gray scale adjustments during the manufacture and servicing of a television receiver, is constructed to disable the receiver's vertical deflection by opening the cathode circuit of the vertical output tube. By connecting into a relatively low impedance cathode circuit, any tendency for the switch network to pick up and couple horizontal pulse voltages into the vertical circuitry will be minimized, and interlace performance will be optimized. This will be so though the leads from the vertical output tube to the service switch on the television chassis are of the order of 24 inches, and longer.

3,715,494
PROJECTION SYSTEM

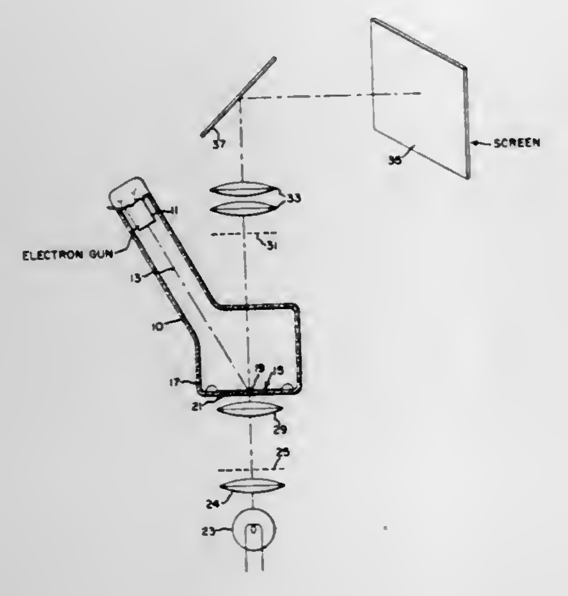
Edward F. Perlowski, Jr., Baldwinsville, N.Y., assignor to General Electric Company

Filed Jan. 28, 1971, Ser. No. 110,519

Int. Cl. G02b *5/22;* **H04n** *5/72*

U.S. Cl. 178—7.5 D **6 Claims**

An improved electronic image projection system having a container with a conducting interior and a deformable medium in the container which decreases in resistivity with decreases in thickness in the presence of electrical charge on the surface of the medium is provided by using as the deformable medium a polymeric material having as an additive a 9,10-anthracene derivative.



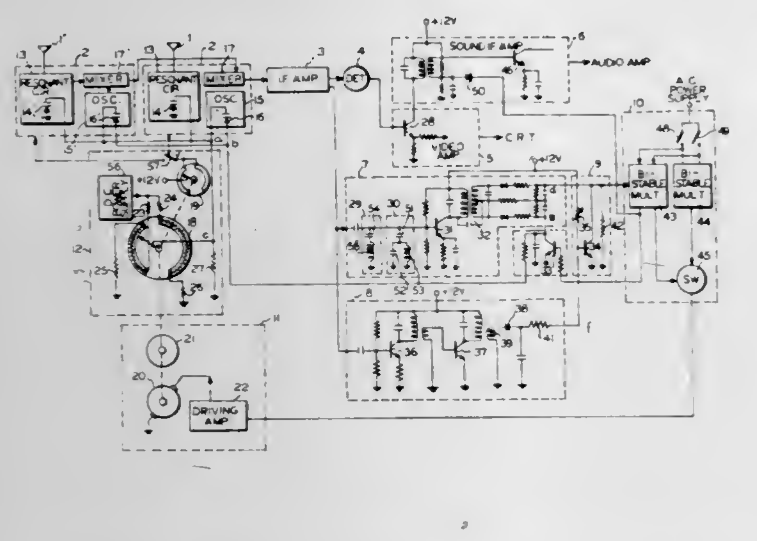
3,715,495

SIGNAL SEEKING TYPE AUTO-TUNING TELEVISION RECEIVER

Tsuneo Takezaki, Neyagawa, and Sukeichi Miki, Hirakata, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Feb. 26, 1971, Ser. No. 119,136
Int. Cl. H04n *5/62*

U.S. Cl. 178—5.8 A **7 Claims**



A signal seeking type auto-tuning television receiver including a tuning means which has a reversely biased voltage variable capacitance diode, a main detecting means which comprises a limiter with a filtering circuit and a frequency discriminator for detecting sound IF carrier signals and developing a main control signal, a subsidiary detecting means which comprises a tuned amplifier, a transistor detector and a rectifier for detecting picture IF carrier signals and developing a subsidiary control signal, and a scanning means coupled to the tuning means to supply a sweep voltage to the voltage variable capacitance diode and controlled by the main and subsidiary control signals so as to stop when a desired television signal is received and so as not to stop when undesired noises are detected.

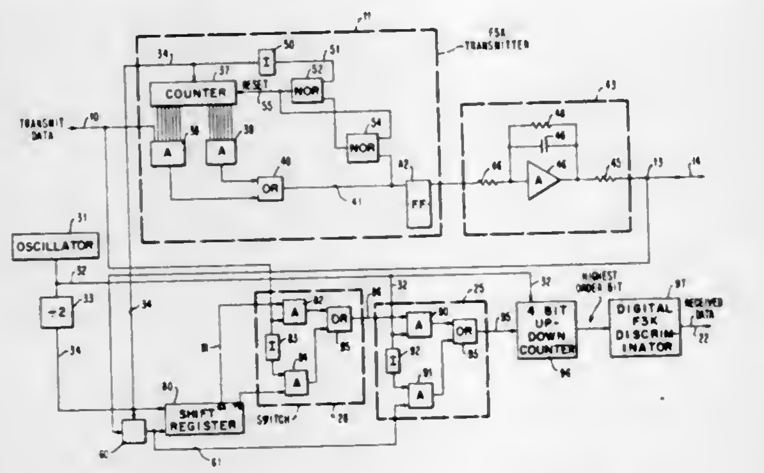
3,715,496

DIGITAL BAND-PASS FILTER FOR A SINGLE CIRCUIT FULL DUPLEX TRANSMISSION SYSTEM

Gardner D. Jones, Jr., Raleigh, N.C., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 21, 1971, Ser. No. 191,295
Int. Cl. H04l *5/14*

U.S. Cl. 178—58 **4 Claims**



A full duplex data communications system using a single transmission circuit is shown. Each terminal of the system has its receiver circuit provided with a digital filter to remove from its input circuit, the frequencies being used for data transmission at that terminal. The digital filter is switchable by the data signal to be transmitted and will be set to block from the receiver, the particular frequencies then being used to transmit data. In the preferred embodiment, the signal on the transmission line is converted to a delta modulated signal which is combined with its prior signal delayed by an interval dependent upon the data being transmitted from that terminal to generate a delta modulated filtered signal carrying the received data. The filtered signal is then converted to recover the received data.

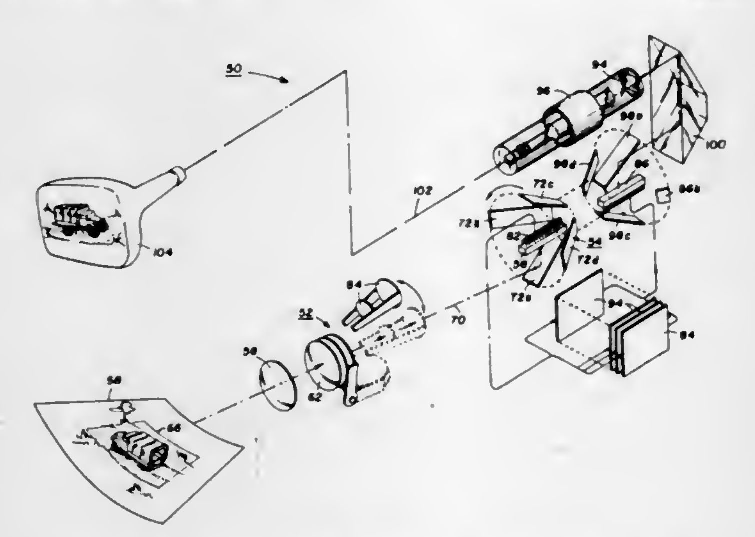
3,715,497

OPTICAL SCANNER AND REAL TIME IMAGE CONVERSION SYSTEM

Erwin E. Cooper, and Howard V. Kennedy, both of Dallas, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jan. 2, 1969, Ser. No. 790,508
Int. Cl. H04n *3/00*

U.S. Cl. 178—6.8 **35 Claims**



A system for converting infrared radiation in the 8–14 micron region to a real time visual image is disclosed. A lens system focuses the image at an image plane. A plurality of mirrors are disposed between the lens system and the image plane and are rotated about an axis intersecting the optical axis at the entrance pupil. Each mirror is disposed to focus an arcuate segment of the image onto a linear array of detectors located substantially on the axis of rotation as the mirror moves through the optical field of view. The image thus scanned is reconstituted at the target of a vidicon type television camera by the same type of system having mirrors rotated in synchronism with the scanning mirrors, but utilizing light emitters rather than light detectors. The video signal from the television camera is then displayed on a conventional television display tube for visual observation.

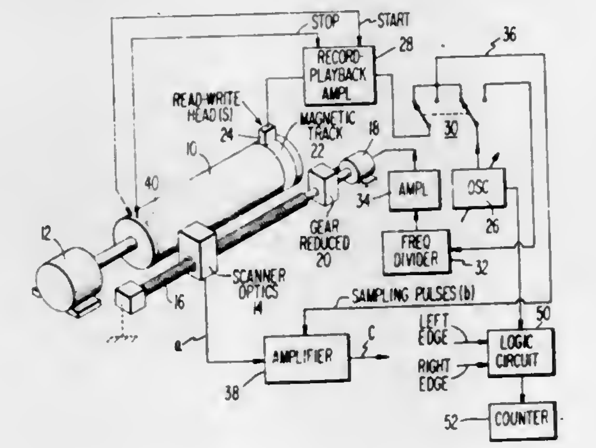
3,715,498

SCANNING SYSTEM WHICH INCLUDES MEANS FOR CONTROLLING PICTURE SAMPLING DENSITY

Harold E. Haynes, Cranbury, N.J., assignor to RCA Corporation

Filed Sept. 7, 1971, Ser. No. 178,330
Int. Cl. H04n *1/04*

U.S. Cl. 178—69.5 F **3 Claims**



Clock signals are recorded on an erasable track, such as a magnetic track, on the surface of a facsimile-type drum. These signals are read from the drum during the optical scanning process and employed to sample the electrical signal produced by the optical scanner. Any desired sampling density in the circumferential direction, over a relatively broad range, may be achieved by control of the frequency at which the clock signals are recorded on the erasable track. The same sampling density in the axial direction may be obtained by control of the speed, in the direction of the drum axis, of the optical scanner.

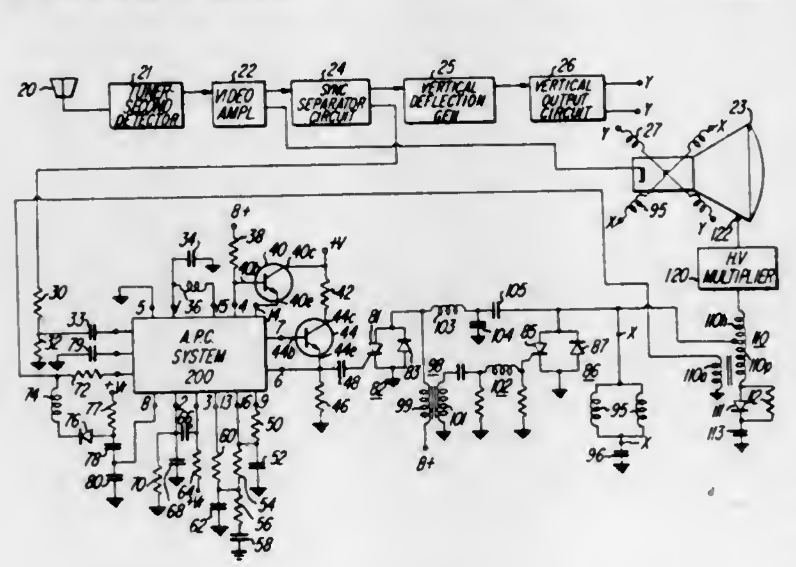
3,715,499

DUAL MODE AUTOMATIC FREQUENCY CONTROLLED OSCILLATOR SYSTEM

Steven Alan Steckler, Clark, N.J., assignor to RCA Corporation

Filed Dec. 3, 1970, Ser. No. 94,889
Int. Cl. H04n *5/04*

U.S. Cl. 178—69.5 TV **13 Claims**



A dual mode automatic phase controlled oscillator system employs multiple keyed phase comparators to produce control signals which are applied to lock the oscillator frequency and phase to a reference signal. One of the keyed comparators is continuously employed to produce an in-sync control signal. A coincidence gate is utilized to detect the existence of out-of-sync conditions, and associated circuitry produces a mode control signal which is applied to activate the second keyed phase comparator upon such occurrence: The second keyed comparator is thereby selectively operative during out-of-sync conditions to develop an additional control signal to enhance the pull-in characteristics of the system.

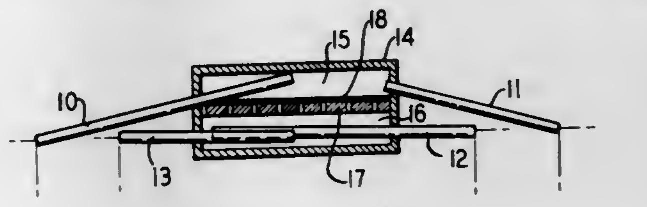
3,715,500

UNIDIRECTIONAL MICROPHONES

Gerhard Martin Sessler, Summit, and James Edward West, Plainfield, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed July 21, 1971, Ser. No. 164,507
Int. Cl. H04r *1/32*

U.S. Cl. 179—1 DM **10 Claims**



A second-order unidirectional microphone is constructed with two pairs of acoustic tubes arranged to sample a sound field at four different points on a straight line. Acoustic signals from two diametrically opposed tubes, one short and one long, are summed in a first cavity and signals from two other opposed tubes, one short and one long, are summed in another cavity. Signals developed in the two cavities are differentially combined by an electret or other transducer interposed between the cavities. Necessary signal delay is provided directly by differences in tube lengths.

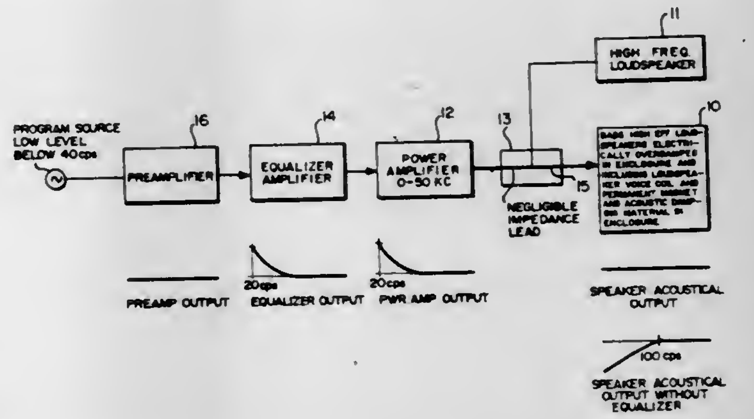
3,715,501

LOUDSPEAKER SYSTEM

Roger Howard Russell, Binghamton, N.Y., assignor to McIntosh Laboratory, Inc., Binghamton, N.Y.

Filed Nov. 3, 1969, Ser. No. 873,264
Int. Cl. H04r *3/12*

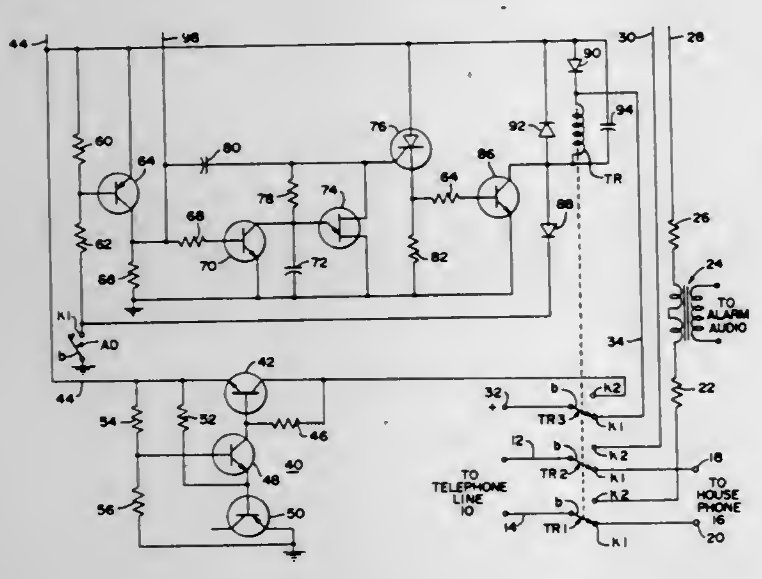
U.S. Cl. 179—1 D **2 Claims**



A flat acoustic pressure response, compensating network, driver amplifier and loudspeaker system, the driver amplifier being an effective voltage source and the loudspeaker system containing multiple speakers including a low frequency loudspeaker mechanism which is both efficient and highly damped magnetically by providing a powerful magnetic flux field, and a many turn motor coil which is capable of enforcing wide cone excursions. The loudspeaker mechanism in the enclosure without acoustic damping has a higher Q than the same mechanism in the same enclosure with acoustic damping added. Response gradually rolls off below 150 Hz and down to system resonance approaching a rate of 6 dB per octave. Below system resonance rolloff gradually approaches 12 dB per octave. Rolloff prior to system resonance occurs due to a high flux density, long motor turns, low resistance, and low moving mass producing a Q at system resonance of 0.5 or less. The speaker is operated at high efficiency above 150 Hz and its rolloff is compensated to about 20 Hz by a compensation equalizer. This equalizer is connected to the input of the driving power amplifier and involves about 20 dB of boost at 20 Hz.

3,715,502
ALARM COUPLER

Stephen J. Martin, Miami, Fla., assignor to Robertshaw Controls Company, Richmond, Va.
Filed March 3, 1971, Ser. No. 120,416
Int. Cl. H04m *11/04*
U.S. Cl. 179—2 C **16 Claims**

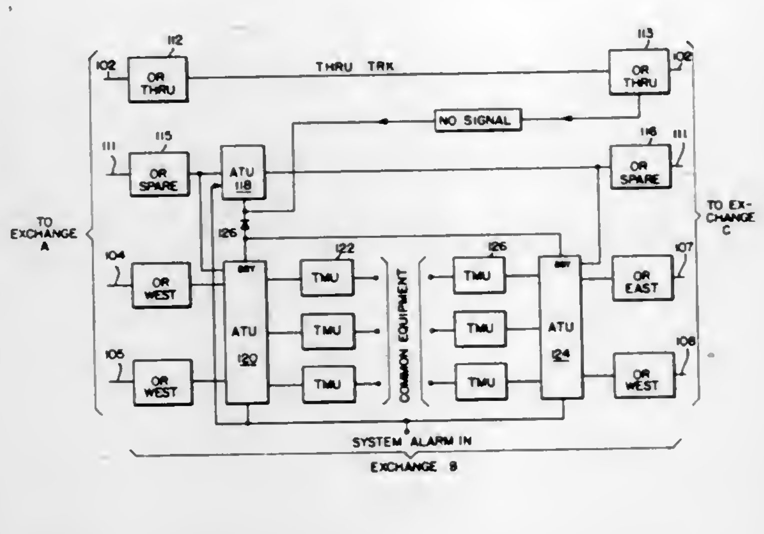


A solid-state coupler for transferring a telephone line from conventional house phones to automatic dialing apparatus upon the occurrence of an alarm includes a main transfer relay, a dialing relay adapted to be controlled by the automatic dialing apparatus, a start hang-up timer for opening the telephone line for a preselected hang-up interval upon actuation of the main transfer relay, a dial pulse reconstitution network, and a release delay timer for holding the main transfer relay energized for a preselected release time upon termination of the alarm sequence. Solid-state timing networks of the coupler provide line clearance and total exclusion of house phones for priority handling of all emergency calls.

3,715,503
AUTOMATIC TRANSFER ARRANGEMENT FOR TELEPHONE SYSTEM

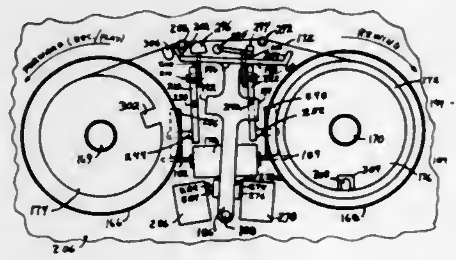
Ernest J. Jungbluth, Penfield, N.Y.; Paul K. Kavanaugh, Webster, N.Y., and Frederick H. Gardner, Penfield, N.Y., assignors to Stromberg-Carlson Corporation, Rochester, N.Y.
Filed Feb. 16, 1971, Ser. No. 115,310
Int. Cl. H04j *3/14*
U.S. Cl. 179—15 BF **3 Claims**

Logic circuitry for automatically substituting a spare trunk line in place of a normal one in response to an alarm signal generated at one or both of the central offices connected by the lines. The spare line is continually monitored, and if a fault develops on it, it is locked out of service.



3,715,504
AUTOMATIC TELEPHONE ANSWERING AND RECORDING SYSTEM

Chester J. Piott, 6824 Cranford Drive, Dayton, Ohio
Filed Nov. 17, 1970, Ser. No. 90,241
Int. Cl. H04m *1/64;* **G11b** *15/44*
U.S. Cl. 179—6 AC **7 Claims**

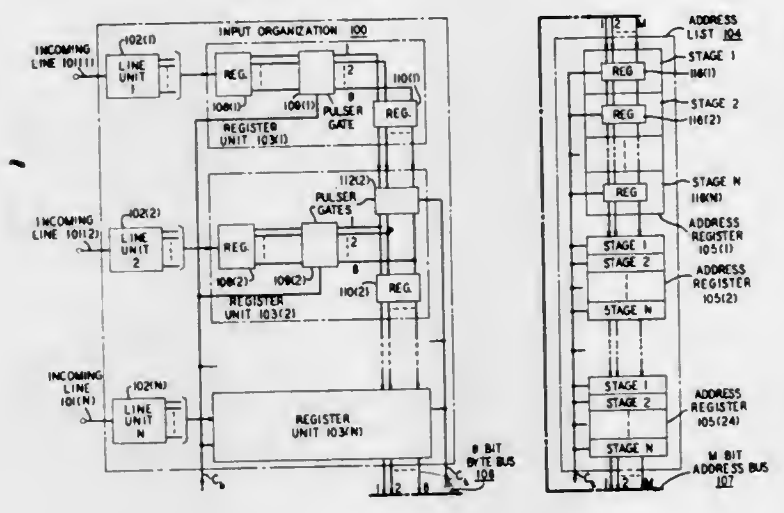


An automatic telephone answering and recording system having a passive circuit for detecting the ringing of a telephone annunciator bell. The signal generated in the circuit is of a sufficient level to cause a passive electronic switching element to become conductive which in turn permits energization of the system. Moreover, the system outgoing message tape is used to actuate a tape rewind mechanism, as well as to control the timing sequence for recording the message on the incoming message tape. The system does not use solonoids, electromechanical relays, alternating current motors or capstan drives and uses a minimum of precision mechanical parts to achieve a low system cost.

3,715,505
TIME-DIVISION SWITCH PROVIDING TIME AND SPACE SWITCHING

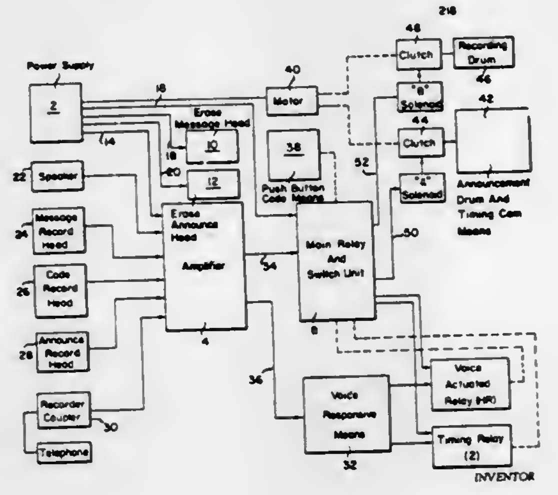
Travis Hill Gordon, New Shrewsbury; Patrick John Marino, Middletown, and Randolph John Pilc, Holmdel, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.
Filed March 29, 1971, Ser. No. 128,767
Int. Cl. H04q *11/04*
U.S. Cl. 179—15 AQ **5 Claims**

Incoming data channels on time-division lines are interconnected with any channels on outgoing time-division lines, the lines accommodating serial multibit bytes during individual time slots. All incoming bytes from the several lines are applied to a common data bus to create a superframe, the data bus having a plurality of parallel leads to carry the bits of the byte. Address data, applied to a common address bus by a processor, steers each byte from the data bus to a selected one of a plurality of registers, each register being dedicated to an outgoing channel. Each outgoing line then sequentially reads out the stored data from the registers dedicated to the outgoing channels accommodated by the outgoing line.



3,715,506
REMOTE CALL BACK TELEPHONE ANSWERING APPARATUS

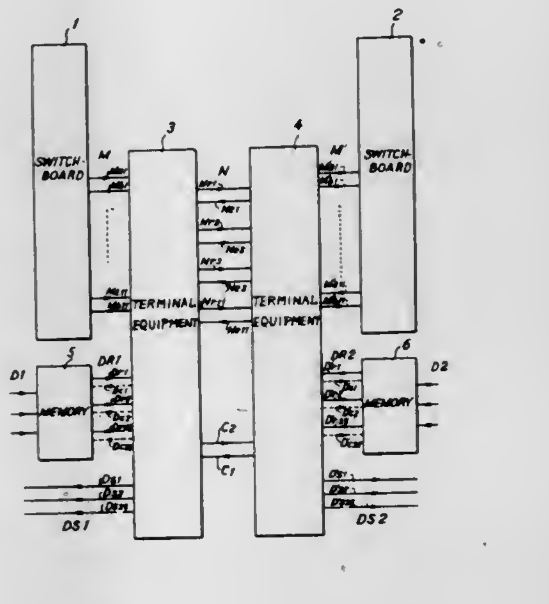
Herman Haag, Dachau Munich, and Willy Muller, Zollikon/Schweiz, Switzerland, assignors to said Muller, by said Haag
Filed May 23, 1968, Ser. No. 731,490
Int. Cl. H04m *1/64;* **G11b** *19/02*
U.S. Cl. 179—6 E **7 Claims**



Remote control means for operating telephone message recording apparatus to play back callers' messages that have been previously recorded on a recording drum. The invention is characterized by the provision of voice-code responsive means for activating the playback means only when a given oral sound is presented at predetermined code-responsive timing intervals.

3,715,507
BILATERAL START-STOP TRANSMISSION SYSTEM FOR DIGITAL INFORMATION

Shintaro Oshima, Tokyo; Yukio Nakagome, Yokohama, and Yasuo Fukata, Tokyo, all, Japan, assignors to Kokusai Denshin Denwa Kabushiki Kaisha, Tokyo-to, Japan
Continuation-in-part of Ser. No. 818,762, April 23, 1969, abandoned. This application May 26, 1972, Ser. No. 257,444
Claims priority, application Japan, July 22, 1968, 43/051372
Int. Cl. H04j *5/00*
U.S. Cl. 179—15 BY **1 Claim**

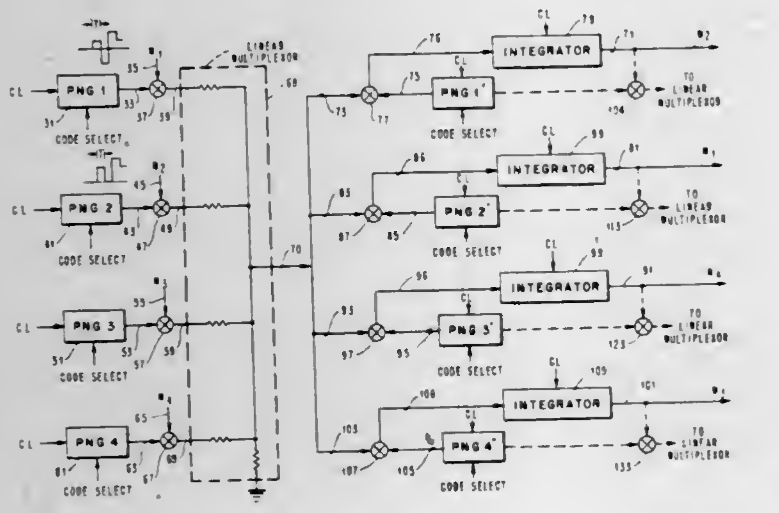


A transmission system for bilaterally transmitting digital information of a first group of two-way communication channels to a second group of two-way communication channels, respectively, corresponding to the first group of two-way communication channels by the use of a pair of terminal equipments and a plurality of two-way start-stop telegraph lines therebetween, the number N of which is at least equal to the number *n* of the two-way communication channels in each group. The digital information of a plurality of first one-way communication channels is temporarily stored at a memory device and then transmitted, after determination of active one-way communication channels to be connected to the two-way start-stop telegraph lines, from one of the terminal equipments to the other in a characterwise manner, so that the stored digital information of the determined active one-way communication channels is successively allocating to idle character periods of the two-way start-stop telegraph lines in a predetermined order of the active one-way communication channels and of the two-way start-stop telegraph lines so as to have particular polarities of start and stop elements distinct from those of the two-way communication channels. The transmitted digital information of the active one-way communication channels is distributed at the other of the terminal equipments to a plurality of active channels of the second one-way communication channels corresponding respectively to the first one-way communication channels by the use of control information indicative of the determined active first one-way communication channels and transmitted from one of the terminal equipment. The digital information of a plurality of third one-way communication channels is similarly transmitted from the other to the one of the terminal equipments to distribute to a plurality of fourth one-way communication channels.

This invention relates to a transmission system for transmitting digital information of a plurality of bilateral channels through a plurality of start-stop telegraph lines.

3,715,508
SWITCHING CIRCUITS EMPLOYING ORTHOGONAL AND QUASI-ORTHOGONAL PSEUDO-RANDOM CODE SEQUENCES

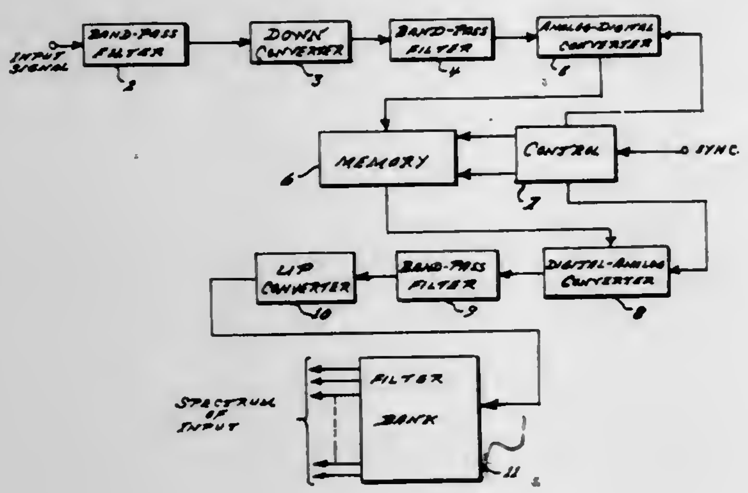
Herman L. Blasbalg, Baltimore, Md., assignor to International Business Machines Corporation, Armonk, N.Y.
Filed Sept. 15, 1967, Ser. No. 667,972
Int. Cl. H04m *3/00*
U.S. Cl. 179—15 BC **16 Claims**



Switching circuits employing pseudo-random orthogonal or quasi-orthogonal code sequences to accomplish line to line or line group to line group switching in both a linear and nonlinear mode.

3,715,509
METHOD AND MEANS FOR PROVIDING RESOLUTION LEVEL SELECTION IN A SPECTRUM ANALYZER

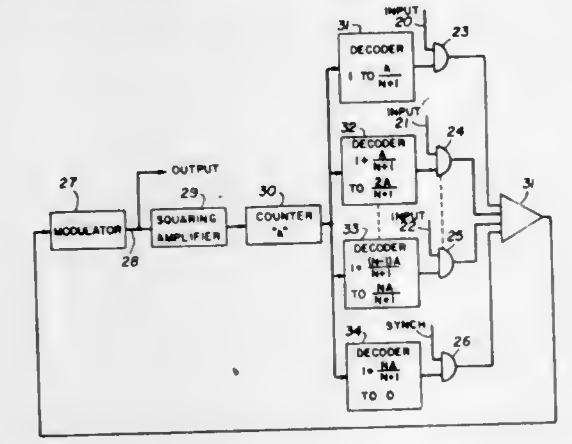
Edward C. Dawson, Saratoga, Calif., assignor to The United States of America as represented by the Secretary of the Air Force
Filed Feb. 18, 1971, Ser. No. 116,337
Int. Cl. H04b *1/66*
U.S. Cl. 179—15.55 T **1 Claim**



Resolution level selection in a spectrum analyzer is provided by digitizing the IF analog input signal at a controllable rate, storing it in a digital memory device, and reading out the stored digital signal at an increased rate into a digital-to-analog converter. The resolution level is determined by the relationship between the digitizing rate and the memory read out rate.

3,715,510
METHOD AND APPARATUS FOR HANDLING DATA FROM A PLURALITY OF CHANNELS

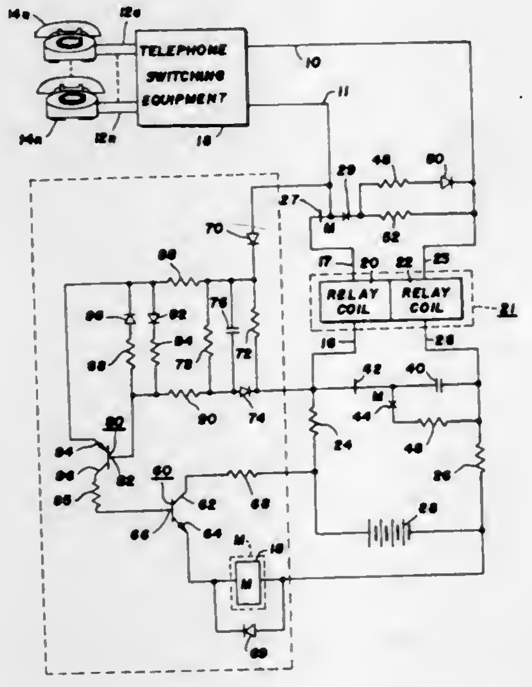
Burton H. Birnbaum, Floral Park, and Daniel J. Spier, Little Neck, both of N.Y., assignors to Computer Instruments Corporation, Hempstead, N.Y.
Filed Sept. 25, 1970, Ser. No. 75,607
Int. Cl. H04j *3/16*
U.S. Cl. 179—15 BM **6 Claims**



A time-multiplexing system wherein a frequency-modulated signal contains the data from a plurality of channels in time-sequential order. Each channel is represented by the same integral number of periods of a sample of the signal therein. Upon reception of this signal, it is converted back to individual channels of data by controlled integration of a constant signal in accordance with the duration of the period of the signals in each sample.

3,715,511
TELEPHONE PULSING CIRCUIT

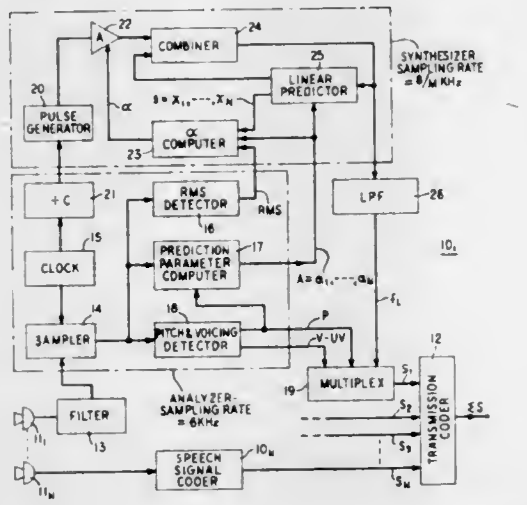
William E. Shaffer, Rochester, N.Y., assignor to Stromberg-Carlson Corporation, Rochester, N.Y.
Filed Sept. 24, 1969, Ser. No. 860,646
Int. Cl. H04g *1/36*
U.S. Cl. 179—16 E **12 Claims**



An inductive control device, such as a relay, is connected in series with a direct current power source, across a pair of conductors adapted to be connected to a telephone line to function as a pulsing circuit. A control circuit monitors the current flow in the series circuit and actuates a switching circuit when the telephone loop is open circuited to momentarily disconnect the pulsing circuit from the conductors and connect a resistive circuit across the conductors.

3,715,512
ADAPTIVE PREDICTIVE SPEECH SIGNAL CODING SYSTEM

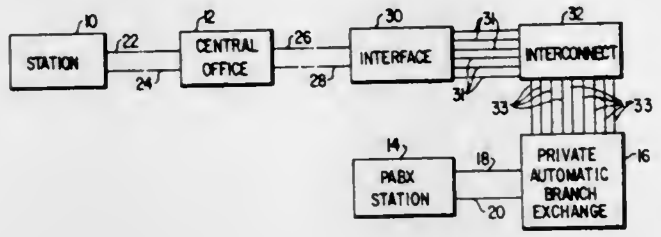
James Michael Kelly, Holmdel, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.
Filed Dec. 20, 1971, Ser. No. 209,655
Int. Cl. G10l *1/06*
U.S. Cl. 179—1 SA **8 Claims**



In an adaptive, predictive coder for speech signals, the transmitted signal generally consists of an rms value, a pitch signal, a voice-unvoiced indication, and a number of parameter signals for adjusting the coefficients of a linear predictor. Transmission of these signals is improved in this invention by generating a low rate pulsive signal and by shaping its spectrum in accordance with the parameter signals. The pulsive signals thus act as a carrier for the parameters. The bandwidth required for transmitting the resulting composite signal, i.e., the modulated pulsive signal and the subsidiary signals, is substantially less than that of the original speech signal and somewhat less than that required for the transmission of predictively coded signals.

3,715,513
PABX-INTERFACE INTERCONNECTION DEVICE

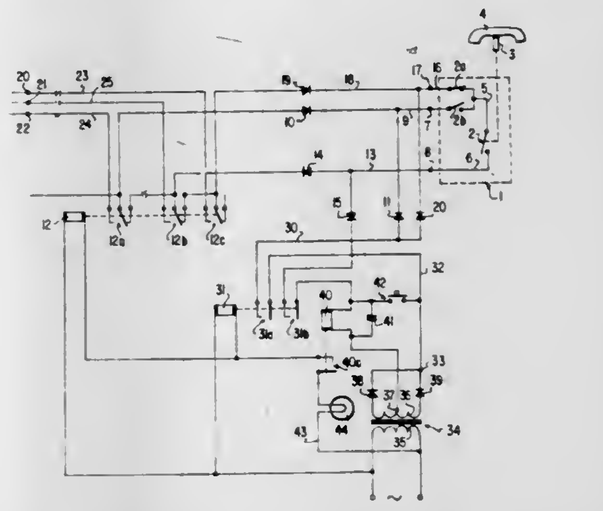
Louis A. Miller, Utica, N.Y., assignor to DND Electronics, Utica, N.Y.
Filed Oct. 29, 1970, Ser. No. 85,036
Int. Cl. H04m *7/06*
U.S. Cl. 179—18 AD **8 Claims**



An interconnection device for telephonic circuits automatically restores to a two-wire configuration telephonic signals applied to a multiple wire telephone interface circuit. Supervision, polarity, and/or alert signals distributed by an interface in the form of multiple circuit closures are reproduced in the form of two-wire signals made available to customer-owned equipment. The interconnect device permits duplex services between the premises of the customer user and outside locations reached through the central office. A plug-in printed card construction of the interconnect offers extremely convenient access to customer-owned equipment and provides numerous interconnect options with efficient mounting thereof.

3,715,514
TELEPHONE SECURITY DEVICE

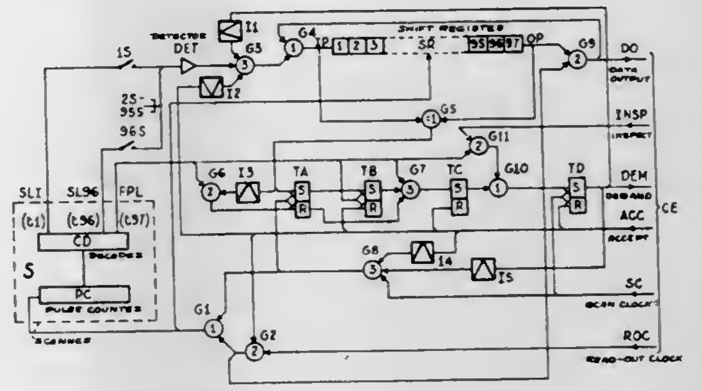
Allan D. Bell, Jr., Annandale, Va., assignor to Dektor Counter-intelligence and Security, Annandale, Va.
Filed Oct. 7, 1970, Ser. No. 78,765
Int. Cl. H04m *1/00*
U.S. Cl. 179—81 E **4 Claims**



A device for preventing use of an on-hook telephone for eavesdropping or "bugging." A voltage source is connected to the telephone line selector and hook switch through a diode matrix and sensing relay coil. When the telephone is "on-hook" (hook switch open) all conductors from the telephone instrument are short circuited together and are disconnected from the telephone conductors leading out of a private or secure area in which the telephone is located. The short circuiting is accomplished by a plurality of relays responsive to the condition of the sensing relay. When the instrument is off-hook the telephone conductors leading from the instrument are connected to the conductors leading from the area for normal conversational use. A lamp and photoresistor device is provided to isolate the annunciator from external conductors.

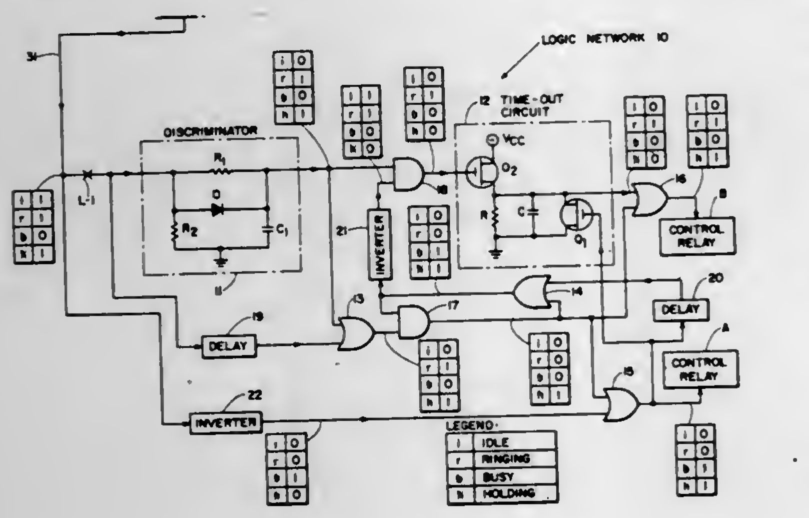
3,715,515
SHIFT-REGISTER RE-ENTRY SCANNER WITH CONFIRMATION SCAN FOR DETECTED DISPARITY

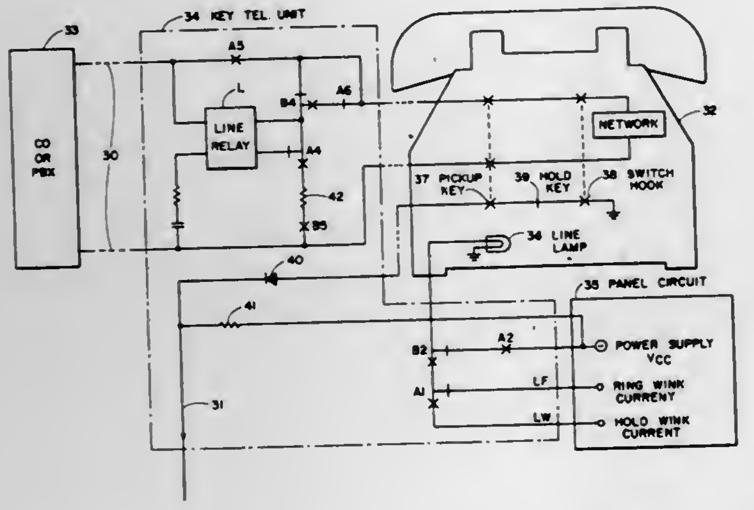
Harold James Stirling, Reading; Roger Morley Williams, Maidenhead; Peter Samuel Hampson, Leigh, and James Kenneth Price, Wollaton, all of England, assignors to Plessey Handel und Investments A.G., Zug, Switzerland
Filed May 25, 1971, Ser. No. 146,687
Claims priority, application Great Britain, May 27, 1970, 25,580/70
Int. Cl. H04m *3/22*
U.S. Cl. 179—18 FF **3 Claims**



In automatic telephone exchanges of the stored-program-controlled type it is necessary for information randomly initiated at telephone peripherals (subs. line circuits, markers, junction relay sets etc) to be communicated to the central data processing equipment. The peripherals may be single or multiple signal-initiating points (e.g., relay "make" contacts which may randomly change their states). The proposal enables a single form of circuit to be used for say 96 signal-initiating points relevant to single or multiple-point peripherals or combinations thereof. The circuit comprises a shift register SR for storing the state of each signalling of the block and means S for scanning the signalling points to determine their states. The shift register and scanner are so co-ordinated as to enable the state of each point, at the time which it is scanned, to be compared with its previously stored state. If one or more changes of state are detected during the scanning cycle, the comparison cycle is repeated to confirm that a change-of-state was not of a transient nature (i.e., due to "contact-bounce") and, if the states are confirmed, connection to the data processing equipment is demanded and the states of all the signalling points (changed and unchanged) now stored in the shift register are transmitted from the shift-register as a high-speed pulse train. During transmission, a re-circulation path is provided by the register so that upon conclusion of transmission it is again available for the comparison function when scanning now resumes.

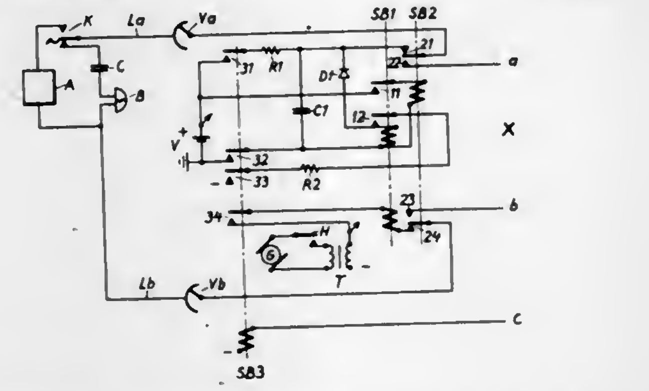
3,715,516
LINE CIRCUIT FOR KEY TELEPHONE SYSTEM
Jalal Ebrahimi, Ottawa, Ontario, Canada, assignor to Northern Electric Company Limited, Quebec, Canada
Filed June 17, 1971, Ser. No. 154,004
Int. Cl. H04g *1/30*
U.S. Cl. 179—18 FA **2 Claims**





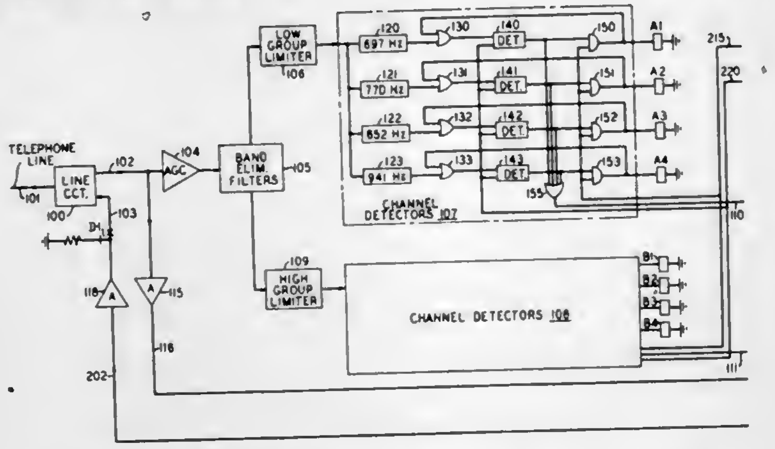
A line circuit for interfacing subscriber sets of a key telephone system with a telephone line terminating at its other end in a central office or a private branch exchange. The line circuit embodies a novel approach in this particular field, utilizing logic building blocks to condition two control means performing functions associated with such systems. The approach is well suited to MIS components and technologies.

3,715,517
TRIPPING ARRANGEMENT FOR RINGING CURRENT SIGNALS IN TELEPHONE EXCHANGES
Curt Ove Bille Sandberg, Tyreso, Sweden, assignor to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden
Filed March 8, 1971, Ser. No. 121,922
Claims priority, application Sweden, March 19, 1970, 3787/70
Int. Cl. H04m *3/02*
U.S. Cl. 179—18 HB **2 Claims**



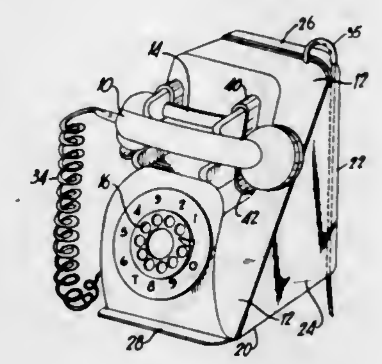
In an automatic telephone exchange a relay means is provided for ringing current signal tripping upon calls to a subscriber's instrument. The volume and cost for such a relay means are reduced with the help of a current-direction-dependent supervisory relay and a capacitance means connected in parallel and with a direct current source and a resistance means charging said capacitance means to a voltage of such a magnitude and polarity that the supervisory relay receives a direct-current voltage in backward direction during the ringing signals.

3,715,518
INTERRUPT NETWORK TO PROTECT A VOICE FREQUENCY SIGNAL DETECTOR FROM BEING TALKED-OFF BY OUTGOING SPEECH SIGNALS
Robert Riddle Campbell, Holmdel; George Herbert Honnold, Middletown, and Michael Lefkowitz, Old Bridge, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.
Filed Dec. 8, 1971, Ser. No. 205,805
Int. Cl. H04m *1/50*
U.S. Cl. 179—84 VF **8 Claims**



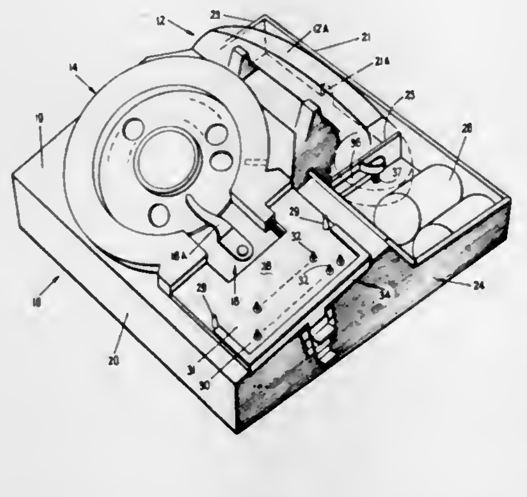
A station set which includes a two-way voice channel interconnects a telephone line and a voice recorder. The station set receiver detects incoming voice-frequency tone signals an, in response thereto, instructs the recorder to record, play back, select desired records, stop, et cetera. The playback signals may also contain the tone signals and the receiver is protected from being talked-off by the reflection of these outgoing signals. The protection involves momentarily interrupting the outgoing transmission when the tone signals are detected and enabling the station set to provide instructions to the recorder only in the event that detection of the tone signals continues during the interrupt interval. The duration of the interrupt interval is short so that the playback interruption is not objectionable and may not even be noticed by a listener.

3,715,519
DEVICE FOR CONVERTING TABLE TELEPHONE TO WALL TELEPHONE
Timothy J. O'Leary, Houston, Tex., assignor to The Raymond Lee Organization, Inc. New York, N.Y.
Filed June 24, 1971, Ser. No. 156,384
Int. Cl. H04m *1/11*
U.S. Cl. 179—100 C **2 Claims**



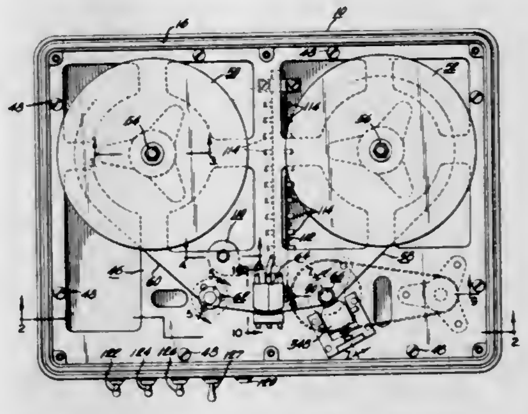
A device for converting a table telephone to a wall telephone wherein: the handset is held in normal cradle position even when the base is tilted forward; the handset can be easily removed from the cradle at all times; the telephone can be readily reconverted for table use; the dial face is held essentially vertical; and space is provided for storage of miscellaneous small items.

3,715,520
TELEPHONE DIALING APPARATUS
Nicholas S. Lambrou, 35 Devereaux Street, Arlington, Mass.
Filed Dec. 1, 1971, Ser. No. 203,569
Int. Cl. H04m *1/45*
U.S. Cl. 179—90 A **20 Claims**



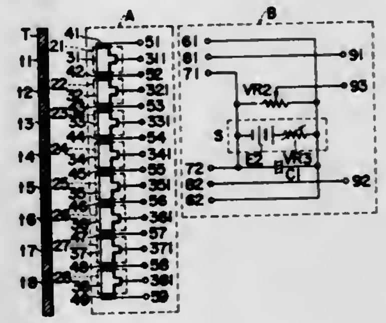
An accessory for a telephone to assist in the dialing of the digits of the telephone dial includes a housing that partially covers the telephone and has an opening therein through which the dial may be observed, an array of lights preferably disposed in a semi-circle about the dial with one light associated with each digit of the dial, and a stepping switch responsive to each dialing of the dial for stepping the stepping switch. The apparatus employs a code card having two sets of connectors that are interconnected in a predetermined pattern to identify an entire telephone number. This code card is coupled between the stepping switch and the light array and is adapted to control the successive illumination of the lights in a sequence corresponding to the telephone number and with one light being illuminated at a time associated with one digit which digit is the next one to be dialed.

3,715,521
RECORDER APPARATUS USING FLUID SUPPORT
John H. Licht, Middletown, N.J., assignor to AMBAC Industries, Incorporated, Philadelphia, Pa.
Continuation of Ser. No. 818,880, April 24, 1969, abandoned. This application Aug. 24, 1971, Ser. No. 174,566
Int. Cl. G11b *5/60, 21/20*
U.S. Cl. 179—100.2 P **6 Claims**



A long-life, high-reliability magnetic tape recorder in which the relatively-moving parts of the system are separated from each other by fluid films. The recorder components are immersed in a fluid contained in a sealed housing which serves as a fluid supply reservoir. A pump in the housing pumps the fluid to fluid-film devices for rotatably supporting a pair of tape reels and a capstan drive system, and for urging the tape against the capstan drive member. The pump also supplies fluid under pressure to a tape guide and to a magnetic head in such manner as to hold the moving tape out of contact with the guide and with the head; it also supplies pressurized fluid to its own fluid-film device to support its own moving parts. The fluid-film structure for the magnetic head provides a fixed spacing of the moving tape from the head for both high and low tape speeds and despite substantial changes in fluid viscosity.

3,715,522
MULTI-TRACK MAGNETIC HALL HEAD
Tsunehiro Tsukagoshi, Tokyo, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan
Filed July 29, 1970, Ser. No. 59,219
Claims priority, application Japan, July 29, 1969, 44/59478
Int. Cl. G11b *5/38*
U.S. Cl. 179—100.2 CH **7 Claims**



A multi-track magnetic head comprising a plurality of three-terminal T-type Hall elements each having one Hall potential terminal and two current terminals provided at both ends thereof, said Hall elements being arranged at positions aligned with a corresponding number of tracks provided on a magnetic tape to be reproduced, an electric power source supplying electric currents only to a selected number of Hall elements aligned with the tracks to be reproduced simultaneously, a common terminal provided on a balancing resistor connected across the power source, and a capacitor for adjusting the impedance of the power source so that the ratio between the impedance of each Hall element to the impedance of the power source is selected to be more than 100 in general cases and to be more than 10 when a stereophonic reproduction is undertaken.

3,715,523
POSITIONING MECHANISM FOR MAGNETIC HEAD

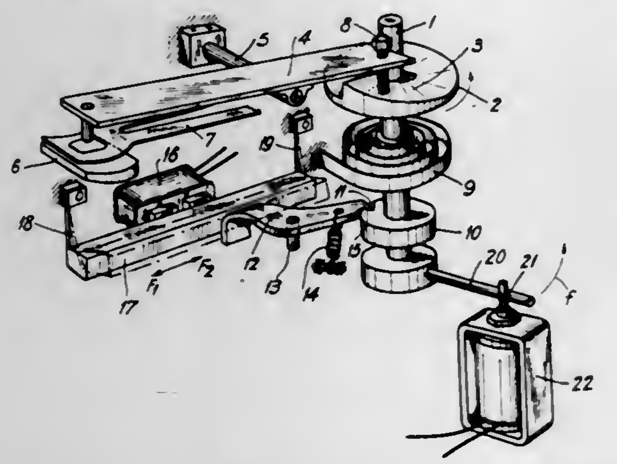
Hubert Cecyl Albert Rousseau, and Lucien Robert Prieur, Paris, France, assignors to Societe Industrielle Honeywell Bull (Societe Anonyme), Paris, France

Filed June 25, 1971, Ser. No. 156,633

Claims priority, application France, July 2, 1970, 7024574

Int. Cl. G11b *5/54*

U.S. Cl. 179—100.2 CA **8 Claims**



A device for controlling the positioning of heads for magnetic discs between non-operative retracted positions and operating positions proximate a surface of the disc wherein a simple compact mechanism selectively moves and locks the heads in their operating position when they reach a reference position opposite the disc or continues the heads in their retracted position for maintenance purposes.

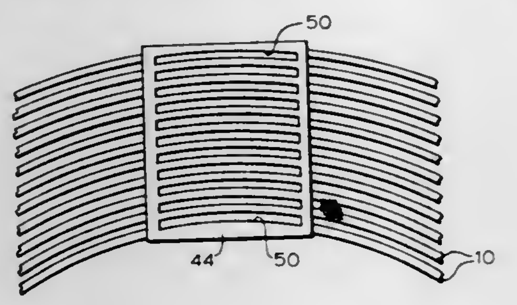
3,715,524
ELECTRO-OPTICAL GROOVE TRACKING APPARATUS FOR VIDEO REPRODUCING SYSTEM

Robert Adler, Northfield, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.

Filed April 20, 1972, Ser. No. 246,048

Int. Cl. G11b *7/14, 7/18, 7/24*

U.S. Cl. 179—100.3 V **5 Claims**



Video information is stored optically along a helical track on a rotating disc over which an optical pick-up moves radially in correspondence with progressive displacement of a monitored portion of the track. To maintain constant alignment between the pick-up and the track regardless of deviations in the intended radial progression of either, a control signal is applied to an electromechanical transducer in order to vary the position of the pick-up transversely relative to the monitored track portion. Spaced parallel from the disc is a mask to span a plurality of track segments. All of the slits are oriented generally along those segments, and the number of slits is slightly different from the number of the segments in the width of the span. A generally collimated beam of light is projected through the slits and the portion of the disc which carries the segment. A balanced photodetector system responds to a moire' pattern in the light which is projected through both the slits and the disc portion in order to develop a pair of signals which represent relative departure of the pick-up laterally from the monitored track length. A differential amplifier combines these signals into a control signal which is applied to the transducer to effect a compensatory variation in the position of the pick-up.

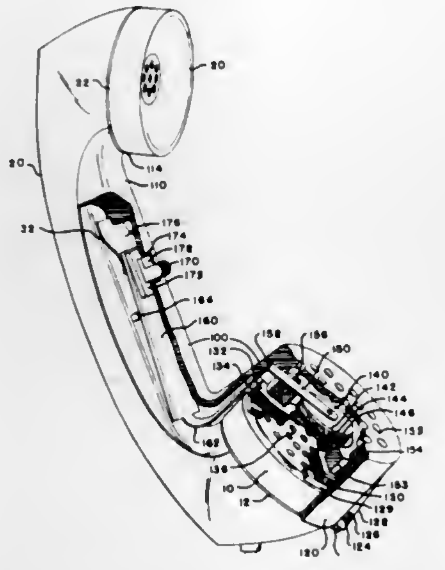
3,715,525
TELEPHONE HANDSET SHUTTER ATTACHMENT

Gordon Wilder Fielding, 11 Bruce Circle, Randolph, Mass.

Filed Aug. 12, 1971, Ser. No. 171,274

Int. Cl. H04r *1/08*

U.S. Cl. 179—187 **11 Claims**



The shutter attachment disclosed clips over the mouthpiece and handle of a standard telephone handset and provides means by which pressing a button on the handle portion of the attachment, a valve closes against a valve plate, shutting off the telephone transmitter to ambient noise. Alternative embodiments are shown for lever operation of the valve and for pneumatic linkage. Constrained layer construction provides efficient exclusion of noise.

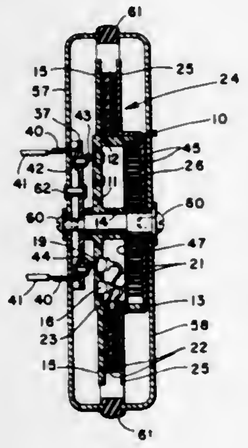
3,715,526
MINIATURIZED ELECTRIC CORD REEL

Charles H. Blanch, Maple Heights, and James W. Kovacik, Parma, both of Ohio, assignors to Alert Stamping & Mfg. Co., Inc., Bedford Heights, Ohio

Continuation-in-part of Ser. No. 859,701, Sept. 22, 1969, Pat. No. 3,619,518. This application March 15, 1971, Ser. No. 124,328

Int. Cl. H02g *11/00*

U.S. Cl. 191—12.2 R **13 Claims**



An improved electric cord reel construction is provided that is characterized by its miniature size. The simplified, relatively small structure is lightweight, relatively inexpensive to manufacture and assemble. The principal component part of the reel is preferably molded from plastic and has combined features normally supplied by additional, different parts secured together by various fasteners, thereby avoiding in the present structure the usual overall heavy, relatively bulky assembly. In one form, this component comprises a unitary, cup-shaped member which is so compactly designed as to include a hub portion on which an electric cord reel is wound, a flange for guiding the deposition of the cord, commutator rings to receive and transmit electrical energy to the cord, a bearing for mounting a shaft around which the unitary member relatively rotates, and a housing for a coiled spring adapted to maintain the reel in a home position. The cup-shaped member receives and supports a second flange in spaced relation to its own flange, preferably at a spaced apart distance substantially equal to the width of a single electric cord.

3,715,527
ROTARY SWITCH WITH DOUBLE NOSED CONTACTS FIXEDLY SECURED TO STATOR SECTION

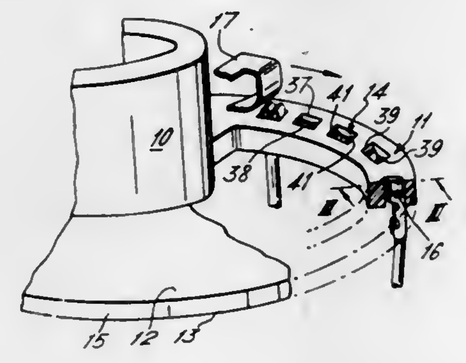
Franco Trevisiol, and Mario Bergonzi, both of Turin, Italy, assignors to AMP Incorporated, Harrisburg, Pa.

Filed June 1, 1971, Ser. No. 148,358

Claims priority, application Italy, June 27, 1970, 26693 A/70

Int. Cl. H01h *19/58, 21/78*

U.S. Cl. 200—11 K **3 Claims**



A rotary switch includes a base plate having spaced holes each of which receives an electrical contact. A wiper arm is arranged to wipe contact surfaces of the contact projecting out of the holes.

Each contact has a portion for connection to a conductor and a contact portion for engagement with the wiper arm. The contact portion has a part shaped as a channel having sides and a base. Two extensions project from the ends of the channel sides, the extensions bending back to form at the bends, contact surfaces disposed generally perpendicularly to the travel path of the wiper arm. The ends of the extensions are formed as spring tongues which are arranged to snap behind shoulders provided in the associated hole to prevent withdrawal of the contact.

3,715,528
CENTRIFUGAL ADVANCE DEVICE FOR AN IGNITION DISTRIBUTOR

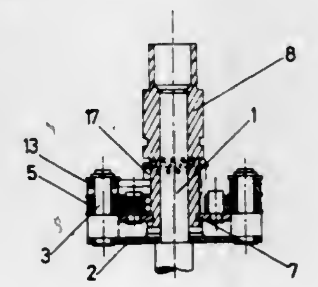
Roger Habert, Epinay/Seine, France, assignor to Ducellier & Cie, Paris, France

Filed June 24, 1971, Ser. No. 156,207

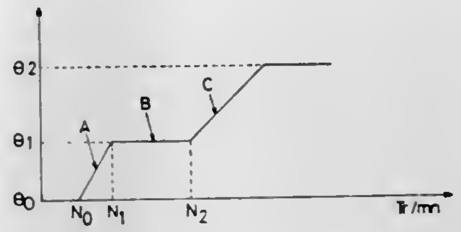
Claims priority, application France, July 10, 1970, 7025775

Int. Cl. H01h

U.S. Cl. 200—19 R **3 Claims**



A centrifugal advance device for an ignition distributor for an internal combustion engine wherein there are provided two main flywheel masses and two auxiliary flywheel masses. The main masses are each pivotable on a pin mounted on a plate which is connected to a drivable shaft and the auxiliary masses are coupled to the main masses. These masses are adapted on rotation of said shaft to displace a plate connected to a cam which is adapted to actuate a contact-breaker arm for obtaining a variation in the timing of the spark. The auxiliary masses are arranged to move the main masses in their angular displacement during a first stage of variation corresponding to a lower region of engine speed. After the engine speed has passed through this lower region, two abutments fixed to the plate connected to the control shaft prevent further angular movement of the auxiliary masses and main masses, thus providing an intermediate region of engine speed during which the timing of the spark does not vary. As the engine speed increases still further into an upper region spring means acting on said masses are overcome to permit further angular movement of the main masses and thus further angular movement of the plate connected to said cam.



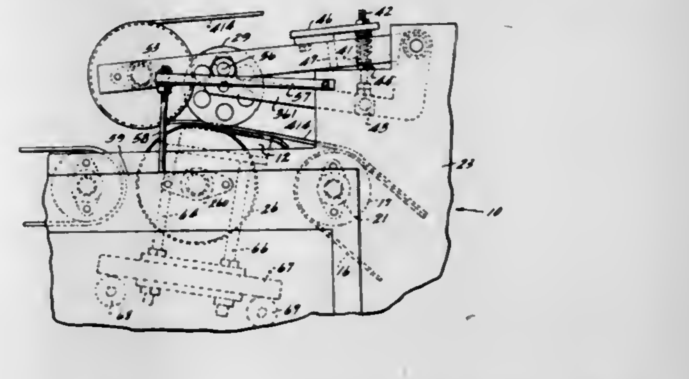
3,715,529
SWITCH DEVICE FOR COUNTING FLAT ARTICLES

Allen H. Lloyd, Terrace Park, Ohio, assignor to Tech-Art, Inc., Milford, Ohio

Filed Dec. 29, 1971, Ser. No. 213,333

Int. Cl. B65g *43/00*

U.S. Cl. 200—46 **8 Claims**



A switch device for counting articles that includes a shoe member having an elongated portion extending cantilever-fashion over a body thereof to adjacent a head of a plunger. Flat articles such as carton blanks are directed over the shoe member to pass over the head of the plunger. An elongated leaf spring attached to the body has a portion extending cantilever-fashion under a foot of the plunger to urge the plunger outwardly. A switch element is mounted with a push button thereof engaging the spring. A first jack screw extends between the cantilever-extending portion of the shoe member and the body and a second jack screw extends between the base member and the spring member.

3,715,530
ACTUATING DEVICE

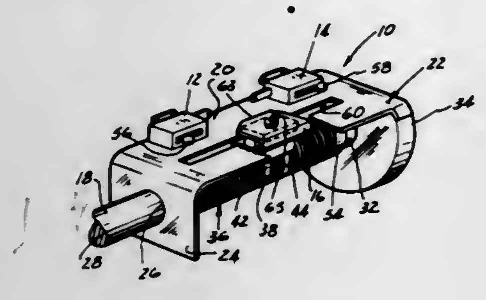
Thomas B. Dalton, Muskegon, Mich., assignor to Westram Corporation, Muskegon, Mich.

Continuation-in-part of Ser. No. 4,883, Jan. 22, 1970, abandoned. This application Aug. 24, 1971, Ser. No. 174,453

Int. Cl. H01h *3/16*

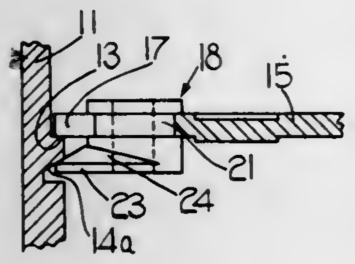
U.S. Cl. 200—47 **8 Claims**

A device for actuating a pair of spaced limit switches in which an actuating member is reciprocably mounted for movement between the limit switches. The device comprises a rotatably mounted shaft having a wire wound around a selected length of the shaft and defining a helical path. The opposite ends of the wire are fixed to the shafts in such a manner that when a portion of the actuating member is disposed in the helical path, that is, between any two adjacent turns of the wire, the adjacent sides of each of the remaining successive turns of the wire are normally in abutment. As the shaft is rotated in opposite directions, the wire reciprocally drives the actuating member between the limit switches.



3,715,531
DISTRIBUTOR HOUSING AND PLATE ASSEMBLY WITH ROTATABLE CLAMPING MEANS

Gordon Keeley, Sutton Coldfield, England, assignor to Joseph Lucas (Industries) Limited, Birmingham, England
Filed July 20, 1971, Ser. No. 164,313
Claims priority, application Great Britain, July 23, 1970, 35,694/70
Int. Cl. H01h *9/02*; **E05c** *3/04, 3/14*
U.S. Cl. 200—19 R **4 Claims**

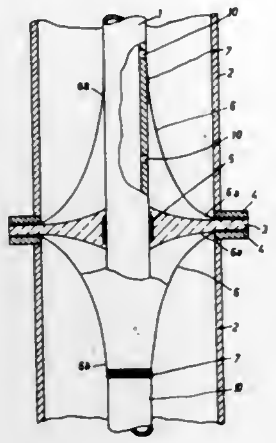


An ignition distributor for a road vehicle, wherein the hollow casing of the distributor is formed internally with a support surface, and the contact breaker assembly base plate of the distributor is engaged with the support surface. A pair of cam members are engaged with the base plate and the casing, and are operable upon rotation, to clamp the base plate against said support surface.

3,715,532
ENCAPSULATED HIGH VOLTAGE-SWITCHING INSTALLATION

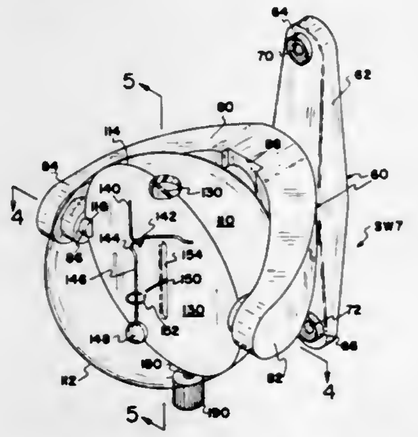
Tibor Morva, Oberentfelden, Switzerland, assignor to Sprecher & Schuh AG, Aarau, Switzerland
Filed Dec. 21, 1971, Ser. No. 210,366
Claims priority, application Switzerland, April 19, 1971, 5629/71
Int. Cl. H01b *9/04*
U.S. Cl. 174—28 **4 Claims**

An encapsulated high voltage-switching installation, the cylindrical conductor of which serves to carry a high voltage and is surrounded by a grounded cylindrical sheath filled with an insulating gas. The conductor is concentrically attached within the sheath by means of insulating supports. According to important aspects of this invention at least one trumpet-shaped foil possessing a rotationally symmetrical construction and widening in the axial direction of the conductor is arranged between the conductor and the sheath, this trumpet-shaped foil being formed of an insulating material.



3,715,533
VEHICLE PENDULUM ALARM SWITCH

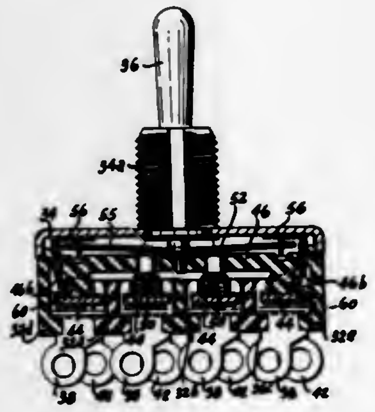
William Joe Seaton, Kearns, Utah, assignor to Emdeko International, Inc., Salt Lake City, Utah
Filed April 2, 1971, Ser. No. 130,754
Int. Cl. B60r *25/10*
U.S. Cl. 200—61.52 **2 Claims**



An alarm system for automobiles and other vehicles is disclosed in which pendulum switches are provided, including one wherein the sensitivity can be readily adjusted.

3,715,534
MINIATURE MULTI-POLE TOGGLE SWITCH WITH MOMENTARY ACTION

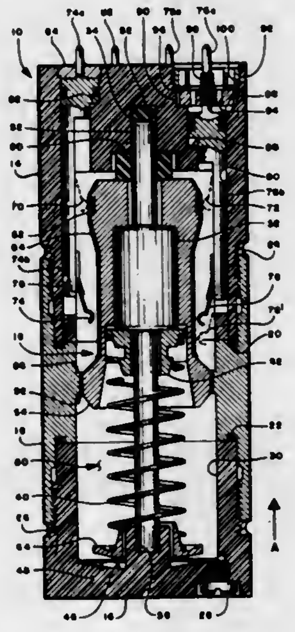
Earl T. Piber, Oconomowoc, Wis., assignor to Cutler-Hammer Inc., Milwaukee, Wis.
Filed Aug. 2, 1971, Ser. No. 167,964
Int. Cl. H01h *13/28*
U.S. Cl. 200—67 G **10 Claims**



Three and four pole toggle switches. Miniature size is attained by providing springs affording contact pressure that require a minimum of space and by providing momentary action spring structure that can be incorporated in the same dimensional housing as used for the non-momentary action switches.

3,715,535
ACCELERATION ACTUATED SWITCH

Ruben S. Urenda, Albuquerque, N. Mex., assignor to The United States of America as represented by the United States Atomic Energy Commission
Filed July 20, 1971, Ser. No. 164,378
Int. Cl. H01h *35/14*
U.S. Cl. 200—61.53 **4 Claims**

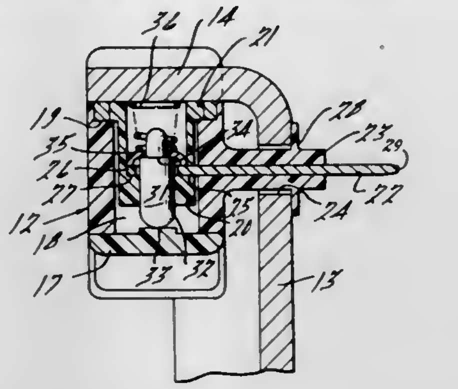


An electrical switch actuatable at one or more levels of acceleration including a sealed tubular housing having spaced apart reset actuate walls with damping fluid filling a chamber therebetween, a movable sensing mass within the chamber carrying a shorting conductive member, a helical spring intermediate the actuate wall and the sensing mass to position the sensing mass at an initial location adjacent the reset wall and to resist movement of the sensing mass when the mass is subjected to acceleration forces, electrical contacts extending through the housing walls into the chamber in the path of movement of the shorting member, and means carried by a housing wall accessible from the exterior of the housing for moving at least one of the contacts to a position in substantially transverse alignment with another contact for generally simultaneous contact with portions of the shorting member after some desired movement of the sensing mass. Provision is also made by means of an annular orifice to minimize circuit closures from extraneous shocks and by a bimetallic curved ring to compensate for temperature caused changes in spring characteristics.

3,715,536
SWITCH WITHIN A MOTOR VEHICLE DOOR LOCK MECHANISM

Albert Husch, Pulheim; Franz Kemenes, Cologne, and Ludwig Pregel, Dansweiter, all of Germany, assignors to Ford Motor Company
Filed Sept. 13, 1971, Ser. No. 179,892
Int. Cl. H01h *3/16*
U.S. Cl. 200—61.64 **11 Claims**

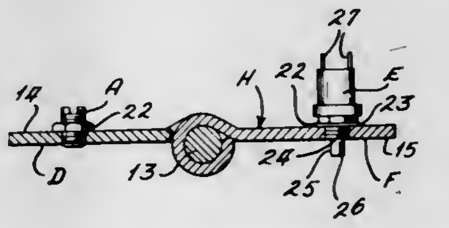
A switch device in a motor vehicle door latch mechanism. The latch mechanism includes a resilient wedge yieldable in a direction transversely of the door closing movement. A switch contact component is housed within a chamber in the wedge. In unlatched condition of the latch mechanism, the switch contact component closes an electrical circuit from a ground lead in the wedge to the latch mechanism metal support plate. The circuit may be used to control a warning light, passenger compartment interior lights or a warning buzzer.



Upon the latch mechanism being placed in latched condition when the door is closed, the switch contact component is moved out of contact with the ground lead in response to yielding movement of the wedge as the latter is engaged by a latch bolt or the like.

3,715,537
HINGE MOUNTED MICROSWITCH WITH ADJUSTABLE ACTUATOR PIN MOUNTED ON ADJACENT LEAF

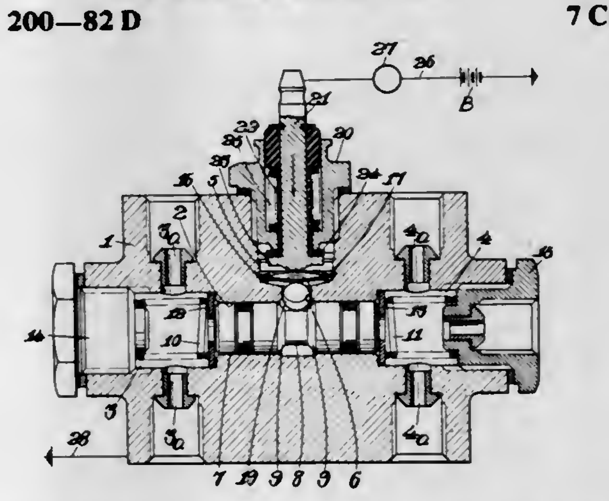
Francis C. Peterson, Affton, Mo., assignor to C. Hager & Sons Hinge Manufacturing Company, St. Louis, Mo.
Filed Aug. 27, 1971, Ser. No. 175,594
Int. Cl. H01h *3/16*
U.S. Cl. 200—61.7 **4 Claims**



A hinge wherein the leaves are pivotally secured together on a pin, one of said leaves having an electric switch connected thereto which contacts cooperating means connected to the other leaf for sounding an alarm or activating a signal when the door is not in its closed position or to activate some means when the door is in its closed position.

3,715,538
HYDRAULIC PRESSURE DIFFERENTIAL SWITCH WITH SNAP OVER LEAF CONTACT

Shinya Ito, Tsushima, Japan, assignor to Kabushiki Kaisha Tokai Rika Denki Seisakusho, Nishikasugai-gun, Japan
Filed May 7, 1971, Ser. No. 141,141
Int. Cl. H01h *35/38, 13/38*
U.S. Cl. 200—82 D **7 Claims**

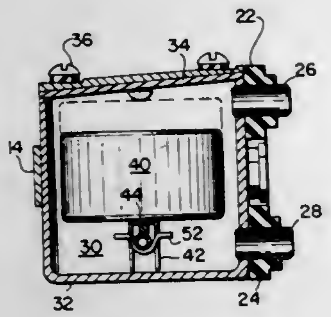


A switch assembly for detecting a difference in hydraulic pressure and capable of detecting and issuing an alarm if leakage occurs in either one of two hydraulic pressure systems independent of each other, such as the pressure systems for the front and rear brakes in a motor-car, by means of an equilibrating piston acted on by the two independent pressures on its opposite ends and adapted to shift toward one end when leakage occurs in the corresponding system. In response to shifting of the piston, a leaf spring is pushed upward to come into contact with a switch terminal connected to a warning circuit thereby issuing an alarm for the leakage. The present switch assembly has the advantage that the alarm remains actuated without interruption until the spring is pushed back by an external force after repair, thereby completely avoiding an accident due to failure in repairing the leakage.

3,715,539
FLUID LEVEL MONITORING SYSTEM

Paul A. Silberg, Cochituate, and John R. Lewis, Cambridge, both of Mass., assignors to Harnessed Energies, Inc., Newton, Mass.

Filed Dec. 10, 1970, Ser. No. 96,765
Int. Cl. H01h *36/02*
U.S. Cl. 200—84 C **5 Claims**



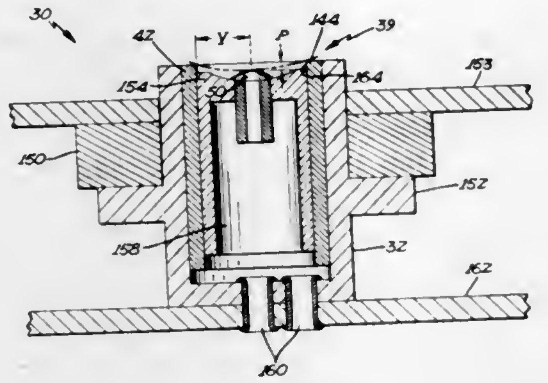
A fluid monitoring system wherein a float having a permanent magnet is disposed in a chamber containing fluid therein. The magnet is disposed on the bottom of the float. A hollow tube passes through the lower portion of the chamber and is sealed in a fluid-tight manner at either end thereof. A magnetic reed switch is disposed in the tube and is connected to a circuit which provides a visual indication when the reed switch is actuated. If the level of the fluid in the chamber decreases to a predetermined level, the float level decreases solely as a function of the fluid level in the chamber. The magnetic field created by the permanent magnet when adjacent the reed switch disposed in the tube in the chamber will actuate the switch which provides a visual indication that the predetermined lower level has been reached. If the level of fluid in the chamber increases, the float moves upwardly as the liquid level increases, the magnet moves away from the reed switch, and the indicator would be deactivated.

3,715,540
TOUCH SENSITIVE ELECTRONIC SWITCH

Willis A. Larson, Wayzata, Minn., assignor to Magic Dot, Inc., Minneapolis, Minn.

Filed Nov. 16, 1971, Ser. No. 199,226
Int. Cl. H01h *35/00*
U.S. Cl. 200—159 R **2 Claims**

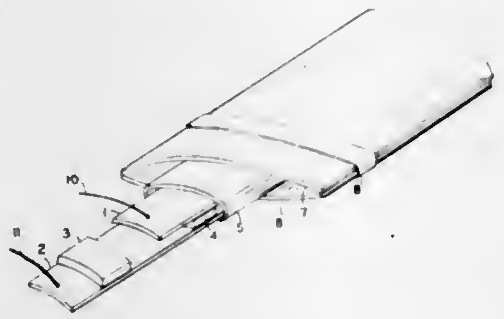
A touch sensitive electronic switch which has no moving parts and is actuated by the skin resistance of an operator causing a lowering of D.C. resistance across the switch is disclosed. The electronic switch shown includes two electrodes laterally spaced and insulated from each other. The top surfaces of the electrodes are exposed to the finger of the operator upon the top surface of an insulator mounting the electrodes in a manner that the operator's finger first touches an outer electrode and then an inner electrode to allow a direct current path to be set up laterally between the outer electrode and the inner electrode to thereby provide a lowering of the D.C. resistance across the switch. The relationship of the top surface of the outer electrode and the top surface of the inner electrode insures that the finger of the operator first touches the outer electrode before contact is made between the finger and the inner electrode to thereby allow the harmless grounding of the usual voltage in the operator's body.



3,715,541
CUSHION SEAT SWITCH SENSOR MEANS

Robert H. Koenig, Huntington Hills, N.Y., assignor to Tapeswitch Corporation of America, Farmingdale, N.Y.

Filed May 18, 1971, Ser. No. 144,584
Int. Cl. H01h *13/16*
U.S. Cl. 200—86 R **3 Claims**



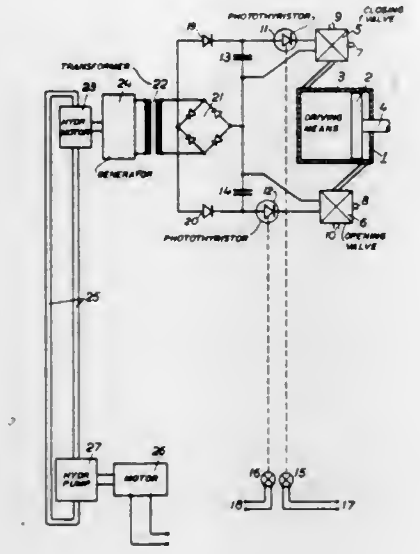
A ribbon switch is provided for operating on cushioned seats, for instance, between the spring and padding of automobile seats. First and second flexible conductive strips are normally separated by a plurality of insulating members sandwiched between them. The insulating members are spaced so as to hold the conductive strips separated unless the conductive strips are flexed or bowed; as for instance, into a soft cushion by someone sitting on them. The spacing of the insulating members and the flexibility of the strips is chosen so that after a predetermined amount of flexing, the conductive strips will snap together forming a good electrical contact. The strips are held together by an appropriate sleeve. The outer cover consists of two flexible strips having transverse curvature placed convexly opposing to form a central shaftway.

3,715,542
CONTROL MEANS FOR PNEUMATICALLY OPERATED HIGH VOLTAGE SWITCHING DEVICE

Per-Olof Grune; Walter Pucher, and Hugo Sandkvist, all of Ludvika, Sweden, assignors to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden

Filed Dec. 8, 1969, Ser. No. 883,134
Int. Cl. H01h *33/54*
U.S. Cl. 200—148 R **4 Claims**

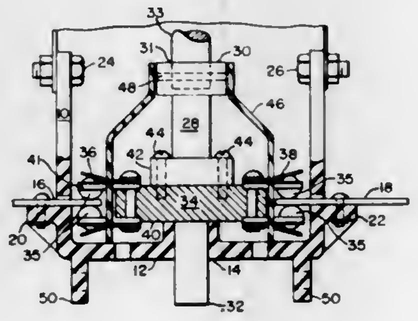
A high voltage switching device is operated by a compressed gas valve having an electrodynamic operating means. The operating means comprises a stationary coil which is inductively connected to a short-circuit winding supported by the movable member of said valve. To operate the switching device a capacitor located at high potential is connected to said coil through a photo-electric switching member.



3,715,543
ROTARY ELECTRICAL SWITCHING CONTACT ASSEMBLY WITH HOLLOW INSULATING ARC BARRIER

August I. Keto, Sharon, and Robert J. Manes, Wheatland, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Jan. 12, 1971, Ser. No. 105,797
Int. Cl. H01h *9/32, 33/06, 21/54*
U.S. Cl. 200—151 **2 Claims**



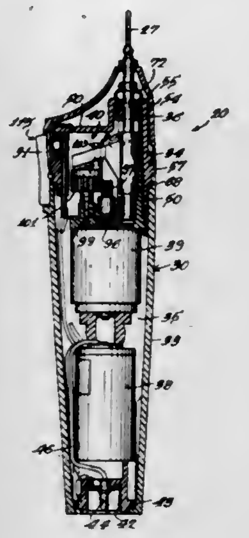
An electrical switching contact assembly having a housing with stationary contacts mounted thereon, and a rotating shaft with movable contacts attached thereto. The rotating shaft is mounted within the housing in a manner which will permit the stationary and movable contacts to engage when the switch is closed. The housing and shaft are constructed to permit stacking of the assembly for polyphase switching operations. An insulated hollow arc barrier member is disposed around the movable contact assembly.

3,715,544
ELECTRIC TOOTHBRUSH

John P. Duve, Brookfield, Ill., assignor to Sunbeam Corporation, Chicago, Ill.

Division of Ser. No. 824,110, May 13, 1969, Pat. No. 3,588,936. This application April 1, 1971, Ser. No. 130,099
Int. Cl. H01h *23/24, 9/06, 3/50*
U.S. Cl. 200—157 **6 Claims**

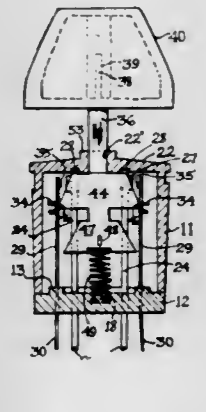
A switch for an electric cordless toothbrushing device comprising a switch actuator with raised projections, which projections engaged spaced wire members thereby detenting the switch actuator in either a contact make or contact break position.



3,715,545
MOMENTARY PUSH BUTTON SWITCH WITH IMPROVED NON-CONDUCTIVE CAM FOR NORMALLY RETAINING MOVABLE LEAF SPRING CONTACTS IN A NON-OPERATIVE POSITION

Eric L. Long, Waukegan, Ill., assignor to Cherry Electrical Products Corporation, Waukegan, Ill.

Filed June 18, 1971, Ser. No. 154,512
Int. Cl. H01h *3/12, 13/62*
U.S. Cl. 200—159 A **8 Claims**



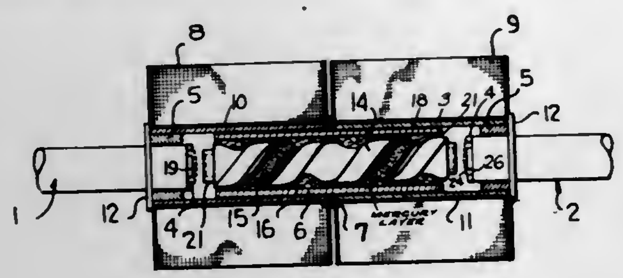
An electrical switch of the push-button type including an actuator movable through a switch housing, with the actuator providing a cam head which when in its original or unactuated position, physically separates the contact ends of the switch blades within the housing, thereby preventing undesirable closing of the switch resulting from shock, vibration, or teasing, while permitting a full actuating movement and harmless overtravel of the actuator so as to positively assure proper and complete switch blade closure.

3,715,546
POSITION INSENSITIVE MERCURY SWITCH HAVING A MAGNETICALLY ACTUATED SLUG FLOATING IN MERCURY

Sheldon S. Bitko, Cherry Hill, N.J., assignor to Fifth Dimension Inc., Princeton, N.J.

Continuation-in-part of Ser. No. 880,128, Nov. 26, 1969, Pat. No. 3,644,693. This application Sept. 11, 1970, Ser. No. 71,294
Int. Cl. H01h *1/08, 29/06*
U.S. Cl. 200—166 C **14 Claims**

A mercury switch including an elongated shuttle floating in mercury, the ends of the shuttle constituting switch contacts including mercury wettable anters, each surrounded by a tantalum or niobium spacer for accepting mechanical impact against the opposing switch contact.



3,715,547

ELECTRICAL SWITCH HAVING AN OBLIQUELY ORIENTATED ROLLER CONTACT

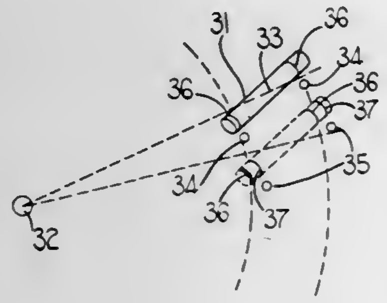
Steven John Tregurtha, Oswaldtwistle, England, assignor to Joseph Lucas (Industries) Limited, Birmingham, England

Filed March 30, 1971, Ser. No. 129,454

Claims priority, application Great Britain, May 16, 1970, 23,833/70

Int. Cl. H01h *9/00*

U.S. Cl. 200—166 BB **2 Claims**



An electrical switch comprises a base, a cover extending over the base and a rotor mounted between the base and the cover for angular movement relative thereto. A conductive roller is carried by the rotor and defines the movable contact of the switch, resilient means urging the roller into contact with the base. A pair of fixed contacts are carried by the base and are engageable by the roller in a predetermined angular position of the roller. The roller is carried by the rotor so that the rotational axis of the roller is parallel with the base but is inclined at an angle to an imaginary line joining the axis of movement of the rotor to the center of gravity of the roller, whereby during angular movement of the roller over the pair of fixed contacts the surface of the roller undergoes sliding movement as well as rotational movement relative to the fixed contacts and so provides a cleaning action to the contacts.

3,715,548

PUSH BUTTON SWITCH POSITION INDICATOR

Rudolf H. Schadow, Konigsbacher Zeile 23, Berlin, 28, Germany

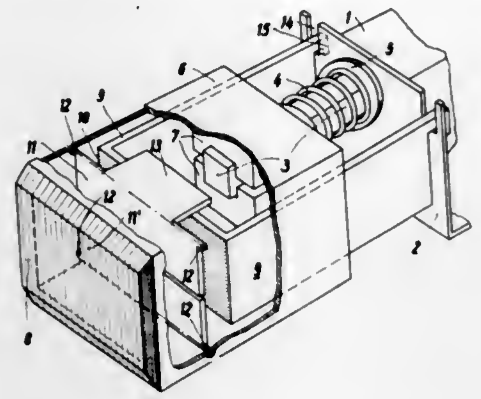
Filed March 20, 1972, Ser. No. 236,109

Claims priority, application Germany, March 25, 1971, P 21 14 526.6; June 15, 1971, P 21 29 688.8

Int. Cl. H01h *9/16*

U.S. Cl. 200—167 R **19 Claims**

A push button switch having a switch operation indicating means comprising a signal face arranged behind a window in the push button head. When the push button of the switch is depressed the signal face lies adjacent the window and when it is not depressed it is removed from it. The switch is provided with at least one covering shutter in the push button head and this shutter is arranged to pivot about an axis which is perpendicular to the axis of the switch. The covering shutter has a limb extending approximately perpendicularly from the shutter. The covering shutter is swung open by the signal surface carrying means on depressing the push button head. On the return of the push button head the limb is so swung from the rear side of the signal face carrier that the covering shutter is swung back over the signal surface.



3,715,549

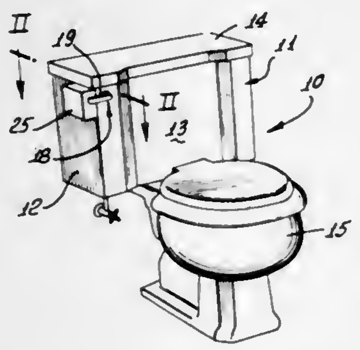
MUSICAL WATER CLOSET

Lillian G. Kraff, 468 South Roxbury Drive, Beverly Hills, Calif.

Filed May 22, 1972, Ser. No. 255,552

Int. Cl. H01h *3/02*

U.S. Cl. 200—172 A **7 Claims**



In combination with a conventional water closet having a water box, bowl, and flushing means, there is provided a music box or sound emitting device which will produce a pleasant sound in response to manual flushing of the water closet.

3,715,550

INDUCTION COOKING/WARMING APPLIANCE INCLUDING VESSEL SUPPORTING MEANS HAVING AN UNDULANT SURFACE AND TEMPERATURE SENSING MEANS ASSOCIATED WITH SAID SURFACE

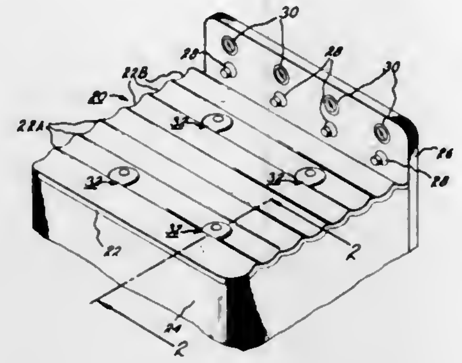
John D. Harnden, Jr., Schenectady, N.Y., and William P. Kornrumpf, Schenectady, N.Y., assignors to General Electric Company

Filed Feb. 22, 1972, Ser. No. 228,135

Int. Cl. H05b *9/00*

U.S. Cl. 219—10.49 **17 Claims**

Disclosed herein is an induction range having a counter including an undulant top surface for supporting a cooking vessel. Since the counter is made of a material which is not inductively heatable the counter remains relatively cool during the cooking process, while the vessel is being inductively heated. Although the counter's top surface has undulations therein, it is, nevertheless, an unbroken surface; i.e., there are no openings therethrough. Moreover, even though the counter's top surface has undulations therein, it may, nevertheless, be relatively smooth so that it can be wiped clean, easily. Furthermore, temperature sensing means are arranged on the top surface of the counter between adjacent undulations thereof and said sensing means are adapted to be contacted and easily compressed by the bottom surface of a vessel resting on the counter's top surface; i.e., resting on the undulations.



3,715,551

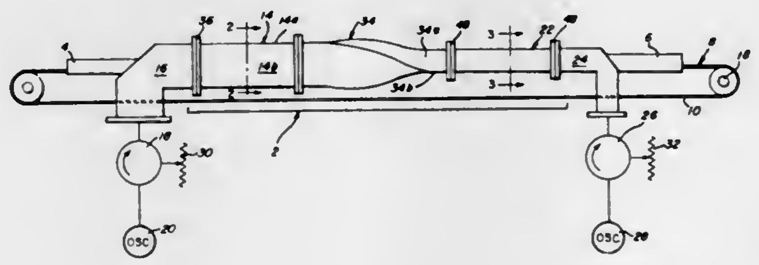
TWISTED WAVEGUIDE APPLICATOR

Robert A. Peterson, Canton, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed July 1, 1971, Ser. No. 158,919

Int. Cl. H05b *9/06*

U.S. Cl. 219—10.55 **10 Claims**



An apparatus is disclosed having an electromagnetic waveguide energy transmission structure providing applied orthogonally disposed high frequency electric fields disposed around material being processed in one complete traversal. The resultant electric field intensity distribution provides for uniform heating of products having nonuniform cross-sectional configuration. Objects, such as rubber moldings or extrusions, may be uniformly cured by the orthogonal electric field orientation. The apparatus utilizes conveyor mechanisms for continuously feeding strip materials to be treated. The transmission structure may be of a hollow rectangular or circular configuration or a combination of both. To assist in the removal of any vapors or to maintain heating temperature, fluid circulation means are disposed over predetermined zones of the oven energy applicator.

3,715,552

HIGH FREQUENCY HEATING APPARATUS

Shiro Umezu; Sadad Takeda, both of Fujisawa; Kaoru Mitsudome, and Tetsuo Hashimura, both of Tokyo, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Kanagawa-ken, Japan

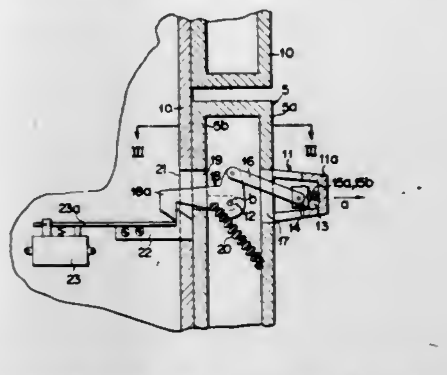
Filed March 3, 1971, Ser. No. 120,610

Claims priority, application Japan, March 4, 1970, 45/18133

Int. Cl. H05b *9/06*

U.S. Cl. 219—10.55 **10 Claims**

In high frequency heating apparatus, typically an electronic oven, the door locking mechanism comprises an operating member mounted on the door outside the heating chamber, a switch in the cabinet and means interlocked with the locking mechanism for operating the switch for deenergizing the high frequency oscillator when the operating member is operated to unlock the locking mechanism.



3,715,553

HIGH-FREQUENCY HEATING EQUIPMENT

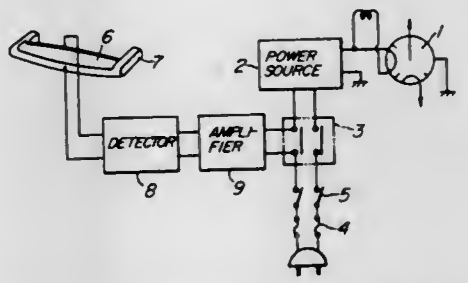
Morimasa Ogawa, and Kiyoshi Gono, both of Nara, Japan, assignors to Matsushita Electric Industrial Co. Ltd., Oaza Kadoma, Kadoma-shi, Osaka, Japan

Filed June 25, 1970, Ser. No. 49,624

Claims priority, application Japan, July 3, 1969, 44/53623

Int. Cl. H05b *9/06*

U.S. Cl. 219—10.55 **6 Claims**



A high-frequency heating equipment in which a high-frequency generator is stopped when the handle of a door of a heating chamber is touched or grasped upon opening the door, thereby avoiding high-frequency waves from leaking out through a port of the heating chamber, thus preventing any accident imparting an impediment to the human body and simultaneously preventing any interference to other communication appliances.

3,715,554

HIGH FREQUENCY HEATING APPARATUS

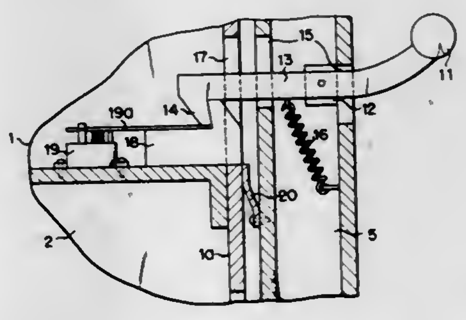
Shiro Umezu; Sadao Takeda, both of Fujisawa; Kaoru Mitsudome, and Tetsuo Hashimura, both of Tokyo, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan

Filed March 3, 1971, Ser. No. 120,649

Claims priority, application Japan, March 4, 1970, 45/18135

Int. Cl. H05b *9/06*

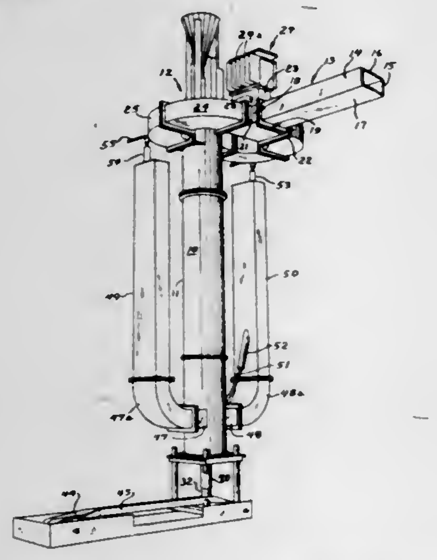
U.S. Cl. 219—10.55 **10 Claims**



In a high frequency heating apparatus of the class comprising a cabinet defining a heating chamber having an access opening at one side thereof, a door mounted on the cabinet for closing the access opening, a high frequency oscillator mounted on the cabinet for radiating high frequency electromagnetic wave in the heating chamber and a locking mechanism for holding the door in the closed position, there are provided a door operating handle connected to the locking mechanism for operating the same and a switch mounted on the cabinet, the switch being interlocked with the locking mechanism for controlling the operation of the high frequency oscillator when the door is locked and unlocked by the locking mechanism.

3,715,555
CIRCULAR WAVEGUIDE MICROWAVE APPLICATOR

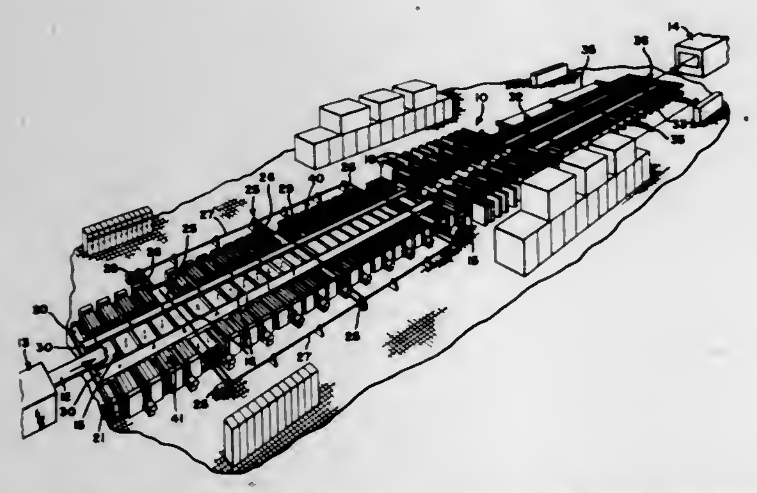
Ray M. Johnson, 155 Lipton Place, Danville, Calif.
Filed April 19, 1972, Ser. No. 245,410
Int. Cl. H05b *9/06*
U.S. Cl. 219—10.55 **7 Claims**



A circular waveguide microwave applicator is excited in either the TM_{01} mode or the TE_{11} mode by means of a hybrid input network receiving energy from a source of microwave power. The material being heated may be conveyed under gravity axially through the circular applicator and along the axis thereof, guided by a dielectric tube extending coaxially with the cylindrical side wall of the applicator. Remnant power is then conducted to terminating water loads connected to the applicator.

3,715,556
SLAB HEATING METHOD AND APPARATUS

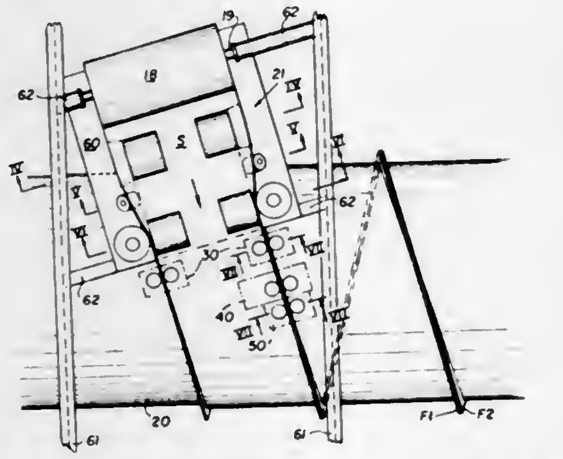
Norbert R. Balzer, Parma, and Robert J. Kasper, Seven Hills, both of Ohio, assignors to Park-Ohio Industries, Inc., Cleveland, Ohio
Filed Oct. 5, 1970, Ser. No. 78,088
Int. Cl. H05b *5/00, 9/00*
U.S. Cl. 219—10.69 **5 Claims**



A preheated slab of metal is moved through induction heating units to raise its temperature prior to rolling. Electric radiant heating devices are spaced along the slab before and after it passes through the induction heating units to maintain the elevated temperature of the slab by directing radiant heat toward the slab in an amount sufficient to compensate for heat loss from the slab to the atmosphere.

3,715,557
METHOD OF, AND APPARATUS FOR SPIRALLY WINDING STRIP METAL ABOUT A PIPE, AND SECURING ADJACENT STRIPS BY WELDING

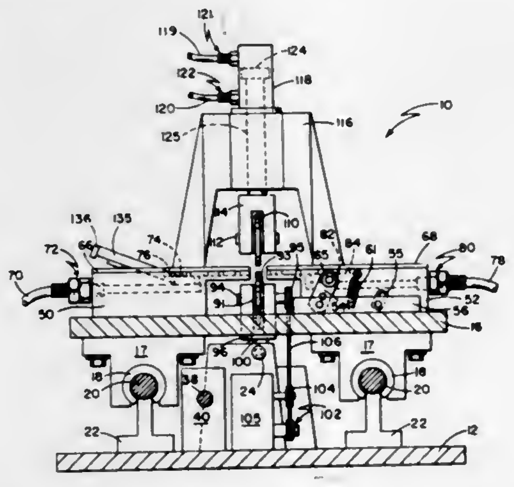
Sture Netterstedt, and Bengt Lindstrand, both of Fagersta, Sweden, assignors to Rostfria Tak AB, Fagersta, Sweden
Filed May 11, 1971, Ser. No. 142,327
Int. Cl. B23k *1/16*
U.S. Cl. 219—62 **21 Claims**



An annular carrier cage is placed around the pipe, which may be insulated. The carrier cage supports a holder for stainless steel strip, a flange forming apparatus, a flange extension apparatus, seam welding apparatus and a post-welding, flange stress relieving apparatus. To permit curling of the flanged strip about the circumference of the pipe, the flange extension apparatus reduces the diameter of the formed flange adjacent the edge thereof, for example by exerting pressure against the flange strip by a pair of conical rollers having their greater diameter adjacent the free edge of the flange. Adjacent flanges are welded together by roller electrodes, and a pair of conical rollers similar to the flange extension apparatus then bear against the welded joints to relieve stresses due to welding and provide for a tight wrap of the spiral, welded strip about the pipe.

3,715,558
WELDING APPARATUS

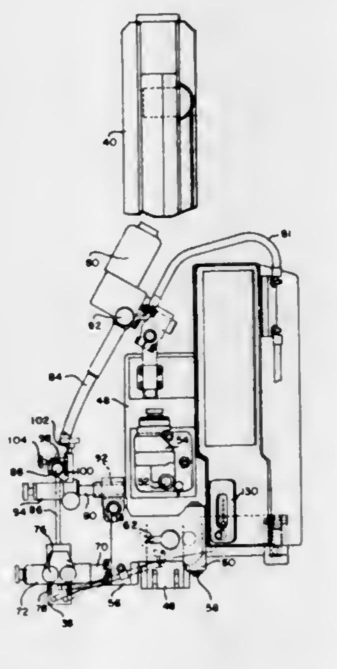
Thomas Alan McGill, Hamilton, Mass., assignor to The Gillette Company, Boston, Mass.
Division of Ser. No. 758,465, Sept. 9, 1968, Pat. No. 3,597,571. This application Sept. 29, 1970, Ser. No. 76,525
Int. Cl. B23k *11/06*
U.S. Cl. 219—82 **2 Claims**



Welding sheets of 0.0015 inch thick stainless steel razor blade stock together by overlapping two ends of two sheets 0.0040 inch, inserting the overlapped ends between the peripheral welding surfaces of two adjacent copper-tungsten alloy welding rollers, forming a spot weld under pressure by applying a 1,000 ampere, 60 cycle current at 3.8 volts to the rollers for 8 cycles, advancing the overlap longitudinally between the rollers for a distance about one-third the average length of the spot weld, stopping this advance and forming a second spot weld, and repeating this process until the entire overlap is welded.

3,715,559
VERTICAL WELDING MACHINE HAVING SWINGING EQUIPMENT HEAD

James E. Norcross, Media, Pa., and George Garwood, Philadelphia, Pa., assignors to Arcos Corporation, Philadelphia, Pa.
Filed April 10, 1972, Ser. No. 242,360
Int. Cl. B23k *9/12, 9/18*
U.S. Cl. 219—126 **4 Claims**

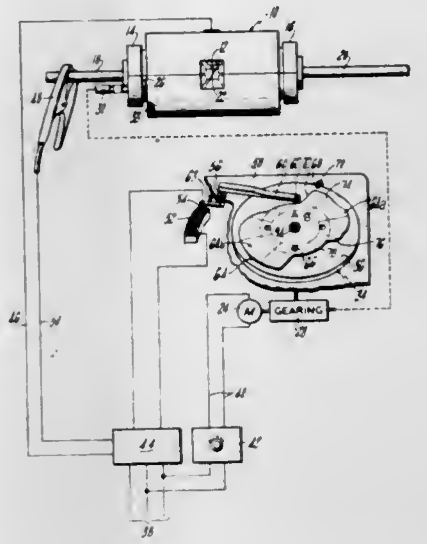


A vertical welding machine for welding the vertical weld groove between two plates or the like, having a vertically moving carriage which has a vertical pivot on which a swinging equipment head is positioned which supports the adjoining weld shoe, the snorkel and possibly also other equipment. In a vertical welding machine which has a carriage having outboard pressure support for the weld shoe remote from the vertical axis of its column, the machine may have roller support for the carriage on the opposite side of the vertical column to offset the deflection or distortion which may be caused by the pressure on the shoe.

3,715,560
WELDING PROGRAMMER

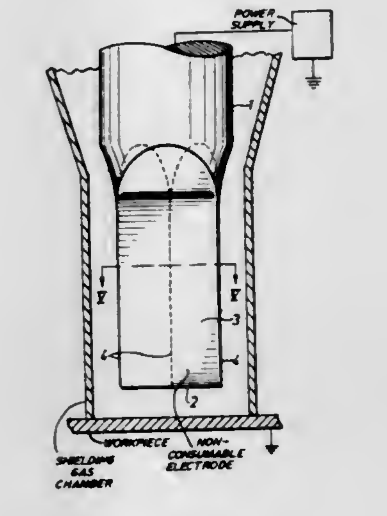
John O. Emmerson, c/o Magnatech, The DSD Company, Bradley Park, East Granby, Conn.
Filed March 1, 1971, Ser. No. 119,735
Int. Cl. B23k *9/10*
U.S. Cl. 219—131 R **13 Claims**

A portable programmer for an automatic orbital tube welder comprises a turntable for mounting a shaped cam which is engaged by the stylus of a control arm to control the welding current through the use of a potentiometer having a wiper connected to the control arm. The turntable is rotated at a speed proportional to the speed of the welding head so that the rotation of the cam controls the welding current throughout all the orbits of the welder around the tube required to produce the weld. A support plate for indexing the cam on the turntable is mounted by a self-centering clutch comprising a resilient O-ring carried by the turntable platen and a flange on the support plate having a locking taper for engaging the O-ring.



3,715,561
NON-CONSUMABLE ELECTRODE CONFIGURATION HAVING INCREASED ARC STARTING CAPABILITIES

Alf Martin Hammarlind, Vasteras, Sweden, assignor to Aktiebolaget Atomenergi, Stockholm, Sweden
Filed June 15, 1970, Ser. No. 46,045
Int. Cl. B23k *35/00*
U.S. Cl. 219—145 **4 Claims**

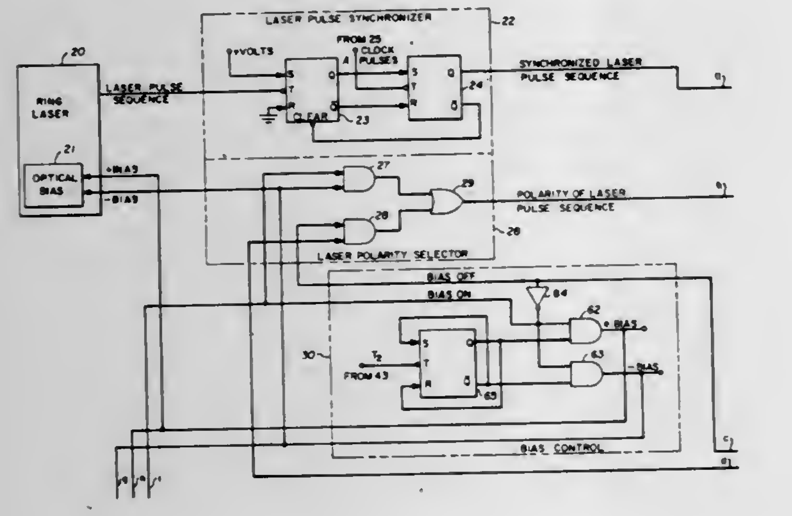


There is disclosed a non-consumable electrode for electric arc welding in a highly controlled inert atmosphere. In order to improve the initiating characteristics the rod-shaped electrode has at least one longitudinal edge starting from the end of the rod facing the arc, the edge angle of at least one of said edges being acute.

3,715,562
COMPUTER FOR USE WITH RING LASER ROTATIONAL RATE SENSORS

Joe B. Dendy, Phoenix, Ariz.; Kenneth Thomson, Lloyd Neck, and Robert F. Morrison, Halesite, both of N.Y., assignors to Sperry Rand Corporation
Filed March 19, 1970, Ser. No. 20,965
Int. Cl. G06f *15/20;* **G01b** *9/02*
U.S. Cl. 235—150.31 **22 Claims**

A computer responsive to the pulse sequence output signal of a ring laser rotational rate sensor having contra-rotating beams and biasing means to prevent mode locking. The biasing means selectively changes the effective optical path length around the ring of one of the beams with respect to the other. The pulse repetition frequency of the laser output pulse sequence is representative of the difference in oscillation frequency between the contra-rotating beams. The computer comprises a bias control circuit for selecting the polarity of the bias applied to the ring and includes a compensation circuit for providing a bias compensation pulse sequence whose pulse repetition frequency is representative of the magnitude of the applied bias. The computer in addition provides signals representative of the polarities of the laser output pulse sequence and the bias compensation pulse sequence respectively. The laser polarity is chosen in accordance with the selected polarity of the applied bias. The polarity of the bias compensation pulse sequence is chosen opposite to the selected laser polarity. A pulse sequence combining circuit is included for combining the laser output pulse sequence and the bias compensation pulse sequence thereby providing a combined pulse sequence. The pulse sequence combining circuit furthermore combines the associated polarity signals thereby providing a combined polarity signal. The combined pulse sequence is integrated in accordance with the combined polarity signal for providing a signal representative of the ring about an axis normal thereto.

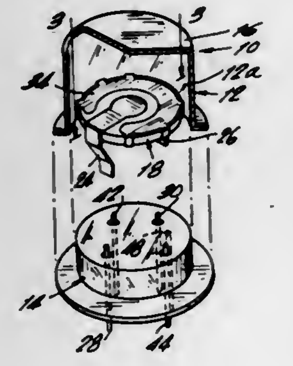


3,715,563
CONTACT HEATERS FOR QUARTZ CRYSTALS IN EVACUATED ENCLOSURES

Martin Bloch, New York, N.Y., assignor to Frequency Electronics, Inc., New Hyde Park, N.Y.

Filed April 19, 1971, Ser. No. 135,271
Int. Cl. H05b *1/00*

U.S. Cl. 219—210 **1 Claim**



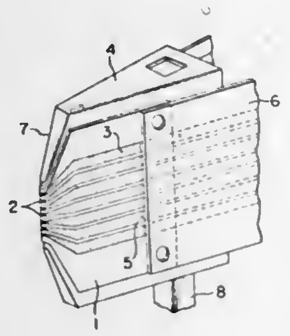
Thin metallic films are deposited on surfaces of quartz crystals in selected patterns and appropriate leads are provided to pass a current through the metallic film in order to heat same and thereby heat the crystals. The crystals are mounted in normal manner to an evacuated chamber. By use of the thin film contact heaters, temperature equilibrium is achieved at a much faster rate of time, with a higher rate of stability and with substantially reduced power consumption.

3,715,564
PRINTING HEAD FOR THERMAL PRINTER AND METHOD FOR MANUFACTURING SAME

Kfnji Hiruma and Inawo Sugaya, both of Tokyo, Japan, assignors to Ricoh Co. Ltd., Tokyo, Japan

Filed Sept. 9, 1971, Ser. No. 178,876
Intc. Cl. H05b *1/00*

U.S. Cl. 219–216 **3 Claims**



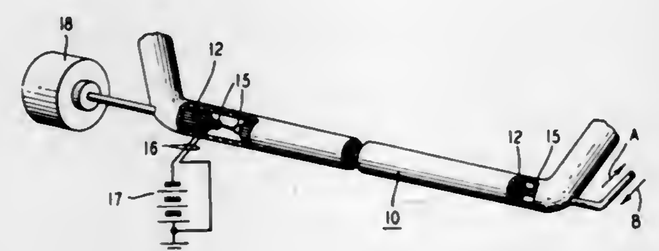
A plurality of heating resistors and their lead wires are formed upon a heat-resistive flexible film, and the flexible film is then curved and mounted upon a head structure in such a manner that the heating resistors are arrayed along a projecting edge of the head structure.

3,715,565
SYSTEM FOR MAINTAINING LOW RELATIVE HUMIDITY IN CLOSURES

Wendell Glenn Nutt, Phoenix, Md., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Division of Ser. No. 99,820, Dec. 21, 1970, Pat. No. 3,679,810. This application Feb. 17, 1972, Ser. No. 227,050
Int. Cl. F22b

U.S. Cl. 219—274 **3 Claims**



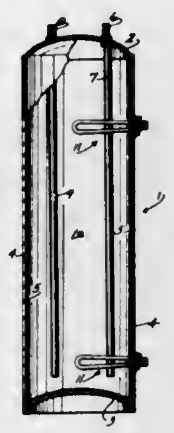
This disclosure describes a system for maintaining a reduced level of relative humidity in telephone cables. A moisture-permeable tube of, for example, polyvinyl chloride with a pulp-insulated pair within it is included in the cable core. The pulp insulation, being a natural desiccant, absorbs moisture that passes through the tube wall from the cable, thus holding down the relative humidity inside the cable. When the pulp is saturated, a longitudinal flow of air coupled with applied electrical current sufficient to heat the pair, purges the moisture from the tube. The pulp insulation is ready thereafter to absorb moisture anew.

3,715,566
CORROSION GUARD SYSTEM FOR ELECTRIC WATER HEATER

Loerwood C. Wasson, Milwaukee, Wis., assignor to A. O. Smith Corporation, Milwaukee, Wis.

Continuation-in-part of Ser. No. 125,209, March 17, 1971, abandoned. This application Jan. 24, 1972, Ser. No. 219,936
Int. Cl. F24h *1/00*

U.S. Cl. 219—322 **5 Claims**



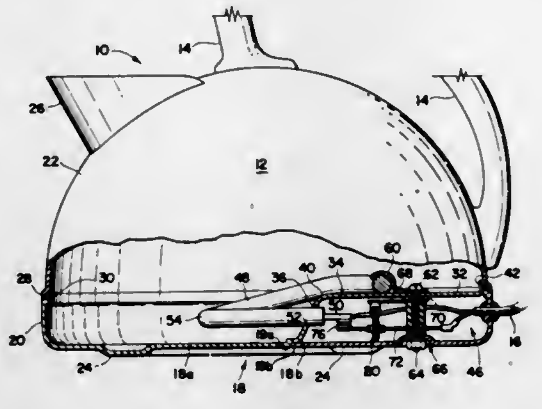
A water heater tank has a sacrificial anode and an electric heating element assembly protected by a zinc coated sheath. The element is mounted on the tank wall with the sheath electrically insulated from the steel of the tank. A zinc block also may be mounted at the wall of the heating element assembly.

3,715,567
LIQUID HEATING ASSEMBLY

Ronald S. Mandziak, 85 Albert Avenue, Toronto, Ontario, Canada

Filed Nov. 4, 1970, Ser. No. 86,829
Int. Cl. H05b *1/02;* **A47j** *27/21;* **H01h** *37/22*

U.S. Cl. 219—437 **2 Claims**



An electric liquid heating assembly having a dome shaped upper wall and a flat bottom. A false bottom is mounted within the liquid heating assembly and defines a liquid-tight compartment. The false bottom is composed of a top wall and a lip. The top wall is spaced apart from the liquid heating assembly bottom and disposed parallel thereto and has an area substantially less than the area of the liquid heating assembly bottom. The lip depends downwardly from the top wall to the liquid heating assembly bottom. A thermo-sensitive element is mounted within the compartment and includes a resilient conductor, an insulator mounted to the conductor and a bi-metallic strip. When the temperature of the liquid within the liquid heating assembly exceeds a predetermined temperature, the bi-metallic strip contacts the insulator thereby applying a force to the conductor opposed to its bias and causing a contact, secured to the conductor, to move away from an electric terminal thereby de-energizing a heating element mounted with the liquid heating assembly.

ERRATUM

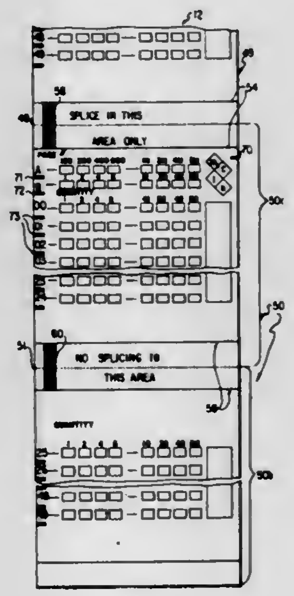
For Class 235—150.31 see:
Patent No. 3,715,562

3,715,568
SYSTEM FOR GATHERING AND TRANSMITTING SOURCE DATA

Leo L. Azure, Jr., Richland, Wash., assignor to Automata Corporation, Richland, Wash.

Filed Nov. 16, 1970, Ser. No. 89,993
Int. Cl. G06k *5/00*

U.S. Cl. 235—61.7 R **32 Claims**

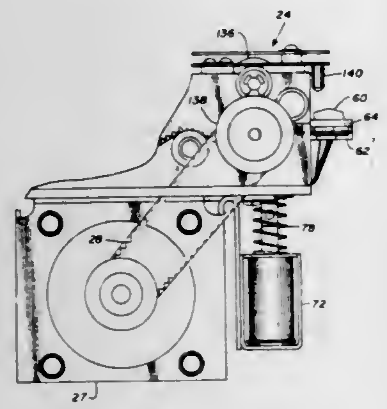


A data gathering and transmitting system includes apparatus for reading data encoded on elongated strips, such as conventional fan-fold strips, and functions in an edit operation for error checking of the read data and compilation of plural such strips, and in a transmit operation for transmitting the data to a central processing station. The fan-fold strip is conformed to a computer memory print out for convenience of marking thereof as in a quantity ordering application. Plural separate fan-fold strips may be spliced together, the reader automatically affording the splicing operation in the edit operation. The reader also effects error checking, including detection of marks of questionable integrity on the fan-fold strip as to reliability of reading as well as to improper marking, either in the omission of required marks, or in the provision of marks not permitted in the encoding format employed, and automatically positions the strip to identify the position thereon at which the error is detected, for human scrutiny and correction. During edit, therefore, the data is compiled and any error automatically identified for scrutiny and correction by the human operator; in the transmit operation, therefore, reliable and accurate transmission is assured. In an order mode, a receiver at the central station responds to the content and format of the data as received from the transmitter to afford an effective doubling of the content of the transmitted data for a given bit rate of transmission. Herein, the sequence of receipt of data words from each strip identifies the word and the related position of the central computer memory to which each such word relates. A change in the format automatically causes the system to switch to a cash mode in which the system functions to transmit and receive digital words of the prescribed format in accordance with the page identification and other encoded identification thereof, as required.

3,715,569
CREDIT CARD AUTOMATIC CURRENCY DISPENSER

John R. Hicks, Duncanville, and William C. Bortzfield, Fort Worth, both of Tex., assignors to Docutel Corporation, Dallas, Tex.

Filed July 29, 1970, Ser. No. 59,241
Int. Cl. G06k *7/08*; **G97f** *1/06*
U.S. Cl. 235—61.11 D **10 Claims**

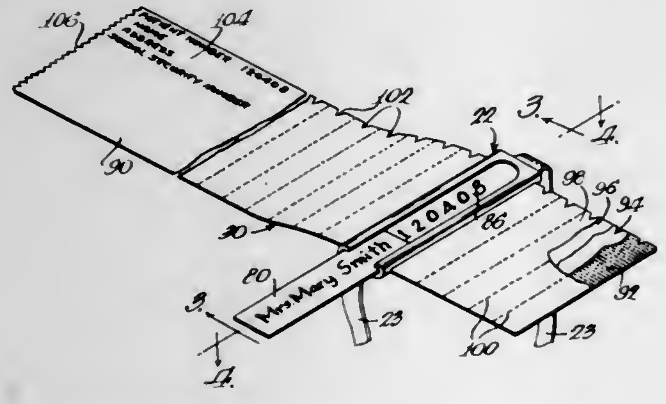


A currency dispenser automatically delivers a medium of exchange in packets in response to a coded credit card presented thereto. The coded credit card is presented to the currency dispenser and an initial check is made to determine if the card has the proper format. After checking the credit card format, coded information thereon is evaluated to check the user's identity prior to authorizing him to receive cash from the machine. When each of several additional checks of the credit card code have been completed, the old code is removed and substituted with a new code. The new code contains the same information as the old but updated to reflect an additional currency dispensing transaction. Both the original code and the updated code are scrambled in accordance with a changing key. Scrambling the credit card code after each use thereof minimizes the chance of unauthorized use of the currency dispenser. When the checks of the credit card code indicate the user is entitled to receive the amount of currency he has selected, a storage container for the packets of currency transports the required number of packets by a positive feed drive to a cash drawer. The cash drawer opens to a detent position which allows the customer to then move the drawer to a fully open position to remove his currency. Upon release of the cash drawer, it returns to a partially opened position from which it automatically closes after a preset time limit.

3,715,570
IDENTIFICATION SYSTEM

Theodore E. Weichselbaum, St. Louis, and Jack L. Wilhelmson, Fenton, both of Mo., assignors to Sherwood Medical Industries Inc.

Filed Dec. 2, 1970, Ser. No. 94,452
Int. Cl. G06k *19/06*; **G01d** *15/12*
U.S. Cl. 235—61.12 M **9 Claims**

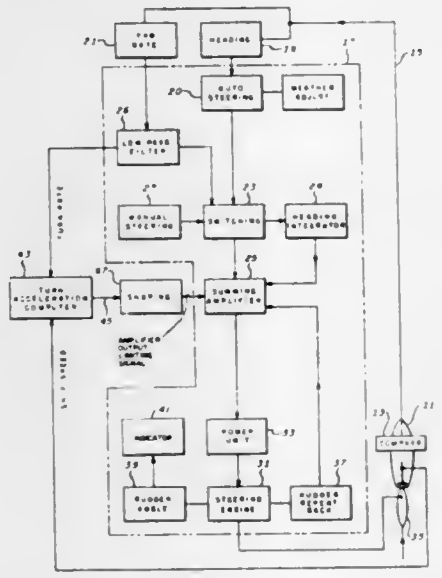


An identification bracelet attached to the arm of each patient entering a hospital dispenses a plurality of magnetically coded tags having an adhesive backing for attachment to samples, prescriptions and the like to uniquely identify the source individual. Tag readers located throughout the hospital decode the magnetic tags in order to correlate an analysis with the proper patient. In the patient's room, a portable battery operated cross-check reader compares a magnetically coded treatment tag with an identification tag from the patient's bracelet to prevent a treatment from being given to the wrong patient.

3,715,571
SHIP'S TURN RATE CONTROL SYSTEM

Frederick D. Braddon, Babylon, N.Y., assignor to Sperry Rand Corporation

Filed June 7, 1971, Ser. No. 150,495
Int. Cl. G06g *7/78*
U.S. Cl. 235—150.2 **3 Claims**



A conventional ship's steering system is modified to limit the degree of heeling during turns by limiting the centrifugal force developed during such turns. The present invention utilizes the fact that centrifugal force is proportional to the product of a ship's speed and turning rate. The ship's speed and rate-of-turn are measured and multiplied in a computer. Rudder command signals are applied to the steering mechanism through a summing amplifier. The output of the computer is used to modify the characteristics of the amplifier to a value that maintains the computer output within the acceptable limits. Thus heel control is achieved by automatically regulating the rudder positioning control.

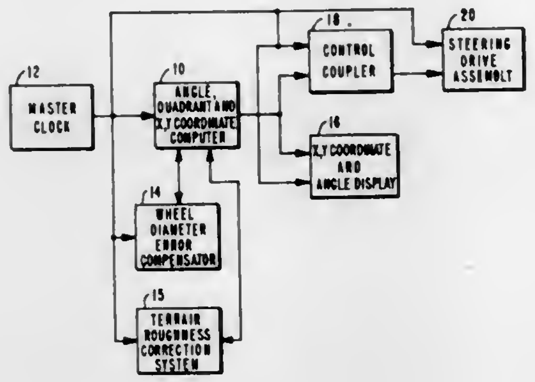
3,715,572
VEHICLE LOCATION AND HEADING COMPUTER SYSTEM

Dale E. Bennett, 801 No. Mountain View Place, Fullerton, Calif.

Filed March 5, 1971, Ser. No. 121,437
Int. Cl. G06f *15/50*; **A01b** *69/04*
U.S. Cl. 235—150.2 **53 Claims**

A system is provided in which pulses generated by the rotation of the wheels or tracks of a vehicle are processed to provide representations of the heading and location of the vehicle relative to X and Y coordinate axes. The angle between vehicle heading and the X axis is represented by the binary value stored in an angle register, the angle register being updated by the generated pulses each time the vehicle travels a predetermined distance. An associated quadrant register provides a binary representation of that one of the four quadrants of the coordinate system in which the vehicle heading is located. Binary representations of the vehicle location relative to the X and Y axes are stored in X and Y registers, which registers are updated in accordance with incremental changes in X and Y by computing the sine and cosine of the new angle stored in

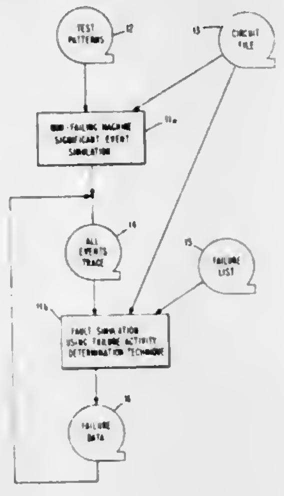
the angle register upon each updating of the angle register. The stored angle and X, Y representations are converted into analog values to provide a visual display of the vehicle heading and location. The stored representations are also processed by apparatus which provides for operation of the vehicle over a predetermined course without the need for a driver or operator.


12
MASTER CLOCK
10
ANGLE, QUADRANT AND X,Y COORDINATE COMPUTER
18
CONTROL COUPLER
20
STEERING DRIVE ASSEMBLY
16
X,Y COORDINATE AND ANGLE DISPLAY
14
WHEEL DIAMETER ERROR COMPENSATOR
15
TERRAIN ROUGHNESS CORRECTION SYSTEM

3,715,573
FAILURE ACTIVITY DETERMINATION TECHNIQUE IN FAULT SIMULATION

Robert E. Vogelsberg, Nichols, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed April 14, 1971, Ser. No. 133,999
Int. Cl. G06f *11/00*
U.S. Cl. 235—153 AC **5 Claims**

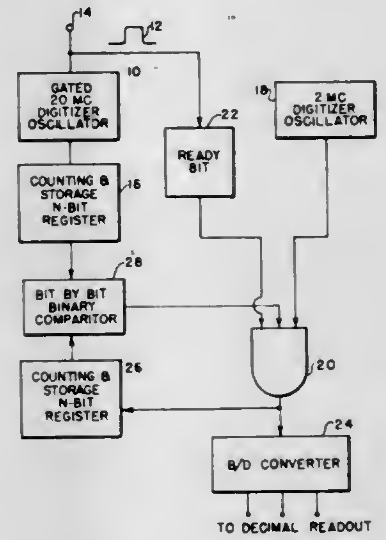


The failure activity determination technique of the present application represents a new approach to fault simulation designed to significantly reduce the time required to perform such simulations. This new technique may be used in conjunction with any interpretive fault simulation program (i.e., any program using list structures to trace and calculate circuit activity in a logic design). The improved technique consists essentially of using previously calculated good machine values during the fault simulation for any logic blocks that are not effected by the failure(s) being simulated. Thus, new values must be calculated for only a subset of the total logic circuitry. This subset, or failure partition, of the logic is determined dynamically during the fault simulation through the use of a series of flags within the circuit list structure.

3,715,574
INTERFACE CONVERTER FOR FEEDING HIGH FREQUENCY SIGNALS INTO LOW FREQUENCY CIRCUITS

Richard L. Gowan, Bonita, Calif., assignor to The United States of America as represented by the Secretary of the Navy

Filed July 21, 1971, Ser. No. 164,564
Int. Cl. G06f *5/02, 5/06*; **H04l** *3/00*
U.S. Cl. 235—154 **1 Claim**

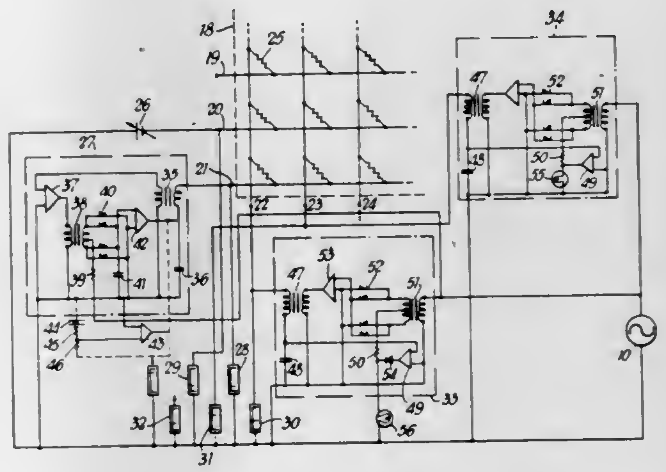

14
12
10
GATED 20 MC DIGITIZER OSCILLATOR
22
READY BIT
18
2 MC DIGITIZER OSCILLATOR
COUNTING & STORAGE N-BIT REGISTER
16
28
BIT BY BIT BINARY COMPARITOR
20
COUNTING & STORAGE N-BIT REGISTER
26
24
B/D CONVERTER
TO DECIMAL READOUT

Apparatus for conversion of high speed binary to binary coded decimal with low speed circuitry. An information incoming pulse is digitized at the high frequency rate and this digital equivalent is stored in a first bit register. A low frequency digitizing oscillator is coupled through a gate circuit to a bit register identical to the first bit register and into a binary-to-digital converter. A bit by bit comparator compares the high frequency pulse count with the low frequency pulse count and produces a stop signal to the gate circuit when the low frequency count equals the stored high frequency count.

3,715,575
ANALOG COMPUTER FOR SOLVING SETS OF SIMULTANEOUS RELATIONS

John Hugh Davey Walton, 2 Broadfield Road, Kent, England

Filed March 9, 1971, Ser. No. 122,338
Int. Cl. G06g *7/34*
U.S. Cl. 235—180 **21 Claims**



An analog computer having a multiplexed negative feedback system comprising : an electrical network of impedances defining linear functions and which network is reciprocal between first and second sets of conductors of the network; and signal transmitting-receiving devices connected to said sets and which multiplex signals passing through the network between said sets in opposite directions. Solutions of the functions can be determined from the signals passing through the network in one direction from the transmitting-receiving devices connected to one of said sets when the system achieves equilibrium, and the signals passing through the network in the opposite direction from the other transmitting-receiving devices being negative feedback signals for controlling said devices connected to said one set of conductors. The multiplexing can be frequency or time multiplexing.

3,715,576

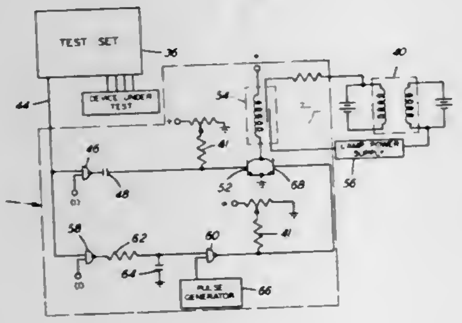
SYNCHRONIZED ILLUMINATION FOR OPERATIONS ON LIGHT SENSITIVE ARTICLES

John W. McGrath, and Dennis E. Repsher, both of Allentown, Pa., assignors to Western Electric Company, Incorporated, New York, N.Y.

Filed March 19, 1971, Ser. No. 126,217

Int. Cl. F21v *23/00*

U.S. Cl. 240—2 R **10 Claims**



A pulsable light source is synchronized with a test cycle during probe-testing of semiconductor devices. A high level of illumination is provided by energizing the light source to thereby assist an operator in viewing the probes and devices through a microscope between tests. During a test the light source is deenergized to eliminate the adverse effects of light on test results.

A typical test requires 10–20 milliseconds. Thus, the pulsable light source flashes at a frequency of approximately 50–100 flashes per second, appearing substantially continuous to the operator. Typically, the effects of light on semiconductor devices disappear within a few microseconds after removal of the light. Thus, through most of the time a device is being tested it is in darkness, while to the operator's eye the device appears to be illuminated.

3,715,577

UNDERWATER LOCALIZATION SYSTEM

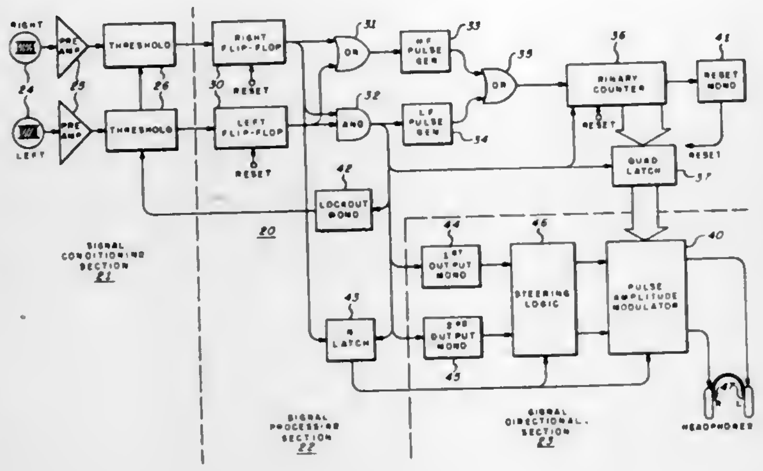
Carl E. Bohman, Sudbury, Mass., assignor to Sperry Rand Corporation

Filed Feb. 8, 1971, Ser. No. 113,184

Int. Cl. G01s *3/00*

U.S. Cl. 340—6 R **10 Claims**

An acoustical apparatus for divers including an underwater omni-directional transmitter and a three-section receiver having two hydrophones and two earpieces mounted on head gear worn by each diver. Pulse signals from the transmitter are sensed by the hydrophones disposed in a signal conditioning section of the receiver and are coupled through preamplifiers and detection circuits to bistable multivibrators in a signal processing section of the receiver. This latter section includes a pair of microcircuit pulse generators and a counter for determining the relative occurrence of the pulses and the time separation between the pulses. A third section of the receiver is comprised of monostable multivibrators, logic gates, attenuation circuits and bone conduction earpieces as output elements. This third section is responsive to the output signals of the processing section and enables the diver to perceive the direction of the underwater transmitter.



3,715,578

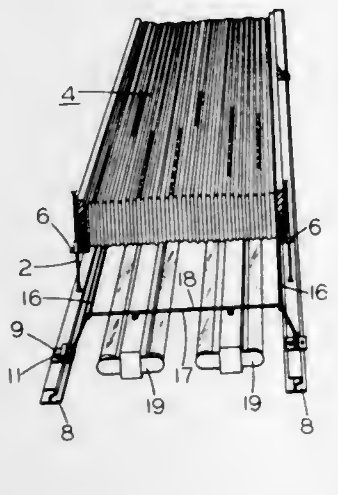
LIGHT AND FILTER ASSEMBLY FOR CEILING STRUCTURE

Walter B. Wood; Bernard R. Schuler, both of Louisville; Charles A. Bromm, Fern Creek, and Wilson A. Welch, Louisville, all of Ky., assignors to American Air Filter Company, Inc., Louisville, Ky.

Filed Feb. 10, 1971, Ser. No. 114,181

Int. Cl. F21s

U.S. Cl. 240—9 R **6 Claims**



A modular light and filter assembly arranged to be suspended from ceiling superstructure with the light assembly being removably supported directly below the filter assembly in an arrangement maximizing laminar flow of the gases to be treated by the filter assembly.

3,715,579

RATE DECODER WITH ACTIVE FILTERS

Roger Eblovi, Fairport, N.Y., assignor to General Signal Corporation, Rochester, N.Y.

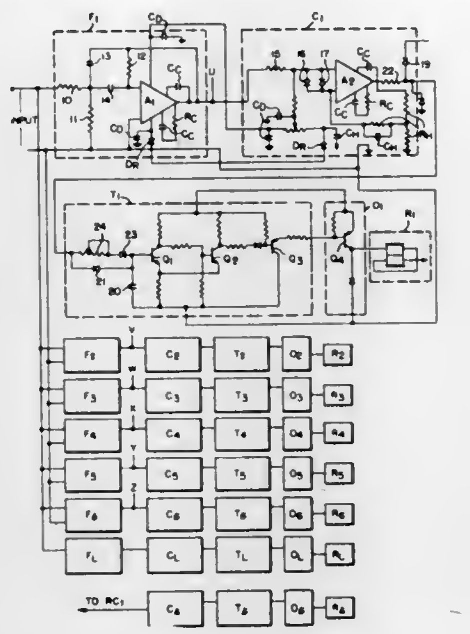
Filed Oct. 22, 1970, Ser. No. 82,916

Int. Cl. B60l *15/06;* **H01h** *47/20*

U.S. Cl. 246—187 A **13 Claims**

The decoding system provides a control signal in response to an input of one of a plurality of selected code rates. The improvement includes a band-pass filtering means for each code rate which is responsive to the input for producing the output when the rate is within the band of the filter. A comparator means has a triggering level responsive to the filter output and

produces a step signal when the amplitude of the filter output exceeds the triggering level. An output means responsive to the step output of the comparator produces the control signal when the step output signal occurs at at least a minimum rate.



3,715,580

MULTI ELECTRON BEAM APPARATUS

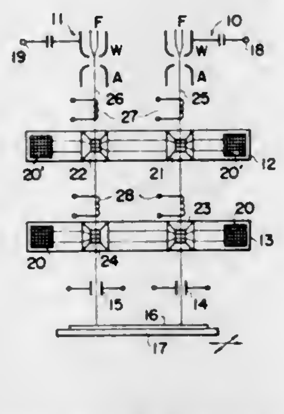
Akiji Maekawa; Chusuke Munakata, both of Kodaira, and Norio Saitou, Kokubunji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed March 4, 1971, Ser. No. 120,975

Claims priority, application Japan, March 4, 1970, 45/17888

Int. Cl. H01j *37/00*

U.S. Cl. 250—49.5 TE **8 Claims**



A multi-electron beam recorder having a new type electron lens composed of common exciting coils and a plurality of closely spaced pole piece parts excited by said coils. Electron beams pass through the respective pole piece parts and are focussed therein to impinge on a plurality of photographic plates and to record desired IC patterns thereon.

3,715,581

RAPID SCANNING DOUBLE FOCUSING MASS SPECTROGRAPH

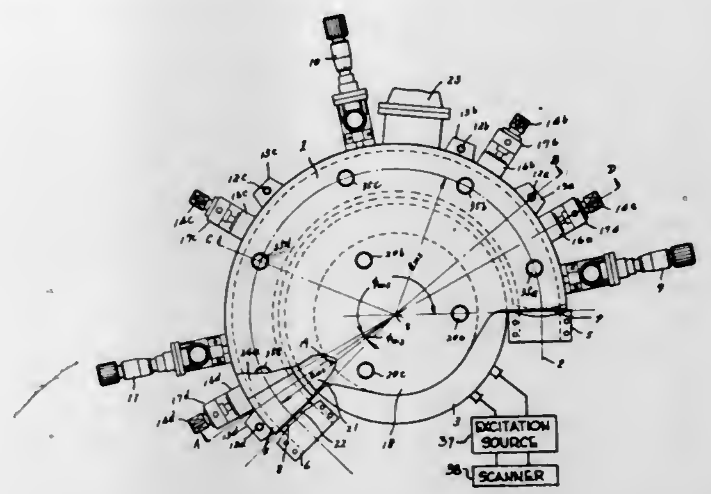
Hisashi Matsuda, Toyonaka, Japan, assignor to Nihon Denski Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 702,469, Feb. 1, 1968, abandoned. This application June 15, 1970, Ser. No. 46,178

Int. Cl. H01j *39/34*

U.S. Cl. 250—41.9 ME **6 Claims**

A rapid scanning double focusing mass spectrograph having a source of ions, means for producing a toroidal electric field, means for producing a homogeneous magnetic field and means for producing an r^{-1} magnetic field, wherein the r^{-1} magnetic field and the homogeneous magnetic field are excited simultaneously with a single energizing magnet and upper and lower parallel pole pieces of the means for producing a homogeneous magnetic field are secured to the rear ends of the upper and lower conical pole pieces of the means for producing an r^{-1} magnetic field with the curvature radii of the two means being kept equal.



3,715,582

METHOD OF AND APPARATUS FOR ATTAINING FOCUSING FOLLOWING VARIATION IN MAGNIFICATION IN ELECTRON MICROSCOPE

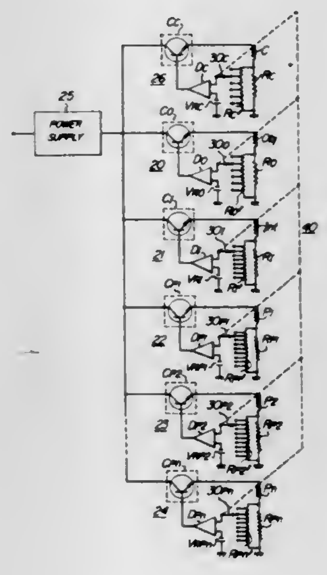
Hiroshi Akahori; Morioki Kubozoe; Toshihiro Furuya, and Sadayasu Ueno, all of Katsuta, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 21, 1970, Ser. No. 65,996

Claims priority, application Japan, Feb. 13, 1970, 45/40945; May 15, 1970, 45/12377

Int. Cl. H01j *37/10*

U.S. Cl. 250—49.5 A **8 Claims**

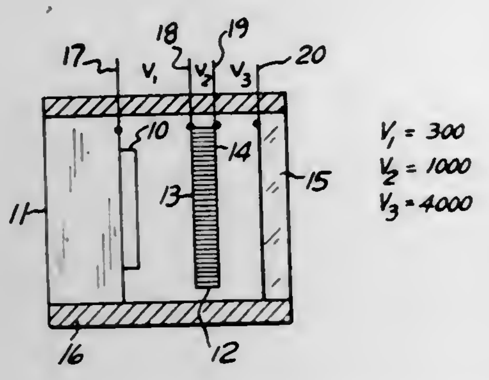


A method of and apparatus for attaining the focusing following a variation in the magnification in an electron microscope having an image producing lens system consisting of three or more lenses or generally *n* lenses including at least an objective lens, an intermediate lens and a projective lens. Means are provided in the apparatus so that, when the value of excitation current for the magnification varying lens is varied to vary the magnification, the excitation current supplied to the focus adjusting lens can be set at a value corresponding to the variation in the magnification, whereby the focusing following the variation in the magnification by the magnification varying lens as well as the adjustment of the intensity of illumination can be achieved by a single regulating operation.

3,715,583
SURFACE IMAGING UTILIZING EXOELECTRON EMISSION

Peter F. Braunlich, Bloomfield Hills, Mich., assignor to The Bendix Corporation

Filed May 13, 1971, Ser. No. 142,967
Int. Cl. G01t *1/11*; H01j *31/50*
U.S. Cl. 250—71 R **17 Claims**

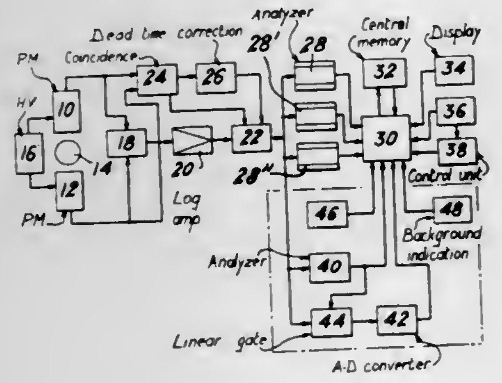


A system for obtaining an image of a surface by utilizing exoelectron emission is described. Surface characteristics such as homogeneity, microscopic flaws and discontinuities in the work function and defect distribution across the surface of the sample can be imaged by detecting the exoelectrons which are emitted from the surface under controlled conditions. The system includes a channel electron multiplier which is positioned in the proximity of the sample under study. The sample is heated to a temperature which enhances exoelectron emission. Exoelectron emission can also be stimulated by illuminating the substance with light or by stressing, cutting, or impacting the material. The emitted exoelectrons are detected by the multiplier and the multiplier emits secondary emission electrons in response to the exoelectrons. A phosphor screen receives the secondary emission electrons and yields a visual output in response thereto. Because the exoelectrons strike the multiplier at positions corresponding to positions from which they emanated from the sample surface, a visual image of the surface is obtained at the output screen. Exoelectron emission from a surface is dependent upon the characteristics of the surface, and therefore flaws and variations in the homogeneity of the surface are evident in the visual image.

3,715,584
METHOD AND APPARATUS FOR EVALUATING THE DEGREE OF QUENCHING IN SCINTILLATION SPECTROMETRY

Emmanuel Rosenstingl, Plaisir, France, assignor to Intertechnique S.A., Plaisir, France

Filed Nov. 17, 1970, Ser. No. 90,362
Claims priority, application France, Nov. 21, 1969, 6940184; Oct. 29, 1970, 7039133
Int. Cl. G01t *1/20*
U.S. Cl. 250—71.5 R **20 Claims**

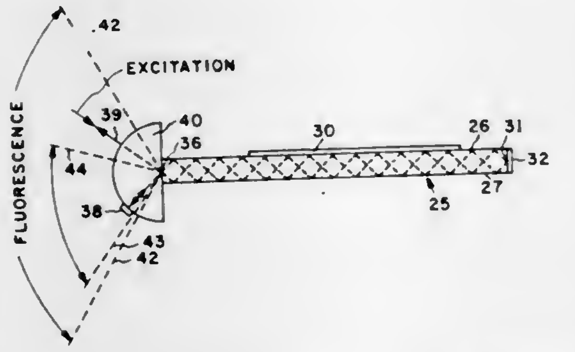


For evaluating the degree of quenching in a liquid scintillation sample, the pulse height corresponding to the centroid of part at least of the net count rate — pulse height spectrum due to a radioisotope in the sample or to an external standard is determined and compared with a calibration curve. Provision is made for subtraction of the contribution of the background noise. Determination of the counting efficiency is made by interpolation on a calibration curve.

3,715,585
FLUORESCENCE SPECTROPHOTOMETRY USING MULTIPLE REFLECTIONS TO ENHANCE SAMPLE ABSORPTION AND FLUORESCENCE COLLECTION

Nicolas J. Harrick, Croton Dam Road, Ossining, N.Y.

Filed June 7, 1971, Ser. No. 150,687
Int. Cl. G01n *21/16*
U.S. Cl. 250—71 R **14 Claims**

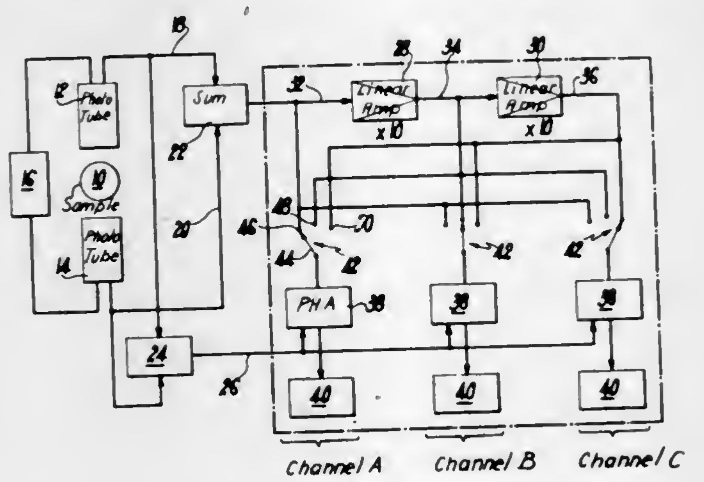


Apparatus for enhancing the sensitivity of fluorescence spectrophotometry is described. Enhanced sensitivity is obtained by a novel sample cell construction in the form of a flat plate providing multiple exposure of the sample to the exciting radiation to increase absorption, and providing concentration of the fluorescent radiation to a small aperture for more efficient collection. The novel cell also provides easy separation of the exciting and fluorescent radiations.

3,715,586
LIQUID SCINTILLATION SPECTROMETRY SYSTEM FOR SAMPLE ANALYSIS

Edward W. Thomas, Rockaway, N.J., and Edward Rapkin, Huntington, N.Y., assignors to Intertechnique S.A., Paris, France

Filed Feb. 5, 1968, Ser. No. 703,153
Int. Cl. G01t *1/20*
U.S. Cl. 250—71.5 R **12 Claims**

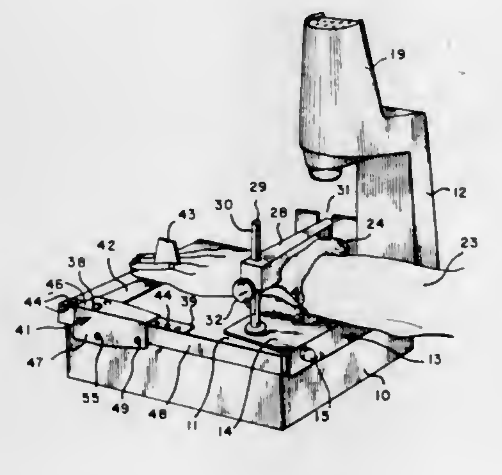


A liquid scintillation spectrometer system includes several discriminator channels and a single amplification chain consisting of several pre-adjusted linear amplifiers providing, for example, three pre-adjusted ranges in the gain ratios of 1, 10, 100. Thus 32P can be counted in a channel with a gain of 1 and tritium can be counted in a channel with a gain of 100. A range switch proceeds each pulse height analyzer permitting any isotope to be counted in any channel. In an alternative system, similar in principle, signals are taken from several dynodes of the photomultipliers, for example the ninth dynodes, the 11th dynodes and the 13th dynodes.

3,715,587
LIMB HOLDER POSITIONER FOR BONE MINERAL ANALYZER

Robert Burkhalter, and George L. Congdon, both of Fort Atkinson, Wis., assignors to Norland Corporation, Fort Atkinson, Wis.

Filed Oct. 26, 1970, Ser. No. 83,945
Int. Cl. G03b *41/16*
U.S. Cl. 250—50 **10 Claims**

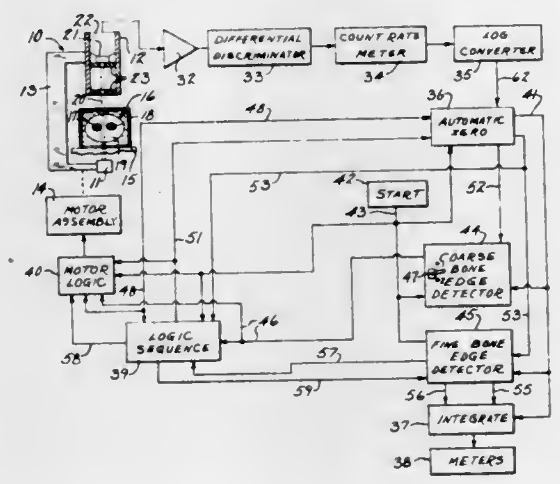


The disclosure relates to instruments for performing in vivo analysis of bone mineral content by measuring the absorption of a scanning beam of monoenergetic photons. Novel means are used for supporting and positioning a limb so that a predetermined increment of a bone therein can be scanned under repeatable conditions. Scanning is done with a tissue equivalent material surrounding the corresponding portion of the limb so that radiation transmission is substantially uniform through the tissue regions of the scan but has a sharp discontinuity where bone is in the beam.

3,715,588
BONE MINERAL ANALYZER

Frederick A. Rose, Fort Atkinson, Wis., assignor to Norland Corporation, Fort Aktinson, Wis.

Filed Oct. 26, 1970, Ser. No. 83,944
Int. Cl. G01t *1/20*
U.S. Cl. 250—71.5 S **57 Claims**

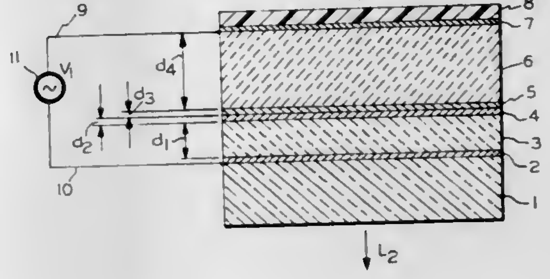


A bone mineral analyzer includes a radioactive photon source and a spaced detector secured to a holder movable along a transverse scanning line. A tissue-covered bone is held in a tissue equivalent cover to produce a constant thickness profile with a photon scanning beam selectively absorbed by the bone and the tissue and tissue equivalent. A dual speed motor moves the holder at a rapid search speed to locate the bone and hold the beam in fixed relation to the tissue and tissue equivalent cover for establishing and storing a tissue reference signal. A slow scan speed is established for scanning the bone and establishing a bone-tissue signal. Corresponding logrithmic signals are subtracted and integrated over the width of the bone to produce a bone mineral related output which drives digital meters. A selection switch interconnects a logic circuitry to permit selection between a pair of bones spaced in a common tissue. Timing circuits improve the characteristic response of the system. Calibration for the digital reader is connected to the output side of the integrator to permit calibration adjustment without disturbing the signal in the integrator.

3,715,589
ELECTROMAGNETIC RADIATION IMAGE DISPLAYING PANEL

Nobumasa Ohoshima, Osakafu; Kinya Himeno, Nara-ken, and Norihiro Tani, Osaka-fu, all of Japan, assignors to Matsushita Electric Industrial Co. Ltd., Osaka, Japan

Filed Oct. 2, 1970, Ser. No. 77,406
Int. Cl. H01j *1/62*
U.S. Cl. 250—80 **12 Claims**



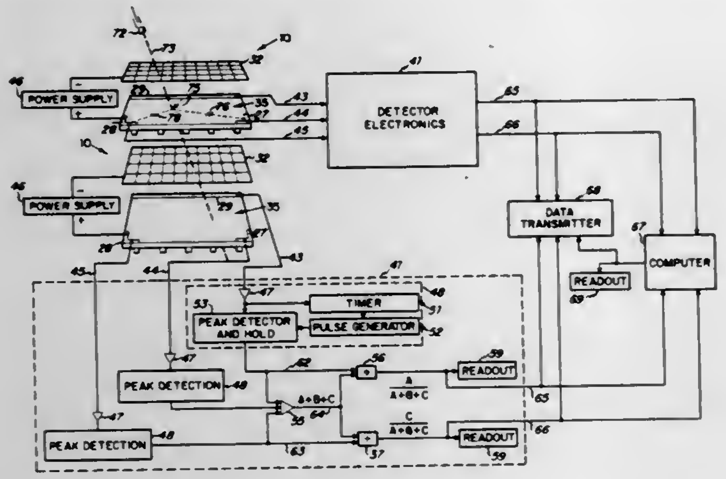
An image converting panel for displaying a pattern of short wave-length electromagnetic radiations, such as X-rays onto the image converting panel. The panel has a transparent substrate having at least the following layers thereon in the order from the bottom up; an electroluminescent layer having a dielectric constant of 7 to 40 and a thickness of d_1; a reflective layer having a dielectric constant of 10 to 200 and a thickness of d_2; an opaque layer having a specific resistivity of 10^5 to 10^{10}, Ω-cm and a thickness of d_3; a photoconductive layer having a linear relation of dark current to AC electric field up to at least 800 V/mm and a thickness of d_4; an electromagnetic radiation permeable electrode; and a covering layer having a high resistance to humidity. The dimension d_2 is equal to 0.1 to 0.3 d_1; d_3 is equal to 0.1 to 0.3 d_1; and d_4 is equal to 3 to 10 d_1.

3,715,590
MICROMETEOROID ANALYZER

Siegfried O. Auer, 67 Ludwigshafen-Rhine, Germany, assignors to the United States of America as represented by the Administrator of the National Aeronautics and Space Administration

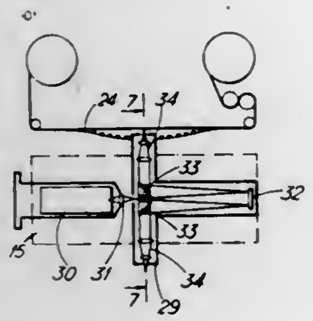
Filed March 26, 1971, Ser. No. 128,419
Int. Cl. G01t *1/00, 1/34*
U.S. Cl. 250—83.3 R **13 Claims**

A system for measuring the direction of flight, velocity, charge, mass and chemical composition of micrometeoroids. The analyzer includes two spaced arrays of interconnected capacitors and an ion detector. Electrodes are fastened to the edge of each array. Micrometeoroids impinge on the arrays and generate signals at the electrodes. The magnitude of the signals is a function of the impact location. Ions accelerated from one array are focused on an ion detector to provide a time-of-flight mass spectrometer.



3,715,591
OPTICAL SCANNING EQUIPMENT

Frank Arthur Gull, St. Albans, England, assignor to Hawker Siddeley Dynamics Limited, Hertfordshire, England
Continuation-in-part of Ser. No. 811,698, March 27, 1969.
This application Dec. 3, 1971, Ser. No. 204,463
Claims priority, application Great Britain, April 1, 1968, 5,299/68
Int. Cl. G01t *1/16*
U.S. Cl. 250—83.3 H **11 Claims**

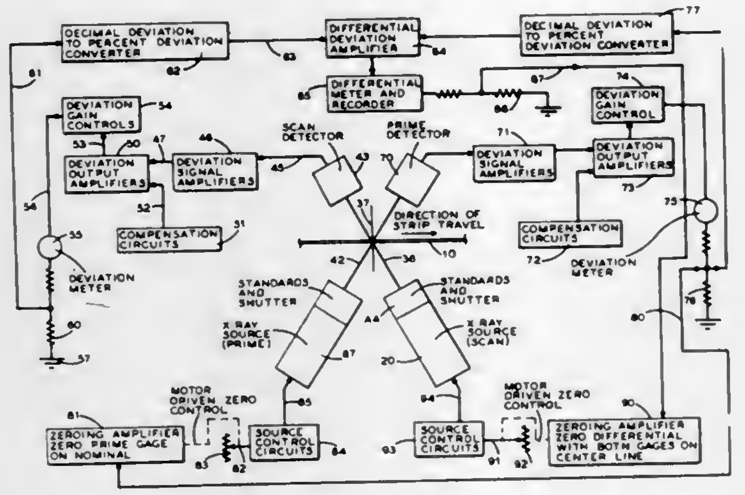


An aerial infra-red line-scanning system is provided in which rotation of a scanning rotor not only scans the terrain below the aerial vehicle and reflects the scanning beam on to an infra-red detection cell but also traverses a plurality of recording beams widthwise in succession across a film record transported close to the rotor in a direction parallel to the rotor axis. The recording beams are modulated in accordance with the signal output of the IR cell. The film is constrained, in the region where it is scanned by the recording beams, to a widthwise curvature centered on the axis of the rotor.

3,715,592
THICKNESS CHANGE RADIATION GAUGE

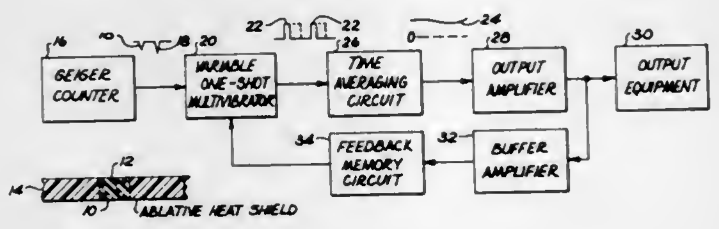
Edward R. Busch, Clarks Summit, and Guy B. Wood, Waverly, both of Pa., assignors to Weston Instruments, Inc., Newark, N.J.
Filed Jan. 12, 1971, Ser. No. 105,886
Int. Cl. G01t *1/16*
U.S. Cl. 250—83.3 D **8 Claims**

An illustrative embodiment of the invention shows a technique for accurately observing relative changes in strip thickness during sheet metal rolling operations. This is accomplished by measuring the apparent attenuations of two collimated beams of radiation. The prime radiation beam and the scanning beam, for instance, are tilted in opposite directions relative to the plane of the longitudinally moving metal strip in order to provide clearance for the radiation sources and associated detectors during traverse across the strip width. These tilted beams enable the relative change in strip thickness to be measured at essentially the same longitudinal position.


DECIMAL DEVIATION TO PERCENT DEVIATION CONVERTER
DIFFERENTIAL DEVIATION AMPLIFIER
DECIMAL DEVIATION TO PERCENT DEVIATION CONVERTER
DIFFERENTIAL METER AND RECORDER
DEVIATION GAIN CONTROLS
DEVIATION GAIN CONTROL
DEVIATION OUTPUT AMPLIFIERS
DEVIATION SIGNAL AMPLIFIERS
SCAN DETECTOR
PRIME DETECTOR
DEVIATION SIGNAL AMPLIFIERS
DEVIATION OUTPUT AMPLIFIERS
COMPENSATION CIRCUITS
DIRECTION OF STRIP TRAVEL
COMPENSATION CIRCUITS
DEVIATION METER
STANDARDS AND SHUTTER
STANDARDS AND SHUTTER
DEVIATION METER
X-RAY SOURCE (PRIME)
X-RAY SOURCE (SCAN)
MOTOR DRIVEN ZERO CONTROL
MOTOR DRIVEN ZERO CONTROL
ZEROING AMPLIFIER ZERO PRIME GAGE ON NOMINAL
SOURCE CONTROL CIRCUITS
SOURCE CONTROL CIRCUITS
ZEROING AMPLIFIER ZERO DIFFERENTIAL WITH BOTH GAGES ON CENTER LINE

3,715,593
AUTOMATICALLY ADJUSTABLE RADIOACTIVE RADIATION DETECTOR CIRCUIT

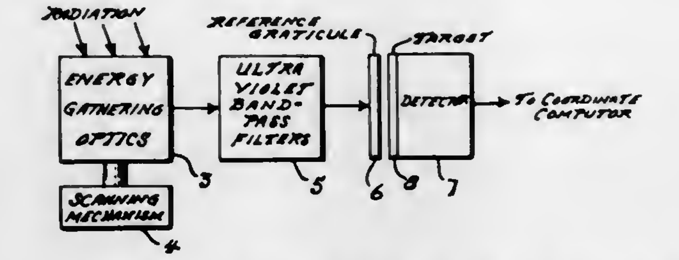
Richard D. McGunigle, Fullerton, Calif., assignor to RdF West
Filed March 19, 1970, Ser. No. 23,107
Int. Cl. G01t *1/16, 1/17, 1/18*
U.S. Cl. 250—83.6 R **10 Claims**



A circuit for measuring short term variations in the average repetition rate of random input pulses, such as from a Geiger counter that monitors the sudden drop in radiation from a test plug containing radioactive wires as the ablative heat shield material is burned away during space vehicle reentry, has a variable one-shot multivibrator that is triggered by each input pulse to generate discrete pulses of selected amplitude and duration. The multivibrator pulses are integrated in a time averaging circuit having a relatively short time constant, compared to duration of the short term variation to be measured, to provide an output signal voltage indicative of the existing input pulse repetition rate. This output signal is delivered through a high gain feedback path having a buffer amplifier and a feedback storage circuit with a relatively long time delay to control a variable impedance element, such as a field effect transistor, in the multivibrator timing circuit to vary the pulse length to compensate for gradual changes in the input pulse rate, such as may result from the slow decline in Geiger counter output rate due to radioactive decay of the material used in the aforementioned test plug wires.

3,715,594
SPACE VEHICLE SYSTEM FOR DETERMINING EARTH'S ULTRAVIOLET RADIATION LIMB

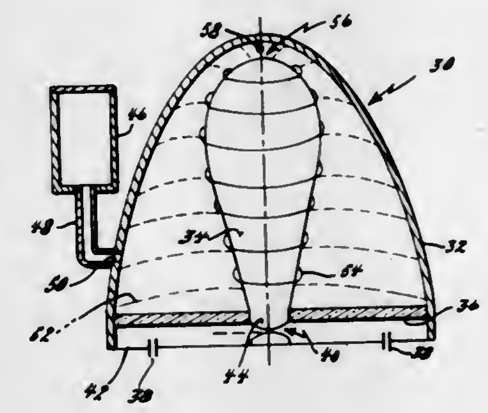
William A. Drohan, Bedford; Juri Valge, Chelmsford, and David A. Warner, Cambridge, all of Mass., assignors to The United States of America as represented by the Secretary of the United States Air Force
Filed Aug. 27, 1969, Ser. No. 853,549
Int. Cl. G01t *1/16*
U.S. Cl. 250—83.3 UV **1 Claim**



An optical system is used to scan the earth's horizon and project an image from which position information is derived for use in a space vehicle navigation control system. The image is projected onto a camera tube target through ultraviolet filters. The system thus utilizes the earth's ultraviolet radiation limb as an earth-space boundary reference. A radioactive reference graticule is positioned in contiguous relationship with the camera tube target to provide both target intensity calibration and a spatial check of the optical image.

3,715,595
PULSED NEUTRON SORCE

Vernal Josephson, Palos Verdes Estates, Calif., assignor to The United States of America as represented by the Secretary of the United States Air Force
Filed May 11, 9170, Ser. No. 48,762
Int. Cl. G21g *3/04*
U.S. Cl. 250—84.5 **8 Claims**

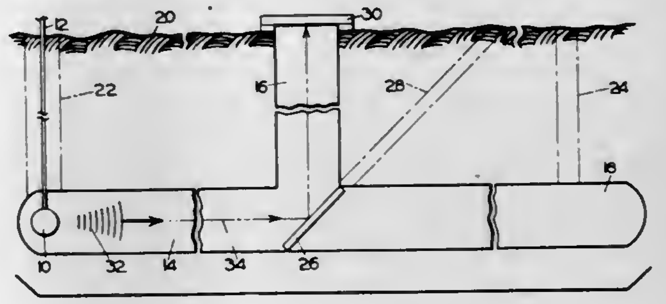


An apparatus for producing neutrons having a base portion, an energy source and a pair of uniquely designed electrodes, one of which is at least partially of titanium. These electrodes are shaped so as to cause a tri-dimensional compression on the plasma or ionized gas within this apparatus. The tri-dimensional compression in conjunction with the titanium electrode provides for higher temperatures and neutron yields than were heretofore possible.

3,715,596
TELLURIAN OPTOEXPLOSIVE SYSTEM INCLUDING NUCLEAR EXPLOSIVE LIGHT GENERATOR AND TARGET IRRADIATION

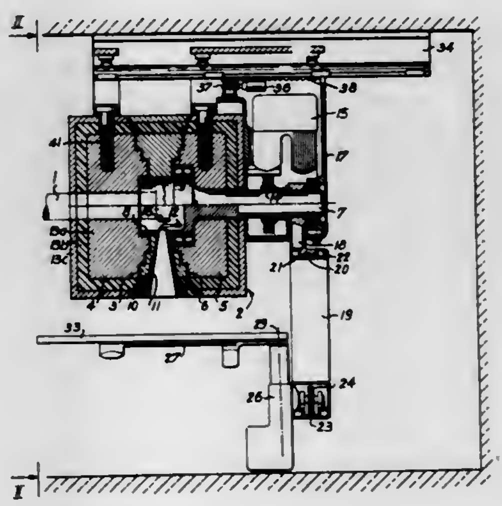
Jack DeMent, 4847 S.E. Division Street, Portland, Oreg.
Continuation-in-part of Ser. No. 407,461, Oct. 29, 1964, Pat. No. 3,414,838. This application Aug. 7, 1968, Ser. No. 750,979
Int. Cl. G21h *5/03*
U.S. Cl. 250—84 **25 Claims**

This disclosure relates to a tellurian(underground) system(an explotron) for the close-in treatment of an irradiable target by explosion-formed electromagnetic energies characterized as reflectable off a frangible reflective optic such that the target is not overwhelmed by non-reflectable explosion energies like blast and plasma. A typical tellurian explotron is a main duct horizontally sited below the ground, within one end of which is positioned and fired a mass of chemical or nuclear explosive (the optoexplosive) that generates electromagnetic and kinetic energies. Junctured midway or at any other convenient site along the main duct is at least one ductoid branch member, which rises to the ground surface and couples with the irradiable target. At the furcation of main duct and branch there is emplaced at a suitable angle a frangible reflective optic such as an aluminum foil mirror which delivers the faster-moving, reflectable radiation via the branch to the target, while the slower-moving, non-reflectable energies transit the main duct and break out the frangible reflective optic, being deposited in the opposite end of the main duct(the shock sink).



3,715,597
ROTATABLE NEUTRON THERAPY IRRADIATING APPARATUS

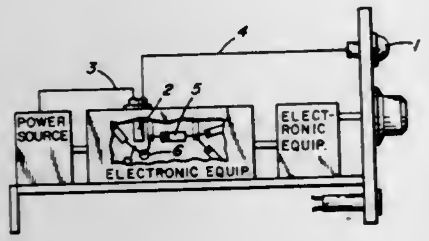
Ernst-Gunther Hofmann; Klaus Meyerhoff; Bernd Peter Offermann, and Rolf Barthel, all of Hamburg, Germany, assignors to Licentia Patent-Verwaltungs-GmbH., Frankfurt, Germany
Filed Sept. 25, 1970, Ser. No. 75,325
Claims priority, application Germany, Sept. 26, 1969, P 19 48 632.9
Int. Cl. G21f *7/00*
U.S. Cl. 250—105 **15 Claims**



A neutron therapy irradiating apparatus including a neutron source mounted within a collimator. The collimator can be opened by moving its two parts away from one another at a parting plane. The neutron source is accessible from the parting plane, and this moving of the two parts away from one another therefore renders the neutron source accessible from outside the collimator. The parting plane contain mutually interfitting steps, so that when the two parts are in abutment, neutrons cannot leak through the parting plane.

3,715,598
INTEGRAL FAULT DETECTION SYSTEM FOR OPERATING ELECTRONICS EQUIPMENT

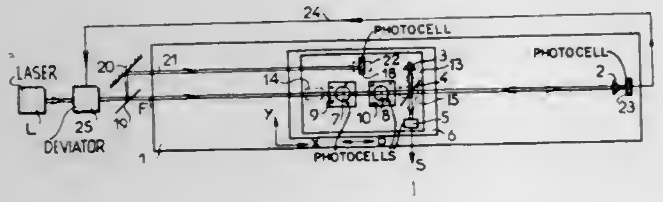
Garland L. Tomlin, Jr., 2342 N. Oak Street, Falls Church, Va.
Filed June 12, 1969, Ser. No. 832,565
Int. Cl. G21h *5/02*
U.S. Cl. 250—106 T **8 Claims**



An alarm or fault detection system for in service electronic equipment which is not electrically connected to the equipment is disclosed. A chemical tracer element which is responsive to the application of a certain force, physical stress, electrical stress, or heat, for example, is embedded in the equipment or portion thereof that is to be monitored. When the equipment's functional tolerance limit of the certain force is reached, the tracer element is released in a gaseous form. Presence of the tracer element's vapors in the equipment enclosure is detected by a transducer which responds to a particular vapor representing a particular component or equipment malfunction and indicates it to an observer.

3,715,599
ELECTRO-OPTICAL SYSTEM FOR CONTROLLING THE ATTITUDE OF A STAGE MOUNTED ON A CARRIAGE SLIDING ALONG A PARALLEL BENCH

Raymond Marcy, Paris, France, assignor to Thomson-CSF
Filed April 20, 1971, Ser. No. 135,659
Claims priority, application France, April 21, 1970, 7014414
Int. Cl. G01d *5/34*
U.S. Cl. 250—231 R **8 Claims**



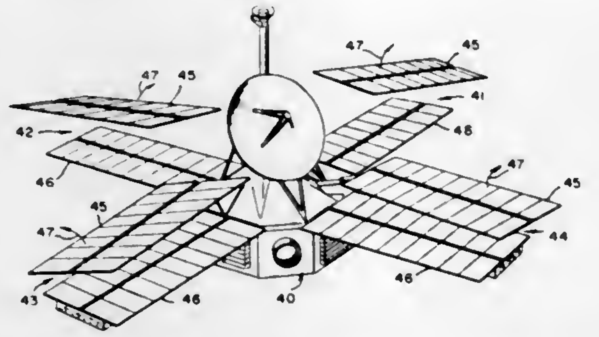
Electro-optical system for controlling the attitude of a stage mounted on a carriage sliding along a parallel bench.

The system in accordance with the invention corrects "yaw" defects on the part of the moving element sliding along the bench. To this end a beam of radiant energy supplies the directional reference and electromechanical transducers are used for controlling the attitude of the stage with respect to this optical reference.

3,715,600
STACKED SOLAR CELL ARRAYS

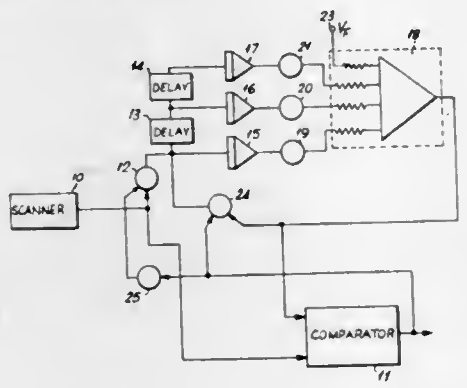
James C. Fletcher, Administrator of the National Aeronautics and Space Administration with respect to an invention of; Jerome M. Weingart, Pasadena, Calif., and Robert K. Yasui, Los Angeles, both of Calif., assignors to the United States of America as represented by the National Aeronautics and Space Administration
Filed Nov. 22, 1971, Ser. No. 200,762
Int. Cl. F64c *39/00;* **F03g** *7/02*
U.S. Cl. 250—212 **8 Claims**

A solar cell stack, for use in a spacecraft or the like, is disclosed. In the stack only the top solar cell panel is exposed to solar energy to provide electrical power. Except the top panel each panel is covered from exposure to damaging bombarding particles by the preceding panels in the stack toward the stack top. When the exposed top panel's performance is degraded, due to bombardment by particles or other unexpected failure, the top panel is ejected, thereby exposing the underlying panel in the stack, which not becomes the power supplying panels. Each panel in the stack is successively exposed when the panel above it is ejected.



3,715,601
APPARATUS FOR DETECTING IRREGULARITIES IN THE LIGHT TRANSMISSION PROPERTIES OF MATERIALS

James Henry Tucker, Cambridge, England, assignor to National Research Development Corporation, London, England
Filed July 8, 1970, Ser. No. 53,139
Claims priority, application Great Britain, July 14, 1969, 35,335/69
Int. Cl. G01n *5/02*
U.S. Cl. 250—222 R **8 Claims**

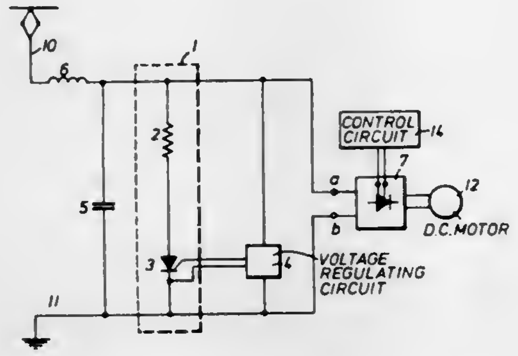


An apparatus and a method are described for detecting areas of a material which differ in opacity or reflectivity from surrounding areas, and particularly for detecting cell nuclei in stained biological preparations. The material is scanned line by line and the output is applied to a comparator which receives a threshold signal dependent on the opacity or reflectivity of the neighborhood of the area being scanned. The threshold signal is derived by summing the scanner output signal for that part of the line immediately preceding the point being scanned and corresponding parts of adjacent previously scanned lines. Means are provided for holding the threshold signal steady when a cell nucleus is being scanned.

3,715,602
CIRCUIT ARRANGEMENT FOR BRAKING A VEHICLE

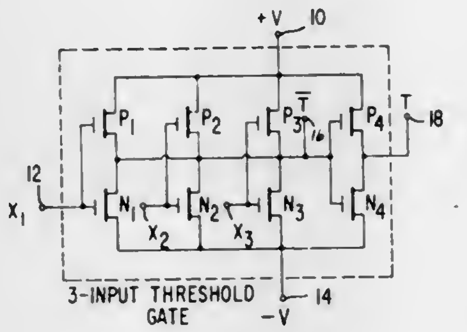
Ulrich Putz, Berlin 41, Germany, assignor to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt, Germany
Filed March 20, 1972, Ser. No. 236,323
Claims priority, application Germany, March 20, 1971, P 21 14 121.9
Int. Cl. H02g *3/00*
U.S. Cl. 307—9 **13 Claims**

A circuit arrangement for the combined net and resistance braking of an electrically driven vehicle is fed via a pair of lines from a direct current power system. A capacitor is connected across the pair of lines, as is a resistive braking circuit composed of a series arrangement of a braking resistor and a controllable switch. A voltage regulating circuit having its input connected in parallel with the capacitor and its output coupled to the control input of the controllable switch is arranged to develop a control signal upon the occurrence of a voltage across the capacitor which exceeds slightly the rated voltage of the pair of lines.



3,715,603
THRESHOLD GATE CIRCUITS EMPLOYING FIELD-EFFECT TRANSISTORS

Joseph B. Lerch, North Brunswick, N.J., assignor to RCA Corporation
Filed Oct. 28, 1971, Ser. No. 193,519
Int. Cl. H03k *19/42*
U.S. Cl. 307—211 **5 Claims**

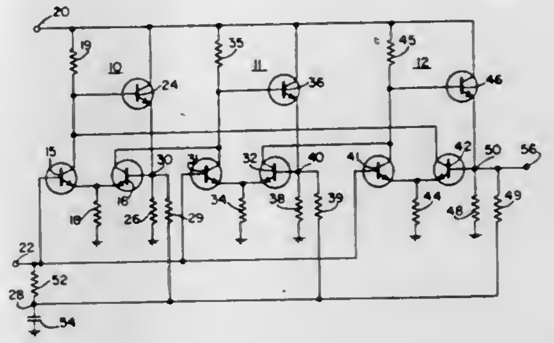


A threshold gate comprising a plurality of complementary-symmetry, field-effect transistor inverters, each inverter receiving at its common gate connection a different input signal and each connected at its output terminal to a common circuit output terminal. The gate may have inputs all of the same weight or, with appropriately chosen values of transistor conduction channel impedance or parallel connected inverters, may have inputs of different weight.

3,715,604
INTEGRATED CIRCUIT FREQUENCY DIVIDER HAVING LOW POWER CONSUMPTION

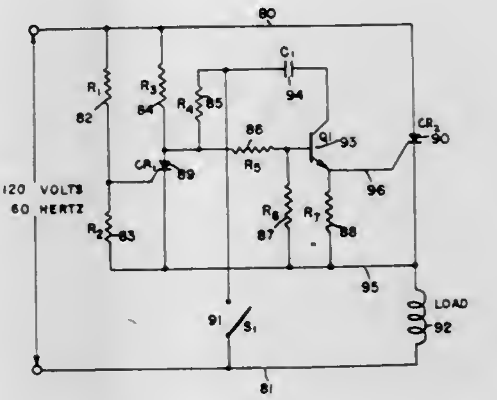
William Rapshys, Palatine, Ill., assignor to Motorola, Inc., Franklin Park, Ill.
Filed Aug. 9, 1971, Ser. No. 170,065
Int. Cl. H03k *21/00*
U.S. Cl. 307—220 **5 Claims**

Frequency divider including three stages each including three transistors, with two being connected in a common emitter circuit, and the third connected as an emitter-follower and providing intra-stage coupling. The three stages are connected in a ring-like configuration providing very high frequency, divide by three operation, and is adapted to be constructed in integrated circuit form. The circuit is suitable for use at low supply voltages.



3,715,605
CONTROL CIRCUIT FOR SINGLE STROKE ELECTRICAL TOOLS

John S. Naber, Route 1, Box 264, Marengo, Ill.
Continuation-in-part of Ser. No. 833,321, June 16, 1969. This application April 12, 1972, Ser. No. 243,299
Int. Cl. H03k *17/00*
U.S. Cl. 307—246 **10 Claims**



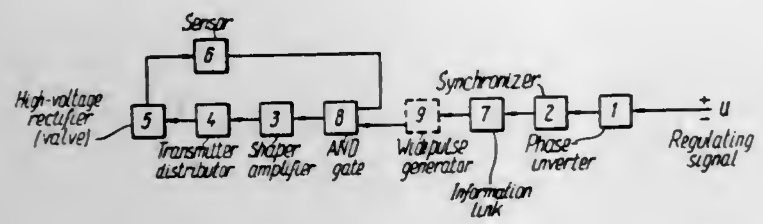
A simplified control circuit for a single stroke electrical tool comprises a first triggerable gate connected in series with the tool across a source of supply. A series circuit including a second gate, a trigger capacitor, and a manually actuated switch is then connected between a trigger terminal of the first gate and a current terminal of the first gate or one of the source terminals. A margin of safety against multiple firing is provided by utilizing the voltage drop developed across the load to develop a reverse charge on the trigger capacitor.

3,715,606
METHOD OF PULSE CONTROL OF HIGH-VOLTAGE RECTIFIERS, FOR EXAMPLE THYRISTORS, OPERATING IN A POLYPHASE CONVERTER, AND A CONTROL SYSTEM TO REALIZE SAID METHOD

Lev Viktorovich Travin, Leninsky prospekt, 101, korpus 136, kv. 125, and Valentin Georgievich Spuv, ulitsa Tukhachevskogo, 28, korpus 1, kv. 49, both of Moscow, U.S.S.R.
Filed Dec. 24, 1970, Ser. No. 101,348
Int. Cl. H03k *17/00*
U.S. Cl. 307—252 Q **5 Claims**

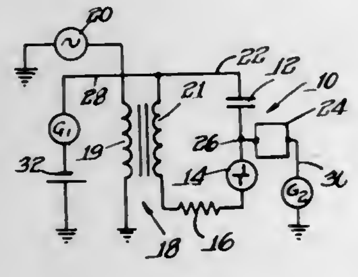
A method and system are characterized in that narrow control pulses are applied to the rectifiers in the presence of a positive voltage across them at the beginning of their conduction interval and at the subsequent passages of the voltage across each rectifier through zero from a negative to a positive value during the entire conduction interval of the rectifier.

The method keeps to a minimum overvoltages in converters operating in the 0-1 mode and completely eliminates the presence of a positive signal at the control electrodes of the thyristors dangerous to them.



3,715,607
ELECTROLUMINESCENT CIRCUIT OR THE LIKE

Gordon R. Fleming, Pontiac, Mich., assignor to Energy Conversion Devices, Inc., Troy, Mich.
Continuation-in-part of Ser. No. 825,153, May 16, 1969. This application March 4, 1971, Ser. No. 120,827
Int. Cl. H03k *3/31*
U.S. Cl. 307—287 **10 Claims**

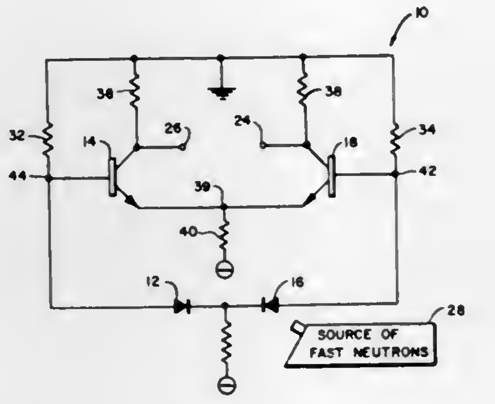


A circuit arrangement rapidly triggering a light-emitting and control bistable circuit into stable ON and OFF states while operating potential is continuously applied to the selective circuit to provide light emitting and de-energized states. A light-emitting element or an element added in series therewith acts as a capacitor. The light-emitting and capacitive elements are connected in series with a threshold switching device having inherent time delay characteristics, and connected at the circuit juncture between the light-emitting and capacitive elements and the threshold switching device is a start and stop circuit preferably with isolation means for selectively applying start and stop pulses to charge the capacitor while bypassing the threshold switching device to initiate operation of the circuit during one instance, and to discharge the energy stored in the capacitive element to terminate operation of the circuit during another instance. A display array of rows and columns of such bistable circuits is formed with mean for energizing selectively desired start and stop circuits associated with selective bistable circuits independently of the threshold switching devices used in the circuits and for providing means, independent of the operating potential lines, for addressing selected ones of the electroluminescent circuits within an array.

3,715,608
PROGRAMMABLE CIRCUIT AND METHOD

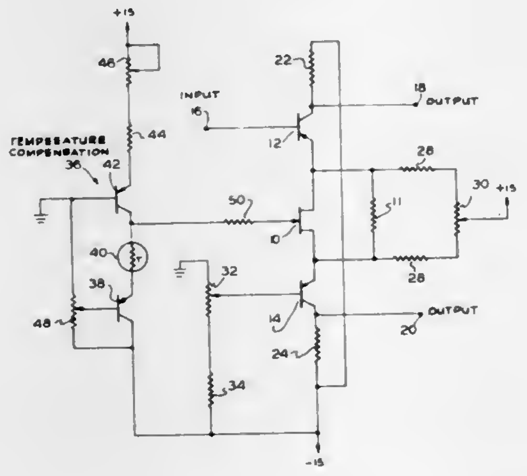
Charles A. Glorioso, Chicago, Ill., assignor to Teletype Corporation, Skokie, Ill.
Filed Sept. 23, 1970, Ser. No. 74,668
Int. Cl. H03k *23/22;* **G21h** *5/06*
U.S. Cl. 307—308 **33 Claims**

Specifically, first and second diffused silicon diodes are connected to first and second transistors, respectively, to control the conduction thereof, conduction of the first transistor providing a first output from the circuit and conduction of the second transistor providing a second output from the circuit. One of the diodes is irradiated with fast neutrons to raise its forward voltage drop above that of the other diode. When the first diode is irradiated so that it has a higher forward voltage drop than the second diode, the first transistor is rendered conductive to the exclusion of the conduction of the second transistor to provide a first output from the circuit in response to an input to the circuit, and vice versa. In general, electrical devices with radiation - alterable parameters are selectively irradiated to program the output of a circuit such as a read-only memory.



3,715,609
TEMPERATURE COMPENSATION OF VOLTAGE CONTROLLED RESISTOR

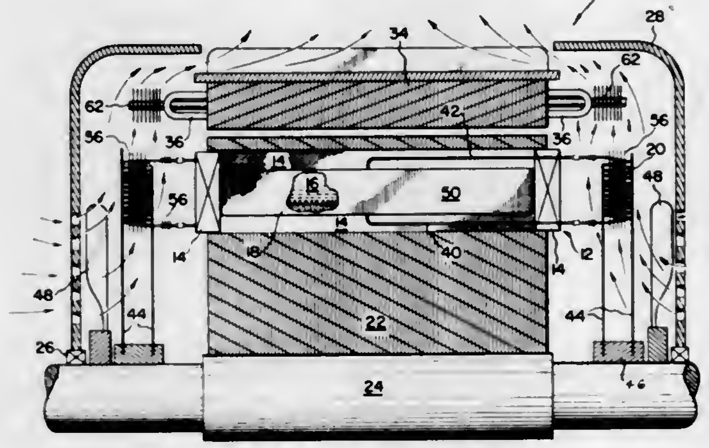
Thor Oscar Hallen, Aloha, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.
Filed Aug. 17, 1971, Ser. No. 172,466
Int. Cl. H03k *3/26*
U.S. Cl. 307—310 **7 Claims**



A voltage controlled resistor of the junction gate field effect type is temperature compensated by a circuit including the emitter-base junction of a bipolar transistor and also a temperature responsive resistor having a temperature sensitivity which is substantially the same as that of the channel of the voltage controlled resistor. The temperature responsive resistor and the bipolar transistor are subjected to substantially the same temperature conditions as the voltage variable resistor and the voltage responsive resistor and emitter-base junction of the bipolar transistor are connected in series with a current source. The voltage drops across such emitter-base junction and voltage responsive resistor vary with such temperature and are employed as parts of a reverse-bias potential applied between the gate and channel of the voltage controlled resistor.

3,715,610
DYNAMOELECTRIC MACHINE COOLED BY A ROTATING HEAT PIPE

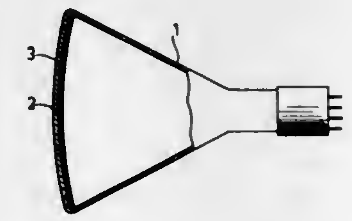
William Guy Brinkman, Schenectady, N.Y., assignor to General Electric Company
Filed March 7, 1972, Ser. No. 232,385
Int. Cl. H02k *9/20*
U.S. Cl. 310—54 **8 Claims**



A dynamoelectric machine is described wherein heat generated within the rotor is removed utilizing a heat pipe rotating about the rotor shaft. Heat is absorbed from the rotor by vaporization of a portion of the refrigerant within a rectangular evaporator juxtaposed with the heat generating region of the rotor whereafter the vaporized refrigerant flows radially inward (due to centrifugal forces acting upon the higher density liquid refrigerant) to pass to a condenser coil secured to the rotor at a relatively cool location. Upon cooling to a liquid state in the condenser, the liquid refrigerant is forced radially outward along the condenser coil to return to the evaporator through a radially outer orifice. Preferably, the evaporator is situated within the rotor coils, e.g., at the center of the field pole winding of a synchronous machine, although the evaporator also could be positioned along any radially extending side of the rotor coil. Because refrigerant passes from the evaporator to the condenser and returns to the evaporator solely by centrifugal forces acting upon the closed cooling system, a separate refrigerant pump is not required to cool the motor.

3,715,611
CATHODE-RAY TUBE CONTAINING CERIUM ACTIVATED YTTRIUM SILICATE PHOSPHOR

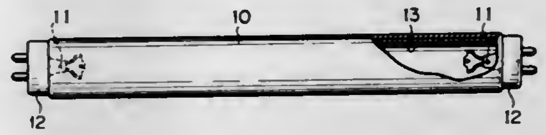
Albert Hijman Gomes De Mesquita, and Alfred Bril, both of Emmasingel, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.
Filed Aug. 7, 1969, Ser. No. 848,179
Claims priority, application Netherlands, Aug. 9, 1968, 6811326
Int. Cl. C09k *1/54;* **H01j** *29/20*
U.S. Cl. 313—92 PH **8 Claims**



A flying-spot scanner or a color television tube having indexing strips comprises a luminescent screen or indexing strips of a substantially non-persistent luminescing material consisting of yttrium silicate activated by trivalent cerium.

3,715,612
LOW PRESSURE MERCURY VAPOR DISCHARGE LAMP RADIATING GERMICIDAL AND ERYTHEMAL RAYS IN RATIO OF LESS THAN 1.5

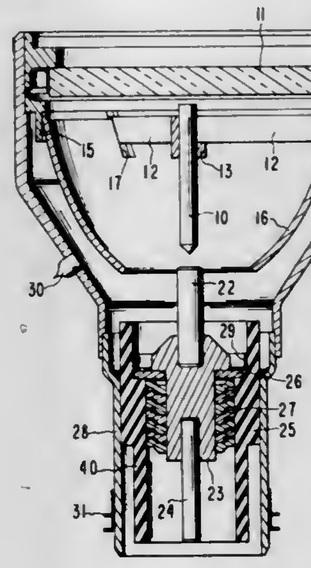
Akira Someya, and Kohtaro Kohmoto, both of Yokohama, Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan
Continuation-in-part of Ser. No. 812,264, April 1, 1969, abandoned. This application June 3, 1971, Ser. No. 149,437
Int. Cl. H01j *61/30, 61/44*
U.S. Cl. 313—109 **2 Claims**



A low pressure mercury vapor discharge lamp emitting erythemal rays and germicidal rays includes an envelope on the inner surface of which there is coated with an erythemal ray emitting film for transmitting to the outside of said envelope visible straight light beams within the range of 45 to 75 percent.

3,715,613
SEALED HIGH-PRESSURE ARC LAMP AND SOCKET THEREFOR

Malcolm F. Parkman, Foster City, Calif., assignor to Varian Associates, Palo Alto, Calif.
Filed May 13, 1971, Ser. No. 143,166
Int. Cl. H01j *1/92*
U.S. Cl. 313—113 **6 Claims**

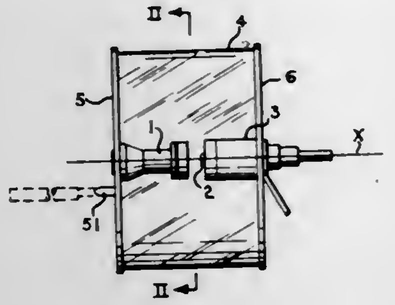


A sealed beam arc lamp is disclosed wherein the lamp exterior is at a single electrical potential. The non-window portion of the lamp exterior can be of high strength metal alloy. Electrical insulation is provided by a thermally conductive ceramic cylinder internal to the lamp and disposed so as to avoid tensile stresses, and by a sealed labyrinthine passage defined by a removable socket.

3,715,614
THREE ELECTRODE SPARK GAP APPARATUS

Irving E. Linkroum, Hancock, N.Y., assignor to The Bendix Corporation
Filed Sept. 28, 1971, Ser. No. 184,381
Int. Cl. H01j *17/30*
U.S. Cl. 313—183 **44 Claims**

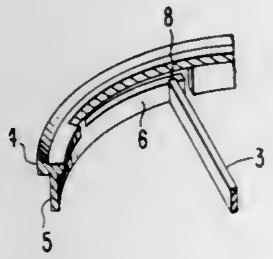
A three electrode spark gap apparatus wherein three electrodes are arranged along the same axis with two of the electrodes concentrically arranged. The electrodes and the enclosure which houses the electrodes are generally cylindrical shaped and are dimensioned so that the radius of the enclo-



sure is at least four times greater than the radius of the largest electrode located within the enclosure to prevent damage to the enclosure from the arc between electrodes.

3,715,615
ELECTRODE SUPPORT FOR ARC LAMPS

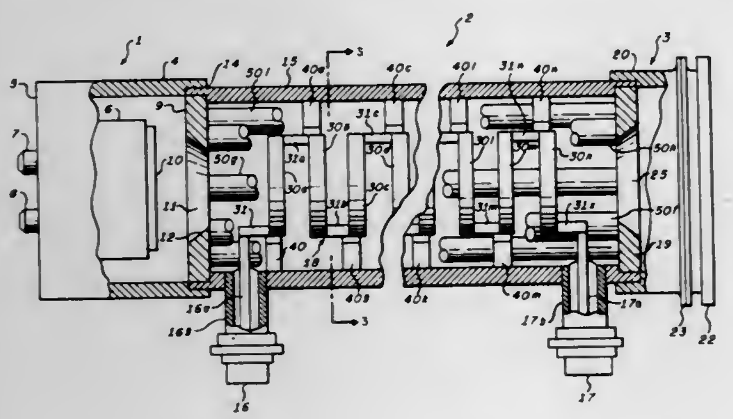
Gordon R. Lavering, Belmont, Calif., assignor to Varian Associates, Palo Alto, Calif.
Filed May 14, 1971, Ser. No. 143,377
Int. Cl. H01j *1/96, 19/50*
U.S. Cl. 313—204 **11 Claims**



An electrode support structure is disclosed for use in a short arc lamp. The structure includes a ring having a plurality of flaps formed therein. Struts are attached to the electrode and to the flaps. These struts may be straight and may be abutted to the electrode. The flaps can bend to minimize the stresses created by the contraction and expansion of the struts relative to the ring during the temperature cycling of assembly and operation.

3,715,616
HIGH-IMPEDANCE SLOW-WAVE PROPAGATION CIRCUIT HAVING BAND WIDTH EXTENSION MEANS

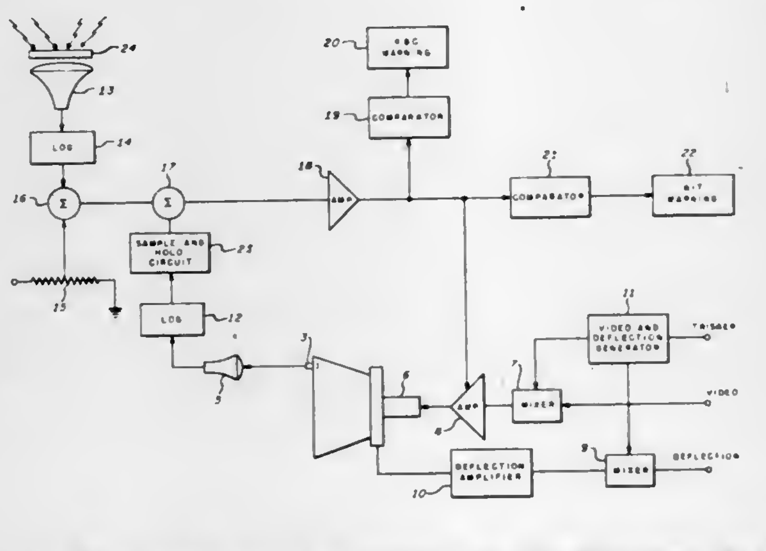
Thomas B. Elfe, Jr., Gainesville, Fla., assignor to Sperry Rand Corporation, Great Neck, N.Y.
Filed Oct. 12, 1971, Ser. No. 188,401
Int. Cl. H01j *25/34*
U.S. Cl. 315—3.5 **5 Claims**



A slow traveling wave bar and ring high frequency transmission line energy propagation structure for traveling wave tubes is supported by a novel electrically isolating, thermally conducting array of support elements coaxially within a shell having spaced longitudinally extending conductivity perturbations.

3,715,617
OPTICAL PROBE FOR CATHODE RAY TUBES

Homer B. Tilton, Tucson, and Jack W. Blanchard, Phoenix, both of Ariz., assignors to Sperry Rand Corporation, New York, N.Y.
Filed July 10, 1970, Ser. No. 53,766
Int. Cl. H01j *31/26*
U.S. Cl. 315—10 **14 Claims**

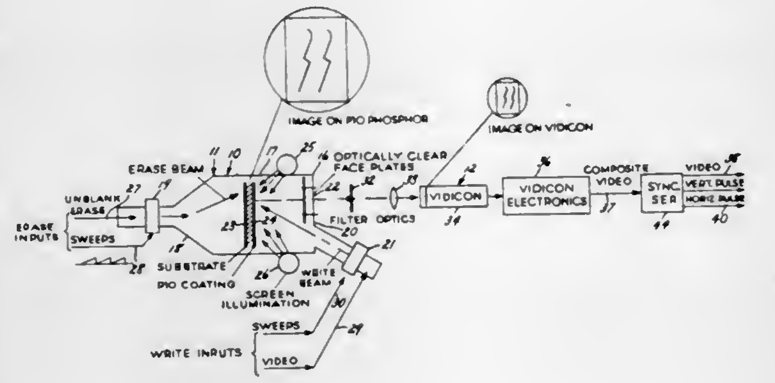


A fiber optics probe, embedded in the faceplate of a cathode ray tube, samples the light emitted from the cathode ray tube phosphor coating. The sampled light is sensed and provides an equivalent electrical signal. The magnitude of the signal is compared with a signal proportional to the ambient light and the resultant signal is utilized to effect an automatic brightness control function. The resultant signal may also be used to effect a built-in test of the cathode ray tube drive and display circuits

---

3,715,618
VIDICON VIEWED STORAGE TUBE IN WHICH THE NEWEST LINE OF INFORMATION IS DISPLAYED ON THE UPPERMOST PORTION OF THE TUBE

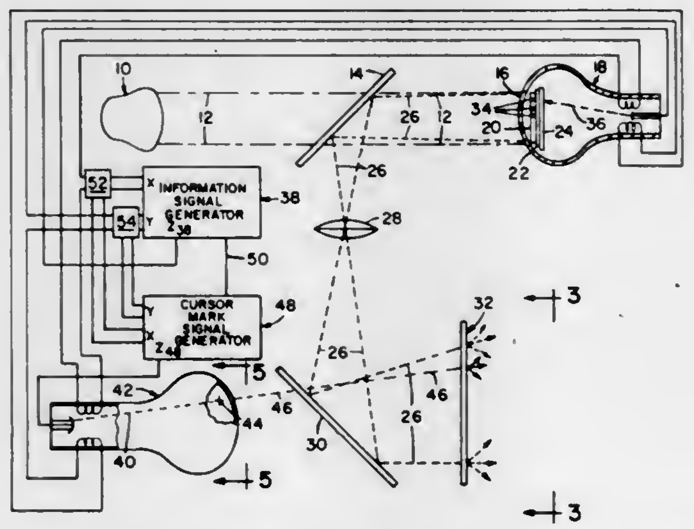
Alfred I. Paley, Wantagh; Leonard Newman, White Plains, both of N.Y.; Peter Seats, Boonton, and Bernard M. Waxenbaum, Paramus, both of N.J., assignors to Loral Corporation, Bronx, N.Y. and Thomas Electronics, Inc., Wayne, N.J.
Filed March 5, 1969, Ser. No. 804,483
Int. Cl. H01j *31/26*
U.S. Cl. 315—10 **2 Claims**



A vidicon viewed storage tube device, in which information is continuously displayed on a dark trace direct view storage tube. The tube contains a first or writing electronic gun, and a second or erase gun which removes the trace by heat impinging upon activated portions of the tube phosphor coating. A vidicon scans the storage tube in such manner that the newest line of information on the storage tube is displayed at the upper most portion of the vidicon display to provide a "-passing scene" or "moving window" type of display.

3,715,619
STORAGE CATHODE RAY TUBE ELECTRON BEAM POSITION INDICATOR

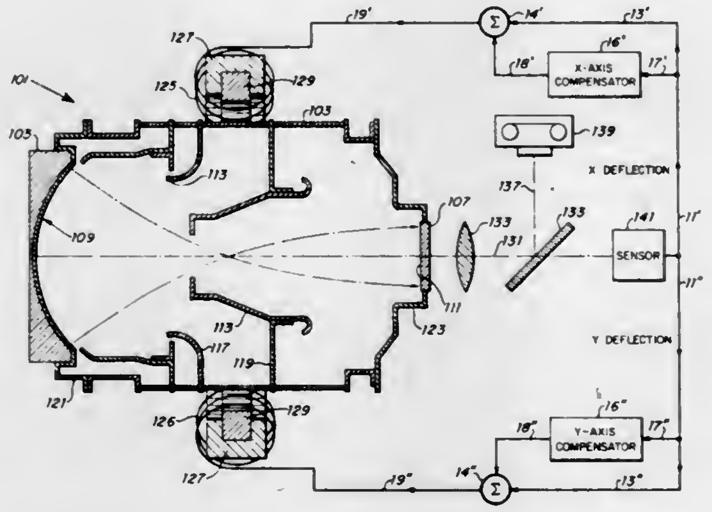
Douglas A. Cotter, Raleigh, N.C., assignor to Corning Glass Works, Corning, N.Y.
Filed Jan. 6, 1971, Ser. No. 104,244
Int. Cl. H01j *31/26*
U.S. Cl. 315—10 **19 Claims**



Apparatus to display a cursor mark image which indicates the electron beam position of a storage cathode ray tube without storing the cursor mark image along with information desired to be stored. To generate the non-storing cursor mark image this apparatus uses a second cathode ray tube, the electron beam of which is deflected substantially in parallel with the electron beam of the storage cathode ray tube. The cursor mark image produced by the second cathode ray tube and the information image produced by the storage cathode ray tube are then optically aligned and simultaneously displayed on a viewing screen.

3,715,620
COMPENSATION DEVICE FOR NON-LINEAR ELECTROMAGNETIC SYSTEMS

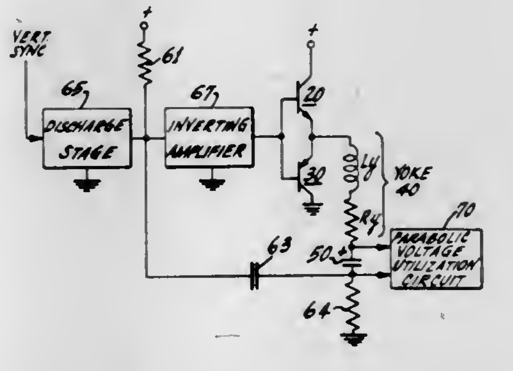
Dominic P. Marro, Chelmsford, Mass., assignor to Itek Corporation, Lexington, Mass.
Filed Sept. 15, 1970, Ser. No. 72,472
Int. Cl. H01j *29/76, 29/70*
U.S. Cl. 315—27 **11 Claims**



Apparatus is disclosed which compensates for non-linear responses of electromagnetic systems which apparatus includes a hysteresis simulator. The simulator samples an input signal to the system and produces an output signal which when combined with the original input effects a linear response of the electromagnetic system with respect to the original input signal.

3,715,621
TRANSISTOR DEFLECTION CIRCUITS UTILIZING A CLASS B, PUSH-PULL OUTPUT STAGE

George Schiess, Stallikon, Switzerland, assignor to RCA Corporation
Filed March 3, 1970, Ser. No. 16,130
Claims priority, application Great Britain, March 3, 1969, 11,212/69
Int. Cl. H01j *29/70*
U.S. Cl. 315—27 TD **10 Claims**

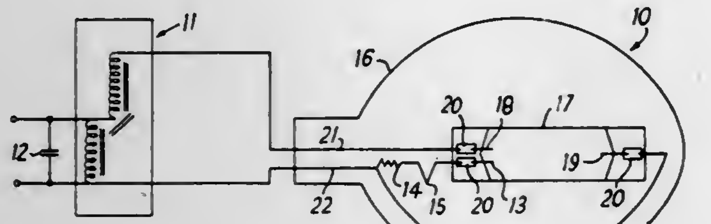


Transistorized vertical deflection circuit employs a multistage deflection wave amplifier including an output stage of a Class B, push-pull, complementary-symmetry type, with vertical yoke windings driven by output stage emitters. Ground return for vertical yoke windings is effected via path including electrolytic capacitor and current sampling resistor, with the capacitor blocking the flow through the yoke windings of direct current from the output stage. Deflection circuit employs Miller Integrator approach to sawtooth wave generation, developing sawtooth wave across a second capacitor included in a negative feedback path looped about the multi-stage deflection amplifier, the feedback voltage being derived from the current sampling resistor. Feedback use enables employment of relatively low-valued electrolytic capacitor for the D.C. blocking function without introducing undesired distortion of deflection current waveform. Vertical rate parabolic voltage developed across low-valued electrolytic capacitor is of adequate magnitude to serve as input waveform for vertical dynamic convergence circuits. In one embodiment, electrolytic capacitor serves as parabola source for additional feedback to Miller Integrator input in order to effect S-shaping of deflection wave.

3,715,622
METAL-HALIDE DISCHARGE LAMPS

Robert Brian Page, and Thomas William Cartwright, both of London, England, assignors to Thorn Electrical Industries Limited, London, England
Filed May 11, 1971, Ser. No. 142,313
Claims priority, application Great Britain, June 26, 1970, 31,200/70
Int. Cl. H01j *7/30, 17/30*
U.S. Cl. 315—60 **15 Claims**

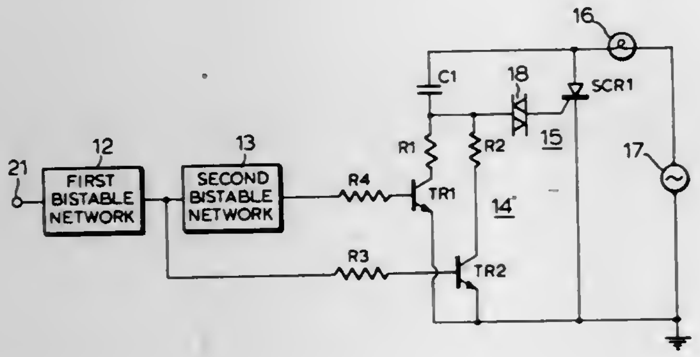
A metal-iodide discharge lamp with two main and one auxiliary electrodes mounted in a quartz discharge tube. Deterioration of the quartz between the metal-to-quartz seals of the auxiliary electrode and the adjacent main electrode is substantially prevented by a thermal switch which keeps the auxiliary electrode disconnected from the remote main electrode while



the discharge tube is running at its normal operating temperature.

3,715,623
NETWORK FOR VARYING CURRENT THROUGH A LOAD

John Szabo, Breslau, Ontario, Canada, assignor to Electrohome Limited, Ontario, Canada
Filed Oct. 18, 1971, Ser. No. 189,890
Int. Cl. G05f *1/00;* **H05b** *37/02*
U.S. Cl. 315—194 **10 Claims**

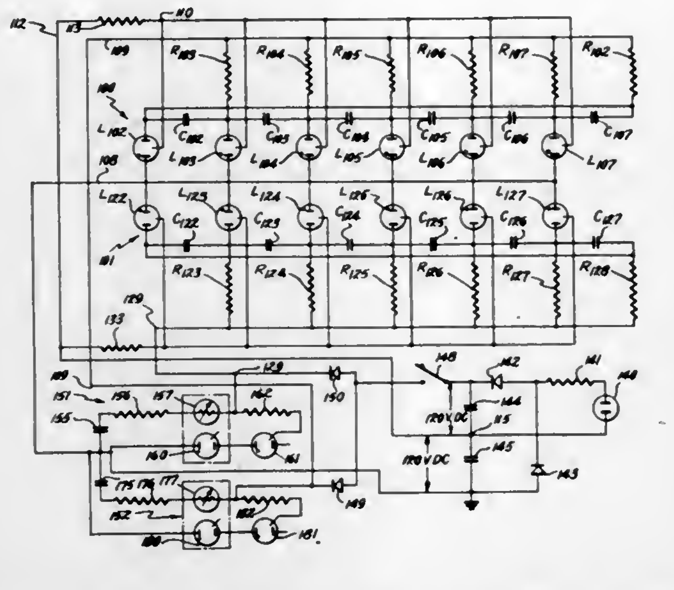


A sensing device controls an input pulse generator that is connected to the input terminal of one of at least two cascaded bistable devices. The output signals of the bistable devices are decoded and the resultant signal is used in a control circuit for controlling the amount of current flowing in a load dependent upon the decoder signal.

3,715,624
ELECTRONIC CHANCE CIRCUIT

Fred W. Herman, 3513 N. San Miguel, Tampa, Fla.
Continuation of Ser. No. 782,976, Dec. 11, 1968, abandoned. This application Feb. 19, 1971, Ser. No. 117,049
Int. Cl. H05b *37/02*
U.S. Cl. 315—209 **4 Claims**

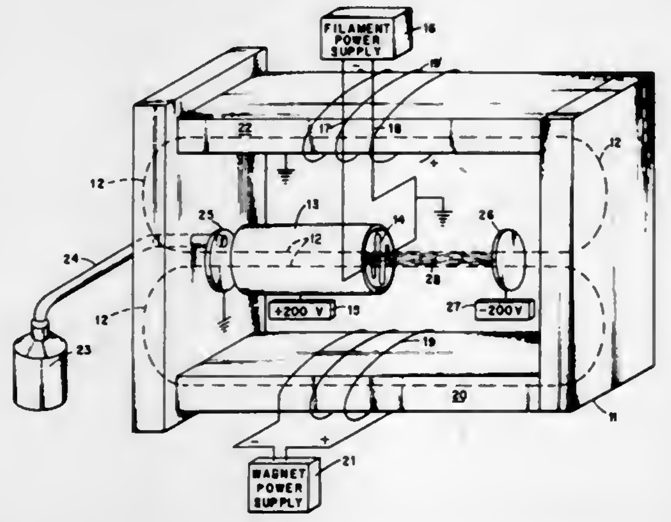
A random pattern generator having a plurality of neon indicator lamps which flash in random or pseudo-random sequence for use in electronic games of chance, probability studies or other desired applications. Each neon lamp is connected in series with a resistor to form one of a plurality of identical circuit branches connected in parallel across a switch controlled power source. The neon lamp-resistor junctions of the plurality of circuit branches are connected in a ring configuration by means of a like number of commutating capacitors. When the power switch is closed the neon lamps are energized to breakdown voltage and flash in a random sequence determined by momentary circuit instabilities. A holding circuit is provided to maintain conduction through the neon lamp which is on at the time the power switch is opened. A time delay circuit is incorporated into the holding circuit



whereby the random flashing will continue for a predetermined time period after the power switch is opened.

3,715,625
PLASMA GENERATOR

Kenneth W. Ehlers, Alamo, Calif., assignor to the United States of America as represented by the United States Atomic Energy Commission
Filed Jan. 12, 1971, Ser. No. 105,880
Int. Cl. H01j *1/20*
U.S. Cl. 317—4 **7 Claims**



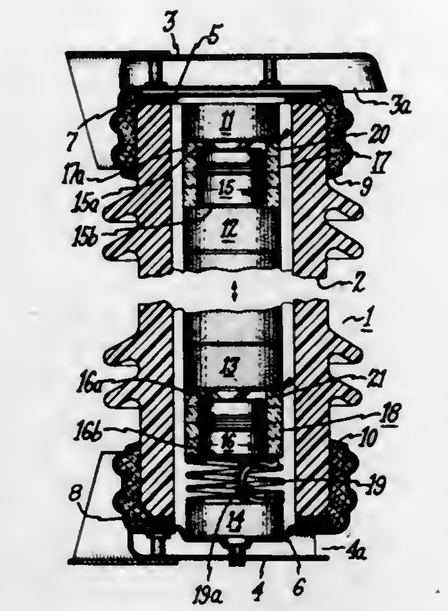
An apparatus for generation of dense ion-electron plasma. Ions are accelerated from an ion source of the apparatus through an electron emitting filament thereof. Electrons from the rear of the filament are abstracted to the positive ions and the combination forms a moving plasma with ions and electrons of equal velocity, the plasma forming a concentrated beam utilized for striking a desired target.

3,715,626
SPRING PLATE CONTACT AND SUPPORT FOR A LIGHTNING ARRESTER SPARKGAP ASSEMBLY AND ASSOCIATED GRADING RESISTORS

Arthur A. Olsen, Pittsfield, Mass., assignor to General Electric Company
Filed March 1, 1972, Ser. No. 230,733
Int. Cl. H02h *9/06*
U.S. Cl. 317—68 **10 Claims**

A lightning arrester having a self-supporting column of sparkgap assemblies and non-linear resistor valve elements, as well as a plurality of load-bearing grading resistors, is provided

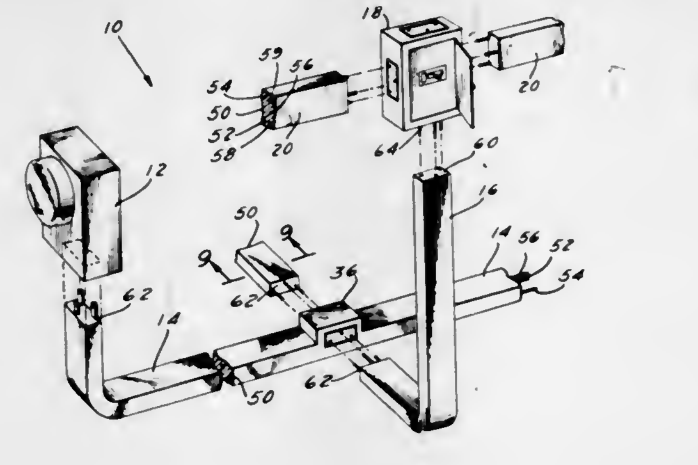
with a spring plate that is effective to form part of the series discharge circuit through the arrester while at the same time affording a resilient support for the column of arrester com-



ponents, thereby to maintain the column of arrester components in spaced-apart relationship with respect to the inner walls of the insulating housing of the arrester.

3,715,627
PRE-FORMED ELECTRICAL WIRING SYSTEM

Robert F. D'Ausilio, 16354 Grayville Drive, La Mirada, Calif.
Filed May 13, 1971, Ser. No. 142,949
Int. Cl. H02b *1/08*
U.S. Cl. 317—99 **6 Claims**

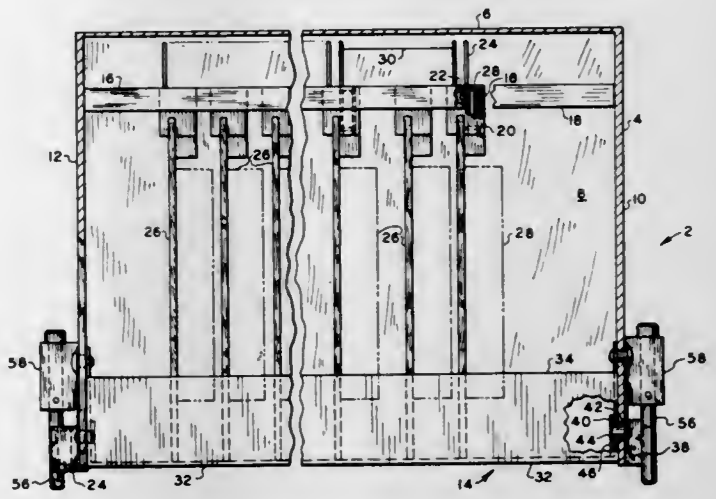


An electrical wiring system which includes a pre-formed, conductive, main trunk line and a plurality of off-shoot lines having two or more conductive wires embedded within a molded body of insulation, and at least one soft metal wire to enable pre-forming of the lines for installation within a molded structure. The system also includes components such as a main circuit-breaker box, individual plug-in circuit breakers, receptacles, light switches, and dummy blocks which are used when forming the molded structure to provide openings therein to receive the various components.

3,715,628
CARD MOUNTING CHASSIS

Arlyn G. Liddell, Bountiful, Utah, assignor to Eaton Corporation, Cleveland, Ohio
Filed July 26, 1971, Ser. No. 166,172
Int. Cl. H02b *1/02*
U.S. Cl. 317—101 DH **5 Claims**

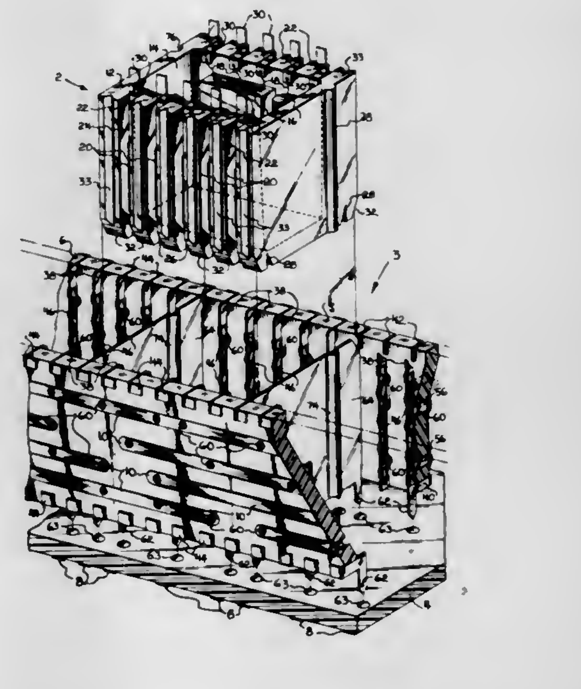
Means for mounting logic cards on a device to be controlled thereby comprising a housing having a connector bar mounted therein for releasably receiving a plurality of logic cards and having all inter-card connections made internally of the housing, the housing being releasably securable to the device to be controlled, and having a connector bar carried by the device



to be controlled connectable to the logic cards while the logic cards are retained in the housing, and having all connections between the logic cards and external equipment made through the connector bar carried by the device to be controlled.

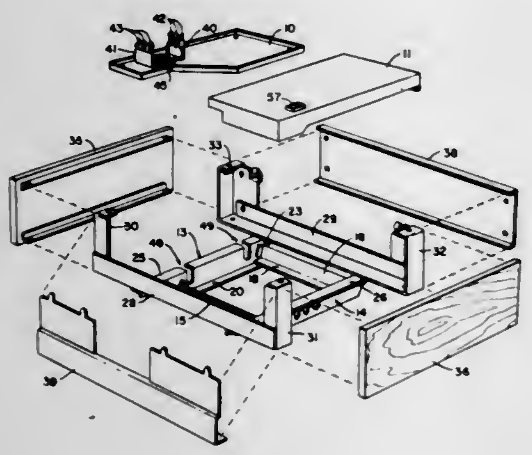
3,715,629
WIRING DEVICE FOR INTERCONNECTING MODULE CIRCUIT UNITS

Robert Charles Swengel, Sr., Hellam, Pa., assignor to AMP Incorporated, Harrisburg, Pa.
Continuation of Ser. No. 848,568, Oct. 26, 1959, abandoned. This application April 5, 1967, Ser. No. 629,868
Int. Cl. H02b *9/00*
U.S. Cl. 317—101 R **17 Claims**



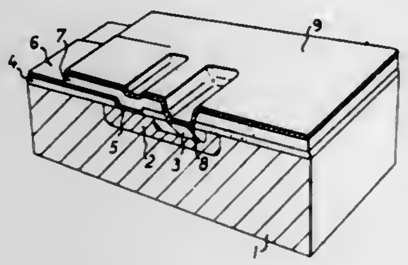
This invention relates to a modular system and its components, and more particularly to a system wherein the functional circuit cells or circuit modules are pluggable elements in a framework providing essentially three dimensions for the intermodule wiring. The framework includes sidewall panels having printed circuitry strips on one side thereof and electrical contacts of the other side thereof, the contacts being selectively connected to the printed circuitry strips according to a predetermined pattern.

3,715,630
ELECTRONIC CHASSIS FRAME ASSEMBLY WITH CABLING FOR PRINTED CIRCUIT BOARDS
Virgil F. Kuhl, Addison, Ill., assignor to Motorola, Inc., Franklin Park, Ill.
Filed March 26, 1971, Ser. No. 128,451
Int. Cl. H02b *1/04*
U.S. Cl. 317—122 **8 Claims**



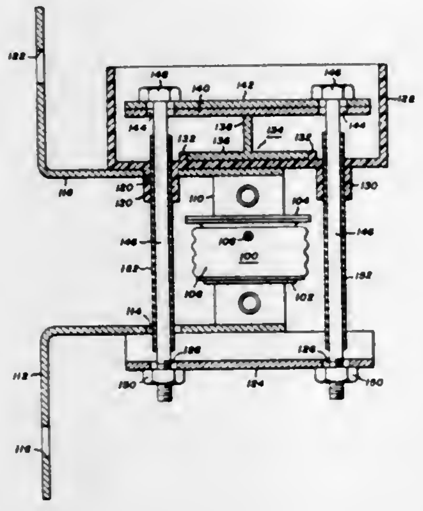
A frame assembly for supporting an electronic chassis includes a main frame having spaced apart side members and spaced apart end members forming a rectangularly shaped base having an open top and bottom. A second portion of the frame assembly includes a second open rectangle which is greater in at least one dimension than the first rectangle and is mounted on the main frame. Cable guiding cutouts are provided on one of the side members of the main frame and connector apertures are formed on the other side member of the main frame to facilitate the guiding and interconnection of cables extending below an electronic chassis supported by the second portion of the frame assembly. In addition a circuit board holding member facilitates mounting and holding circuit boards on the chassis in substantially perpendicular relationship to it.

3,715,631
RADIO-FREQUENCY LINE
Heinz Beneking, Aachen, Germany, assignor to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Germany
Filed May 1, 1970, Ser. No. 33,581
Claims priority, application Germany, May 27, 1969, P 19 26 989.7
Int. Cl. H01l *5/06*
U.S. Cl. 317—234 R **12 Claims**



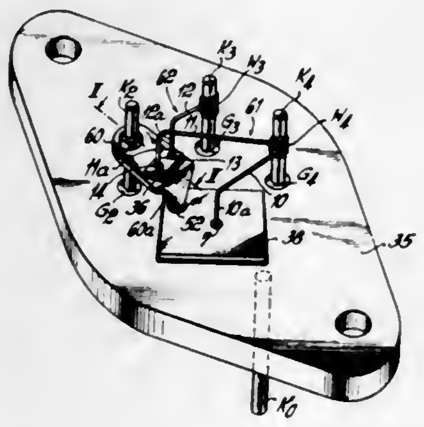
A radio-frequency line suitable for use as an electrical supply lead to semiconductor components, comprising a semiconductor body containing at least one semiconductor component and a strip line comprising a supply lead and a sink which is provided on one surface of the semiconductor body, a dielectric layer being provided between the supply lead and the sink.

3,715,632
LIQUID COOLED SEMICONDUCTOR DEVICE CLAMPING ASSEMBLY
William Warburton, Skaneateles, N.Y., assignor to General Electric Company
Division of Ser. No. 818,578, April 23, 1969, abandoned. This application Jan. 8, 1971, Ser. No. 105,014
Int. Cl. H01l *1/12*
U.S. Cl. 317—234 R **3 Claims**



A semiconductor device adapted to be mounted with compression applied to the major current carrying terminals is assembled with coolant units mounted adjacent opposite ends. The coolant units include a central core of highly electrically and thermally conductive material cooperating with a shell to define a coolant passage therethrough. The coolant units and semiconductor device are compressively associated by bolts cooperating with a fulcrum mounted deflectable plate. An insulative casing positions the bolts, the fulcrum, and a mounting bracket and prevents short circuiting of the semiconductor device terminals. A deflection gauge insures optimum compression of the semi-conductor device.

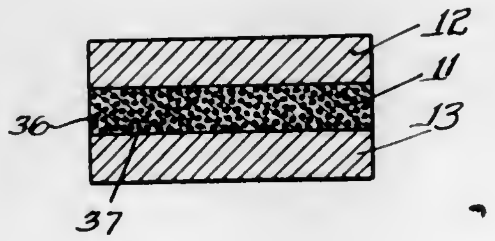
3,715,633
SEMICONDUCTOR UNIT WITH INTEGRATED CIRCUIT
Johannes Nier, Pirmasenser Str. 32, Stuttgart, Germany
Division of Ser. No. 16,303, March 4, 1970, abandoned. This application July 15, 1971, Ser. No. 162,996
Int. Cl. H01l *3/00, 5/00*
U.S. Cl. 317—234 R **7 Claims**



A semiconductor element. A first semiconductor body has a pair of first major surfaces on opposite sides. A first contact is provided on and covers one of the first surfaces. A socket plate is conductively connected to the other of the first surfaces and has a first contact pin. A second semiconductor body has a pair of second major surfaces and a second contact provided on and covering one of these second major surfaces. A carrier is connected with the socket plate and the second semiconductor body and located between the two. A second contact pin is provided on the second body at a side thereof

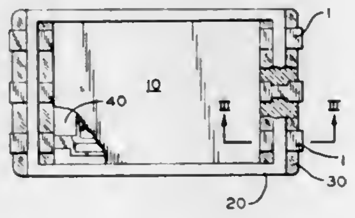
facing away from the carrier and a third contact pin is provided, both the second and third contact pins penetrating the socket in insulated relationship. A connecting wire has a straight first end portion conductively secured to the second contact pin, a helically convoluted second portion conductively secured to the third contact pin, and a center portion with respect to which each of the end portions extends at an angle. An additional contact pin is provided on the first semiconductor body at a side thereof facing away from the socket plate and is in direct electrically conductive engagement with the carrier.

3,715,634
SWITCHABLE CURRENT CONTROLLING DEVICE WITH INACTIVE MATERIAL DISPERSED IN THE ACTIVE SEMICONDUCTOR MATERIAL
Stanford R. Ovshinsky, Bloomfield Hills, Mich., assignor to Energy Conversion Devices, Inc., Troy, Mich.
Filed July 5, 1968, Ser. No. 742,717
Int. Cl. H01l *9/00*
U.S. Cl. 317—234 R **11 Claims**

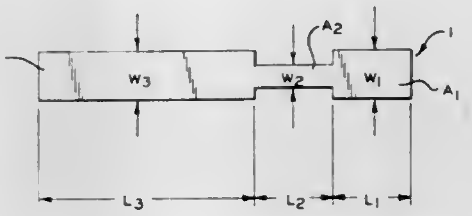


A switchable controlling device for an electrical circuit including a semiconductor element and electrodes in low electrical resistance contact therewith, wherein said semiconductor element has a high electrical resistance to provide a blocking condition for substantially blocking current therethrough, wherein the high electrical resistance is substantially instantaneously decreased to a low electrical resistance in response to a voltage above a threshold voltage value, wherein the semiconductor element in the low electrical resistance conducting condition has a voltage drop which is a fraction of the voltage drop in the high electrical resistance blocking condition near the threshold voltage value, and wherein the semiconductor element consists essentially of an active switchable semiconductor material and a relatively inactive material dispersed throughout the active material to add mechanical strength to the semiconductor element and to inhibit migration or diffusion in the active material.

3,715,635
HIGH FREQUENCY MATCHED IMPEDANCE MICROCIRCUIT HOLDER
Donald E. Michel, Sidney, and Richard R. Komatinsky, Upton, both of N.Y., assignors to The Bendix Corporation
Filed June 25, 1971, Ser. No. 156,641
Int. Cl. H01l *3/00, 5/00*
U.S. Cl. 317—234 R **13 Claims**

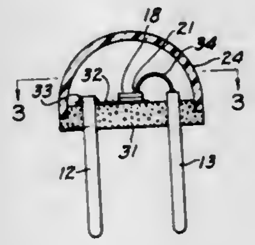


A high frequency (greater than 10^8 hertz) microcircuit holder having a predetermined characteristic impedance that matches the impedance of the incoming transmission lines. The package is designed to achieve maximum power and/or signal transfer to a microcircuit hermetically sealed in the package. The characteristic impedance of the holder is reduced by a predetermined capacitance established between an input contact and a metal base plate. The impedance of the input contact is increased by reducing the cross-sectional area



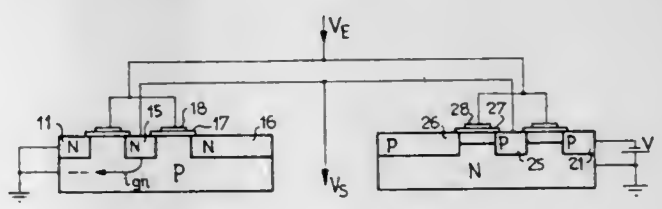
of the input contact as it passes through the dielectric wall of the microcircuit package. This increase in the impedance of the contact reduces the effect of the dielectric surrounding the contact which otherwise would result in a decrease in the impedance of the contact.

3,715,636
SILICON CARBIDE LAMP MOUNTED ON A CERAMIC OF POOR THERMAL CONDUCTIVITY
Mary S. Jaffe, Cleveland Heights, and Ralph M. Potter, Pepper Pike, both of Ohio, assignors to General Electric Company
Filed Jan. 3, 1972, Ser. No. 215,069
Int. Cl. H01l *15/00, 1/02, 1/10*
U.S. Cl. 317—234 R **16 Claims**



A boron-doped silicon carbide light-emitting diode chip is mounted, such as on a support member of porous ceramic or other material of similarly low thermal conductivity, so as to operate at a temperature of at least 150°C. Such a construction increases the amount of light produced by the boron-doped silicon carbide diode, due to increased operating temperature. A cover is placed over the diode to prevent convection cooling, thus further increasing the operating temperature and hence the light output. Instead of boron doping, the silicon carbide diode can be doped with other materials that produce similarly deep acceptor levels.

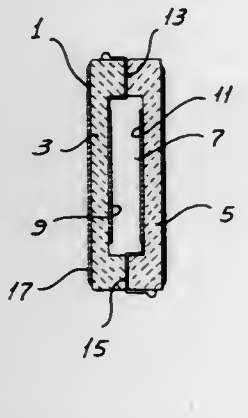
3,715,637
LOGIC CIRCUITS EMPLOYING COMPLEMENTARY FIELD-EFFECT TRANSISTORS IN WHICH THE GATE IS INSULATED FROM THE SUBSTRATE
Raymond Poirier, 75 Paris 101, France, assignor to Societe Europeenne de Semiconducteurs et de Miroelectronique
Filed Dec. 30, 1971, Ser. No. 214,002
Claims priority, application France, Jan. 12, 1971, 7100772
Int. Cl. H01l *19/00*
U.S. Cl. 317—235 R **3 Claims**



An inverter employing complementary MOS transistors, insensitive to light radiation, comprises in each transistor, a diffused zone of opposite conductivity type to that of the substrate this diffused zone being connected by a conduction channel to the corresponding drain, when the transistor is driven conductive.

3,715,638
TEMPERATURE COMPENSATOR FOR CAPACITIVE PRESSURE TRANSDUCERS

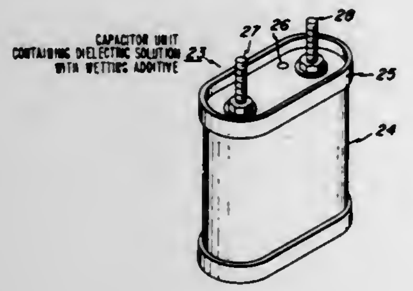
William Ronald Polye, River Edge, N.J., assignor to The Bendix Corporation
Filed May 10, 1971, Ser. No. 112,359
Int. Cl. H01y *3/24*
U.S. Cl. 317—247 **8 Claims**



A pressure transducer of the capacitor type having a body of dielectric material has a thin film resistor deposited on the body for sensing the temperature of the body. The resistor is of a material having a suitable temperature coefficient of resistivity to provide a signal corresponding to the temperature of the body for temperature correction.

3,715,639
ELECTRICAL APPARATUS CONTAINING DIELECTRIC SOLUTION

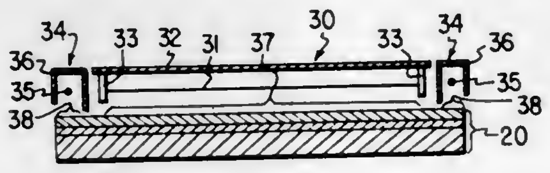
George L. Gaines, Scotia, and Donald G. LeGrand, Burnt Hills, both of N.Y., assignors to General Electric Company
Division of Ser. No. 839,642, July 7, 1969. This application Feb. 16, 1972, Ser. No. 226,948
Int. Cl. H01g *3/04*
U.S. Cl. 317—258 **6 Claims**


CAPACITOR UNIT CONTAINING DIELECTRIC SOLUTION WITH WETTING ADDITIVE
23
27
26
28
25
24

An electrical apparatus containing a dielectric solution with good wetting properties is disclosed as well as an electrical capacitor assembly containing dielectric material comprised of a polyolefin impregnated with the dielectric solution. The solution is comprised of a dielectric liquid and a block copolymer additive which is surface-active therein. The block copolymer is comprised of at least two polymerized comonomers, one of which is soluble in the dielectric liquid thereby distributing the block copolymer therein, and the second of which is sufficiently surface-active in the solution to produce a solution having a surface tension less than that of the dielectric liquid alone.

3,715,640
CORONA CHARGING PROCESS AND APPARATUS IN ELECTROPHOTOGRAPHY

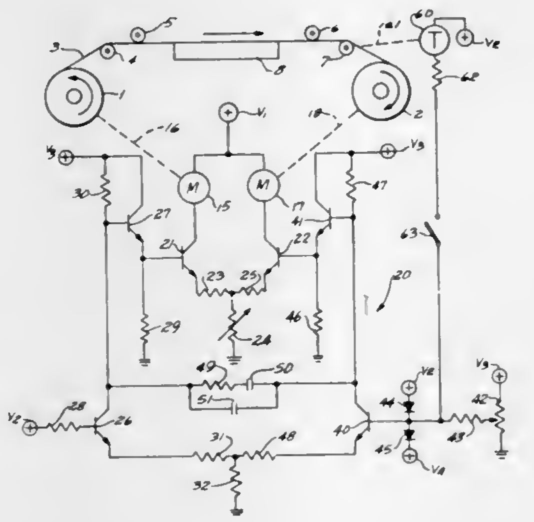
Masamichi Sato, Asaka, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed April 14, 1971, Ser. No. 133,787
Int. Cl. G03g *15/02*
U.S. Cl. 317—262 A **10 Claims**



The method of corona charging comprising a main corona discharging electrode positioned to act upon an insulating layer on an electroconductive supporter which is not earthed, and corona discharge electrodes of a polarity opposite to said main electrode positioned to simultaneously act with said main electrode upon a portion of the electroconductive supporter. In the structure of photographic material comprising the conductive layer on highly insulated supporter, it is difficult to earth the conductive layer.

3,715,641
FILM SUPPORT SYSTEM

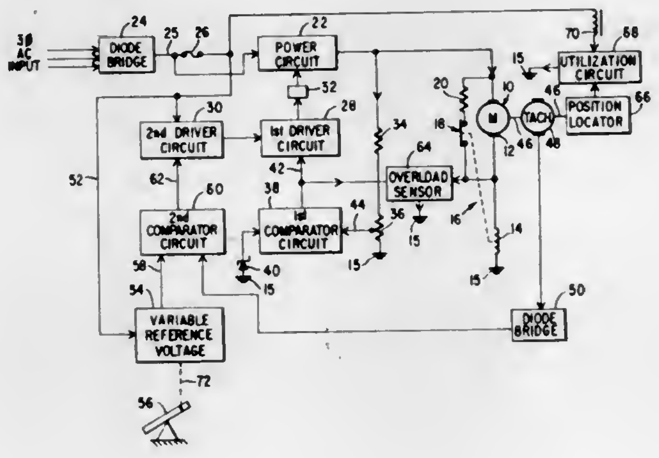
Lyle T. Mattes, Torrance, Calif., assignor to Cutler-Hammer, Inc., Milwaukee, Wis.
Filed Sept. 21, 1970, Ser. No. 74,059
Int. Cl. B65h *77/00*
U.S. Cl. 318—7 **19 Claims**



Film is transferred from one storage reel to another by applying torques to the reels in opposite rotational directions. The ratio of the torques applied to the reels is adjustable such that the sum of the torques remains constant. The excitation windings of the reel driving motors are connected to the outputs of a differential amplifier that maintains the sum of the excitation currents constant. The torques applied to the reels are adjusted by a control signal applied to one input of the differential amplifier so as to maintain approximately constant film transport speed. The control signal is representative of the deviation of the sum of the angular velocities of the reels from an adjustable constant value.

3,715,642
DC CONTROL CIRCUITS FOR DIRECT DRIVE MOTORS CONTINUOUSLY COUPLED TO SEWING MACHINES FOR CONTROLLING SEWING FUNCTIONS

Heinz E. Walter, Blankenloch, Buchig, Germany, assignor to The Singer Company, New York, N.Y.
Filed June 21, 1971, Ser. No. 155,082
Int. Cl. H02p *3/12*
U.S. Cl. 318—269 **13 Claims**

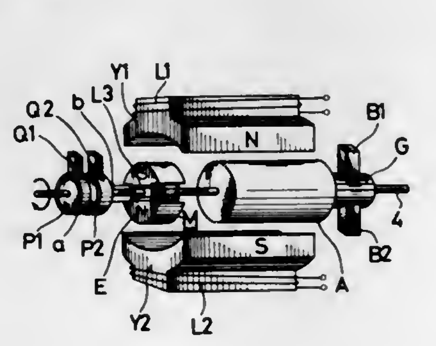


A circuit is disclosed for controlling DC direct drive motors which are continuously coupled to a sewing machine drive shaft. A variable DC reference voltage is supplied by a foot pedal controller which in turn controls the output voltage of the power drive transistors which are coupled to the DC direct drive motor. A tachometer coupled to the motor shaft generates a feedback voltage which subtracts from the variable reference voltage, effectively reducing the reference voltage to maintain a constant motor speed. The maximum voltage and current applied to the motor is controlled at all times by a second feedback loop.

Automatic positioned stopping responsive to input commands is accomplished by a solenoid-actuated mechanical brake which is energized for a predetermined time by a special utilization circuit comprising a transistor which is turned on for a limited period determined by a capacitor discharge initiated by a position sensor pulse enabled by the input command. The drive circuits are disabled for the braking period to permit all mechanical actuation to cease before the machine can be restarted.

3,715,643
ELECTRICALLY DRIVEN MOTOR

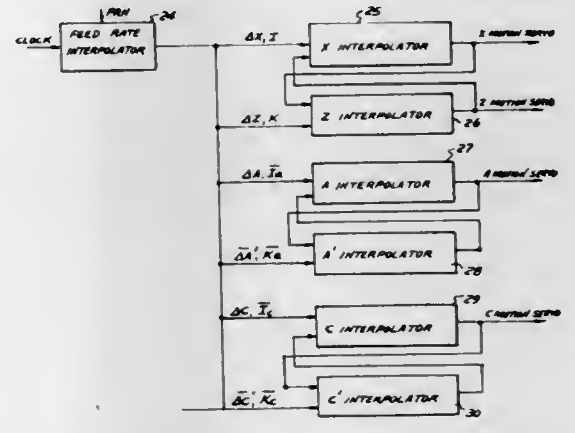
Kazumi Masaki, Toyonaka-shi, Osaka-fu, Japan, assignor to Yamato Mishin Seizo Kabushiki Kaisha, Osaka-fu, Japan
Filed March 24, 1971, Ser. No. 127,545
Claims priority, application Japan, April 2, 1970, 45/28391; March 31, 1970, 45/27320; Oct. 9, 1970, 45/88994; Dec. 9, 1970, 45/109096
Int. Cl. H02p *3/02*
U.S. Cl. 318—466 **4 Claims**



An electrically driven motor that can be rapidly rotated and stopped at a predetermined position about its own axis of rotation. To this end, the motor is provided with a rotational shaft rigidly mounted with a rotary magnet in coaxial relation to the rotor, said rotary magnet being adapted to be magnetized in one predetermined direction to produce a a magnetic force acting on the rotor so as to stop said rotor at a predetermined position about its own axis of rotation.

3,715,644
PROPORTIONAL INTERPOLATOR IN MULTIAXIS MACHINES

Vincent F. Bobrowicz, Livonia, and Hubert B. Henegar, Detroit, both of Mich., assignors to The Bendix Corporation
Filed June 2, 1971, Ser. No. 149,266
Int. Cl. G05b *19/24*
U.S. Cl. 318—573 **17 Claims**

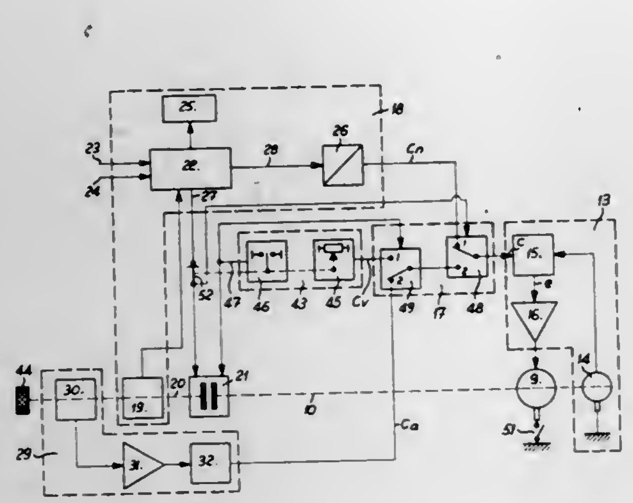


A system for causing proportional interpolation in a numerically controlled machine having three, or more, degrees of motion is described. Two of the degrees of motion may occur in a plane defined by perpendicular axes and can be planar or revolutional motions. These two motions would then be defined with respect to the axes and could be mathematically linear or nonlinear. The other degrees of motion can be revolutional or planar motions individually defined with respect to any of the axes of the system. The invention is directed to a system for causing all motions to be proportional to a selected one of the motions irrespective of whether the selected motion is linear or nonlinear. This is achieved by calculating proportionalities between the selected motion and the other motions and combining the calculated proportionalities with the programmed data to cause the final motion to be in accordance with the combined data.

3,715,645
HIGH PRECISION READING DEVICE OF THE GRADUATIONS OF A PRECISION RULER

Robert Viret, and Jacques Pettavel, both of Geneva, Switzerland, assignors to Societe Genevoise D'Instruments de Physique, Geneva, Switzerland
Filed Aug. 2, 1971, Ser. No. 168,210
Claims priority, application Switzerland, Sept. 2, 1970, 13079/70
Int. Cl. G05b *19/28*
U.S. Cl. 318—603 **4 Claims**

The invention concerns a measuring machine comprising a supporting stand carrying a mobile member which can be moved relative to this supporting stand in at least one direction, and a motor fitted with its servo-control device, for driving this mobile member in its movements. The servo-control device is operated alternately by a numerical control device comprising a reversible counter and by an analog control device through the intermediary of a switching device. The analog control device comprises a precision scale carried by the mobile member, a photo-electric microscope furnished with an optical sighting device possessing a rotating field diaphragm, movable between positions corresponding to portions of the measuring field centered on two different marks of the graduation of the precision scale. An impulse generator is angularly rigidly connected to the field diaphragm and delivers control signals for the reversible counter causing the algebraic subtraction from the value recorded in the counter of a number of units equal to the linear movement of the mobile member corresponding to the angular displacement of the rotating diaphragm.



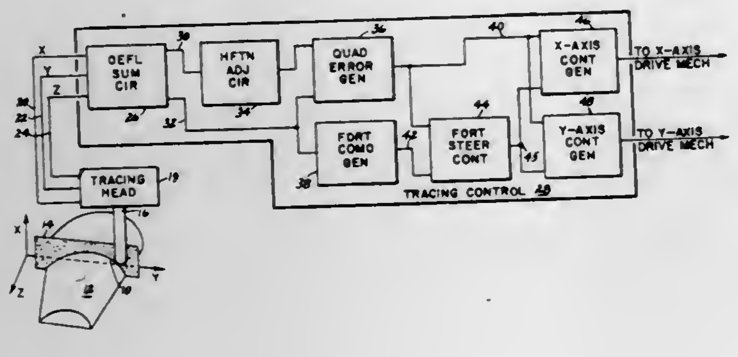
3,715,646
TRACING FEED RATE STEERING CONTROL

Robert G. Wise, Loveland, Ohio, assignor to Cincinnati Milacron Inc., Cincinnati, Ohio

Filed July 21, 1971, Ser. No. 164,591

Int. Cl. G05b *11/01*

U.S. Cl. 318—632 **4 Claims**



An improved electronic tracing control for automatically steering the direction of the command feedrate vector to maintain a substantially zero quadrature error.

3,715,647
FREQUENCY CONVERTER FOR CONVERTING MULTI-PHASE LOW FREQUENCY ALTERNATING CURRENT INTO SINGLE-PHASE HIGHER FREQUENCY ALTERNATING CURRENT

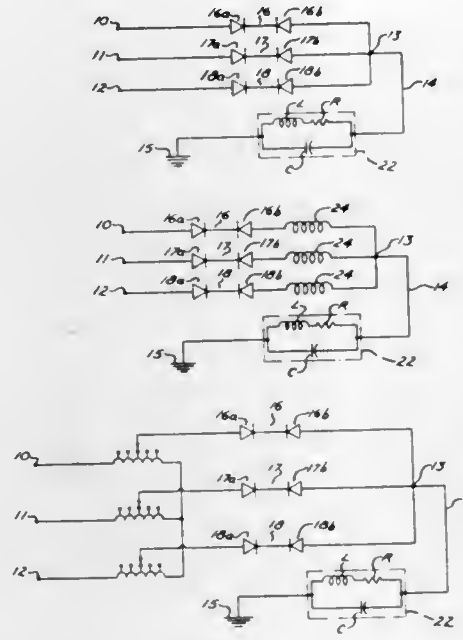
Paul Peter Biringer, Toronto, Ontario, Canada, assignor to Ajax Magnethermic Corporation, Warren, Ohio

Filed March 31, 1971, Ser. No. 129,889

Int. Cl. H02m *5/20*

U.S. Cl. 321—7 **4 Claims**

There is disclosed herein a solid state frequency changer wherein multiple phase supply current is converted to single phase current of increased frequency. Each line of the multiple phase supply is provided with a pair of reverse switching rectifiers or PNPN devices connected back-to-back in series therewith. A load is connected between a common point of the multiple phase supply and a ground or an artificial neutral point.



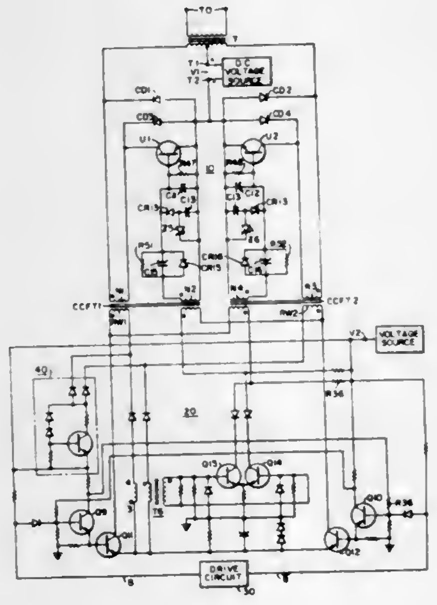
3,715,648
TECHNIQUE FOR USE OF CONTROLLED CURRENT FEEDBACK TRANSFORMERS IN POWER INVERTER APPARATUS

Andress Kernick, Murrysville, Pa.; Glenn W. Ernsberger, Worthington, Ohio; John F. Vonderembse, and Manvel A. Geyer, both of Lima, Ohio, assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Feb. 1, 1972, Ser. No. 222,522

Int. Cl. H02m *1/18, 7/52*

U.S. Cl. 321—11 **4 Claims**



A technique for improving the interlock operation of a power inverter apparatus including a power stage operatively coupled to a steering stage by a controlled current feedback

transformer (CCFT). Each of the stages includes a pair of switching devices and the alternate conduction of the switching devices controls the conductive state of the switching devices of the power stage. An interlock circuit operatively coupled between the power stage and steering stage controls the conductive states of the switching devices of the steering stage in response to current flow in the switching devices of the power stage. A residual bias circuit is operatively connected to the steering stage to maintain the switching devices in a conductive state for a period of time to assure effective interlock circuit operation. A non-linear energy absorbing device, such as a transformer is positioned intermediate to said CCFT and said interlock circuit to absorb erroneous currents produced by stored energy in the core of the CCFT.

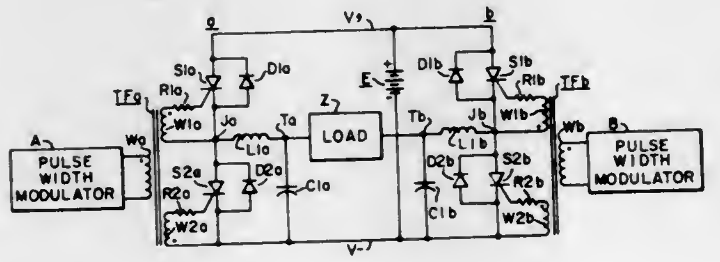
3,715,649
STAGGERED PHASE PULSE WIDTH MODULATED INVERTER APPARATUS

Richard J. Ravas, Monroeville, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Jan. 25, 1967, Ser. No. 611,697

Int. Cl. H02m *7/52*

U.S. Cl. 321—45 R **9 Claims**



This disclosure describes an inverter utilizing semiconductor switching devices, such as transistors or gate controlled switches, in the legs of the inverter. The legs are connected in a bridge circuit and to a source of direct current. A filter network is connected between the legs and a load across which the alternating output of the inverter is to be developed. The devices are gated on by the application of pulse width modulated signals having an actual carrier frequency to the control electrodes of the devices of the various legs of the inverter. The pulse width modulated signals are applied to the various legs in a predetermined staggered phase relationship so that the effective carrier frequency as seen by the filter network is a higher multiple of the actual carrier frequency. Thus, the filter network need only filter out the effective carrier frequency rather than the lower actual carrier frequency, while the switching devices are switched at the actual carrier frequency at high efficiency.

3,715,650
PULSE GENERATOR FOR IGNITION SYSTEMS

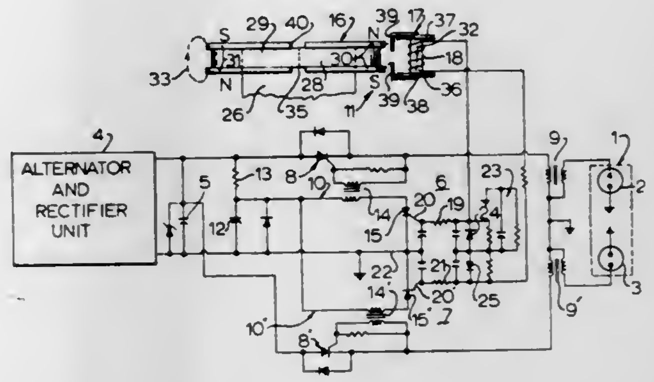
James R. Draxler, Fond du Lac, Wis., assignor to Brunswick Corporation, Chicago, Ill.

Filed Nov. 23, 1971, Ser. No. 201,456

Int. Cl. F02p *1/00*

U.S. Cl. 322—51 **10 Claims**

A capacitor discharge ignition includes a pulse generator coupled to an engine establish pulse signals to trigger a thyristor at all speeds including engine cranking speed. The generator includes a permanent magnet rotor formed in a continuous doughnut shape having planar faces, with 180° axially polarized with one polarity and the opposite 180° directly oppositely polarized. Circumferential pole shoes of slightly less than 180° in length are centrally secured to the top and bottom of each magnet and project radially therefrom. A common pick-up winding is wound on a generally U-shaped core which opens toward the rotor with the ends of the arms aligned with and adjacent the outer edges of upper an lower shoes. The rotation of the rotor results in the reversal of flux within the pick-up core at each of the abutting sections with the corresponding single polarity pulse being generated as the rotor moves by the U-shaped core.



3,715,651
ANALOG-TYPE CONSTANT-CURRENT REGULATOR

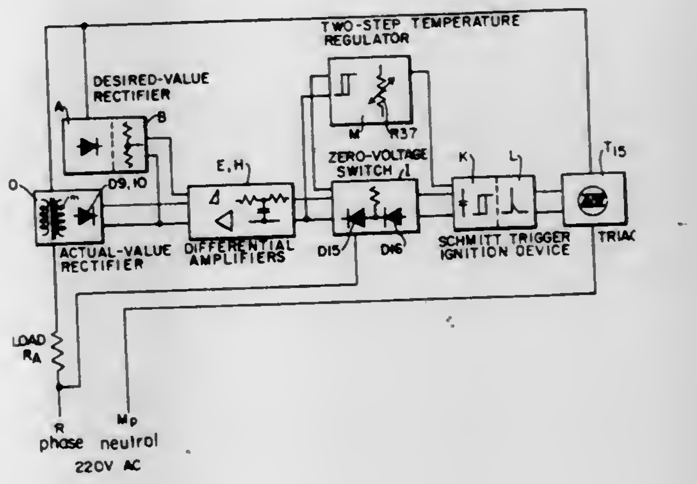
Erich Ott, Rudiger Strasse 15, Wiesbaden, Germany

Filed Jan. 4, 1971, Ser. No. 103,733

Claims priority, application Germany, Jan. 2, 1970, P 20 00 130.3

Int. Cl. G05f *1/44, 5/00*

U.S. Cl. 323—4 **33 Claims**



Analog-type constant-current regulator which works as an alternating-current setting controller. It operates with a phase-angle split control and a zero-voltage switch. Across a rectifier, the actual value is impressed as a current. The regulator is suitable in particular for obtaining, independently of the load, a constant, effective alternating current, as a matter of example, for heating protective housings and small-diameter conduits in which measurements are made of liquid and gaseous substances. The main circuit of the regulator includes a series connection of the load with a transducer forming part of an actual-value rectifier circuit and a control circuit which is preferably in the form of a Triac.

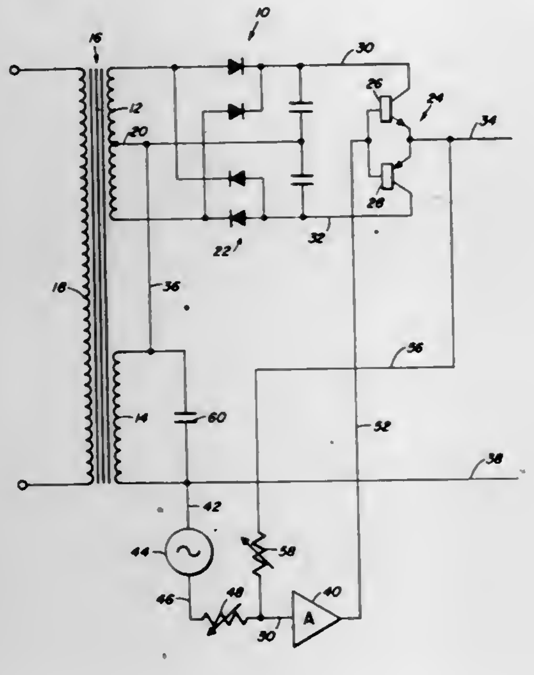
3,715,652
HIGH SPEED BUCK-BOOST ALTERNATING CURRENT REGULATOR

Robert O. Elliston, Del Mar, Calif., assignor to Elgar Corporation, San Diego, Calif.

Filed March 15, 1972, Ser. No. 234,973

Int. Cl. G05f *1/38;* **H02m** *5/44*

U.S. Cl. 323—45 **3 Claims**



An alternating current regulator in which all current flowing to an output conductor from a secondary winding of a transformer flows through a power amplifier, including the current flowing through a feedback loop.

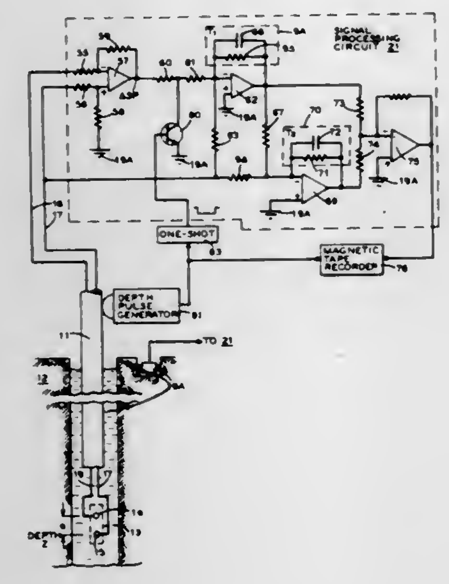
3,715,653
WELL LOGGING METHODS AND APPARATUS FOR CONVERTING SPATIAL DERIVATIVE MEASUREMENTS TO TIME DERIVATIVE MEASUREMENTS

William D. Sauter, Sherman, Conn., assignor to Schlumberger Technology Corporation, New York, N.Y.

Filed Jan. 4, 1971, Ser. No. 103,449

Int. Cl. G01v *3/18*

U.S. Cl. 324—1 **6 Claims**



In accordance with illustrative embodiments of the present invention, a technique is disclosed for converting a spatial derivative well logging measurement to a time derivative one. Pulses having a rate representative of the velocity of the electrode are used in converting the spatial derivative to a time derivative. This is accomplished in connection with a system which combines a measurement of the difference between the potentials at electrodes in a borehole and at the surface of the earth with a measurement of the gradient or spatial derivative of the potential at the electrode in the borehole to produce a compensated measure of the spontaneous potential.

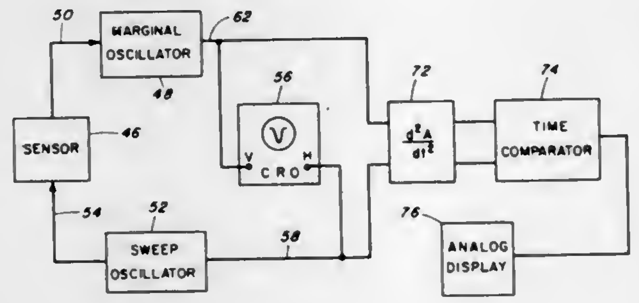
3,715,654
CRYSTAL MAGNETOMETER AND GRADIOMETER

John F. Scarzello, Silver Spring, Md., assignor to The United States of America as represented by the Secretary of the Navy

Filed June 4, 1970, Ser. No. 43,330

Int. Cl. G01r *33/08*

U.S. Cl. 324—.5 R **2 Claims**



A sensor for measuring component magnetic fields utilizing a first magnetic field to be measured, and a perpendicular second magnetic field. The fields are modulated by first and second coils individually wound around first and second nonmagnetic cores. The nonmagnetic cores are hollow and intersect. A paramagnetic crystal is located at the intersection of the cores and is oriented to provide a maximum nuclear magnetic resonance signal. In one embodiment, a magnetometer is employed which includes a sweep generator, marginal oscillator, feedback loop and the sensor for determining the magnitude of the component magnetic field to be measured. An alternative embodiment utilizes a sweep generator, marginal oscillator, differentiating network and the sensor for determining the point gradient of the fiel to be measured.

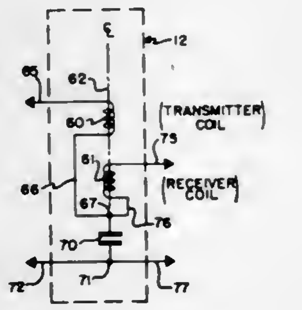
3,715,655
INDUCTION LOGGING APPARATUS HAVING A COMMON SERIES ELEMENT FOR NULLING

Donald J. Dowling, and George R. Atwood, both of Houston, Tex., assignors to Texaco Inc., New York, N.Y.

Filed Dec. 30, 1970, Ser. No. 102,749

Int. Cl. G01v *3/10, 3/18*

U.S. Cl. 324—6 **2 Claims**



Induction logging apparatus employing a transmitter coil with a receiver coil spaced therefrom along a common axis. It has an excitation circuit for the transmitter coil and an output circuit for signals induced in the receiver coil, thus a common circuit for nulling the direct coupled receiver signals. All three of the circuits are located on a logging sonde that may be run down a well.

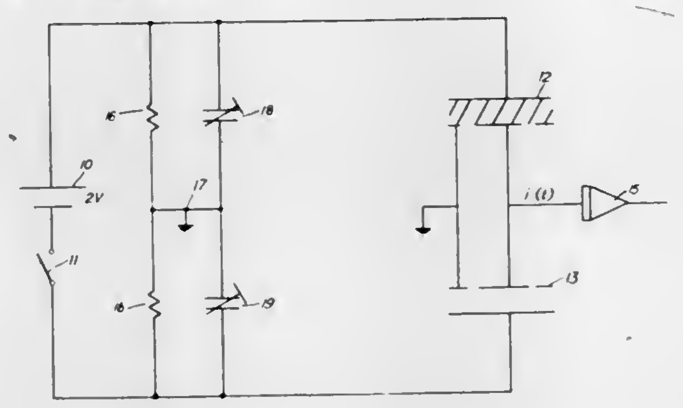
3,715,656
METHOD AND APPARATUS FOR MEASURING THE CHARGE-TIME RESPONSE OF MATERIALS BY APPLYING A VOLTAGE STEP ACROSS THE SAME

Peter John Hyde, Codicote, Hitchin, Hertfordshire, and Wilson Reddish, London Colney, Hertfordshire, both of England, assignors to Imperial Chemical Industries Limited, London, England

Continuation-in-part of Ser. No. 4,012, Jan. 19, 1970, abandoned. This application May 27, 1971, Ser. No. 147,523

Int. Cl. G01n *27/26*

U.S. Cl. 324—61 R **24 Claims**



A method and apparatus for measuring the charge-time response of an insulating material to a voltage step applied across it by applying to a capacitor containing a specimen of the material as dielectric, a voltage step or repeated voltage steps in the form of a pulse train, and sampling the charge on the specimen after a time interval from the application of the voltage step, said time intervals increasing logarithmically with successive samples. The charge-time response data obtained is particularly suited to the determination of permittivity and loss factor with frequency using approximations to the Fourier transform

---

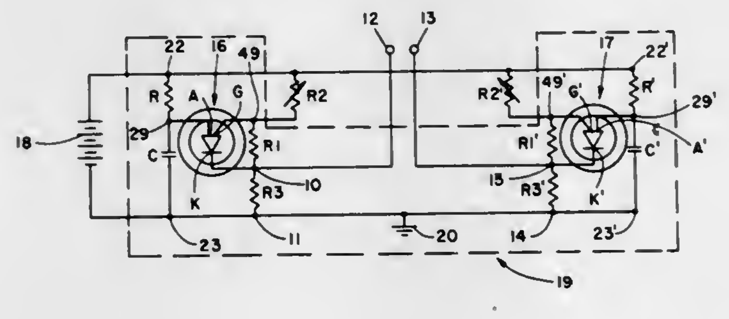
3,715,657
TRANSDUCER FOR CONVERTING SELECTED ENVIRONMENTAL PARAMETER DIFFERENTIALS TO FREQUENCY DIFFERENTIALS

Robert W. Sampson, Arlington Heights, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed Dec. 28, 1970, Ser. No. 101,651

Int. Cl. G01n *31/08;* **H03k** *17/60*

U.S. Cl. 324—140 R **2 Claims**



To form a transducer, two uniformly d.c. biased signal detector means are connected in parallel. Each of these signal detector means includes a variable resistor that controls the output frequency of that signal detector means. The variable resistors are located in environments differing only in a parameter for which differential measurement is desired. Such parameters include temperature, thermal absorption, and other variables that affect electrical current flow in the resistors. A non-uniform change in the variable resistors changes the frequency differential existing between the two signal detector means.

3,715,658
ROTARY COIL ASSEMBLY WITH COUNTER-BALANCE FOR AN ELECTRICAL MEASURING INSTRUMENT AND METHOD OF MAKING THE SAME

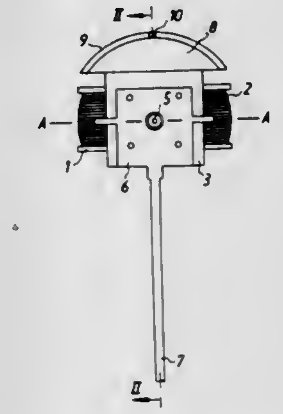
Willy Kisselmann, Gruenwald; Fritz Ruempelein, Munich, and Paul Kopf, Unterhaching, all of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed Dec. 10, 1971, Ser. No. 206,668

Claims priority, application Germany, Dec. 11, 1970, P 20 60 986.3

Int. Cl. G01r *1/00;* **G01d** *13/22*

U.S. Cl. 324—154 PB **6 Claims**



A rotary coil for an electrical measuring instrument is made by providing the coil frame with a winding and with needle bearings. A pointer is mounted on the frame and a section of synthetic plastic material is mounted on the frame as a counterbalance. The section is heavier than the pointer and is provided with an arcuate wall portion curved over a portion of arc with a plane of symmetry coinciding with the axis of rotation of the frame. The wall portion is then provided with one or more slots so located, and with sufficient material being removed, that the existing imbalance is corrected and the coil is balanced.

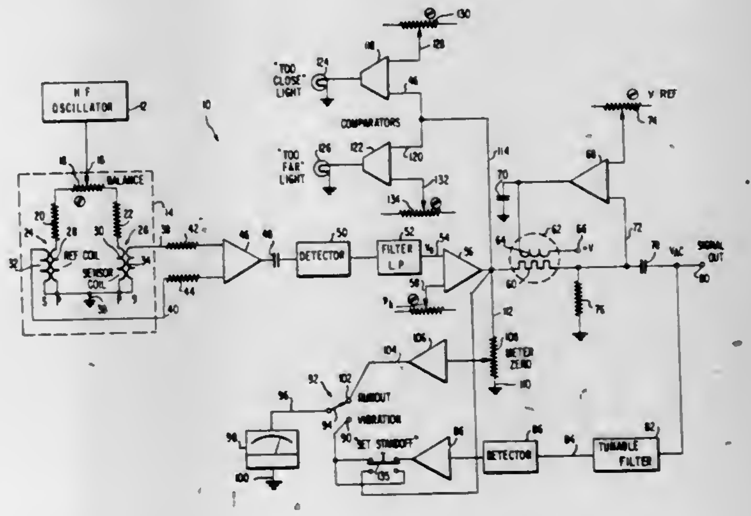
3,715,659
INDUCTIVE NON-CONTACT VIBRATION ANALYZER WHICH IS INDEPENDENT OF STANDOFF DISTANCE

Albert C. Abnett, Westerville, and George B. Foster, Worthington, both of Ohio, assignors to Reliance Electric Company, Columbus, Ohio

Filed March 25, 1970, Ser. No. 22,416

Int. Cl. G01r *33/00*

U.S. Cl. 324—34 D **6 Claims**



Disclosed is a non-contact vibration analyzer that is substantially independent of standoff distance. An inductive probe produces an electrical output having AC and DC components that vary similarly with standoff. An automatic gain control circuit maintains the DC component constant so that the AC output signal is representative of vibration and does not vary with standoff. By connecting the probe through a meter zero potentiometer and switch to a DC meter, the analyzer also indicates shaft runout.

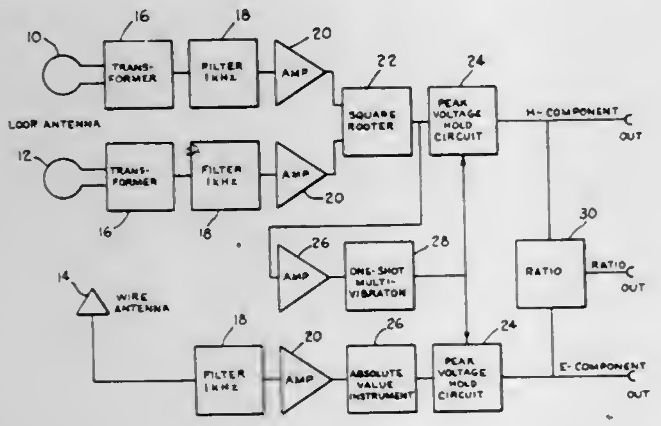
3,715,660
DETERMINING DISTANCE TO LIGHTNING STROKES FROM A SINGLE STATION

Lothar H. Ruhnke, Boulder, Colo., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration

Filed Dec. 30, 1971, Ser. No. 213,949

Int. Cl. G01r *31/02*

U.S. Cl. 324—72 **4 Claims**



Apparatus for determining the distance to lightning strokes from a single station. The apparatus includes a first loop antenna system for sensing the magnetic field produced by the lightning which signal is filtered, square rooted, and fed into a peak voltage holding circuit. A second antenna is provided for sensing the electric field produced by the lightning which is fed into a filter, an absolute value meter, and to a peak voltage holding circuit. A multivibrator gates the magnetic and electric signals through the peak holding circuits to a ratio meter which produces a signal corresponding to the ratio between the magnetic component and the electric component. The amplitude of this signal is proportional to the distance from the apparatus to the lightning stroke.

3,715,661
INDICATING METER WITH VISUAL ALARM

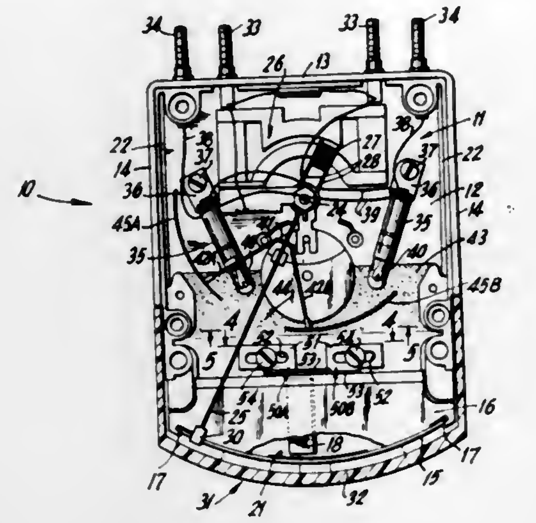
Alfred Henry Posey, West Haven, and Harry Clifford Quick, Jr., Weston, both of Conn., assignors to Sigma Instruments, Inc., Braintree, Mass.

Filed March 24, 1969, Ser. No. 809,602

Int. Cl. G01r *15/08, 19/14*

U.S. Cl. 324—115 **15 Claims**

An indicating meter with an indicating member movable over a scale provides a visual alarm when the indicating member enters a selected range of the scale. One or more light sources are provided in the meter, and the indicating member carries one or a pair of arcuate masks, symmetrically on either side of the indicating member, and spaced by a predetermined angular or arcuate distance. The single mask or each of the pair of masks blocks light from a respective source from illuminating the scale unless the indicating member is in a respective selected range of the scale. Mask means are mounted on the meter casing, and are adjustable as to length, and these mask means cooperate with the mask or masks carried by the indicating member. The scale is translucent or transparent, and the illumination of the selected range of the scale, when the indicating member moves into such range, provides a visual alarm. If desired the visual alarm may be a colored illumination. In a modification, a photocell arranged in a suitable electronic circuit with one or more transistors is arranged to effect the illumination of a lamp when the indicating mark enters a selected range or one of two or more selected ranges of the scale.



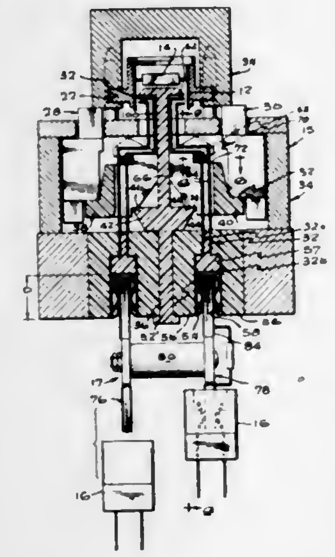
3,715,662
TEST CONTACTOR HEAD FOR CIRCUIT MODULES

Bernd H. Richelmann, San Diego, Calif., assignor to Republic Corporation, Beverly Hills, Calif.

Filed Nov. 19, 1970, Ser. No. 90,952

Int. Cl. G01r *31/22, 15/12*

U.S. Cl. 324—158 F **8 Claims**



A contactor head useful in a testing complex for quickly receiving and contacting the leads of circuit modules, including a housing having a circuit module-receiving region and a compensating board-receiving region and having several pairs of resilient contact members. A button that is depressed when a circuit module is received, pivots a comb within the housing that deflects outer ends of the contact members against the leads of the circuit module. A plug-in compensating board is provided which has conductive strips that can lie against inner ends of the contacts, the board being wired with electrical compensating components. The plug-in boards enable rapid change of compensation to enable the same contactor head to be used for a variety of different circuit modules. An oil or grease film spread on the compensating board reduces current leakage from moisture condensation.

ERRATUM

For Class 324—58.5 B see:
Patent No. 3,715,667

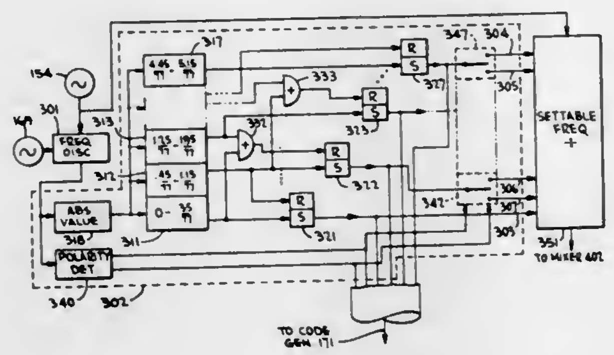
3,715,663
DOPPLER COMPENSATION BY SHIFTING TRANSMITTED OBJECT FREQUENCY WITHIN LIMITS

Charles R. Laughlin, Silver Spring, Md.; Roger C. Hollenbaugh, Shippensburg, Pa., and Walter K. Allen, Silver Spring, Md., assignors to the United States of America as represented by the Administrator of the National Aeronautics and Space Administration

Division of Ser. No. 701,679, Jan. 30, 1968, Pat. No. 3,534,367. This application June 18, 1970, Ser. No. 47,440

Int. Cl. H04b *7/20*

U.S. Cl. 325—4 **11 Claims**



Disclosed are a system and method for position locating, deriving centralized air traffic control data and communicating via voice and digital signals between a multiplicity of remote aircraft including supersonic transports and a central station, as well as a peripheral ground station (or stations), through a synchronous satellite relay station. Side tone ranging patterns, as well as the digital and voice signals, are modulated on a carrier transmitted from the central station and received on all of the supersonic transports. Each aircraft communicates with the ground stations via a different frequency multiplexed spectrum. Supersonic transport position is derived from a computer at the central station and supplied to a local air traffic controller. Position is determined in response to variable phase information imposed on the side tones at the aircrafts, with a plurality of different side tone techniques being employed, and relayed back to the transports. Common to all of the side tone techniques is Doppler compensation for the supersonic transport velocity.

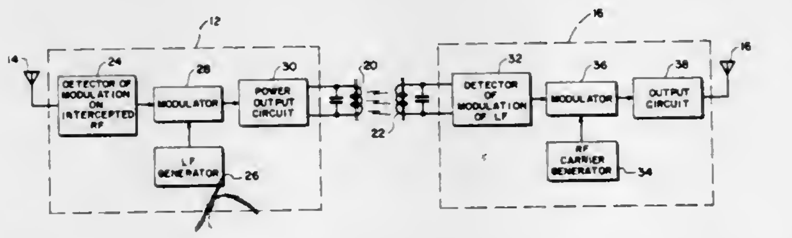
3,715,664
METHOD OF REPEATING RF-BORNE SIGNAL ACROSS AN EARTH BARRIER

Kurt Ikrath, Elberon, N.J., assignor to The United States of America as represented by the Secretary of the Army

Filed Feb. 12, 1971, Ser. No. 114,853

Int. Cl. H04b *7/14*

U.S. Cl. 325—9 **3 Claims**



A method of relaying VHF in mountainous terrain that includes planting a receiver and a transmitter, that operate at the same carrier frequency, on opposite sides of a mount such that the mountain between them shields the receiver from rf radiated by the transmitter, and transferring intelligence on the rf detected by the receiver through the earth to the transmitter by means of a magnetic or seismic link. The magnetic link can transfer audio band frequency while the seismic link can transfer mark-space coded intelligence.

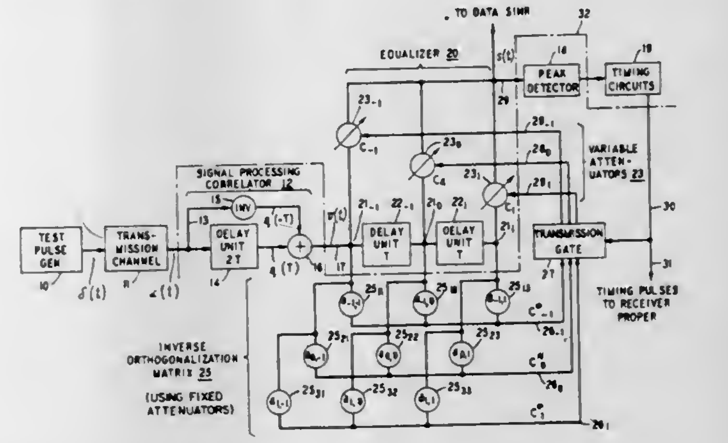
3,715,665
JOINT INITIAL SETTING OF ATTENUATOR COEFFICIENTS AND SAMPLING TIME IN AUTOMATIC EQUALIZERS FOR SYNCHRONOUS DATA TRANSMISSION SYSTEMS

Robert Wu-lin Chang, Middletown, N.J., assignor to Bell Telephone Laboratories Incorporated, Murray Hill, N.J.

Filed June 15, 1971, Ser. No. 153,184

Int. Cl. H03h *7/36*

U.S. Cl. 325—42 **7 Claims**



Method and apparatus for rapid joint setting in synchronous data transmission systems of the parameters of sampling time and transversal equalizer tap gain coefficients utilizes auxiliary delay means for a preliminary correlation of samples of transmitted test pulses and reference test pulses to obtain a signal which after application to the transversal equalizer generates an output wave whose peak coincides with the optimum sampling instant. This effect is assured by inversely orthogonalizing the tap output signals from the transversal equalizer. Once the optimum sampling time is established the tap gains can be set in a single adjustment to provide an open data eye pattern.

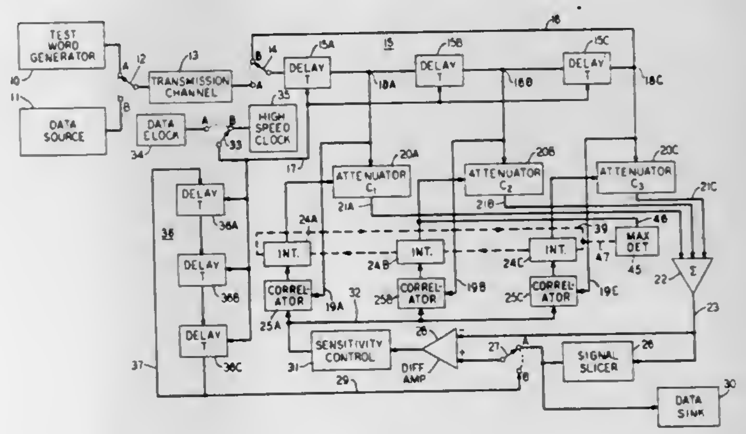
3,715,666
FAST START-UP SYSTEM FOR TRANSVERSAL EQUALIZERS

Kurt Hugo Mueller, Matawan, and David Adams Spaulding, Colts Neck, both of N.J., assignors to Bell Telephone Laboratories Incorporated, Murray Hill, N.J.

Filed March 30, 1971, Ser. No. 129,328

Int. Cl. H03h *7/36*

U.S. Cl. 325—42 **9 Claims**



Initial convergence of automatic transversal equalizer tap gain settings is rapidly achieved without first establishing synchronization between a test signal incoming at a receiving location over a distorting transmission channel and a locally generated ideal reference signal. Identical periodic digital patterns of fixed length equal to the number of taps available on the equalizer comprise the respective test and reference signals. Error signals obtained from a comparison of test and reference signals at an arbitrary speed which need not be related to the data rate assigned to the transmission channel are correlated with tap signals to obtain a sequence of coarse tap gain coefficients. Just prior to message data transmission this sequence is cyclically shifted with respect to the tap locations to align the highest of them at an assigned reference location.

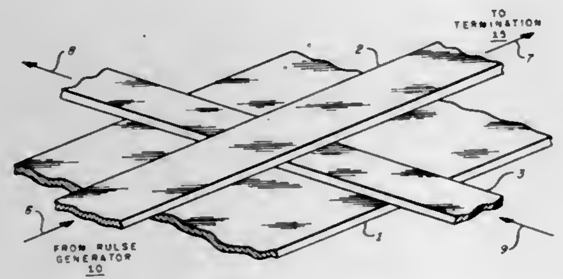
3,715,667
NON-DESTRUCTIVE ELECTROMAGNETIC ENERGY TESTING OF WEB MATERIAL

Alexander M. Nicolson, Concord, Mass., assignor to Sperry Rand Corporation, New York, N.Y.

Filed Oct. 4, 1971, Ser. No. 186,213

Int. Cl. G01r *27/04*

U.S. Cl. 324—58.5 B **13 Claims**



The forward or back scattered high frequency energy from a moving web of dielectric material exposed to incident impulses of base band duration electromagnetic energy in a parallel plate transmission line is continuously monitored by a signal sampling and comparison system for providing defect-stimulated alarm or control signals.

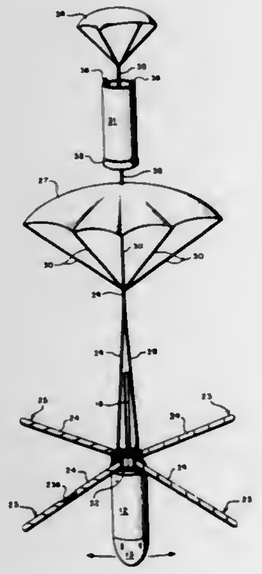
3,715,668
AIR-LAUNCHED RADIO APPARATUS

Theodore C. Herring, New Hope; Ernest F. Bracht, Jenkintown; Robert E. Ainslie, Glenside; Eugene M. Todd, Doylestown, and Joseph J. Franz, Philadelphia, all of Pa., assignors to The United States of America as represented by the Secretary of the Army

Filed Sept. 26, 1967, Ser. No. 670,807

Int. Cl. H04b *1/02*

U.S. Cl. 325—112 **11 Claims**



An air-deliverable package for radio apparatus having a self-deploying antenna system including a flexible RF radiating element and laterally projecting, flexible ground plane elements which are foldable about a packed main parachute received within a tubular container which, in turn, is detachably connected to the aft end of the package and is separated therefrom by deployment of a pilot chute to enable deployment of the main parachute and the antenna system.

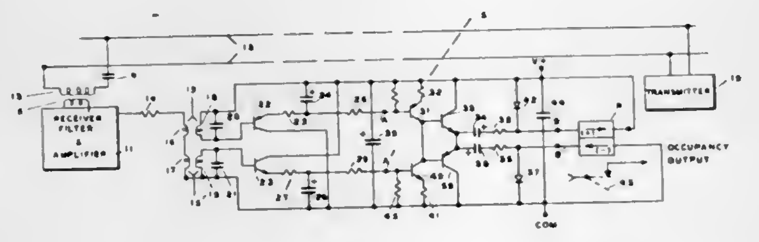
3,715,669
RECEIVER FOR A FREQUENCY MODULATED OVERLAY TRACK CIRCUIT

John P. LaForest, Conesus, N.Y., assignor to General Signal Corporation, Rochester, N.Y.

Filed Aug. 13, 1970, Ser. No. 63,453

Int. Cl. B61l *21/10;* **G08b** *13/22;* **H04b** *1/16*

U.S. Cl. 325—320 **18 Claims**



A receiver is provided for a frequency modulated overlay track circuit in which a frequency modulated signal having alternately occurring extreme side-band components is communicated along a railroad right of way. The system which is subject to the influence of the presence of a railroad vehicle comprises, a tuner means responsive to the F.M. signals separating one side-band component of the signal from the other and polarizing means for generating distinctive signals of opposite polarity in response to the respective side-band components. A relay is provided which is responsive to the distinctive signals occurring periodically and alternately for providing manifestation of a clear right of way.

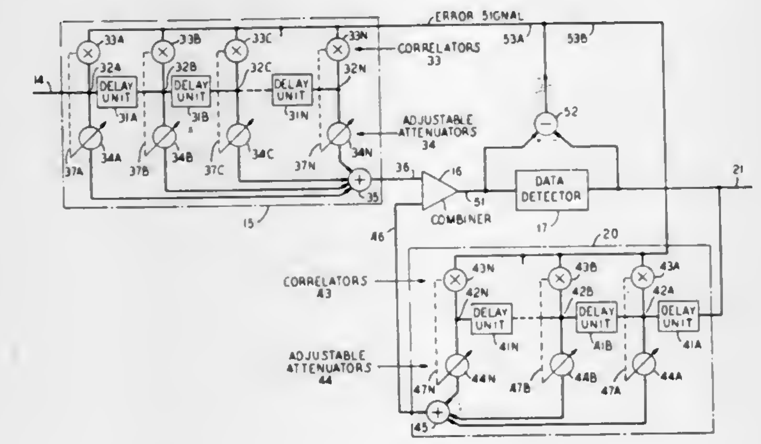
3,715,670
ADAPTIVE DC RESTORATION IN SINGLE-SIDEBAND DATA SYSTEMS

Donald Hirsch, Holmdel, and David Adams Spaulding, Colts Neck, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 20, 1971, Ser. No. 209,654

Int. Cl. H04b *1/68*

U.S. Cl. 325—331 **5 Claims**



Single-sideband, as well as vestigial-sideband, transmission of synchronous digital data over channels of limited bandwidth, such as voice telephone channels, is facilitated by removing low-frequency signal energy at the transmitter to provide frequency space for a demodulating carrier component and by adaptively restoring such energy at the receiver after demodulation. A first transversal filter in series with, and a second transversal filter in parallel feedback relationship with a data detection circuit at the receiver are made jointly responsive to a common error component to both equalize and restore dc components adaptively to a received signal. More efficient bandwidth utilization than that achieved in systems using bandedge pilot ones is thereby attained.

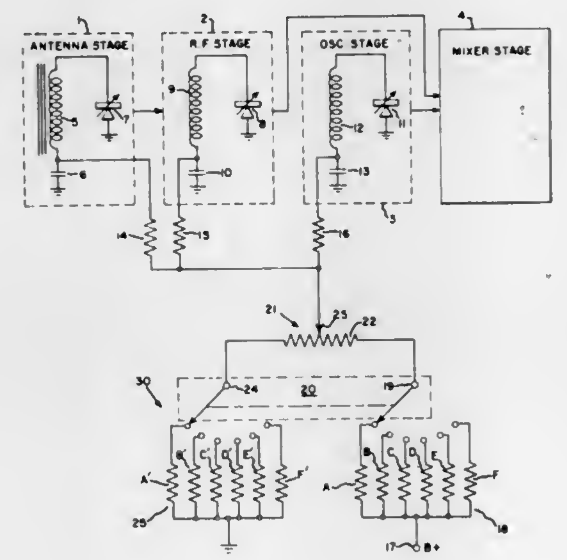
3,715,671
MULTIPLE SPREADBAND TUNING IN A VARACTOR TUNED RADIO RECEIVER

Joseph A. Worcester, Frankfort, N.Y., assignor to General Electric Company, Syracuse, N.Y.

Filed Dec. 29, 1970, Ser. No. 102,331

Int. Cl. H04b *1/16*

U.S. Cl. 325—468 **4 Claims**



In a radio receiver including varactors for tuning the receiver, a circuit is provided for regulating the range of voltage impressed upon the varactors, to tune the receiver to any selected one of a plurality of spreadbands. This circuit includes first, second, and third variable resistances. A first contact means simultaneously adjusts the resistance of the first and second variable resistances to vary the ratio therebetween for impressing a given range of voltage across the varactors to tune to a selected spreadband. A second contact means adjusts the third variable resistance means to impress a particular voltage, within the given range of voltage, upon the varactors to tune the receiver to a particular frequency within the selected spreadband.

3,715,672
SONIC DETECTION APPARATUS

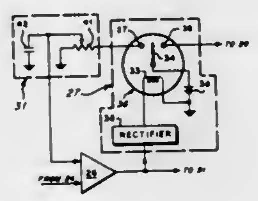
Henry Suter, Hatboro, Pa., assignor to the United States of America as represented by the Secretary of the Navy

Division of Ser. No. 31,042, Apr. 9, 1970, Pat. No. 3,646,506.

Filed Nov. 18, 1971, Ser. No. 199,868

Int. Cl. H03k *17/00*

U.S. Cl. 328—150 **7 Claims**



An improved swimmer and floater detector having a sonic generator and receiver and a shift detector indicating the doppler frequency difference between the generated and received sonic waves within a guarded volume of flowing water. The shift detector output is passed to a plurality of adjacent narrow bandpass filters, each being connected via a respective gain-controlled amplifier to a common multiple frequency meter. The amplifier gain control is non-proportional to the output amplitude and is operative in two modes to steadily increase or decrease the gain when the output is below or above threshold respectively.

3,715,673
NOISE SUPPRESSION FOR COMMUNICATION CABLES

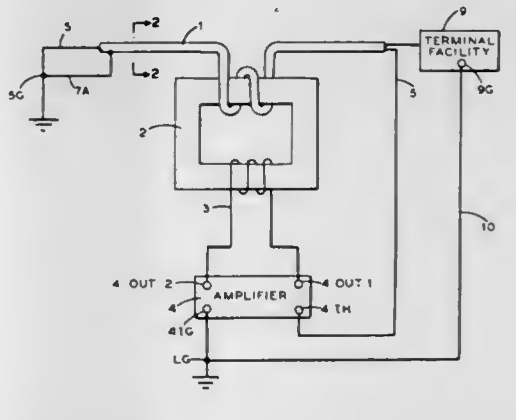
Walter Baum, Nurnberg, and Michael Still, Langenhagen, both of Germany, assignors to Baum Electrophysik GmbH, Nurnberg, Germany

Filed Feb. 17, 1971, Ser. No. 116,182

Claims priority, application Germany, Feb. 19, 1970, P 20 07 641.9

Int. Cl. H04b *3/28*

U.S. Cl. 328—165 **11 Claims**



Noise developed along the sheath (or shield) of a communications cable, is bucked out by means of an amplifier-transformer combination located in proximity to the terminal facility which receives a cable. The bucking voltage is applied to the sheath itself. The sheath itself may be wound so as to constitutes the secondary winding of the transformer.

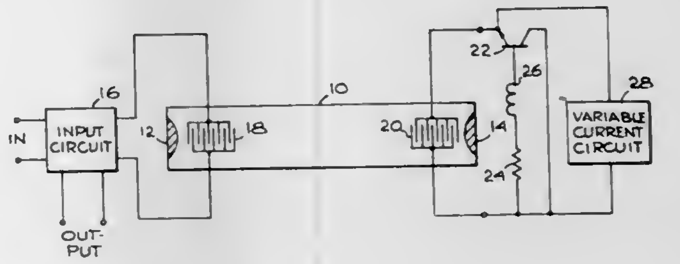
3,715,674
ELECTRICALLY CONTROLLED REFLECTION OF ACOUSTIC SURFACE WAVES

Alfred J. Bahr, Mountain View, Calif., assignor to Stanford Research Institute, Menlo Park, Calif.

Filed July 23, 1971, Ser. No. 165,638

Int. Cl. H03h *7/30;* **H03f** *3/04*

U.S. Cl. 330—12 **5 Claims**



A circuit is provided for tuning out the reactance established at the electrical port of an acoustical surface wave transducer thereby providing near perfect reflection of the acoustic surface waves. The variable impedance circuit, which is controlled electrically, besides a positive reactance generates a negative resistance that can be used to provide reflection and transmission gain for the surface waves.

3,715,675
VARIABLE RESISTOR DEVICE USING A FIELD TRANSISTOR

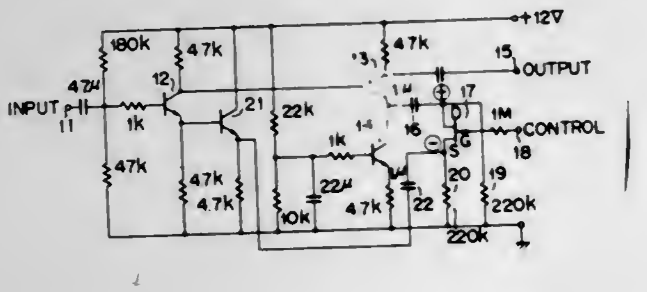
Masanobu Chibana, Hamamatsu, Japan, assignor to Nippon Gakki Siezo Kabushiki Kaisha,. Hamamatsu-chi, Shizuoka-ken, Japan

Filed Sept. 8, 1971, Ser. No. 178,680

Claims priority, application Japan, Sept. 10, 1970, 45/79112; Sept. 10, 1970, 45/79113

Int. Cl. H03g *3/30*

U.S. Cl. 330—28 **6 Claims**



A variable resistor device using a field effect transistor wherein two resistors having an equal value of resistance are connected in series between the source and drain of the field effect transistor and a variable control D.C. voltage source is connected between the gate and the connection point of the two resistors to vary the resistance across the source and drain with an improved linearity. The variable resistor device is preferably adapted to be connected to an amplifier to control its gain with little distortion of A.C. signals.

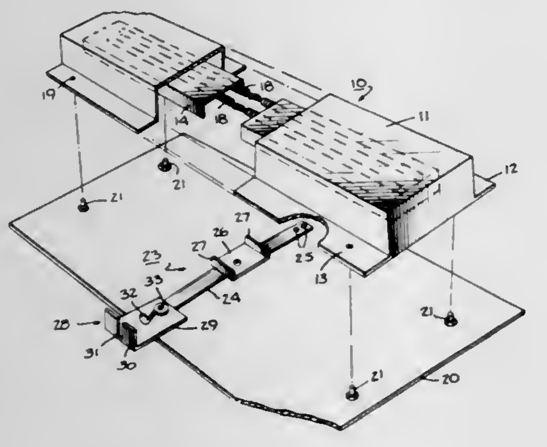
3,715,676
CLAMP FOR A REVERBERATION UNIT

Murray S. Figlin, Linden, and John R. Boenisch, South Plainfield, both of N.J., assignors to The Ampeg Company, Inc., Linden, N.J.

Filed Jan. 28, 1970, Ser. No. 6,368

Int. Cl. H03h *1/00*

U.S. Cl. 333—30 R **14 Claims**



The clamp is mounted within a reverberation unit so as to hold reverberation springs in place during transportation. The clamp is actuated by pushing an actuator into the unit so as to deflect a leaf spring and bring a channel-shaped holder thereon into restraining position about the reverberation springs. Movement of the actuator out of the unit allows the leaf spring to flatten and the holder to be moved away from the reverberation springs.

3,715,677
AMPLIFIERS OF HYBRID INTEGRATED SUBMINIATURISED CIRCUIT DESIGN

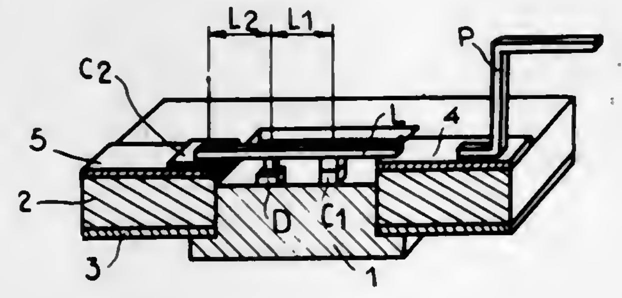
Claude Vergnolle, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Jan. 28, 1971, Ser. No. 110,465

Claims priority, application France, Feb. 3, 1970, 7003737

Int. Cl. H03f *3/04*

U.S. Cl. 330—31 **4 Claims**



A tunnel diode or transistor amplifier in the form of a hybrid integrated circuit, whose gain bandwidth product is as large as possible. The amplifier comprises a circuit having a band-pass filter structure, whose coil elements form the linking structures.

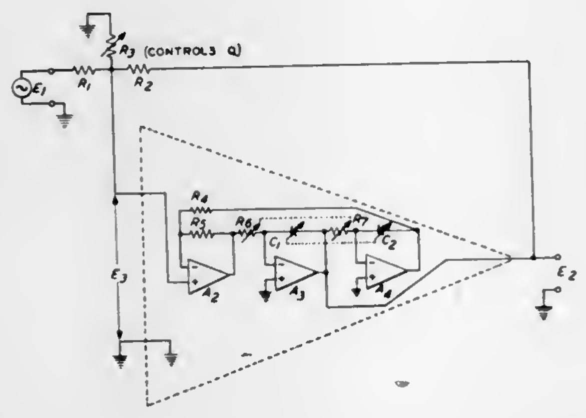
3,715,678
ACTIVE ELECTRICAL FILTER

Harry S. Reichard, Princeton, N.J., assignor to Princeton Applied Research Corporation, Princeton, N.J.

Filed July 27, 1971, Ser. No. 166,381

Int. Cl. H03f *1/36*

U.S. Cl. 330—86 **6 Claims**



An active electrical filter having an input, output and circuit common, and providing Q variation without affecting on-resonance gain, and including amplifier means including an inverting input and having a complex gain function G(S) which equals K $(ST/[(ST)^2+1])$; and combining means including a single variable element for combining the filter input and output and for applying the resultant thereof to the inverting input of said amplifier means, adjustment of said variable element providing said Q variation without affecting on-resonance gain of said filter.

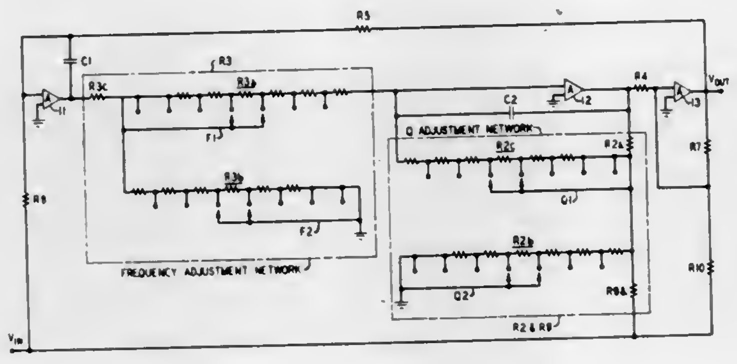
3,715,679
ACTIVE RC DELAY EQUALIZER

Paul Egon Fleischer, Little Silver, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed July 29, 1971, Ser. No. 167,241

Int. Cl. H03f *1/36*

U.S. Cl. 330—107 **13 Claims**



An active resistance-capacitance (RC) delay equalizer circuit which exhibits an "all-pass" transfer characteristic is disclosed. The quality factor, Q, and the center frequency of the equalizer delay characteristic are independently adjustably by sliding switches which alter predetermined circuit resistor values. The equalizer circuit is preferably realized using operational amplifiers bonded to a thin film circuit substrate.

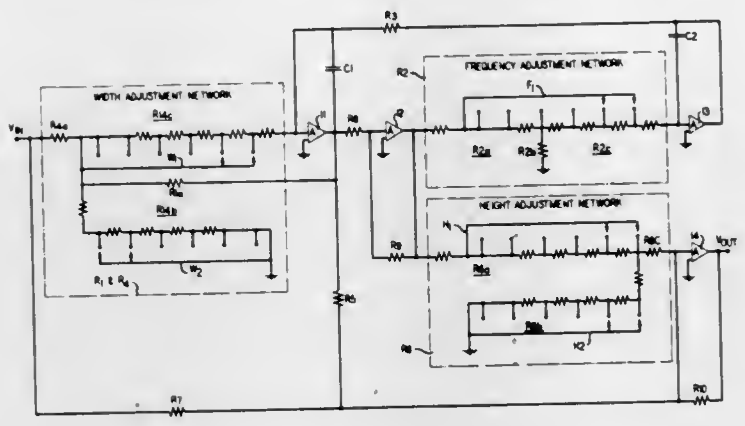
3,715,680
ACTIVE RC LOSS EQUALIZER

Paul Egon Fleischer, Little Silver, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed July 29, 1971, Ser. No. 167,242

Int. Cl. H03f *1/36*

U.S. Cl. 330—107 **13 Claims**



An active resistance-capacitance (RC) loss equalizer circuit which provides a second order "bump" in the frequency domain is disclosed. The bump height, bump width, and bump center frequency are independently adjustable by sliding switches which alter predetermined circuit resistor values. The equalizer circuit is preferably realized using operational amplifiers bonded to a thin film circuit substrate.

3,715,681
FREQUENCY DISCRIMINATOR WITH VARIABLE CENTER FREQUENCY

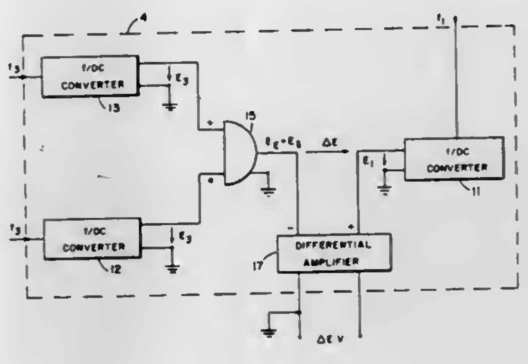
Franz Peter Madert, D-8541 Greding der Bundeswehr, Germany, assignor to The United States of America as represented by the Secretary of the Army

Filed March 13, 1972, Ser. No. 234,092

Int. Cl. H03b *3/04*

U.S. Cl. 331—11 **2 Claims**

The frequencies of a reference oscillator, a voltage controlled oscillator and a signal source are all converted to dc voltages proportional to their individual frequencies. The voltages from the signal and the voltage controlled oscillator are summed in a summing amplifier and fed to one input of a differential amplifier. The other input of the differential amplifier is fed by the dc voltage from the reference oscillator. The dc output of the differential amplifier is used to control the variable controlled oscillator so that its frequency output will be different from the reference oscillator's frequency output by the frequency of the signal.



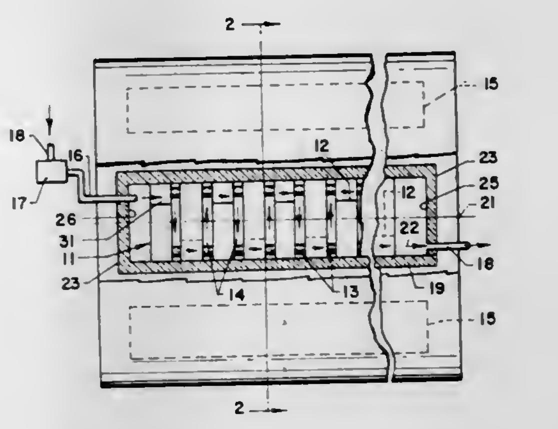
3,715,682
RECTANGULAR DISC LASER

Charles Gilbert Young, Storrs, Conn., assignor to American Optical Corporation, Southbridge, Mass.

Filed March 19, 1970, Ser. No. 20,946

Int. Cl. H01s *3/00*

U.S. Cl. 331—94.5 P **9 Claims**



A rectangular-disc laser structure of all-glass support construction. A segmented neodymium-doped glass laser rod is supported in a glass tubing and is designed to permit fluid coolant flow within the tubing and amongst the rod segments. The non-laserable glass supporting means consists of samarium-doped cladding glass to reduce interference by "off axis" spontaneously emitted light. The fluid coolant has an index of refraction which matches that of the laser glass to achieve a high efficiency. The absence of metallic supporting means minimizes the chance of metallic decomposition under the influence of pump light.

3,715,683
COUPLED ION EYE-SAFE LASER

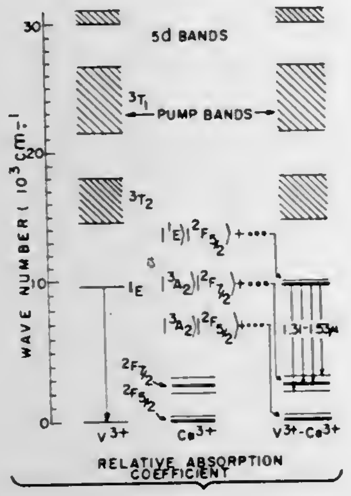
Marvin J. Weber, Wayland, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed Feb. 19, 1971, Ser. No. 116,987

Int. Cl. H01s *1/02, 3/10*

U.S. Cl. 331—94.5 **11 Claims**

A coupled ion laser operating at a frequency determined by the energy levels characteristic of the coupling of a lanthanide or actinide group ion with an iron group ion in an orthoaluminate material, such as yttrium orthoaluminate, is described in which low threshold high efficiency starting operation at



predetermined frequencies in the region of eye safety is provided.

3,715,684
WINDOW FOR A LASER TUBE END PIECE

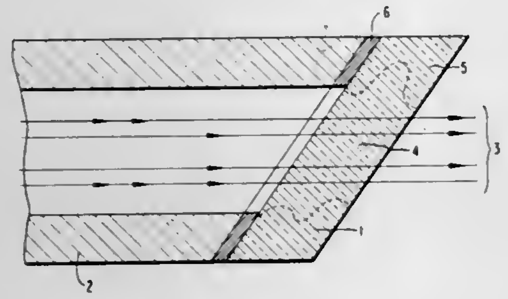
Jean-Pierre Biet, Saulx-les-Chartreux, France, assignor to Compagnie General D'Electricite, Paris, France

Filed April 10, 1972, Ser. No. 242,537

Claims priority, application France, April 9, 1971, 7112779

Int. Cl. H01s *3/08*

U.S. Cl. 331—94.5 **11 Claims**



A window for a laser tube end piece, made of doped semi-conductor material comprising super-doping in the vicinity of the parts of the windows which are to come in contact with the end pieces of the laser tubes.

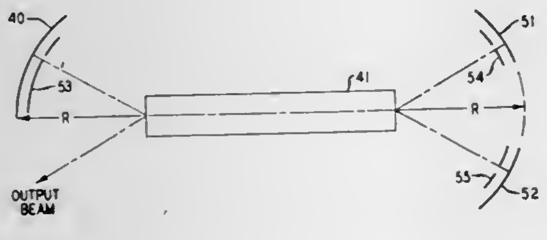
3,715,685
HIGH EFFICIENCY INJECTION LASER CAVITIES

Eugene Irving Gordon, Covent Station, and Dan Maydan, Berkeley Heights, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed April 30, 1971, Ser. No. 139,009

Int. Cl. H01s *3/00*

U.S. Cl. 331—94.5 C **12 Claims**



The specification describes injection lasers employing heterosemiconductor structures for obtaining an enlarged cross-sectional area cavity defined by an optical waveguide terminated by the cleaved faces of the semi-conductor structure (usually known as mirrors). The enlarged area of the cavity allows higher power output from the laser for the same power density on the mirrors. The power density is limited by damage to the mirrors. The waveguide produces an output consisting of two plane wave lobes for each mode. Techniques for mode enhancement are described from which higher ultimate power for a single mode and higher efficiency can e predicted without exciting modes of other order. Separation between the thresholds of competing modes can be enhanced, for example, by placing a spherical reflector in the path of one output lobe to focus the energy back into the original cavity while at the same time aperturing the mirror to block modes of other order. This expedient is based upon the uniqueness of the lobe angle for a given mode. Also described is a technique for combining the dual lobe output characteristic of this laser structure by using a beam splitter in reverse.

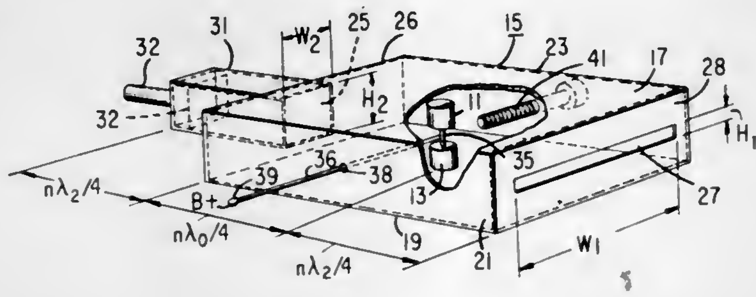
3,715,686
PAIRED NONLINEAR ACTIVE ELEMENTS IN A WAVEGUIDE CAVITY ADAPTED TO SUPPORT ORTHOGONAL TE MODE WAVES AND TE MODE WAVES

Barry Stuart Perlman, Hightstown, N.J., assignor to RCA Corporation, New York, N.Y.

Filed March 31, 1971, Ser. No. 129,807

Int. Cl. H03b *7/14*

U.S. Cl. 331—96 **7 Claims**



A pair of nonlinear semiconductive active devices are located in a cavity dimensioned to support electromagnetic waves at the desired fundamental frequency in the TE$_{10}$ mode. The cavity is further dimensioned to support electromagnetic waves in the TE$_{01}$ mode at the second harmonic of the fundamental frequency. Coupling irises are arranged to couple out of the cavity either the TE$_{10}$ mode waves or the TE$_{01}$ mode waves.

3,715,687
NON-LINEAR VOLTAGE GENERATING APPARATUS

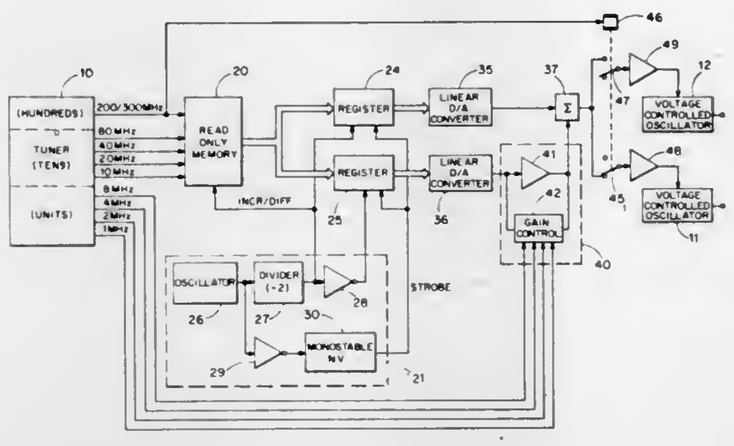
Peter E. Solender, Williamsville, N.Y., assignor to GTE Sylvania Incorporated

Filed April 5, 1972, Ser. No. 241,322

Int. Cl. H03j *5/00*

U.S. Cl. 331—179 **5 Claims**

Non-linear voltage generating apparatus for producing curves of tuning voltages for operating voltage controlled oscillators. Binary signals which indicate the desired output frequency of a voltage controlled oscillator to the 10 MHz value are applied to a read only memory. The read only memory produces an incremental digital output signal of value representing the appropriate voltage for the 10 MHz value and also a companion differential digital output signal of value representing the differential between the voltage for the 10 MHz value and for the next higher 10 MHz value. Both digital output signals are applied to respective linear digital-to-analog converters. The differential analog output signal from the linear digital-to-analog converter and binary signals which indicate the units of MHz of the desired output frequency of the voltage controlled oscillator are applied to interpolating circuitry. The interpolating circuitry produces an interpolated analog output signal of the proper proportion of the differential analog output signal. The incremental analog output signal and the interpolated analog output signal are added in a summing network to produce the proper tuning voltage causing the voltage-controlled oscillator to operate at the desired frequency.



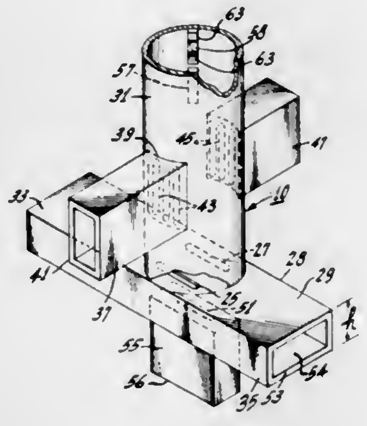
3,715,688
TM$_{01}$ MODE EXCITER AND A MULTIMODE EXCITER USING SAME

Oakley McDonald Woodward, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Sept. 4, 1970, Ser. No. 69,842

Int. Cl. H01p *5/12, 1/16*

U.S. Cl. 333—1 **14 Claims**



Dual elongated apertures are cut along a broad wall of a rectangular waveguide to excite in electromagnetic waves the TM$_{01}$ mode in a circular waveguide symmetrically joined to the dual apertured region. A multimode exciter system is provided wherein the TM$_{01}$ mode wave is excited as described above and a linearly polarized TE$_{11}$ mode wave is excited in the circular waveguide by a second rectangular waveguide section coupled along the side walls of the circular waveguide. A second TE$_{11}$ mode wave oriented orthogonal to the first mentioned TE$_{11}$ mode wave is excited in the circular waveguide by an elongated aperture cut along the center of the broad wall of the first-mentioned rectangular waveguide opposite that of said first-mentioned broad wall with a third rectangular waveguide symmetrically joined to the center apertured region. A dual channel rotary joint system is herein described using two such multimode exciter systems with the circular waveguide sections connected to each other by a rotary joint section.

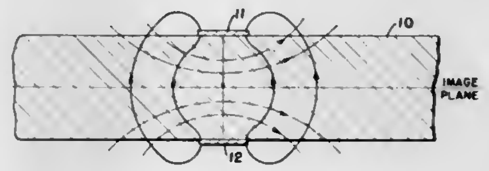
3,715,689
WIDEBAND MICROWAVE POWER DIVIDER

Gordon J. Laughlin, Columbia, Md., assignor to The United States of America as represented by the Secretary of the Army

Filed Feb. 10, 1972, Ser. No. 225,041

Int. Cl. H01p *1/16, 3/08, 5/12*

U.S. Cl. 333—9 **8 Claims**



A microwave structure comprising a parallel transmission line that is bisected by a conducting septum to form two independent microstrip circuits that are in anti-phase; i.e., the conducting septum becomes a common ground plane for a pair of equal amplitude microstrip circuits that are in anti-phase relative to the common ground at points equidistant from the point of bisection of the parallel transmission line. In one embodiment, the proprosed microwave structure is utilized as a power divider with input power being supplied to a conventional microstrip circuit formed of a pair of spaced parallel conductor strip members which also form the parallel transmission line and the anti-phase microstrip circuits, and whose widths are varied to form a reflectionless transition from the input microstrip circuit to the parallel transmission line and subsequently to the pair of output microstrip circuits, each of which receives half of the input power supplied to the device.

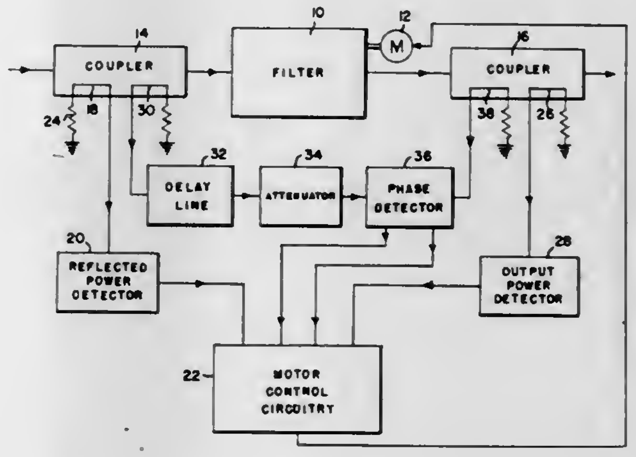
3,715,690
AUTOMATIC TUNING ELECTRIC WAVE FILTER

Robert W. Young, Erial, and Frederick J. Radler, Mt. Royal, both of N.J., assignors to TRW Inc., Euclid, Ohio

Filed May 18, 1971, Ser. No. 144,100

Int. Cl. H03h *7/10;* **H03g** *5/24*

U.S. Cl. 333—17 **14 Claims**



A band pass filter for use in RF transmitting or receiving apparatus comprises a plurality of resonant stages coupled through variable apertures whose areas are dependent on the tuning adjustment of the resonant stages whereby a substantially constant bandwidth and insertion loss are achieved over the tuning range. Tuning is effected by a servomechanism responsive to the conditions of phase and signal level at the input and output ports of the filter. The phase and signal level are sensed through directional couplers at the input and output ports of the filter. The couplers at the filter input and output act as matching sections, thereby minimizing losses.

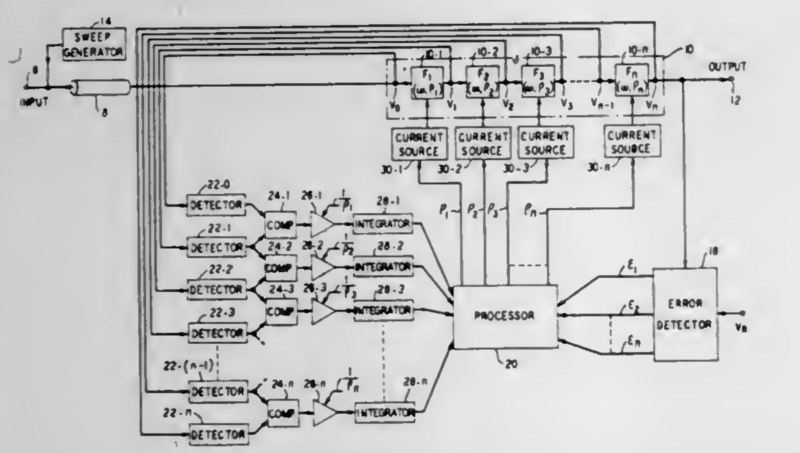
3,715,691
ADJUSTABLE EQUALIZER HAVING MEANS RESPONSIVE TO THE INPUT AND OUTPUT SIGNALS OF EACH EQUALIZER SECTION

Carl Ferdinand Kurth, Andover, Mass., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Feb. 22, 1972, Ser. No. 227,742

Int. Cl. H04b *3/04*

U.S. Cl. 333—18 **11 Claims**



In an adjustable equalizer comprising a plurality of independently adjustable, serially connected equalizer sections, precise signal information about the effect of each section in each of a plurality of frequency ranges is generated by apparatus which compares input and output signal levels of each equalizer section in each frequency range. This information is used in the processing of simultaneously generated signal information indicative of the overall misalignment of the equalizer to produce output signals suitable for controlling adjustment of the equalizer sections to reduce overall misalignment of the system.

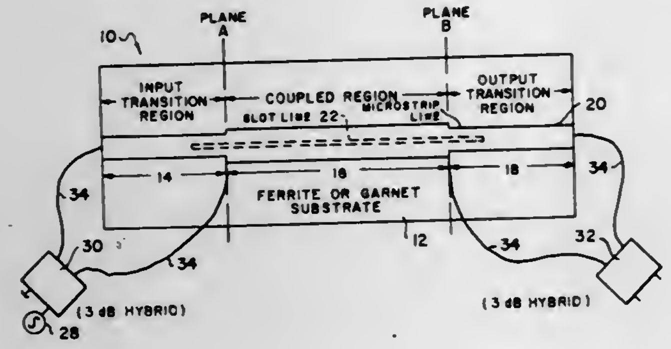
3,715,692
MICROSTRIP-SLOT LINE PHASE SHIFTER

Max L. Reuss, Jr., New Carrollton, Md., assignor to The United States of America as represented by the Secretary of the Army

Filed Jan. 10, 1972, Ser. No. 216,510

Int. Cl. H01p *1/32*

U.S. Cl. 333—24.1 **8 Claims**



A microwave-integrated-circuit phase shifter comprising a dielectric substrate such as ferrite, one side being metallized to form a slot line and the other being metallized to form a parallelling microstrip transmission line, the two lines being coupled together through the dielectric substrate. A region of circular polarization of the input signal is set up between the lines and a magnetic field which is adjustable in amplitude is applied in the direction of the two lines. Variation of the amplitude of the magnetic field varies the amount of phase shift between the input and output of the device.

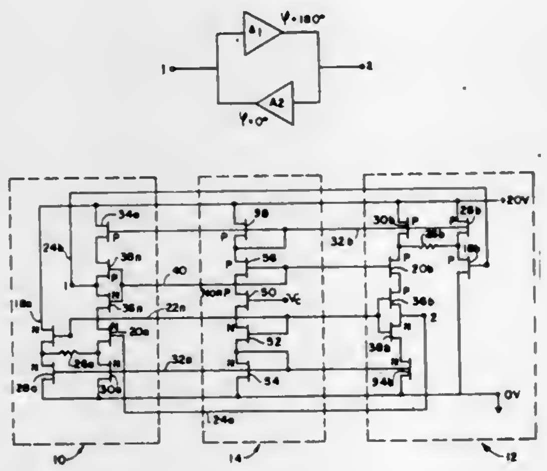
3,715,693
GYRATOR EMPLOYING FIELD EFFECT TRANSISTORS

James C. Fletcher, Administrator of the National Aeronautics and Space Administration with respect to an invention by, and Erwin S. Hochmair, Huntsville, Ala.

Filed March 20, 1972, Ser. No. 236,281

Int. Cl. H03h *7/44, 11/00*

U.S. Cl. 333—80 T **31 Claims**



A gyrator circuit of the conventional configuration of two amplifiers in a circular loop, one producing zero phase shift and the other producing 180° phase reversal. All active elements are MOS field effect transistors. Each amplifier comprises a differential amplifier configuration with current limiting transistor, followed by an output transistor in cascode configuration, and two load transistors of opposite conductivity type from the other transistors. A voltage divider control circuit comprises a series string of transistors with a central, voltage input to provide control, with locations on the amplifiers receiving reference voltages by connection to appropriate points on the divider. The circuit produces excellent response and is well suited for fabrication by integrated circuits.

ERRATUM

For Class 333—30 R see:
Patent No. 3,715,676

3,715,694
SOLENOID SWITCH, PARTICULARLY CRYOGENIC SWITCH

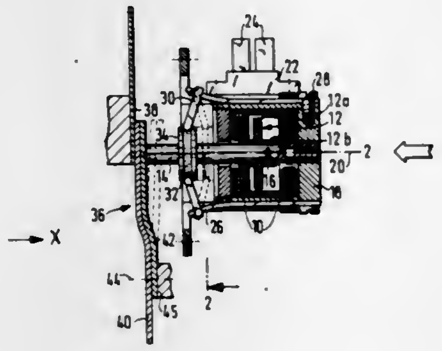
Peter Kruger, Munich, Germany, assignor to Max-Planck-Gesellschaft Zur Forderung der Wissenschaften e.v., Gottingen, Germany

Filed Feb. 28, 1972, Ser. No. 229,820

Claims priority, application Germany, Feb. 26, 1971, P 21 09 327.6

Int. Cl. H01h *51/12*

U.S. Cl. 335—177 **9 Claims**



In a two-position solenoid switch an armature made of a non-ferromagnetic material of good electric conductivity is movable back and forth between two separately energizable spaced coreless coils. The motion of the armature is started by virtue of the interaction between the magnetic field of the energized coil and the magnetic field generated by the eddy-currents induced in said armature by the energized solenoid.

3,715,695
ELECTROMAGNETIC SWITCH HAVING A FLEXIBLE PERMANENT MAGNET ARMATURE

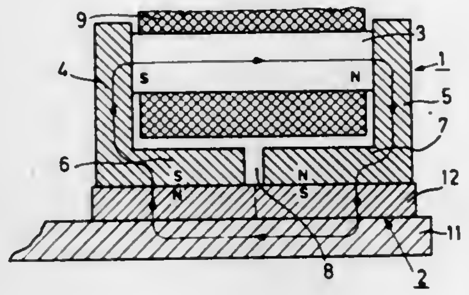
Wytze Hofman, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 25, 1971, Ser. No. 174,731

Claims priority, application Netherlands, Aug. 30, 1970, 7012890

Int. Cl. H01f *7/08*

U.S. Cl. 335—229 **7 Claims**



An electromagnetic switch provided with at least one magnetic circuit comprising a permanent magnet, the polarity of which is reversible by means of a magnetizing coil. The permanent magnet is provided with pole pieces which magnetically cooperate with a flat flexible magnet of a movable armature. The flexible magnet may be provided with soft-iron insertion pieces in the regions of the poles. Preferably, the coercive force H_c of the main magnet is smaller than 1,500 oersted and that of the armature magnet is greater than 2,000 oersted.

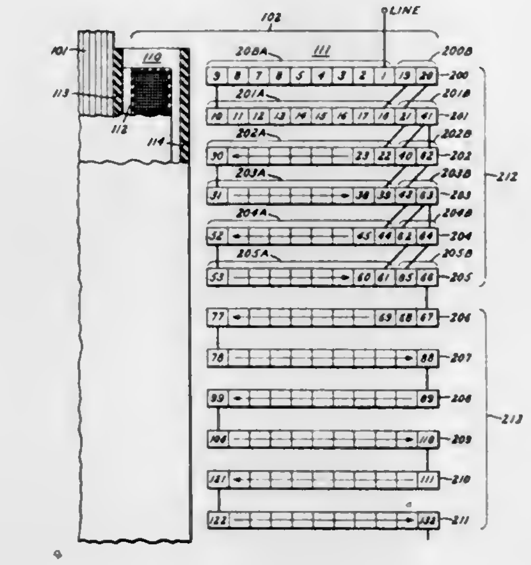
3,715,696
DISC WINDING WITH INTEGRAL LOAD CURRENT CARRYING RIB SHIELDING

Robert E. Gearhart, Rome, Ga., assignor to General Electric Company

Filed May 22, 1972, Ser. No. 255,383

Int. Cl. H01f *15/14*

U.S. Cl. 336—70 **6 Claims**



In electrical transformers of the type which utilize a plurality of axially spaced disc coils connected to form a winding, a turn arrangement for more uniformly distributing surge potentials across and within the winding wherein certain current carrying turns are utilized to provide additional transient current paths through the winding upon the occurrence of a voltage surge.

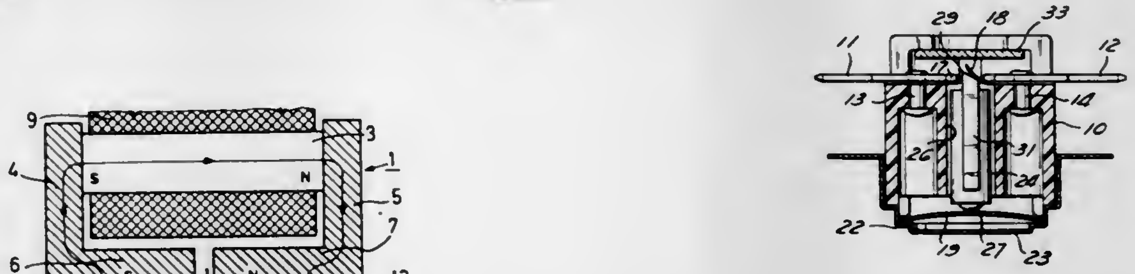
3,715,697
THERMAL FUSE

Edward G. Them, Mansfield, Ohio, assignor to Therm-O-Disc, Incorporated, Mansfield, Ohio

Filed May 24, 1971, Ser. No. 146,143

Int. Cl. H01h *37/00*

U.S. Cl. 337—157 **13 Claims**



A thermal fuse is disclosed in which a bimetallic snap disc operates an elongated cutter causing the cutter to engage and rupture a thin metal conductor. Terminal elements provided with sawtooth-like teeth engage the side of the conductor opposite the cutter to provide points of high localized stress which facilitate the cutting or rupturing operation.

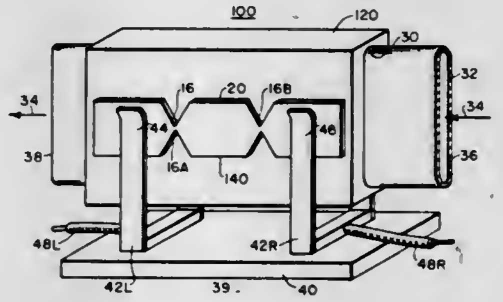
3,715,698
CURRENT LIMITING FUSE

Donald D. Blewitt, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Feb. 16, 1971, Ser. No. 115,197

Int. Cl. H01h *85/02*

U.S. Cl. 337—166 **2 Claims**



A current limiting fuse element comprising a fuse link or portions of reduced cross section of such a relatively small area or size that they would normally be unable to support themselves alone. The fuse element is intimately bonded or attached to a relatively larger rigid dielectric mass by methods, such as printing, vacuum deposition or etching, so that the larger dielectric mass provides the structural support for the relatively thin current limiting regions or portions and also assists in removing heat from the fuse element during both normal operation and also during fusing of the fuse element. The fuse element and its dielectric support may be used independently or may be used as the fuse element in a cartridge-type fuse where the entire fuse element is disposed in a casing and embedded in a pulverulent, arc quenching material, such as sand, which may be provided to assist in arc extinction upon fusing of the fuse element and to absorb the heat during fusing. In addition, the relatively rigid, dielectric mass may be adapted to accommodate or receive a heat transferring means through which fluid may flow. Heat generated during normal operation of the fuse or during a fusion operation may be removed by the moving fluid.

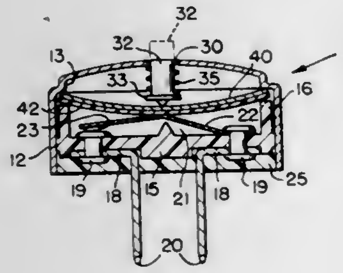
3,715,699
THERMOSTAT WITH RESET PIN

Charles John Hire, Pittsford, N.Y., assignor to Fasco Industries, Inc., Rochester, N.Y.

Filed July 15, 1971, Ser. No. 162,975

Int. Cl. H01h *37/70*

U.S. Cl. 337—348 **2 Claims**



A reset pin is mounted to reciprocate in one end of a thermostat, and a pair of terminals project from the opposite end. A switch in the thermostat is normally held closed by a bimetallic, temperature-responsive disc, which is positioned between the reset pin and switch arm to operate both. A compression spring normally holds the reset pin in a retracted position in the thermostat, when the switch is closed. When the ambient temperature of the thermostat exceeds a predetermined value, the disc snaps against the reset pin to drive it outwardly to an extended position, and to allow the switch to open. The disc can be reset by pushing the pin inwardly when the ambient temperature falls to normal.

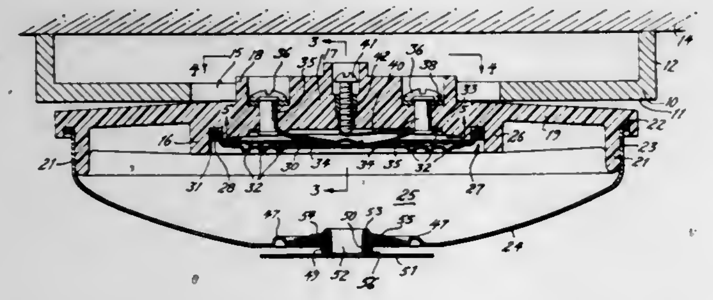
3,715,700
AUTOMATIC HEAT DETECTOR

Fred A. Gloeckler, Huntington Valley, Pa., assignor to Star Sprinkler Corporation of Florida, Philadelphia, Pa.

Filed June 17, 1971, Ser. No. 153,956

Int. Cl. H01h *37/76*

U.S. Cl. 337—407 **7 Claims**



An automatic heat detector is provided which has one or more electric circuits with spring metal contacts and a diaphragm is a closed controlled vented chamber, the contacts being controlled by the expansion of the diaphragm in accordance with rapid temperature rise or by the release of a spring at a predetermined temperature, which spring engages the diaphragm and causes the contacts to move and control the circuits.

3,715,701
NON-LINEAR RESISTANCE ELEMENT

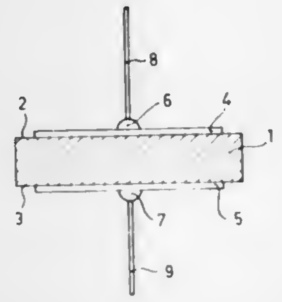
Jean Michel Baudry Ghislain Yperman, Woluwe, and Jean Rodolphe Rapaille, Brussels, both of Belgium, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 19, 1971, Ser. No. 116,922

Claims priority, application Netherlands, March 5, 1970, 7003118

Int. Cl. H01c *7/10*

U.S. Cl. 338—20 **2 Claims**



A varistor whose ceramic body contains bismuth oxide and antimony oxide containing semiconducting titanium oxide having a relatively low C-value and a low β value.

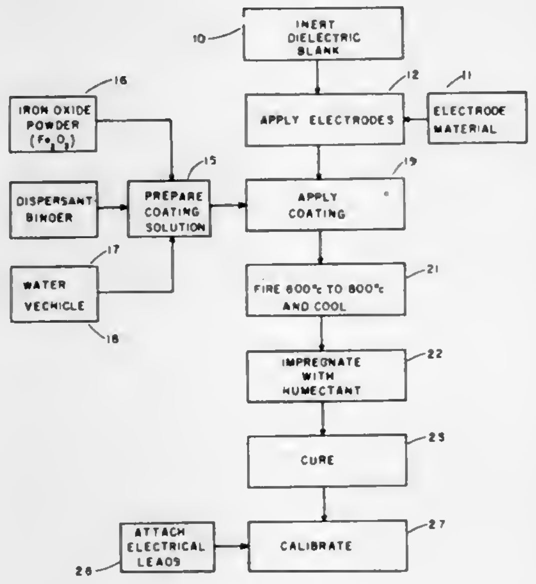
3,715,702
RELATIVE HUMIDITY SENSOR

Merle Nicholas, Minneapolis, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed June 23, 1971, Ser. No. 155,987

Int. Cl. H01c *13/00*

U.S. Cl. 338—35 **9 Claims**



An essentially full range resistance type relative humidity sensing element is produced by providing a dielectric blank, on which an electrode system has been applied, with a metal oxide coating, in a manner which produces a porous structure therein, and subsequently impregnating that coating with a humectant material. The metal oxide used is selected from a group, including oxides of the metals found in Group VIII, Period 4 of the Periodic Table, which exhibit electrical insulating properties, and wherein the amount of electrical resistance varies with the relative humidity of the environment to which it is exposed. The humectant material, which may be any nonvolatile, reversibly hygroscopic material capable of being retained in the porous oxide structure, such as polyethylene glycol, for example, reduces both the amount of electrical resistance and the magnitude of the change in that resistance produced in response to changes in relative humidity into a range readily measured by ordinary electrical resistance measuring devices.

3,715,703
SUPERCONDUCTING SWITCH

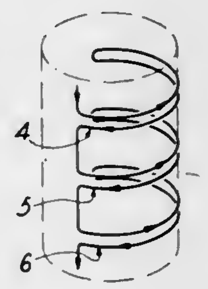
Hubert Croso, Ris-Orangis; Gerard Prost, Bagneux; Andre Quefellec, Villeneuve-Saint-Georges, and Jean Sole, Clamart, all of France, assignors to Commissariat A L'Energie Atomique, Paris, France

Filed June 8, 1971, Ser. No. 151,172

Claims priority, application France, June 18, 1970, 7022448

Int. Cl. H01c *7/16*

U.S. Cl. 338—32 S **5 Claims**



The superconducting switch comprises at least one superconducting hairpin element having two arms through which currents pass in opposite directions and the distance *d* between the two arms of a hairpin element is appreciably smaller than the distance D between two adjacent elements.

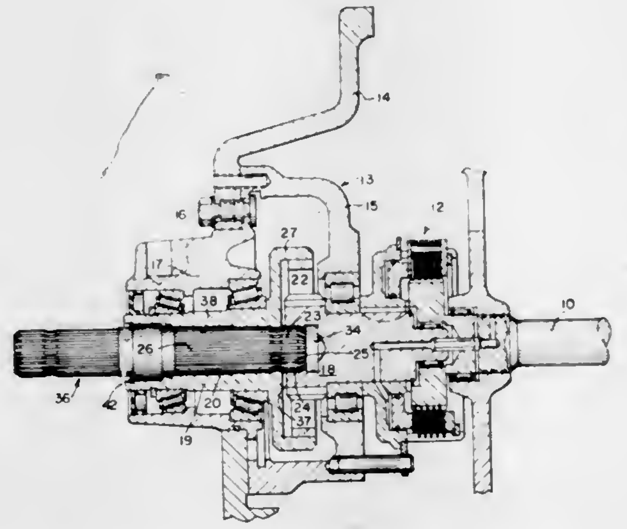
3,715,704
REVERSIBLE POWER TAKE-OFF SHAFT

Ralph C. Boyle, Mountain Home, Ark., and Leonard Paulius, Clarendon Hill, Ill., assignors to International Harvester Company, Chicago, Ill.

Filed Nov. 3, 1971, Ser. No. 195,292

Int. Cl. F16h *37/04*

U.S. Cl. 74—15.4 **8 Claims**



A power take-off shaft having two standard spline ends and a third off centrally located spline set. In conjunction with a multi-speed independent power take-off unit, the single shaft is reversible to provide two different output speeds.

3,715,705
MULTICOMPARTMENT CONNECTOR

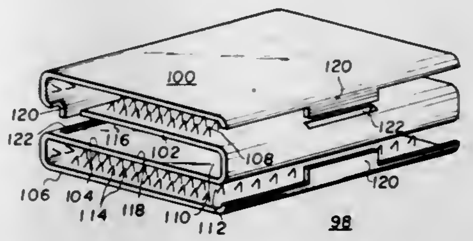
Lai Che Kuo, Elizabeth, N.J., assignor to Thomas & Betts Corporation, Elizabeth, N.J.

Filed March 29, 1971, Ser. No. 129,003

Int. Cl. H01r *11/20*

U.S. Cl. 339—98 **10 Claims**

A uniquely formed, deformable, multicompartment connector having two or more adjacently disposed, independently deformable article receiving portions selectively arranged for intimate engagement about one or more articles disposed therewithin, to provide a secure coupling therebetween. The connector may be suitably formed from electrically conducting material, with locking means and internally disposed teeth,



to provide a highly effective electrical connector for use in conjunction with variously configured insulated or noninsulated electrical conductors.

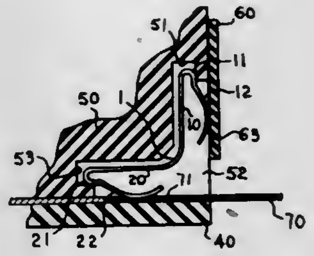
3,715,706
RIGHT ANGLE ELECTRICAL CONNECTOR

Donald E. Michel; Le Roy W. Fairbairn, and James W. Cook, all of Sidney, N.Y., assignors to The Bendix Corporation

Filed Sept. 28, 1971, Ser. No. 184,380

Int. Cl. H01r *13/50;* **H05k** *1/07*

U.S. Cl. 339—156 R **14 Claims**



A right angle electrical connector for connecting in electrical circuit relationship a printed circuit board to a tape cable. The connector contains a plurality of electrical contacts that are retained within the connector by the resilient action of the contact acting against an inside wall of the connector.

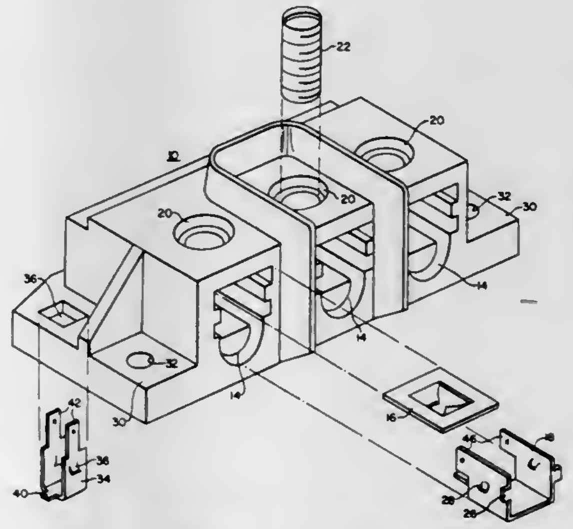
3,715,707
TERMINAL BLOCK WITH SNAP-IN COMPONENTS

Melvin R. Anderson, Avon Lake, Ohio, assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed March 16, 1971, Ser. No. 124,854

Int. Cl. H01r *9/00*

U.S. Cl. 339—198 R **9 Claims**



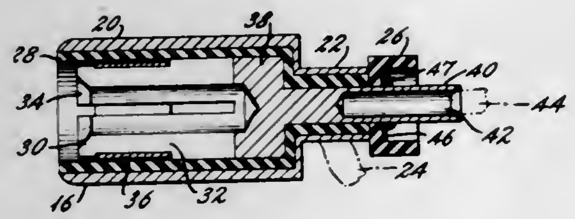
A terminal block assembly for connecting electrical conductors constructed in the form of an insulating plastic block having communicating apertures therethrough and therein. Metal connector members are snap-fitted into the apertures and are releasably retained therein. The metal connector members provide for the positive connection of electrical conductors without the use of soldered, brazed, riveted or mere contact junctures which could cause high resistance locations.

3,715,708
ELECTRICAL CONNECTOR

Richard E. Lloyd, Beltsville, and Linus E. Wallgren, Rockville, both of Md., assignors to Pace, Incorporated, Silver Springs, Md.

Filed Oct. 21, 1970, Ser. No. 82,722
Int. Cl. H01r *17/06*

U.S. Cl. 339—177 E **9 Claims**



An electrical connector adapted for use on a universal cord for electrically powered hand tools, formed as a female assembly and a male assembly both of a coaxial type of construction. The female assembly comprises a central contact, an outer contact and an insulator member therebetween, the members being nested together so that relative movement in one axial direction is prevented. A centrally apertured second insulator bears against the base ends of the outer contact and other insulator. The rearward end of the central contact extends through the aperture. The second insulator which is retained in position by a lock washer serves to prevent relative movement of the components in the other axial direction. The male assembly also has a central contact, an outer contact and an insulator therebetween. The outer contact and insulator have internal shoulders which nest, and the central contact has a flange thereon which seats against the insulator thereby preventing relative movement in one axial direction. The same lock washer retained second insulator arrangement prevents relative movement in the other direction.

ERRATUM

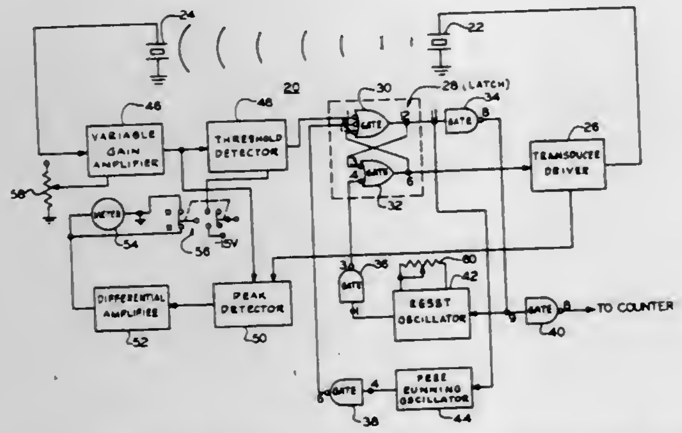
For Class 340—6 R see:
Patent No. 3,715,577

3,715,709
SING-AROUND VELOCIMETER

Ellis M. Zacharias, Jr., and Uldis Cirulis, both of Paramus, N.J., assignors to Nusonics, Inc., Paramus, N.J.

Continuation-in-part of Ser. No. 853,465, Aug. 27, 1969, abandoned. This application Jan. 14, 1970, Ser. No. 2,719
Int. Cl. H04b *11/00*

U.S. Cl. 340—3 E **17 Claims**



A sing-around velocimeter having a fixed sound path length so that the repetition rate is a function of the velocity of sound in the fluid and consequently of the characteristics of the fluid. A digital latch is employed to control the application of a signal to the transmitting transducer as determined by the signal received by the receiving transducer or by a free running oscillator if no signal is received.

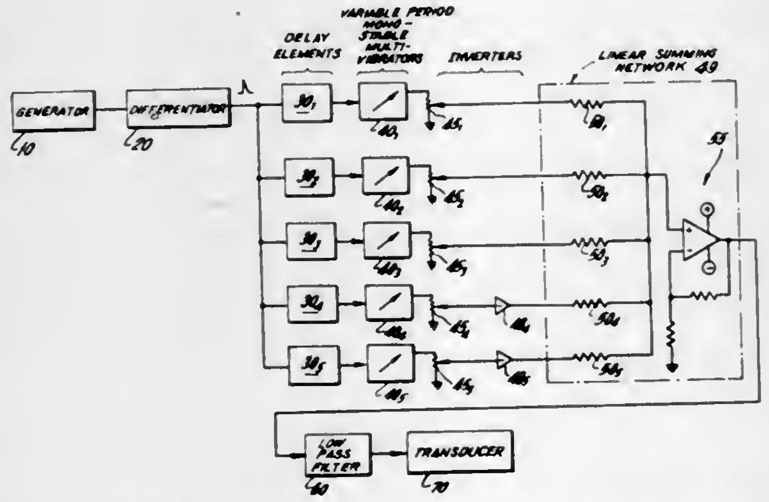
The probe used in the velocimeter has a fixed path length and is shaped so that spurious signals are not received by the receiving transducer. A pair of reflectors and the transducers are mounted in a ring of fixed radius to maintain the path length constant. In one construction, the probe is capable of being inserted in a breaker or similar vessel to measure the characteristics of the contents. A similar construction is used for insertion in a pipe containing flowing fluid to measure the fluid's characteristics.

3,715,710
UNIPOLAR ACOUSTIC PULSE GENERATOR

Julius Bernstein, 166-25 Powells Cove Boulevard, Beechhurt; Sid I. Schildkraut, 22-25 147th Street, Flushing, and John P. Muller, 521 Secatogue Avenue, Farmingdale, all of N.Y.

Filed Nov. 25, 1970, Ser. No. 92,798
Int. Cl. H04b *11/00*

U.S. Cl. 340—5 R **22 Claims**



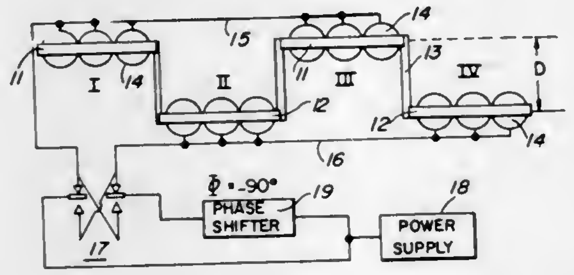
Unipolar acoustic pulses of relatively large amplitude and short duration are formed by driving an electroacoustical transducer with a generally staircase-shaped waveform, advantageously through a low pass filter. The applied waveform is formed by linearly summing constituent electrical pulses of preselected amplitude, duration, polarity, and relative time of occurrence. The transducer driving signal acts to reinforce the transducer output in the desired direction, while opposing its output in the reverse direction.

3,715,711
HIGH POWER, LOW FREQUENCY UNDERWATER TRANSDUCER ARRAY

Frank Massa, Cohasset, Mass., assignor to Massa Division, Dynamics Corporation of America, Hingham, Mass.

Filed Sept. 14, 1970, Ser. No. 71,826
Int. Cl. H04r *1/40*

U.S. Cl. 340—9 **14 Claims**



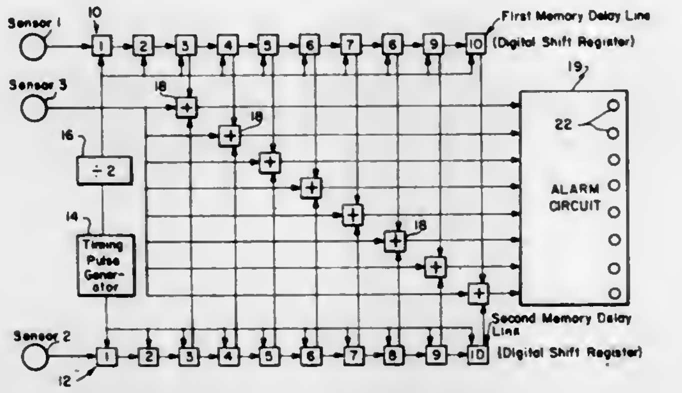
A plurality of underwater transducers are physically mounted in two spaced parallel planes, a quarter wavelength apart. The signals driving the transducers in each of the two planes are electrically displaced from each other by a quarter wavelength. In this way, the sound from the transducers adds on one side of the two planes and cancels on the other side, to provide a unidirectional beam of sonic energy.

3,715,712
INTRUSION DETECTION SYSTEM EMPLOYING TRIPLE COINCIDENCE SPACE-TIME LOGIC

Robert Beagles, Pacific Palisades, Calif., assignor to TRW Inc., Redondo Beach, Calif.

Filed June 21, 1971, Ser. No. 154,817
Int. Cl. G08b *25/00*

U.S. Cl. 340—276 **4 Claims**


Sensor 1
10
First Memory Delay Line (Digital Shift Register)
Sensor 3
18
19
22
16
÷2
ALARM CIRCUIT
14
Timing Pulse Generator
Second Memory Delay Line (Digital Shift Register)
Sensor 2
12

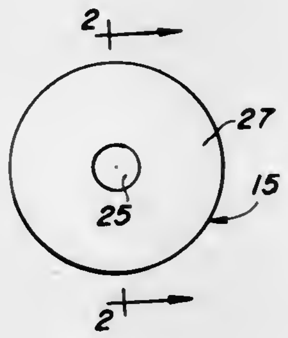
First, second, and third sensors are arranged along a path so that the second sensor is equidistant from the first and third sensors. An intruder passing the first sensor causes a signal to be inserted into a shift register and thence to a coincidence gate. When the intruder passes the second sensor, another signal is inserted into a second shift register and thence into the coincidence gate. The stepping rate of the second shift register is twice that of the first shift register. When the intruder passes the third sensor, a third signal is inserted directly into the coincidence gate, and at that time, the second signal will have caught up with the first signal so that all three signals will be coincident. When all three signals are coincident, an alarm is actuated to indicate the presence of the intruder.

3,715,713
PRESSURE GRADIENT TRANSDUCER

Frank Massa, Cohasset, Mass., assignor to Massa Division, Dynamics Corporation of America, Hingham, Mass.

Filed Feb. 19, 1970, Ser. No. 12,565
Int. Cl. H04r *17/00;* **H01v** *7/00*

U.S. Cl. 340—10 **11 Claims**



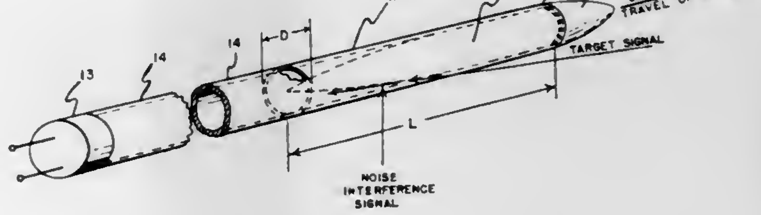
A simple tubular housing structure has a vibratile diaphragm sealing each open end. Each of these diaphragms is mechanically connected to a separate vibratile piston. These pistons are rigidly bonded to the opposite sides of a piezoelectric transducer element assembly. These assemblies generate at least two independent voltages when sound pressure impinges upon the diaphragms. The voltages generated by each of these two piezoelectric plates are combined to effectively neutralize each other when sound pressures of the same amplitude and phase are simultaneously applied to each of the two pistons.

3,715,714
POROUS PIPE ACOUSTIC SENSOR

Tibor G. Horwath, Alexandria, Va., assignor to The United States of America as represented by the Secretary of the Army

Filed Oct. 23, 1970, Ser. No. 83,560
Int. Cl. H04b *11/00*

U.S. Cl. 340—15 **5 Claims**



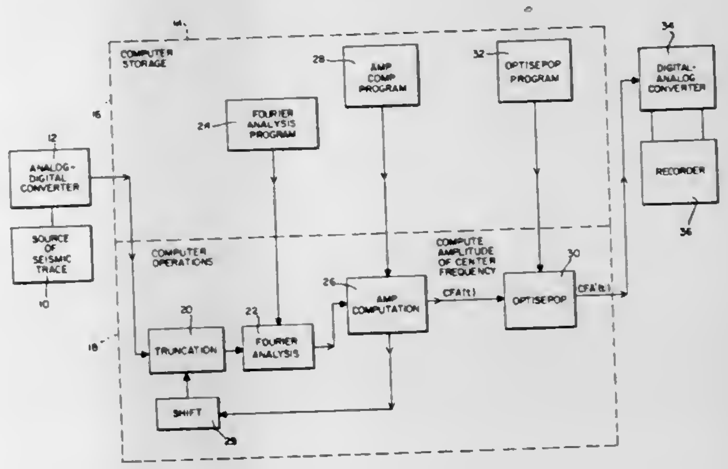
This invention is a dynamic pressure sensor of the porous pipe variety for use in sensing the presence of an acoustic energy source in a moving fluid environment. The sensor is especially adaptable to moving vehicle applications wherein the sensor is located on the moving vehicle and boundary layer interference due to movement of the vehicle and the sensor in air are prime considerations.

3,715,715
APPARATUS FOR AND METHOD OF TREATING SEISMIC DATA TO OBTAIN A WIDE BAND REPRESENTATION

William H. Ruehle, Duncanville, Tex., assignor to Mobil Oil Corporation

Filed Oct. 30, 1970, Ser. No. 85,630
Int. Cl. G01v *1/36*

U.S. Cl. 340—15.5 DP **7 Claims**



A computer apparatus for and computer performed method of obtaining a wide band representation of seismic reflection amplitudes. The seismic trace is successively truncated, each of the successive truncations is successively Fourier analyzed, and each center frequency component amplitude of the successive Fourier analyses is computed. The effects of successive truncation on the resulting center frequency function are then removed through the use of an optimum separation operator.

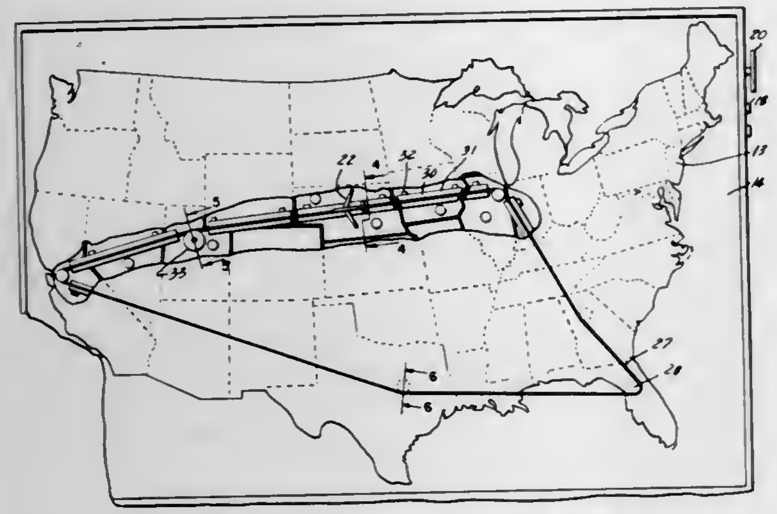
3,715,716
PROGRESSIVE DISPLAY SCREEN

Jean R. Stiegemeier, 559 Andes Ave., Orlando, Fla.

Filed May 13, 1970, Ser. No. 36,784
Int. Cl. G08g *1/12*

U.S. Cl. 340—23 **10 Claims**

A progressive display screen apparatus for indicating the position of a vehicle in which a flexible guide located behind the screen guides an indicator which indicates where the vehicle is located with respect to a referenced map which may be on the screen or a separate topographical map located behind the screen. A variable speed motor, or the like, drives the indicator at a speed analagous to the speed of the vehicle and lights may be provided to illuminate various locations or sections of the map.



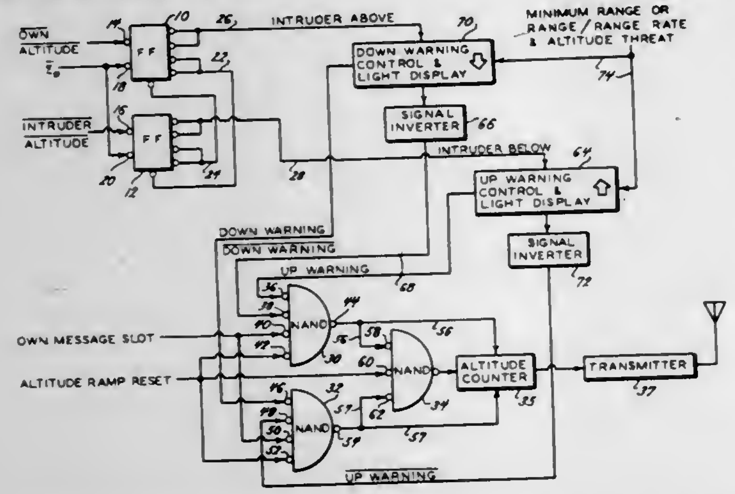
3,715,717
MEANS FOR HANDLING ALTITUDE INFORMATION IN COLLISION AVOIDANCE SYSTEMS

Robert E. Perkinson, St. Louis County, Mo., assignor to McDonnell Douglas Corporation, St. Louis, Mo.

Filed Feb. 12, 1970, Ser. No. 10,907

Int. Cl. G08g *5/04*

U.S. Cl. 340—27 R **11 Claims**



An apparatus for improving the handling of altitude information in collision avoidance systems and the like including means to minimize the possibility that a command maneuver to climb or dive to avoid being on a collision course will cause the involved aircraft to fly through each others altitude, said apparatus also including means to improve the reporting of altitude information in collision avoidance systems so that actual as well as shifted altitude information will be transmitted when a maneuver is commanded to forewarn other aircraft of possible dangerous situations developing as a result of the maneuver.

3,715,718
GROUND PROXIMITY WARNING SYSTEM UTILIZING RADIO AND BAROMETRIC ALTIMETER COMBINATION

Ralph A. Astengo, Redmond, Wash., assignor to Sundstrand Data Control, Inc.

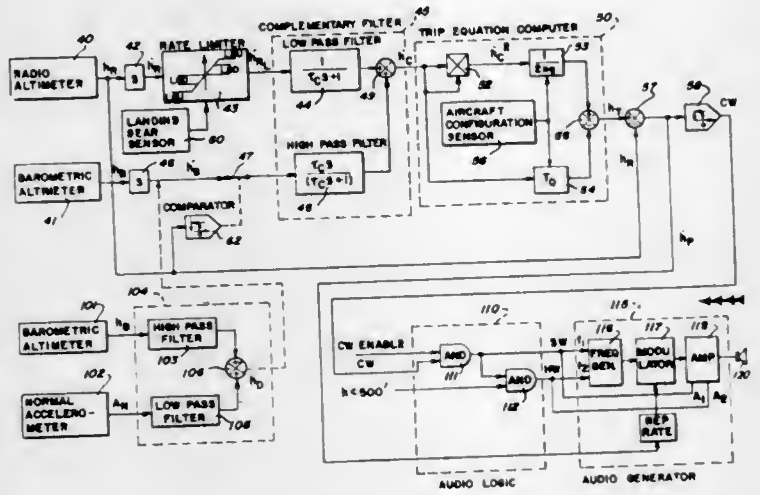
Filed Aug. 11, 1970, Ser. No. 62,861

Int. Cl. G01c *5/00*

U.S. Cl. 340—27 R **17 Claims**

A ground proximity warning system for an aircraft which produces a warning signal when the rate of descent of the aircraft exceeds a limiting value determined by the aircraft altitude. The rate of descent of the aircraft is calculated from a combination of measurements of the altitude of the aircraft above ground and the barometric altitude of the aircraft. A signal representing the rate of change of the altitude of the aircraft above ground is limited, to minimize false warnings as a result of surface irregularities. The barometric portion of the system is disabled during take-off run and the initial portion of the aircraft climb-out to avoid a false warning resulting from an increased barometric pressure condition during this maneuver. The limits on the aircraft altitude rate signal are modified in accordance with the flight mode of the aircraft, to reduce the sensitivity of the warning system during the final stage of a landing approach.

The warning system provides an alarm to the pilot which is an audio tone modulated at a low frequency repetition rate. A soft warning is actuated when the sink rate of the aircraft exceeds a desired level for the altitude at which the aircraft is operating. If the aircraft is also below a limiting altitude, a hard warn signal is provided. The repetition rate of the warning signal, while in a soft warn condition, is a function of the difference between the altitude of the aircraft and the altitude at which the sink rate would be proper.



A complementary filter with which the altitude rate signals are combined, includes an operational amplifier connected in an unloading amplifier configuration with a resistive circuit connecting one input signal with the amplifier and a capacitive circuit connecting the other input signal with the amplifier, the resistive and capacitive input circuits forming a low pass filter for the first signal and a high pass filter for the second signal.

3,715,719
TIRE PRESSURE INDICATION SYSTEM

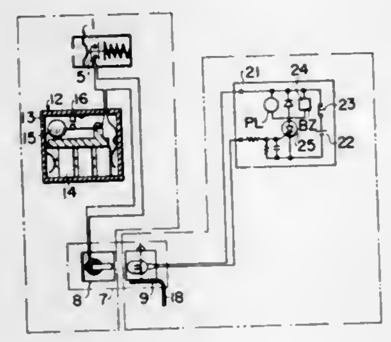
Uichiro Sugiyama, 21-10, Zenpukuji 1-chome, Suginami-ku, Tokyo, Japan

Filed Feb. 10, 1971, Ser. No. 114,180

Claims priority, application Japan, March 3, 1970, 45/20261; March 3, 1970, 45/20262; April 6, 1970, 45/20263; Nov. 4, 1970, 45/108908

Int. Cl. B60c *23/04*

U.S. Cl. 340—58 **2 Claims**



An air pressure responsive electric switch is mounted on a rotatable tire and wheel assembly of a vehicle and is subjected to the tire internal pressure. A magnetically actuated switch is mounted on a non-rotatable component of the vehicle, such as a brake mounting plate. A magnet is mounted on the tire and wheel assembly for rotation in a plane adjacent the magnetically actuated switch and is caused to operate the latter switch when the pressure responsive switch is operated responsive to a predetermined decrease in the tire pressure. The magnet may be an electromagnet whose energization is controlled by the pressure responsive switch, or it may be a permanent magnet normally retracted from operative relation with the magnetically actuated switch and moved to an operative position by the pressure responsive switch upon a predetermined decrease in the tire pressure. The magnetically actuated switch controls the activation of an indicating unit including an audible and visual alarm positioned in the driver's compartment of the vehicle, and the control circuit for the indicating unit includes a thyristor, such as an SCR, whose gating is controlled by the magnetically actuated switch. The units mounted on the tire and wheel assembly and on the brake drum may be encased in an epoxy resin for protection against ambient conditions.

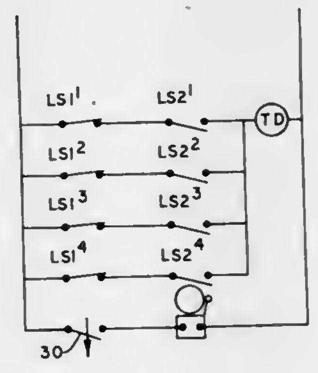
3,715,720
APPARATUS FOR DETERMINING AN UNDERINFLATED CONDITION IN PNEUMATIC TIRES

Frederick S. Jehle, 517 East 25th, Hutchinson, Kans.

Filed Feb. 25, 1971, Ser. No. 118,825

Int. Cl. B60c *23/00;* **G08b** *13/10*

U.S. Cl. 340—58 **5 Claims**



A device for detecting a flat or underinflated condition in a pneumatic vehicle tire as the tire traverses the device. The rod end of a ram serves as a probe mounted in the path of the vehicle tire and is biased into engagement with the tire by a predetermined force maintained in the ram through a regulated pressure circuit. A tire having adequate air pressure will exert sufficient downward force to overcome the biasing force and cause the rod to depress. An associated signal circuit is controlled by limit switches actuated by rod movement. Depression of the rod permits the switched circuit to remain inactive. Failure of the rod to depress the tire as it passes across the rod causes the circuit to actuate an appropriate signal.

3,715,721
VEHICLE STATION KEEPING DEVICE

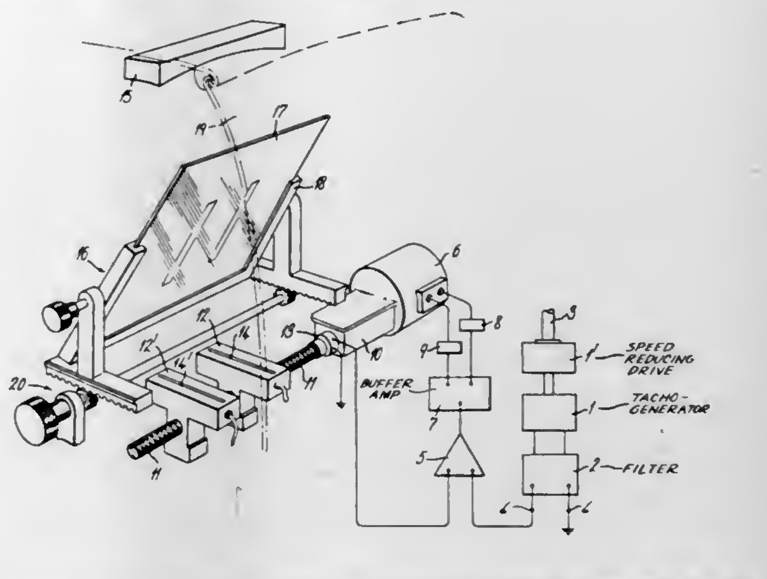
Alexander Irving, Farnborough, and Reginald Alfred Francis Priest, Crowthorne, both of England, assignors to National Research Development Corporation, London, England

Filed Feb. 23, 1971, Ser. No. 118,037

Int. Cl. B60q *1/00*

U.S. Cl. 340—62 **12 Claims**

A vehicle station keeping device provided in which the images of two fiducial marks are projected to infinity so that they can be viewed by the driver of the vehicle. The marks can be moved either continuously or in discrete steps so that the spacing between the marks is proportional to the vehicle's speed.



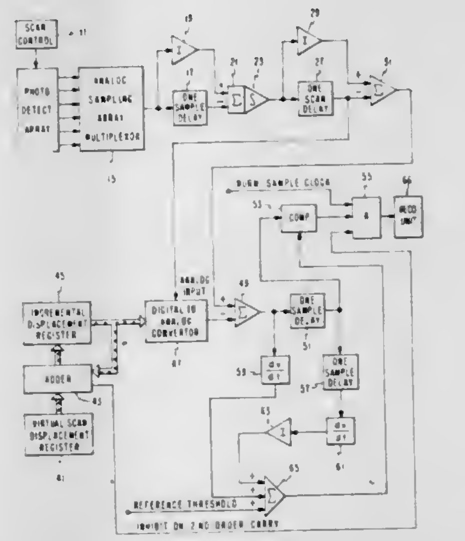
3,715,722
DATA NORMALIZATION SYSTEM

Richard E. Hall, Rochester, Minn., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed July 2, 1971, Ser. No. 159,285

Int. Cl. G06r *9/00*

U.S. Cl. 340—146.3 H **11 Claims**



A data normalization system including sampling of interpolation functions generated from original fixed pitch data samples. The accuracy of digital data generated from the interpolation function is increased by modulating the binary discrimination threshold.

3,715,723
FREQUENCY DIVISION MULTIPLEX TECHNIQUE

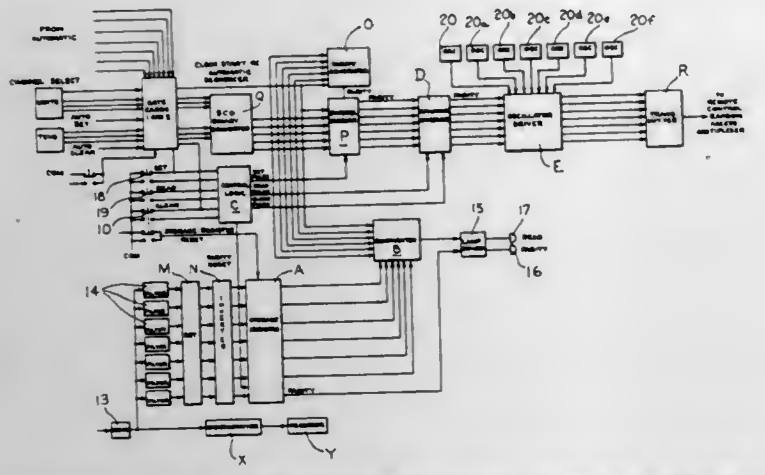
James C. Fletcher, Administrator of the National Aeronautics and Space Administration in respect to an invention of, and Hans Brey, Route 1, Box 88, Huntsville, Ala.

Filed Dec. 28, 1971, Ser. No. 212,921

Int. Cl. G08b *25/00;* **G08c** *25/00*

U.S. Cl. 340—146.1 C **4 Claims**

A system for monitoring a plurality of condition responsive devices. It consists of a master control station and a remote station. The master control station includes a channel select means, a BCD to binary converter, a parity generator, a storage register, a comparator, a plurality of sources of identifying frequencies, an oscillator driver, and a transmitter. The remote station includes a bank of filters for separating the transmitted signals, a detector, a driver, a parity correlator, a command verification and command reset circuit, a storage register, a random access multiplexer, a plurality of identifying frequency sources, an oscillator driver, and a transmitter. The master control station is capable of transmitting command signals which includes a parity signal to a remote station which transmits the signals back to the command station so that such can be compared with the original signals in order to determine if there are any transmission errors. The system utilizes frequency sources which are 1.21 multiples of each other so that no linear combination of any harmonics will interfere with another frequency.



3,715,724
APPARATUS FOR RECOGNIZING GRAPHIC SYMBOLS

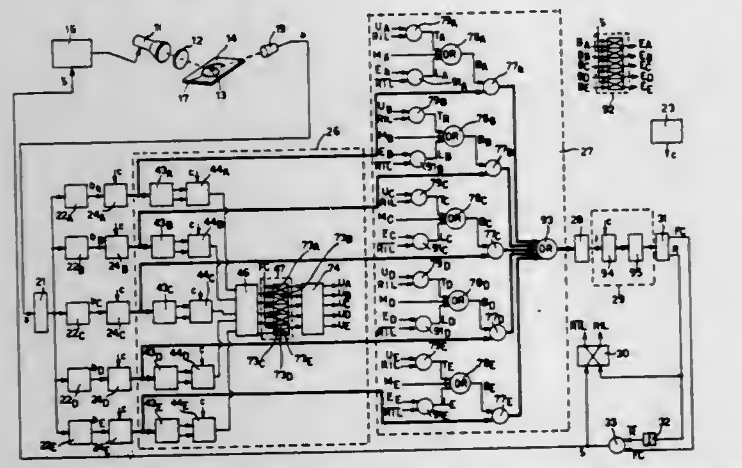
Filippo Demonte, Borgofranco D'Ivrea, and Luciano Pipino, Ivrea, both of Italy, assignors to Ing. C. Olivetti & C.S.p.A., Ivrea (Turin), Italy

Filed Dec. 10, 1970, Ser. No. 96,931

Claims priority, application Italy, Dec. 24, 1969, 54500 A/69

Int. Cl. G06k *9/00*

U.S. Cl. 340—146.3 AG **10 Claims**



An optical character recognition device is disclosed wherein a character is scanned by a cathode ray tube along a plurality of parallel scan lines and a photo-detector derives an analogue electrical signal proportional to the intensity of the light signal output from each scanned point. The derived analogue signals are compared with a plurality of threshold values, and an optimum threshold is selected. The resulting digital signal is then compared with pre-established graphic signals to provide a recognition symbol identifying the character. Means are also provided to command a re-examination of an unrecognized signal by selecting a different threshold value. A logical filter apparatus is also provided to operate on the binary value assigned to the point under examination and the surrounding points and to assign to the examined point a binary signal level depending at least in part on the signal levels of the surrounding points. This logic filter circuit also includes means for detecting end points in lines and for detecting and eliminating break points in lines by comparing signal bits corresponding to the points surrounding the point examined to a pre-established set of conditions.

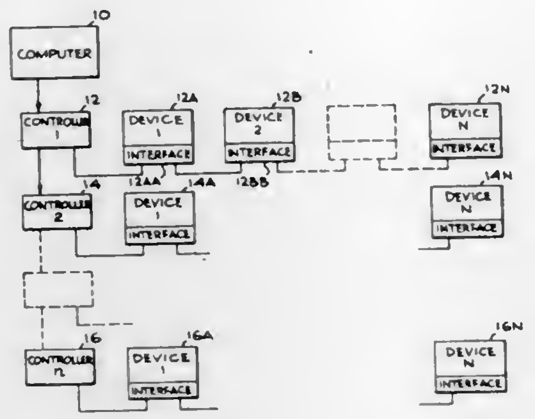
3,715,725
ADDRESS RESPONSIVE CONTROLLER FOR COMPUTER HANDLING OF PERIPHERAL EQUIPMENT

James M. Klevit, Des Plaines, and James L. Howe, Chicago, both of Ill., assignors to A. B. Dick Company, Chicago, Ill.

Filed Jan. 11, 1971, Ser. No. 105,241

Int. Cl. H04q *5/00, 9/00, 11/00*

U.S. Cl. 340—147 **9 Claims**



A system is provided for enabling a computer to communicate efficiently with a larger number of peripheral devices than provided for by the computer design and construction. The computer first addresses a controller which in turn addresses peripheral devices.

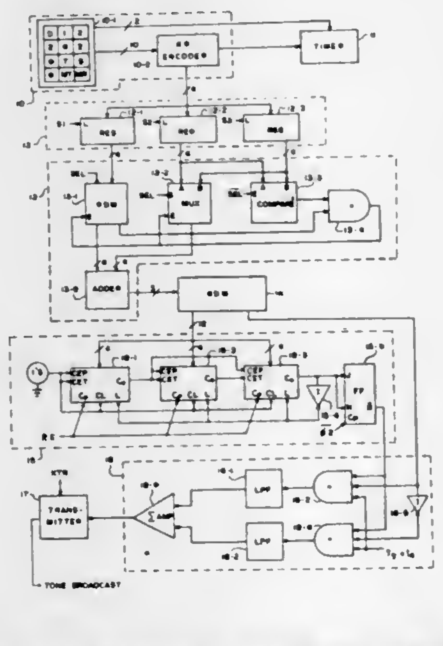
3,715,726
SELECTIVE TONE SIGNALLING APPARATUS

Gary P. Wallin, Manchester, and Gary N. Stapleford, Nashua, both of N.H., assignors to Comex Systems, Inc., Manchester, N.H.

Filed Sept. 16, 1971, Ser. No. 181,165

Int. Cl. H03k *1/00, 21/36*

U.S. Cl. 340—171 PF **10 Claims**



Sequential tone generator useful in paging applications. Three digit call numbers are entered into a register for temporary storage from an input device. Values indicative of the tones in the tone repertoire are stored in a first memory. Encoder values indicative of a desired tone encoding scheme are stored in a second memory. The stored call number is employed to address the encoder values of the second memory and to modify them so as to form the first memory addresses of the tone values specified by the call number. The addressed tone values are employed as divisor values in a frequency divider network to generate the tones.

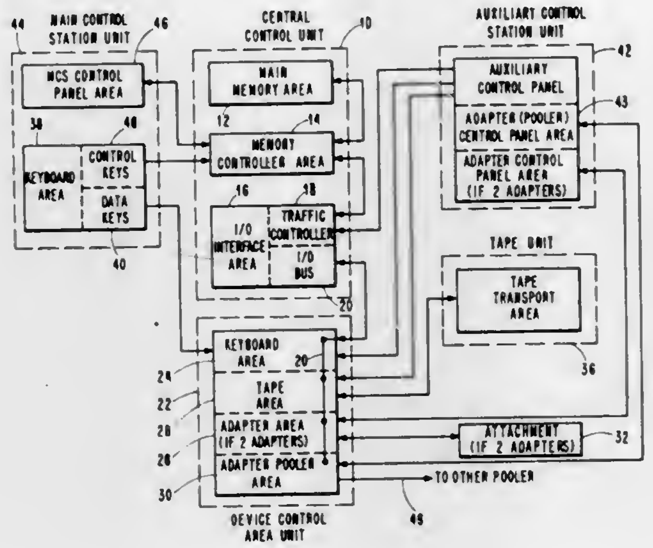
3,715,727
CONTROL MECHANISM AND BUS FOR A DATA PROCESSING POOLER SYSTEM

Frank K. Yu, Burlington, Mass., assignor to Honeywell, Inc., Minneapolis, Minn.

Filed June 11, 1970, Ser. No. 45,523

Int. Cl. G06f *3/00*

U.S. Cl. 340—172.5 **25 Claims**



An improved data processing pooler system for pooling data cooperatively to a central computer compatible magnetic tape or tapes from other computer compatible magnetic tape or tapes, utilizing key-to-tape units, each key-to-tape unit having device-control-area (DCA) units as an interface between said key-to-tape units, said DCA's being coupled to each other by a pooler bus of the "hand shake" type having a plurality of bidirectional lines for transmitting or receiving control and/or data signals. The system comprises input/output devices of the key-to-tape type, one device having a master pooler adapter and controls capable of operating as the master or control pooler unit, whereas the other devices have a slave pooler and controls capable of operating as slave or controlled pooler unit(s). An input/output (I/O) bus connects a central processor (CCU or CPU) unit in each key-to-tape unit with the device-control-area (DCA) also in each key-to-tape unit; said I/O bus contains a group of bi-directional multifunction lines, single function lines and a second group of control lines which form an array. Sending key-to-tape units and receiving key-to-tape units, each individually having its own memory, are connected by a pooler bus, and interfaced via the key-to-tape device-control areas (DCA's) which contain the necessary logic to link the sending and receiving pooler adapters together, and to provide the control of information flow to and/or from the respective sending and receiving memories. Additional logic circuitry write and/or read information into or out of said memories and onto or out of the magnetic tapes.

3,715,728
SIMULATION TIMING CONTROL SYSTEM

Bernard J. Fontaine, Ris-Orangis, and Alonso Gabriel, Antony, both of France, assignors to International Standard Electric Corporation, New York, N.Y.

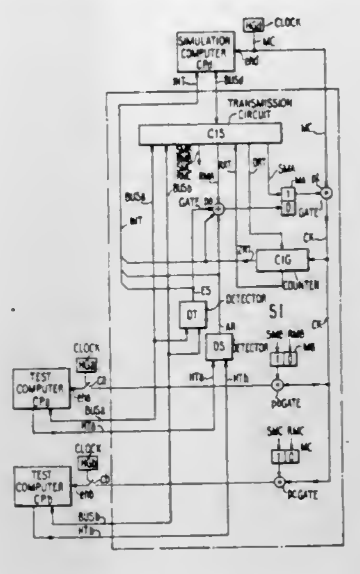
Filed July 10, 1970, Ser. No. 53,746

Claims priority, application France, July 24, 1969, 6925251

Int. Cl. G06f *15/16*

U.S. Cl. 340—172.5 **2 Claims**

The simulation of real time program within computer systems such as telephone switching systems is accomplished by performing the program under the control of a timing clock without direct relation to the real time. A timing indicator is used to follow the progress of the program, the indicator being settable to control the duration of the test programs.



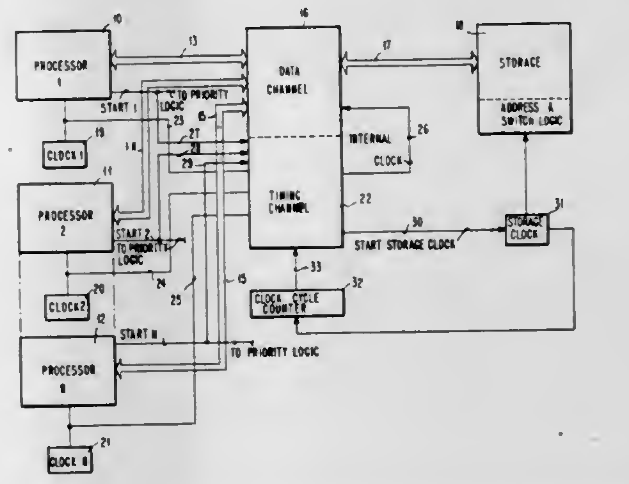
3,715,729
TIMING CONTROL FOR A MULTIPROCESSOR SYSTEM

Brian R. Mercy, Wappingers Falls, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed March 10, 1971, Ser. No. 122,893

Int. Cl. G06f *15/16*

U.S. Cl. 340—172.5 **10 Claims**



A multiprocessor system has plural autonomous digital data processors operable to communicate individually with a common storage system. Each processor has its own clock. The timing control means selectively uses any one of the individual processor clocks for timing the communication of its or any other processor with the common storage system.

3,715,730
MULTI-CRITERIA SEARCH PROCEDURE FOR TRAINABLE PROCESSORS

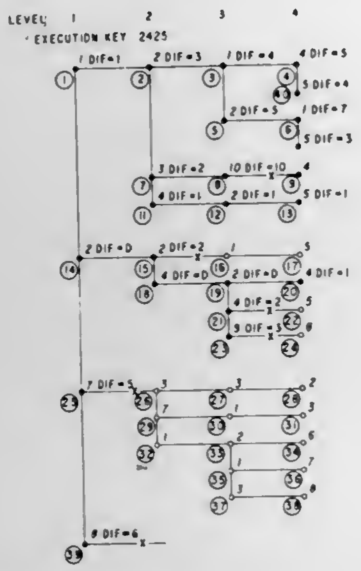
Stanley L. Smith, Richardson; William C. Choate, Dallas, and Michael K. Masten, Richardson, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed June 1, 1970, Ser. No. 42,431

Int. Cl. G06f *15/40*

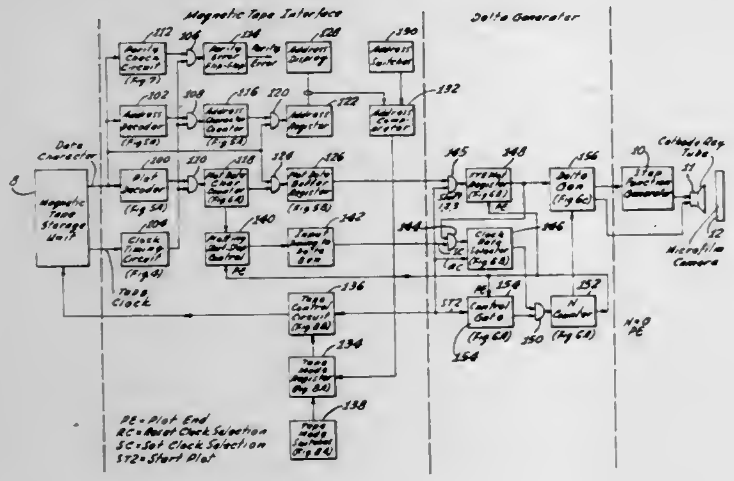
U.S. Cl. 340—172.5 **8 Claims**

In the execution mode of a trained processor, query key functions are compared with reference key functions stored in a memory array to select a desired response. During the comparison operation, a criterion is imposed to indicate when reference key functions corresponding to a given group of trained responses can not be an appropriate response for an encountered untrained point, wherein an untrained point is a query key for which no corresponding reference key exists. In response, search of some stored reference key functions is waived. In the multi-criteria search procedure of this invention a plurality of criteria may be imposed in an expanded search operation to waive search of specific stored reference key functions.



3,715,731
MICROFILM PLOTTER SYSTEM

Philip T. Kan, Reseda, Calif., assignor to Computer Industries, Inc., Van Nuys, Calif.
Filed March 16, 1970, Ser. No. 19,589
Int. Cl. G06f *9/00;* **G05b** *19/18*
U.S. Cl. 340—172.5 **5 Claims**

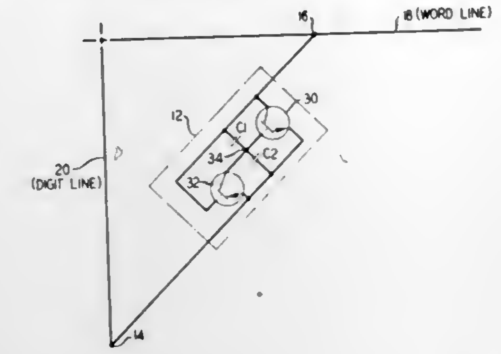


The present invention relates to an improved digital incremental plotter system of the microfilm type, and it relates more particularly to such a system in which information to be plotted and recorded on microfilm may be derived from an associated digital computer in the form of a series of instructions, either directly on-line, or in an off-line system from punched cards, punched paper tape, magnetic tape, or the like.

3,715,732
TWO-TERMINAL NPN-PNP TRANSISTOR MEMORY CELL

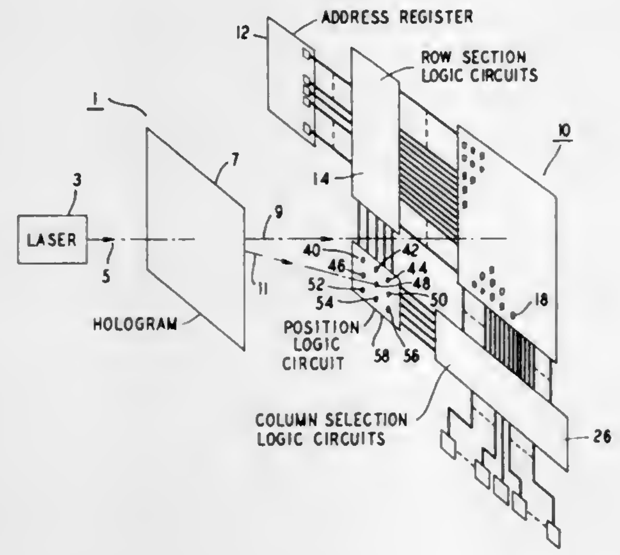
Dennis Joseph Lynes, Madison, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.
Filed Dec. 9, 1971, Ser. No. 206,272
Int. Cl. G11c *11/40, 11/24*
U.S. Cl. 340—173 R **5 Claims**

A semiconductor memory array contains memory cells each of which contains an NPN transistor and a PNP transistor. The collector and base of the NPN transistor are respectively coupled to the base and collector of the PNP transistor. Bit information is written into the cell by causing or inhibiting conduction in the PNP transistor in order to set the potential of the base of the NPN transistor to one of two values which represent, respectively, a "1" and a "0." A positive polarity voltage pulse applied to the collector of the NPN transistor causes information previously stored in the cell to be read out.



3,715,733
ERROR COMPENSATING OPTICAL DETECTOR APPARATUS AND METHOD

Alexander Feiner, Rumson, N.J., and Philip A. Harding, Palos Verdes Penisula, Calif., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.
Filed Feb. 11, 1972, Ser. No. 225,515
Int. Cl. G11c *13/04;* **G11b** *27/10*
U.S. Cl. 340—173 LM **19 Claims**

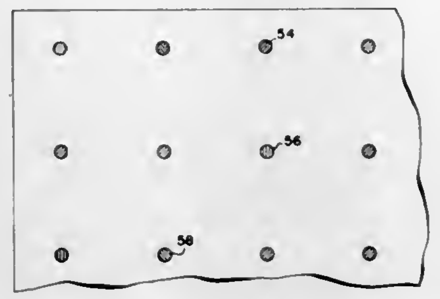


An optical memory system comprises a laser light beam that illuminates a hologram, which contains stored bit and position information, in order to produce a position light beam and signal light beams, which are imaged respectively on an array of position detectors and an array of information detectors. Any misregistration of the laser light beam causes the position detectors to generate an error signal which is used to correct the outputs of the information detectors.

3,715,734
MEMORY STORAGE DEVICE AND METHOD OF MAKING THE SAME

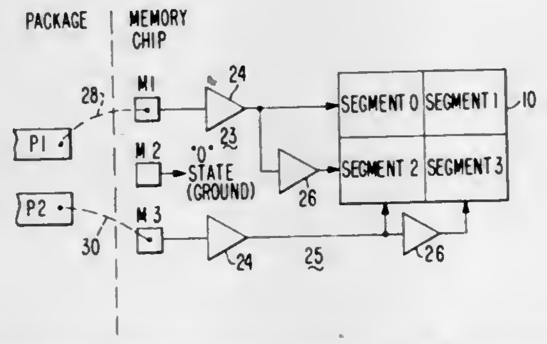
Jack Fajans, 1133 Magnolia Road, Teaneck, N.J.
Continuation-in-part of Ser. No. 871,573, Oct. 10, 1969, abandoned, and a continuation of Ser. No. 599,608, Dec. 6, 1966, abandoned. This application Nov. 12, 1970, Ser. No. 89,114
Int. Cl. G11c *13/04*
U.S. Cl. 340—173 LM **10 Claims**

A three-dimensional memory storage unit is prepared by carbonizing selected spots in a block of polymethylmethacrylate by means of a steeply converging laser beam. The energy of the beam is applied in pulses of such duration and at such intensity that carbonization takes place only at the focal point of the beam and in the immediate vicinity of the focal point while the radiant energy at a small distance from the focal point is too widely distributed to cause carbonization. By shifting the block between pulses, a three-dimensional network of black, opaque spots is produced. The device is read by an optical system having a wide-angle objective lens.



3,715,735
SEGMENTIZED MEMORY MODULE AND METHOD OF MAKING SAME

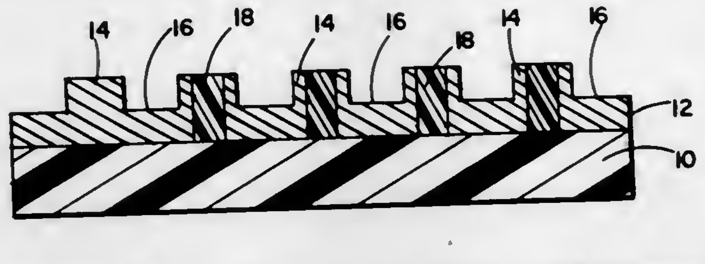
William E. Moss, Sunnyvale, Calif., assignor to Monolithic Memories, Inc.
Filed Dec. 14, 1970, Ser. No. 97,586
Int. Cl. G11c *7/00, 17/00*
U.S. Cl. 340—173 R **16 Claims**



A method of utilizing a memory array or module containing inoperative memory cells or bits is accomplished by electrically segmentizing the memory module and then permanently isolating the segment(s) containing inoperative bits to form a segmentized but functional memory module. This is accomplished by forcing the address means associated with the segment(s) containing inoperative bits to a permanent, single binary state which is inconsistent with the binary address codes for the memory cells in the segment(s) containing the inoperative bits.

3,715,736
MAGNETIC BUBBLE DOMAIN SYSTEM

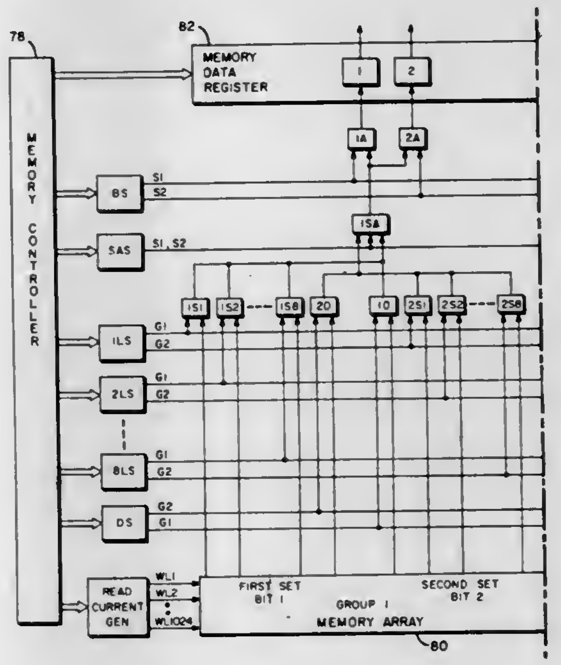
Cedric F. O'Donnell, Fullerton, and George R. Pulliam, Anaheim, both of Calif., assignors to North American Rockwell Corporation
Filed April 1, 1971, Ser. No. 130,128
Int. Cl. G11c *5/02, 11/14*
U.S. Cl. 340—174 TF **12 Claims**



A magnetic bubble domain system having localized areas of spatial stability for bubble domains is disclosed. The bubble domain system includes a thin film of single crystal magnetic bubble domain material on a single crystal substrate. The film has a plurality of isolated thick portions surrounded by thinner regions. The bubble domains when formed preferentially move into the thick portions. The surrounding relatively thin regions of film serve as energy barriers to the movement of the bubble domains and confine the bubble domains in the relatively thick portions of the film. Bubble domains may be moved to and from the thick portions in a plurality of directions.

3,715,737
MEMORY ARRAY READOUT WITH LEADING AND TRAILING EDGES OF THE READ SIGNAL

Gary L. Grundy, St. Paul, Minn., assignor to Sperry Rand Corporation, New York, N.Y.
Continuation of Ser. No. 810,153, March 25, 1969, abandoned. This application May 6, 1971, Ser. No. 141,038
Int. Cl. G11c *7/00, 11/14*
U.S. Cl. 340—174 M **4 Claims**

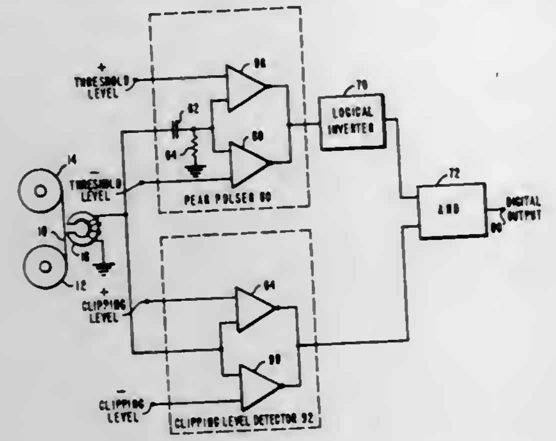


A scheme for reading out the information content of a memory array on the leading and trailing edges of a unipolar read signal. The sense lines of two memory elements that are simultaneously affected by the read signal couple their associated output signals through associated output gates to a single gated sense amplifier. The output signals are, in turn, coupled to associated different portions of a memory register through associated sense amplifier output gates. The read signal causes the two memory elements to generate associated output signals at both its leading and trailing edges. By properly gating the output signals at the associated output gates at, alternatively, the times of the read signal leading and trailing edges, the information associated with each of the two memory elements is stored in the associated different portions of the memory register.

3,715,738
DATA DETECTION SYSTEM

Robert A. Kleist, and Robert L. Thorne, both of Anaheim, Calif., assignors to Peripheral Business Equipment, Inc.
Filed Oct. 19, 1970, Ser. No. 81,989
Int. Cl. G11b *5/02*
U.S. Cl. 340—174.1 H **9 Claims**

A data detection system is disclosed in which digital data bits represented by flux transitions on a magnetic medium produce peaks in a signal sensed by a magnetic read head as the magnetic medium moves relative to the read head. The sensed signal is passed to a peak pulser where the signal is differentiated and thereafter compared with positive and negative threshold levels to produce a data pulse corresponding to each peak of the sensed signal. The sensed signal is also passed to a clipping level detector where it is compared with positive and negative clipping levels to produce a gating pulse when

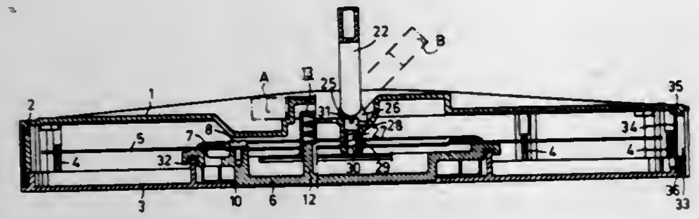


the clipping levels are exceeded. The gating pulses are employed to selectively gate the data pulses to an output as the detected data.

3,715,739

DATA PROCESSING CASSETTE AND SPINDLE

Paul Antonius Ferdinand Van Acker, Rijswijk, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Sept. 10, 1971, Ser. No. 179,462
Claims priority, application Netherlands, Sept. 24, 1970, 70/4068
Int. Cl. G11b *23/04*
U.S. Cl. 340—174.1 C **9 Claims**

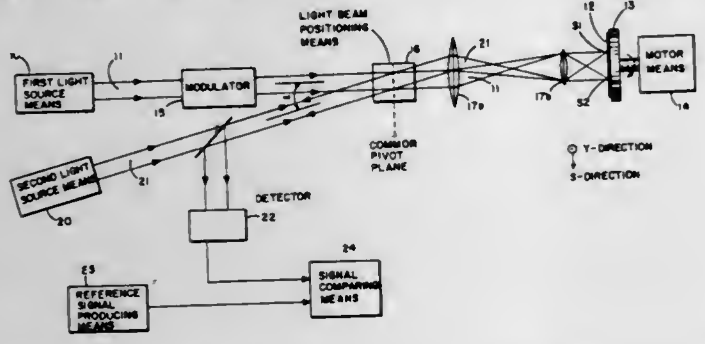


A cassette for use in a data processing apparatus, which cassette contains a magnetizable recording disc which is supported by a support provided with a central bore by means of which the cassette may be placed on the driving spindle of the apparatus. The cassette is provided with a clamping device in the form of a collet by means of which the cassette may be clamped and which is adapted to be operated by a handle hingedly connected to the cassette.

3,715,740

OPTICAL MASS MEMORY

Francis M. Schmit, St. Louis Park, Minn., assignor to Honeywell Inc., Minneapolis, Minn.
Filed Aug. 30, 1971, Ser. No. 176,158
Int. Cl. G11b *5/02;* **H01v** *3/04*
U.S. Cl. 340—174.1 M **4 Claims**

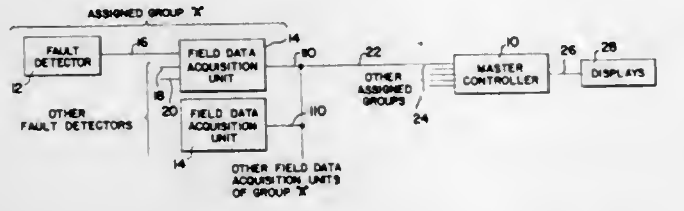


An optical mass memory of the Curie point writing type includes a separate read-out beam for checking written bits within fractions of microseconds after storage to ensure that the magnetization direction of the bit was properly stored.

3,715,741

AIRPORT LIGHTING MONITORING SYSTEM AND SYSTEM COMPONENTS

John E. McWade, Media; Jan Keizer, Brookhaven; Wiley I. Moore, Folsom, and Ernest M. Purcell, Swarthmore, all of Pa., assignors to Gulf & Western Industrial Products Company, Grand Rapids, Mich.
Filed Feb. 9, 1971, Ser. No. 113,821
Int. Cl. G08b *21/00, 26/00*
U.S. Cl. 340—251 **22 Claims**


ASSIGNED GROUP "X"
FAULT DETECTOR
FIELD DATA ACQUISITION UNIT
OTHER FAULT DETECTORS
FIELD DATA ACQUISITION UNIT
OTHER ASSIGNED GROUPS
MASTER CONTROLLER
DISPLAYS
OTHER FIELD DATA ACQUISITION UNITS OF GROUP "X"

A monitoring system is provided for airport lighting installations employing series connected incandescent lamps. For each lamp there is a fault detector unit with voltage and overcurrent relays supplying an output whenever lamp current or voltage is deficient. There is also a fault detector for supplying an output when output current of a current regulator deviates from the value for which the lamp-current regulator is set.

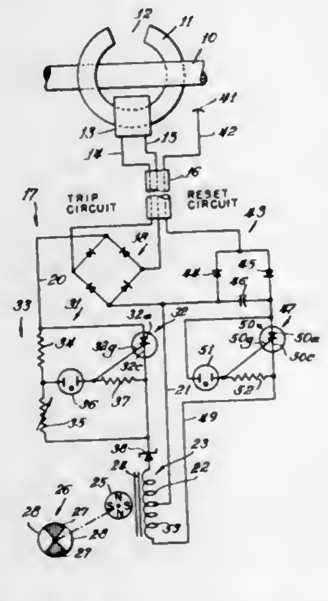
The lamps are divided into groups and for each group there is a field data acquisition unit. The field data acquisition units in turn, are connected in groups to a master controller with an output to suitable fault-indicating displays to warn of unsafe conditions.

The master controller includes a clock circuit, logic for converting data from the field data acquisition units to form for actuating printers and for actuating accumulative fault display, and a sequencer for enabling data from successive groups of field data acquisition units to be handled by a single master controller. There is a print-out, identifying lamp circuits with faults and the runway in which they occur. For each runway there is an accumulative fault display indicating the number of faults in that runway.

3,715,742

ALTERNATING CURRENT FAULT INDICATING MEANS

Edmund O. Schweitzer, Jr., Northbrook, Ill., assignor to E. O. Schweiter Manufacturing Co., Inc., Mundelein, Ill.
Filed June 1, 1971, Ser. No. 148,440
Int. Cl. G08b *21/00*
U.S. Cl. 340—253 A **17 Claims**

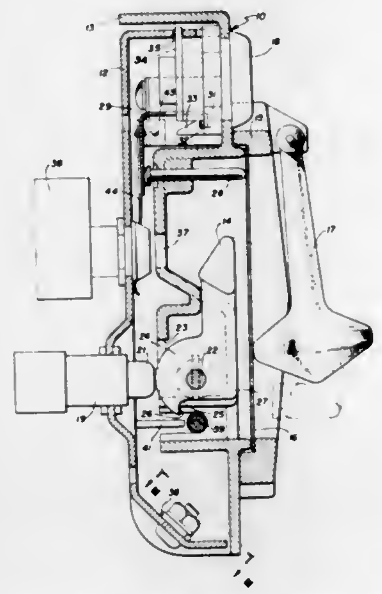


Fault current flow in an alternating current carrying conductor is shown by operation of a target to fault indicating position from which it is restored in response to the energizing voltage of the conductor. A C-shaped magnetic core embraces the conductor and has a winding thereon the output of which is rectified and, when it reaches a predetermined value, is applied to a trip winding of a fault indicator to operate the target. A reset winding of the fault indicator is energized from a capacitor that is charged from the conductor voltage a source of which may be obtained from a capacitor plate embedded in the insulation of a conductor terminator. In a modification alternating current is applied to the trip winding to demagnetize the magnetic core of the indicator and allows a permanent magnet to bias the target to fault indicating position. Other modifications include energization of the reset circuit from the secondary winding of a distribution transformer, provision for magnetizing the distal ends of a U-shaped yoke embracing a conductor carrying fault current, and application of the yoke to the conductor of a pad mounted switching arrangement for a transformer.

3,715,743

FIRE ALARM SIGNALLING APPARATUS

Howard P. Denton, Gardner, Mass., assignor to Simplex Time Recorder Company, Gardner, Mass.
Filed Oct. 26, 1970, Ser. No. 83,929
Int. Cl. G08b *25/00*
U.S. Cl. 340—303 **7 Claims**



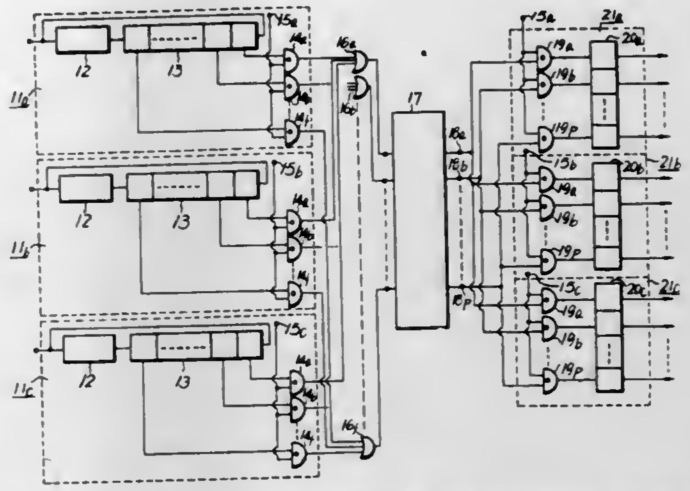
This invention relates to a fire alarm system and, more particularly, to an apparatus for fire alarm signaling, having an alarm actuator enclosed within a glass window and operated upon actuation to break a replaceable glass rod, including means to prevent the actuating lever from being re-set by other than authorized persons.

3,715,744

GRAPHIC SYMBOL DISPLAY SYSTEM INCLUDING PLURAL STORAGE MEANS AND SHARED SIGNAL CONVERTER

Takamasa Ito, Tokyo, and Tsutomu Makino, Kanagawa-ken, both of Japan, assignors to Sony Corporation, Tokyo, Japan
Filed Oct. 15, 1970, Ser. No. 80,947
Claims priority, application Japan, Oct. 16, 1969, 45/82794
Int. Cl. G09f *9/32*
U.S. Cl. 340—336 **7 Claims**

A display system with a plurality of electric indicator devices having a plurality of circuits for memorizing binary digit signals supplied thereto, the number of such memorizing circuits corresponding to that of the indicator devices. Included is a circuit common to all the memorizing circuits for converting the memorized binary digit signals into code signals for display. Circuits are provided for applying the binary digit signals from each of the memorizing circuits to the converting circuit sequentially in a time divisional manner. A plurality of circuits is connected between the converting circuit and the indicator devices, respectively, each of the last-mentioned circuits being supplied with the code signals from the converting circuits in a time divisional manner to



memorize them and to apply them to the respective indicator device. The system also includes a circuit for activating the indicator devices.

3,715,745

DATA INPUT ENCODER

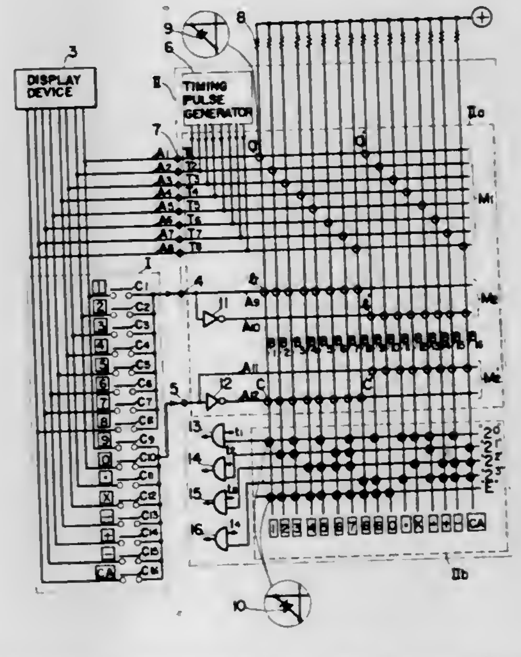
Genio R. Arciprete, Lexington, Mass., assignor to Dennison Manufacturing Company, Framingham, Mass.
Filed Dec. 29, 1970, Ser. No. 102,365
Int. Cl. G06f *3/00*
U.S. Cl. 340—347 DD **13 Claims**

Encoder apparatus for generating a plurality of pulses indicative of the setting of a plurality of switches or the like, said apparatus including a plurality of switches having their common contacts ganged together and having their wiper arms coupled to different gating circuits, said gating circuits being actuated in a predetermined sequence to generate signals having a width proportional to the position of each wiper arm, and means responsive to the pulse width signal for generating pulse signals indicative of the position of each wiper arm.

3,715,746

KEYBOARD INPUT DEVICE

Isao Hatano, Kyoto-fu, Japan, assignor to Omron Tateisi Electronics, Co., Kyoto, Japan
Filed March 10, 1971, Ser. No. 122,667
Int. Cl. H04q *3/00*
U.S. Cl. 340—365 S **11 Claims**



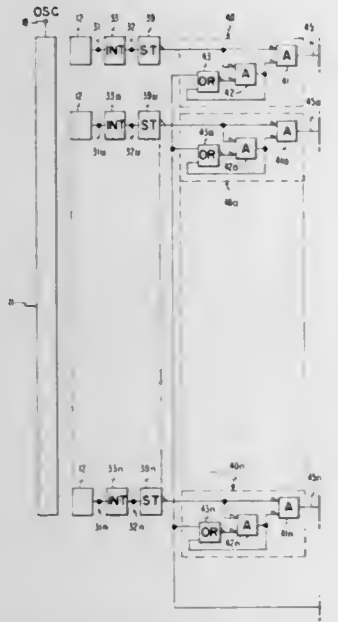
An input device comprising a keyboard circuit arrangement and an input signal converting circuit unit wherein junction terminals therebetween are advantageously reduced to a small number. To this end, the key contacts disposed in the keyboard are divided into a plurality of groups according to the number of timing pulses employed while the signal converting circuit unit is constructed with a plurality of matrices, portions of which are adapted to receive input signals from the keyboard through corresponding group terminals.

3,715,747
CAPACITIVE KEYBOARD ELECTRONICS

Charles Christian Hanson, Rochester; Joseph Ping Liong Ho, Byron, and Merle Edward Houdek, Rochester, all of Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 30, 1971, Ser. No. 214,196
Int. Cl. H04q *3/00*

U.S. Cl. 340—365 E **8 Claims**



In a keyboard, key actuation causes a signal to be coupled from a drive pad to a sense pad. The output from the sense pad is connected to the encoder by a switching circuit. The encoder output goes to both the keyboard data register and through a delay circuit to set a latch which interrupts the switching circuit that was initiated by key depression. Effectively the elapsed time of the delay circuit represents the duration of coupling between the circuit of a depressed key and the data register through the encoding circuits. An overrun condition causes the transmission from encoder to keyboard data register to be inhibited. Although the keyboard is not physically locked by an overrun condition, an audible sound, which occurs upon each key actuation that results in data being received by the keyboard data register, is interrupted to inform the operator that entry of the coded data into such register has not been effected.

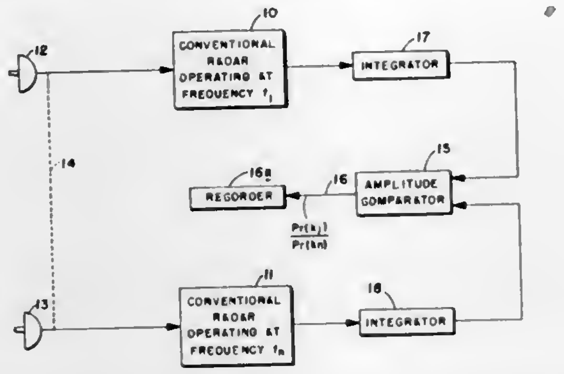
3,715,748
METHOD AND APPARATUS FOR MEASURING THE INTENSITY OF ATMOSPHERIC TURBULENCE

John J. Hicks, Silver Spring, Md., assignor to The United States of America as represented by the Secretary of the Navy

Filed April 30, 1971, Ser. No. 139,069
Int. Cl. G01s *9/00*

U.S. Cl. 343—5 W **4 Claims**

A method and apparatus for measuring, with radar, the intensity of atmospheric turbulence and/or distinguishing between the radar reflections from clear air turbulence and those produced either by clouds or by the occurrence of a large vertical gradient in radar refractivity. Two or more conventional microwave radars operated simultaneously at different preselected frequencies, transmit and receive reflected energy from a selected atmospheric volume. The received signals are processed to obtain a comparison of the signal amplitudes or intensities from the radars and the data derived from this comparison is utilized to indicate the intensity of detected clear air turbulence and to distinguish such turbulence from other atmospheric phenomena; e.g., clouds, etc. which also produce radar reflections.

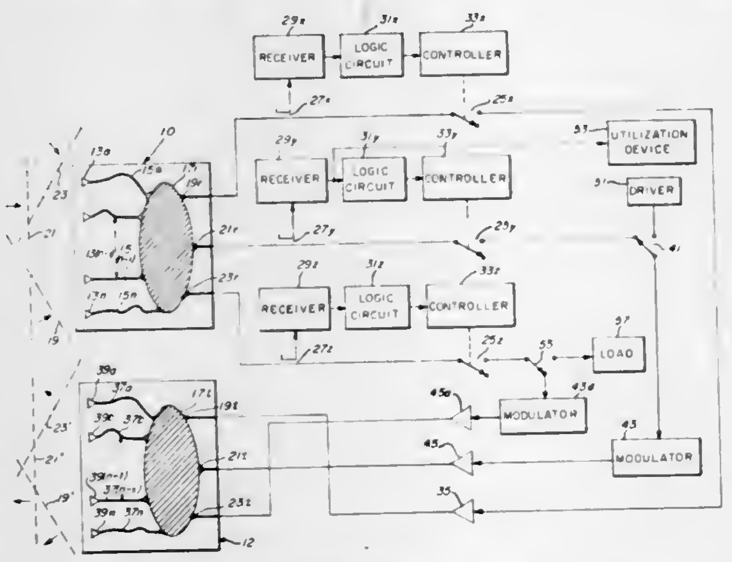

10
CONVENTIONAL RADAR OPERATING AT FREQUENCY f1
17
INTEGRATOR
12
14
15
AMPLITUDE COMPARATOR
16a
RECORDER
16
Pr(λ1)/Pr(λn)
11
CONVENTIONAL RADAR OPERATING AT FREQUENCY fn
18
INTEGRATOR
13

3,715,749
MULTI-BEAM RADIO FREQUENCY SYSTEM

Donald H. Archer, Santa Barbara, Calif., assignor to Raytheon Company, Lexington, Mass.

Filed May 11, 1971, Ser. No. 142,224
Int. Cl. G01s *9/02*

U.S. Cl. 343—5 R **4 Claims**



A transmitting/receiving system for radio frequency energy is shown, such system incorporating a multi-beam array antenna and appropriate control circuitry to adapt the system to operation simultaneously as a radar, as a relay or as a transponder.

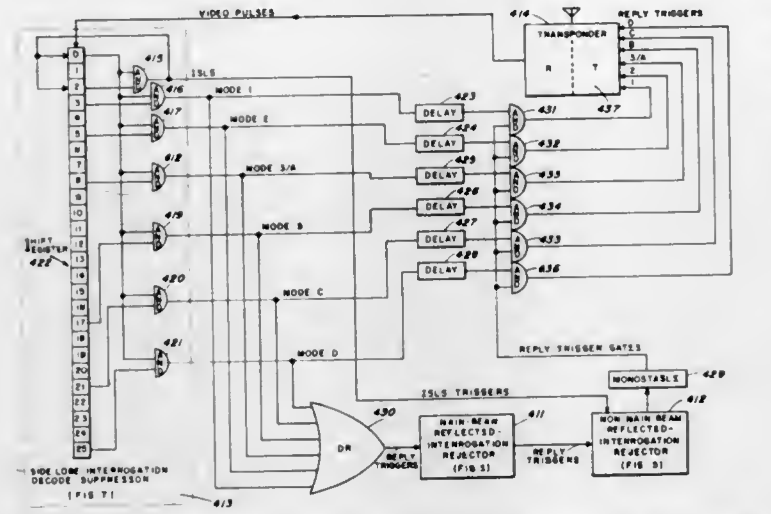
3,715,750
OMNIDIRECTIONAL REFLECTED INTERROGATION REJECTOR

Walton B. Bishop, Oxon Hill, Md., assignor to The United States of America as represented by the Secretary of the Navy

Filed July 31, 1970, Ser. No. 60,009
Int. Cl. G01s *9/56*

U.S. Cl. 343—6.8 LC **4 Claims**

This application describes a way in which radar-beacon transponders can be made to reject nearly all of the reflected interrogations that reach them without rejecting direct-path interrogations unless two or more interrogators operating on the same interrogation-repetition frequency interrogate a particular transponder simultaneously. Logic circuits are provided to show how the IFF Mark X (SIF), also known as the Air Traffic Control Radar Beacon System (ATCRBS) or the Secondary Surveillance Radar (SSR), can be modified to make use of the new technique. Classified military systems can use it equally well if suitable modifications are made. A circuit is also provided to suppress sidelobe-interrogation decoding instantaneously so that the transponder dead time, no longer needed when reflected interrogations are rejected, can be eliminated.

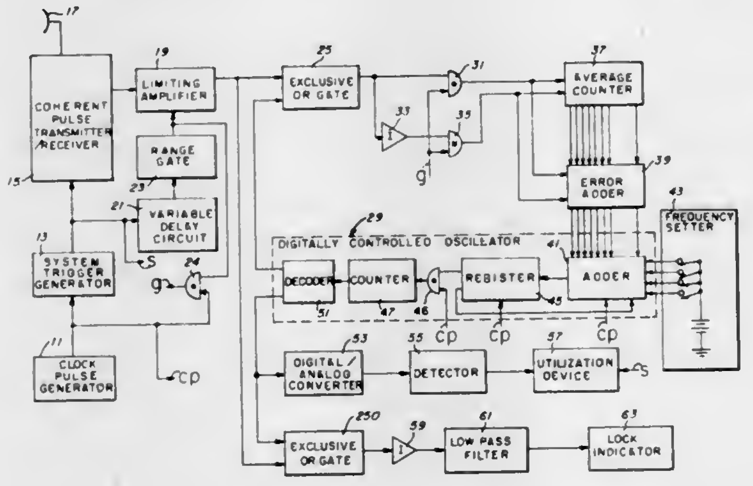


3,715,751
DIGITAL SPEED GATE FOR DOPPLER RADAR

George S. Mead, Maynard, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed Sept. 30, 1970, Ser. No. 76,954
Int. Cl. G01s *9/44*

U.S. Cl. 343—7 A **4 Claims**



A speed gate for a pulse Doppler or CW Doppler radar wherein a signal being tracked is fed, along with a signal from a digitally controlled oscillator, to an exclusive OR gate ro derive gating signals for clock pulses. such gated clock signals are then used to actuate an up-down counter to derive a digital number indicative of the average phase difference between the signal being tracked and the digitally controlled oscillator. Such number is combined with a digital number indicative of the phase difference, measured by the gated clock signals over a relatively short period, between the signal being tracked and the signal out of the digitally controlled oscillator to produce a digital correction signal for the digitally controlled oscillator to change the phase thereof until a phase lock condition occurs between the signals into the exclusive OR gate.

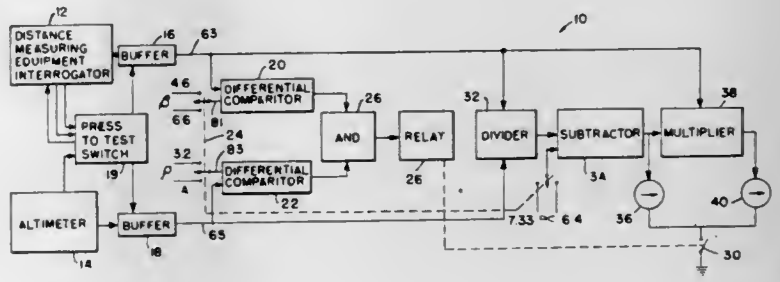
3,715,752
STRUCTURE FOR AND METHOD OF AIRCRAFT GUIDANCE

Patrick H. Garrett, Athens, Ohio, assignor to The President and Board of Trustees of Ohio University, Athens, Ohio

Filed Jan. 26, 1970, Ser. No. 5,771
Int. Cl. G01s *9/14*

U.S. Cl. 343—7.3 **14 Claims**

A vertical guidance system for providing a glide-path for aircraft. An aircraft slant-range signal from a known distance-measuring equipment interrogator is divided by an aircraft altitude signal from known altitude-measuring equipment to provide a true aircraft glide angle, and the true aircraft glide angle is subtracted from a reference aircraft glide angle which determines a reference glidepath to provide an aircraft glide angle error signal in degrees. The glide angle error signal is then multiplied by the slant-range signal to provide a vertical lineal distance error indication of the position of the aircraft relative to the reference glidepath. Structure is also disclosed for electronically compensating for offsetting the usual distance-measuring equipment from a desired aircraft touchdown point. The altitude signal is compensated for variations in field altitude and barometric pressures and in one modification may be synchronized with the pilot's altimeter. Aircraft arrival at a letdown-initiation point is visually indicated by the disclosed guidance system.

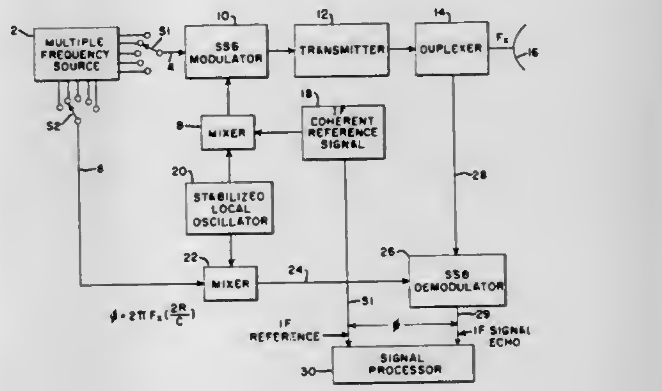


3,715,753
COHERENT RANGE AND LENGTH RESOLUTION

Sidney P. Applebaum, Liverpool, and Bernard H. Geyer, Jr., North Syracuse, both of N.Y., assignors to General Electric Company

Filed May 13, 1964, Ser. No. 367,610
Int. Cl. G01s *7/32*

U.S. Cl. 343—17.2 PC **17 Claims**

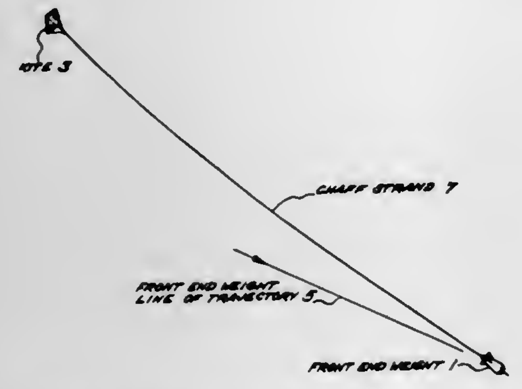


1. A radar system for making precise determinations of target range and target length comprising:
- means for providing RF pulses which are separated by equal increments of frequency and time,
- means for transmitting said pulses,
- means for receiving reflections of said pulses from targets within a range interval of interest,
- means for demodulating said reflections with local signals to provide IF signals, said local signals comprising pulses of the same rate and frequency sequence as said transmitted pulses but delayed with respect thereto, and
- means for processing said IF signals to determine their relative phase shifts and to generate a precise measurement of range and length of targets within said range interval of interest.

3,715,754
TETHERED CHAFF STRAND COUNTERMEASURE WITH TRAILING END KITE

John F. W. Parry, Loma Linda, Calif., assignor to The United States of America as represented by the Secretary of the Air Force

Filed Sept. 15, 1967, Ser. No. 670,013
Int. Cl. H01q *15/14;* **H04k** *3/00*
U.S. Cl. 343—18 B **6 Claims**

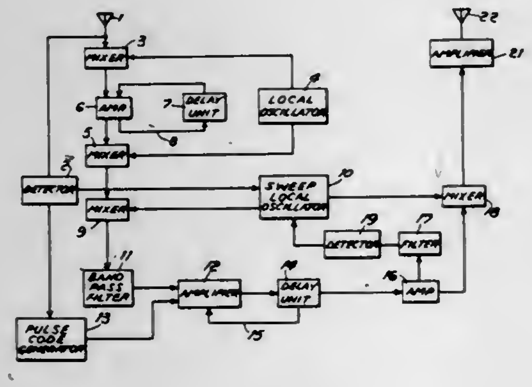


A tethered chaff strand countermeasure system having a trailing end kite to pull the chaff strand out of the line of trajectory of the front end object so as to form a reflecting helix.

3,715,755
REPETITIVE PULSE GENERATING SYSTEM

Theodore J. Goldan, Nutley, N.J., assignor to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed Sept. 10, 1957, Ser. No. 683,186
Int. Cl. H04k *3/00*
U.S. Cl. 343—18 E **9 Claims**



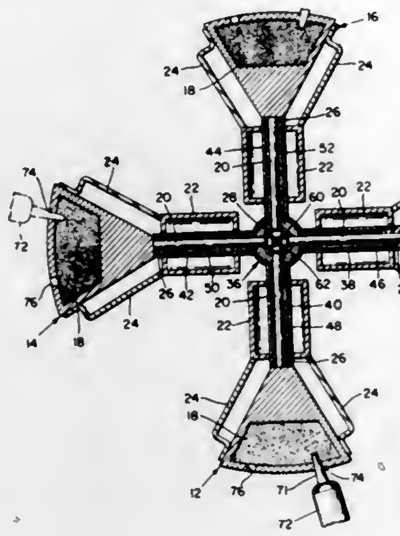
A received pulse produces a plurality of delayed similar pulses by stretching the received pulse and heterodyning it against a swept oscillator derived pulse to obtain a multifrequency pulse at lower frequency. This pulse recirculated through a delay unit and the plurality of successive pulses so produced are heterodyned against the multifrequency source to convert them to the original frequency.

3,715,756
MOISTUREPROOF MICROWAVE ANTENNA

William L. Mackie, Ventura, Calif., assignor to The United States of America as represented by the Secretary of the Navy

Continuation-in-part of Ser. No. 767,884, Aug. 27, 1968, abandoned. This application Jan. 21, 1970, Ser. No. 4,645
Int. Cl. B29d *27/04;* **C08g** *22/44;* **H01g** *1/40*
U.S. Cl. 343—873 **1 Claim**

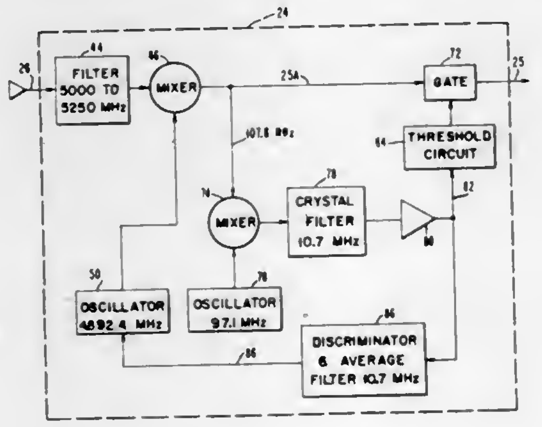
A moisture proof hollow electrical component such as a microwave antenna the interior of which is filled with a closed-cell, foam-in-place, low-density retarded polyurethane plastic substance having a specific dielectric constant approximately equal to that of the air which it replaces, thereby preserving the original electrical impedance characteristics and hence maintaining the operating efficiency of the antenna.



3,715,757
RADIO GUIDANCE SYSTEM WITH SEPARATE TRANSMISSION OF A STANDARD FREQUENCY SIGNAL TO ENHANCE THE DISCRIMINATION OF THE RECEIVER

Donald J. Toman, Pleasantville, N.Y., assignor to Tull Aviation Corporation, Pleasantville, N.Y.

Filed July 13, 1970, Ser. No. 54,510
Int. Cl. G01s *1/16*
U.S. Cl. 343—108 R **21 Claims**



A system for a craft to be guided including a receiver operable to receive guidance signals in a predetermined band of radio frequencies, the receiver also being capable of receiving a separate fixed standard frequency signal from a ground station for control of the receiver to enhance the discrimination function in discriminating the guidance signals.

3,715,758
METHODS AND APPARATUS FOR PRECISE POSITIONING OF LOCATIONS

Friedhelm K. Sender, Hannover-Wulfel, Germany, assignor to Prakla Gesellschaft fur Praktische Lagerstattenforschung GmbH, Hannover, Germany

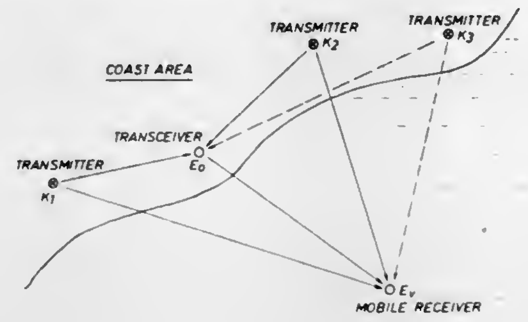
Filed July 7, 1970, Ser. No. 52,893

Claims priority, application Germany, July 10, 1969, P 19 34 960.1

Int. Cl. G01s *5/14*
U.S. Cl. 343—112 R **20 Claims**

A radio location system employing at least two fixedly installed transmitters operating on substantially continuous carrier frequencies and a fixedly installed reference transceiver

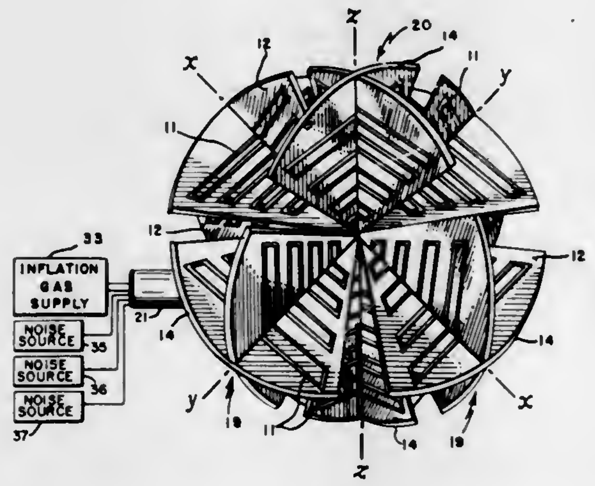
suitably located to receive the carrier frequencies from each of the transmitters. A station receiver is located at the location that is to be precisely positioned which synthesizes the frequencies of the two transmitters and determines position by developing traveltime information to the receiver, these synthesized carrier frequencies being absolutely determined with respect to an atomic clock. A similar atomic clock in the reference transceiver similarly determines synthesized frequencies and their error with respect to the transmitted frequencies. These error corrections are converted to digital form and transmitted to the station receiver for correcting the developed traveltime information and hence developing precision positioning information.



3,715,759
UNFURLABLE ISOTROPIC ANTENNA

Frank J. Esposito, Nassau; Michael J. Pallas, Queens, and Robert W. Martin, Nassau, all of N.Y., assignors to The United States of America as represented by the Secretary of the Air Force

Filed March 8, 1970, Ser. No. 24,412
Int. Cl. H01q *11/10*
U.S. Cl. 343—792.5 **2 Claims**



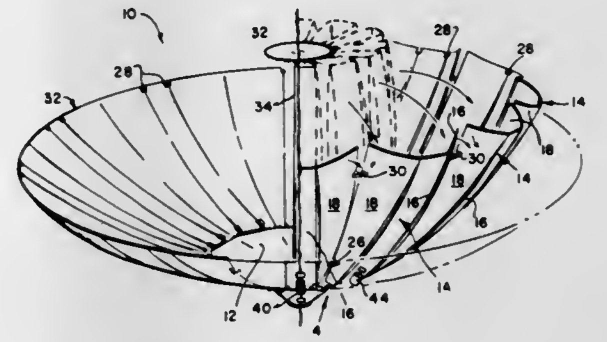
The invention is a broadband isotropic antenna of the triorthogonal type. It is a randomly polarized antenna system that has particular application in satellites. The antenna consists of three independent antenna elements arranged in a mutually orthogonal configuration. Each of the elements is mounted on unfurlable partitions contained within an inflatable spherical enclosure.

3,715,760
RIGID COLLAPSIBLE DISH STRUCTURE

William B. Palmer, Palos Verdes Estates, Calif., assignor to TRW Inc., Redondo Beach, Calif.

Filed April 7, 1971, Ser. No. 132,065
Int. Cl. H01q *15/20*
U.S. Cl. 343—915 **10 Claims**

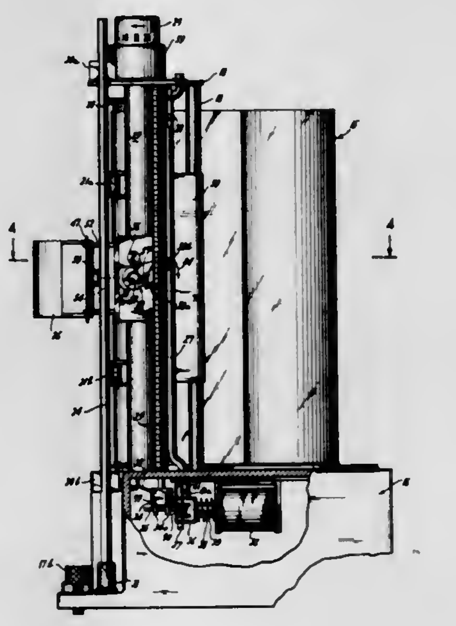
A collapsible dish structure composed of a number of radial petal assemblies spaced circumferentially about a central circular support and having rigid arcuate center petals hinged at their inner ends to the support by means of hinge shafts coupled to the petals and rigid arcuate side panels hinged along their longitudinal edges to one another and the center petals in a manner such that the petal assemblies are foldable inwardly to a compact collapsed configuration wherein the dish structure may be stowed with a space-craft or the like and outwardly to a deployed configuration wherein the petals are disposed edge to edge to form a rigid dish conforming to a surface of revolution generated about the dish axis, such as a parabolic surface.



3,715,761
SEDIMENTATION RATE TEST INSTRUMENT

Isaac J. Drekter, Queens Village, N.Y.; Frank R. Bradley, Bronx, N.Y.; Morton P. Matthew, Norwalk, Conn., and Paul Delaney, Bronx, N.Y., assignors to Sedriter Corporation, New York, N.Y.

Filed Oct. 23, 1970, Ser. No. 83,513
Int. Cl. G01n *33/16*
U.S. Cl. 346—33 A **25 Claims**



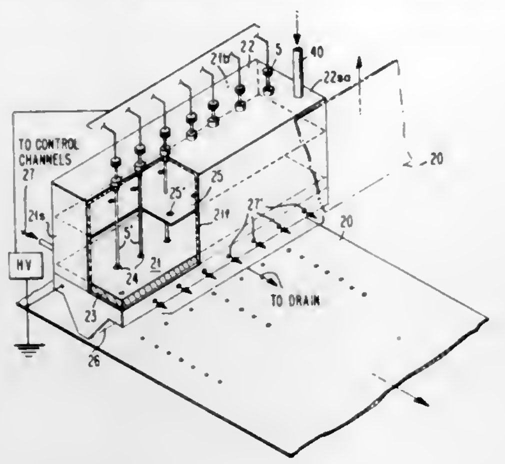
An instrument for automatically recording the falling sedimentation level during an hour-long blood sedimentation rate test. An assembly including a lamp and photo-detector tracks the falling sedimentation level and drops down vertically together with the serum-red cell interface. The falling assembly includes a pen. The assembly drops in equal increments and prior to each drop the pen is brought to bear against a strip of paper which moves at a constant rate past it. The resulting trace is a series of closely spaced dots, the vertical axis of which represents the serum-red cell interface and the horizontal axis of which represents time. The hour-long test can be run unattended, and the unit shuts off automatically.

3,715,762

METHOD AND APPARATUS FOR GENERATING ELECTROSTATIC IMAGES USING IONIZED FLUID STREAM

Peter J. Magill, Endwell; Robert E. McCurry, Vestal, and Charles A. Speicher, Endwell, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Sept. 4, 1970, Ser. No. 69,647
Int. Cl. G03g *15/00*
U.S. Cl. 346—74 ES **8 Claims**

An ionized stream is selectively channeled through a "printing head" to cause image formation on a precharged dielectric coated sheet or to a drain when it is desired to interrupt image formation. The ionized stream, in one embodiment, is channeled directly to the dielectric sheet to cause image formation and is interrupted by a control stream that diverts the ionized stream to the drain. An alternative embodiment provides for a reversal in the functions of the control stream and the ionized stream so that image formation is obtained only when the ionized stream is diverted.



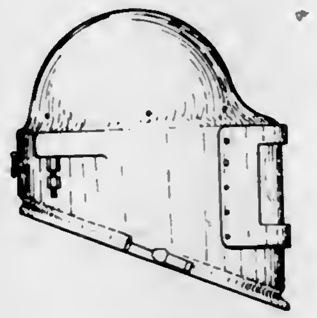
DESIGNS

FEBRUARY 6, 1973

226,251

HEAD PROTECTIVE HOOD

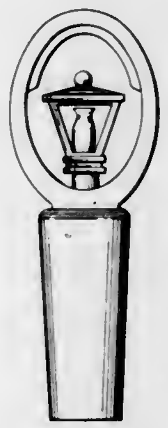
Herbert A. Raschke, Greenbrae, Calif., assignor to E. D. Bullard Company, Sausalito, Calif.
Filed Nov. 27, 1970, Ser. No. 26,204
Term of patent 14 years
Int. Cl. D2—*03*
U.S. Cl. D2—232



226,252

COMBINATION HANDLE AND HANGER FOR A BROOM OR BRUSH

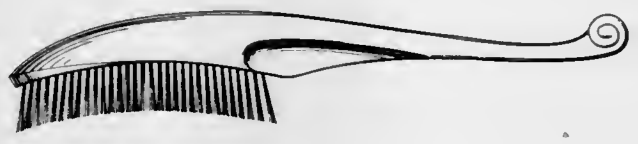
David W. Anthony, Sudbury, and Richard C. Urie, Swampscott, Mass., assignors to Stanley Home Products, Inc., Westfield, Mass.
Filed Apr. 16, 1971, Ser. No. 134,924
Term of patent 14 years
Int. Cl. D4—*01*
U.S. Cl. D4—4



226,253

HAIRBRUSH

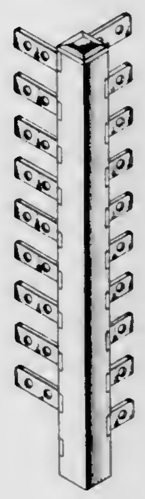
David W. Anthony, Sudbury, and Richard C. Urie, Swampscott, Mass., assignors to Stanley Home Products, Inc., Westfield, Mass.
Filed Apr. 16, 1971, Ser. No. 134,923
Term of patent 14 years
Int. Cl. D4—*02*
U.S. Cl. D4—31



226,254

WALL-CORNER MOUNTED BOTTLE RACK

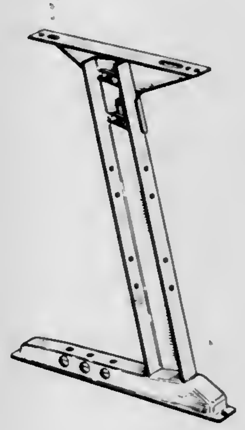
Karl Sigmund Smith, Orland Park, Ill. (ACSC 73-1588 Maxwell AFB, Montgomery, Ala. 36113)
Filed Feb. 23, 1971, Ser. No. 118,206
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—20



226,255

LEG UNIT FOR A WORKTABLE

John K. Williamson, Toronto, Ontario, Canada, assignor to National Machine Products Limited, Downsview, Ontario, Canada
Filed Mar. 15, 1971, Ser. No. 124,623
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—194

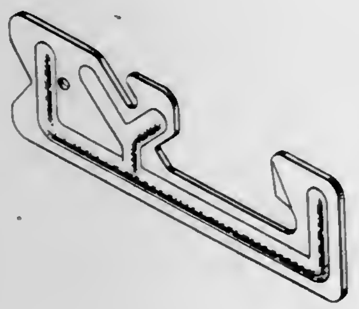


226,256

COMBINED BALE WIRE TYING AND CINCHING TOOL

Jay R. Guhl, San Leandro, Calif., assignor of a fractional part interest to W. Dean Park, San Leandro, Calif.
Filed May 20, 1971, Ser. No. 145,589
Term of patent 14 years
Int. Cl. D8—*05*

U.S. Cl. D8—44

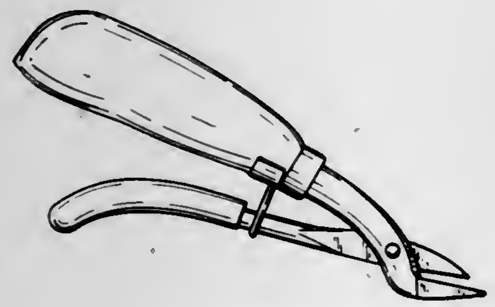


226,257

UPHOLSTERY STAPLE EXTRACTOR PLIERS

Clifton E. Robnett, Centerview, Mo.
(3109 Blackberry St., Mount Vernon, Ill. 62864)
Filed May 27, 1971, Ser. No. 147,729
Term of patent 14 years
Int. Cl. D8—*05*

U.S. Cl. D8—52

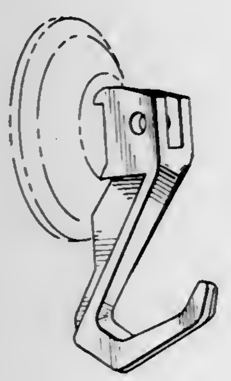


226,258

HOOK

Jordan I. Rotheiser, Highland Park, Ill., assignor to Selfix, Inc.
Filed Mar. 15, 1971, Ser. No. 124,655
Term of patent 14 years
Int. Cl. D8—*08*

U.S. Cl. D8—246

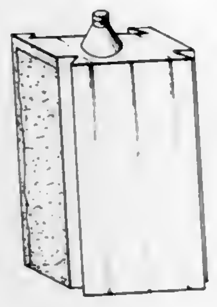


226,259

CONTAINER FOR LIQUIDS

Leard Evander Lisk, Jr., Summerfield, N.C., assignor to Lisk Enterprises Corporation, Greensboro, N.C.
Filed Oct. 8, 1971, Ser. No. 187,929
Term of patent 14 years
Int. Cl. D9—*03*

U.S. Cl. D9—175

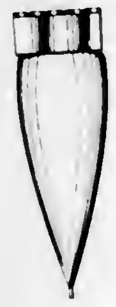


226,260

SQUEEZE TUBE OR THE LIKE

Kenji Hanamura, Tokyo, Japan, assignor to Tancho Co., Ltd., Osaka, Japan
Filed Feb. 9, 1971, Ser. No. 114,101
Term of patent 14 years
Int. Cl. D9—*03*

U.S. Cl. D9—194

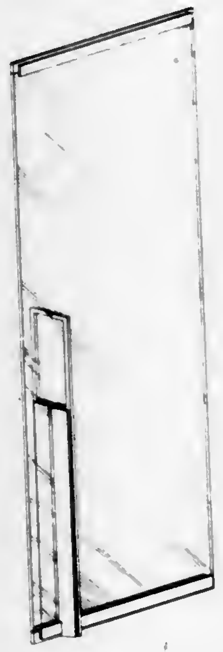


226,261

DOOR

William J. Horgan, Jr., 1299 Folkstone Drive, Pittsburgh, Pa. 15216
Original design application June 1, 1970, Ser. No. 23,254. Divided and this application June 17, 1971, Ser. No. 154,246
Term of patent 14 years
Int. Cl. D25—*02*

U.S. Cl. D13—1

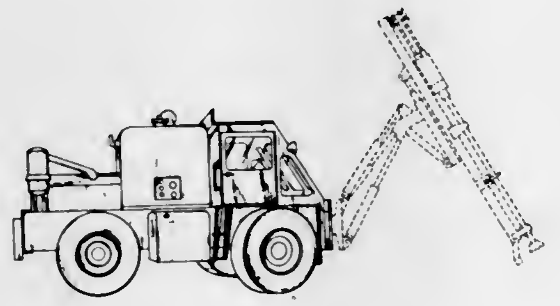


226,262

MOBILE DRILL UNIT

Arthur J. Trueblood, Salt Lake City, Utah, assignor to Western Road Machinery Company, Salt Lake City, Utah
Filed Jan. 4, 1971, Ser. No. 103,945
Term of patent 14 years
Int. Cl. D12—*09*

U.S. Cl. D14—3 A

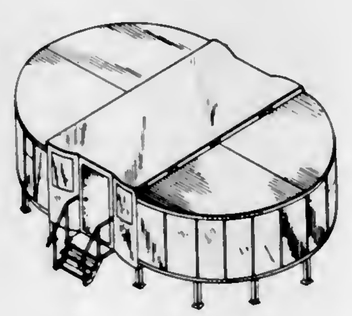


226,263

MOBILE HOME OR SIMILAR ARTICLE

William Bizzaro, Jr., 10 Huron Drive, Hudson, Mass. 01749
Filed Jan. 4, 1971, Ser. No. 103,962
Term of patent 14 years
Int. Cl. D12—*10;* D25—*03*

U.S. Cl. D14—3 E

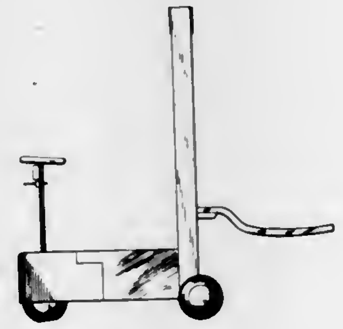


226,264

FORK LIFT VEHICLE

Donald A. Gilbrech, 1302 Beechwood Ave., Fayetteville, Ark. 72701
Filed June 24, 1971, Ser. No. 156,604
Term of patent 14 years
Int. Cl. D12—*05*

U.S. Cl. D14—3

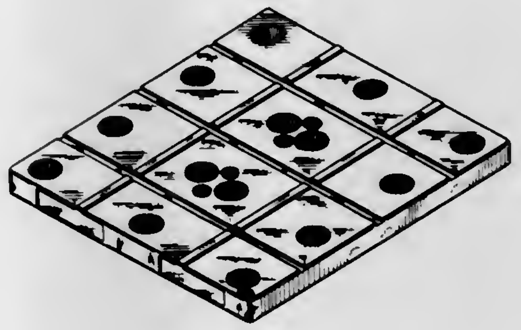


226,265

PALLET

Dennis M. Melnick and Mark Kubick, Baden, Pa., assignors to Pallet Development Inc., Ambridge, Pa.
Filed Oct. 22, 1971, Ser. No. 191,971
Term of patent 14 years
Int. Cl. D12—*99*

U.S. Cl. D14—3

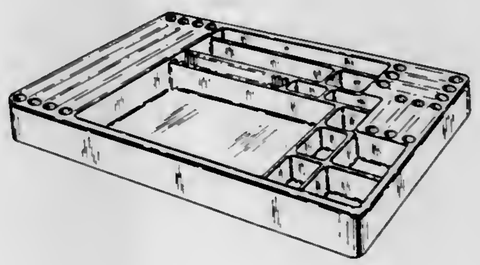


226,266

INSTRUMENT TRAY FOR USE IN HOSPITALS OR THE LIKE

Douglas J. Rem, 20525 Derby 48203, and David H. Smith, 18492 Alcoy 48205, both of Detroit, Mich.
Filed Oct. 21, 1970, Ser. No. 25,588
Term of patent 14 years
Int. Cl. D14—*02*

U.S. Cl. D16—1 A

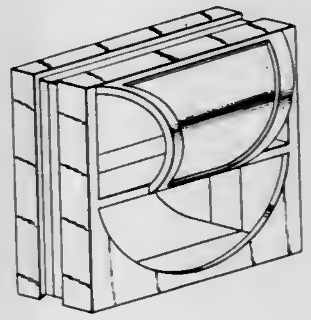


226,267

STRUCTURAL BUILDING BLOCK

Roland Speller, Lemgo, Germany, assignor to Richard Heinze, Herford, Germany
Filed Nov. 9, 1971, Ser. No. 197,201
Term of patent 14 years
Int. Cl. D25—*01*

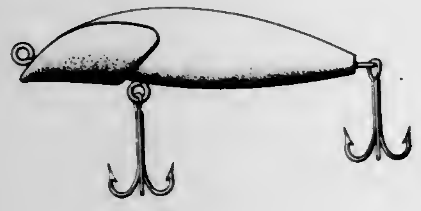
U.S. Cl. D18—2 R



226,268
FISH LURE

Willie J. Teague, 30040 SW. 148th Ave.,
Homestead, Fla. 33123
Filed June 28, 1971, Ser. No. 157,810
Term of patent 14 years
Int. Cl. D22—*05*

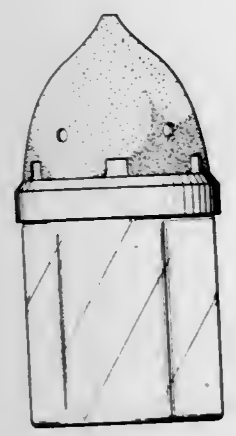
U.S. Cl. D22—27



226,269
DISPENSER FOR TOILET TANKS OR THE LIKE

George A. Sarandos, 6906 Ashcroft,
Houston, Tex. 77006
Filed June 4, 1971, Ser. No. 150,264
Term of patent 14 years
Int. Cl. D23—*99*

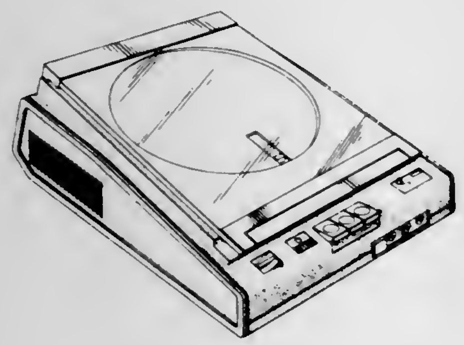
U.S. Cl. D23—3



226,270
TEACHING MACHINE

Masayuki Sakuma, Tokyo, Japan, assignor to Kabushiki Kaisha Ricoh, Tokyo, Japan
Filed June 3, 1971, Ser. No. 149,873
Claims priority, application Japan Dec. 7, 1970
Term of patent 14 years
Int. Cl. D14—*01*

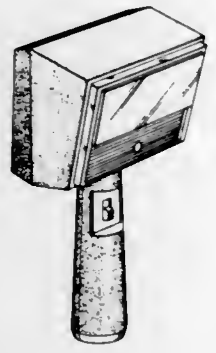
U.S. Cl. D25—1



226,271
MULTIMETER CASING

Norman Holtzman, Los Angeles, Calif., assignor to Hanson-Hawk, Inc., a division of Orion Industries, Chatsworth, Calif.
Filed June 29, 1971, Ser. No. 158,147
Term of patent 14 years
Int. Cl. D10—*05*

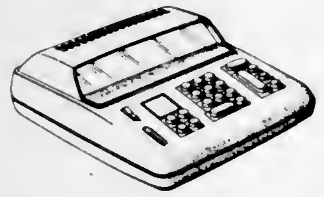
U.S. Cl. D26—1 Q



226,272
ELECTRONIC CALCULATOR

Hideki Ishii and Tatehiko Nakanishi, Tokyo, Japan, assignors to Kabushiki Kaisha Ricoh, Tokyo, Japan
Filed Mar. 16, 1971, Ser. No. 125,024
Claims priority, application Japan Sept. 24, 1970
Term of patent 14 years
Int. Cl. D14—*02*

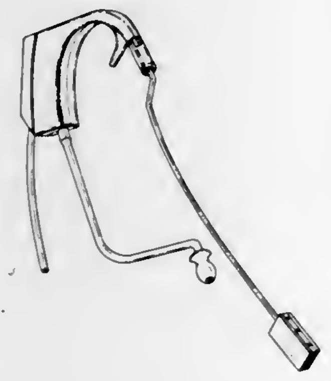
U.S. Cl. D26—5



226,273
LIGHTWEIGHT HEADSET

John F. Tyson and James W. M. Bee, Ottawa, Ontario, Canada, assignors to Northern Electric Company Limited, Montreal, Quebec, Canada
Filed Mar. 3, 1971, Ser. No. 120,801
Term of patent 14 years
Int. Cl. D14—*03*

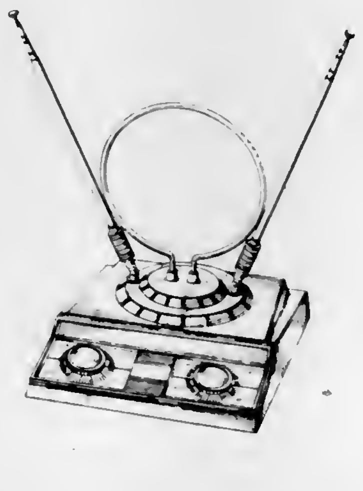
U.S. Cl. D26—14 H



226,274
INDOOR ANTENNA OR SIMILAR ARTICLE

John David Callaghan, Cherry Hill, N.J., and Raymond Kaysen, Glenside, Pa., assignors to RCA Corporation
Filed Aug. 16, 1971, Ser. No. 172,376
Claims priority, application Great Britain May 20, 1971
Term of patent 14 years
Int. Cl. D14—*03*

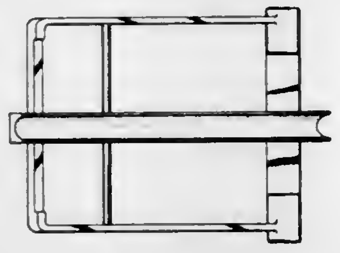
U.S. Cl. D26—14



226,275
POOL TABLE ATTACHMENT FOR PROJECTING CUE BALLS

Willard D. Sanford, East Point, Ga. (2604 Old Hapeville Road SW., Apt. 9, Atlanta, Ga. 30315)
Filed Apr. 12, 1971, Ser. No. 133,469
Term of patent 14 years
Int. Cl. D21—*01*

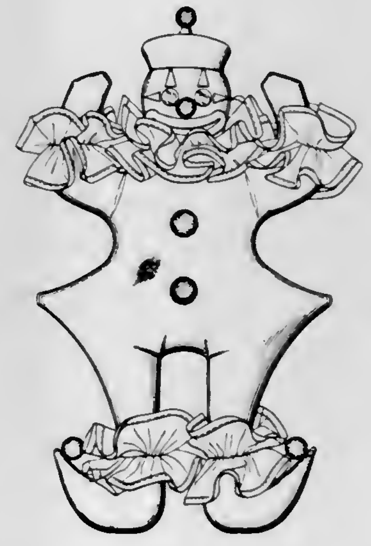
U.S. Cl. D34—3 R



226,276
TOY CLOWN FIGURE

Alma A. Henney, 942 E. Navilla Place,
Covina, Calif. 91722
Filed July 1, 1971, Ser. No. 159,103
Term of patent 14 years
Int. Cl. D21—*01*

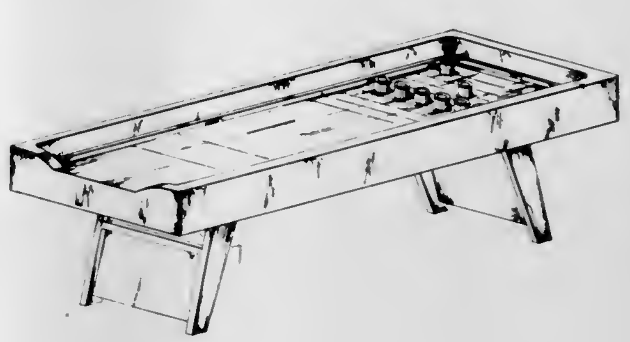
U.S. Cl. D34—4 A



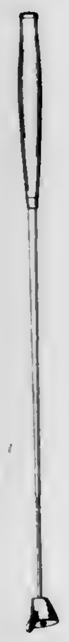
226,277
GAME TABLE

Joseph J. Sparacino, West Berlin, N.J.
(3001 Tennessee Ave., Fort Pierce, Fla. 33450)
Filed May 11, 1970, Ser. No. 22,931
Term of patent 14 years
Int. Cl. D21—*01*

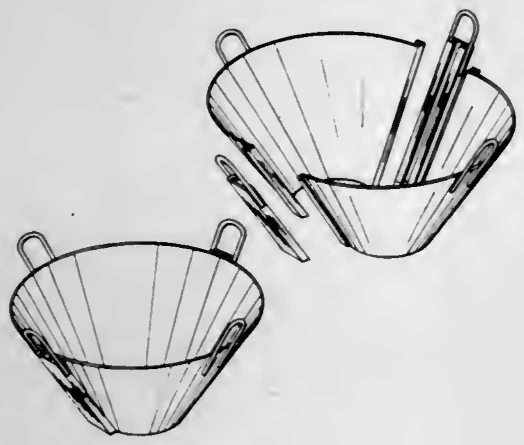
U.S. Cl. D34—5



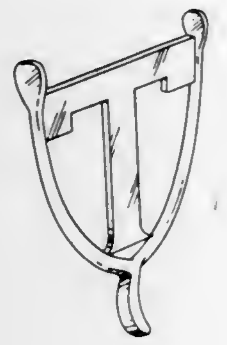
226,278
GOLF CLUB
Samuel Lombardo, 3419 Corinna Drive,
Palos Verdes Peninsula, Calif. 90274
Filed July 23, 1971, Ser. No. 165,874
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5



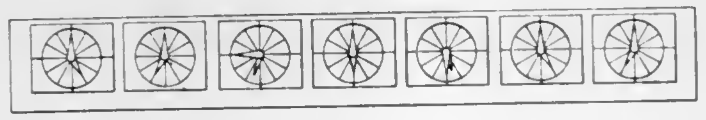
226,279
DISASSEMBLABLE TREE BALL TRANSPORTER
Eugene B. Eyerly, Denver, Colo., assignor to
Lew Hammer, Inc.
Filed Mar. 24, 1971, Ser. No. 127,866
Term of patent 14 years
Int. Cl. D15—*03*
U.S. Cl. D35—1



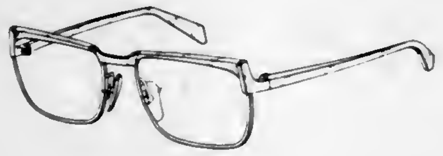
226,280
BROOCH OR SIMILAR ARTICLE
Alan H. Minter, 1602 W. Lynn, Austin, Tex. 78703
Filed Mar. 1, 1972, Ser. No. 231,069
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D45—19 P



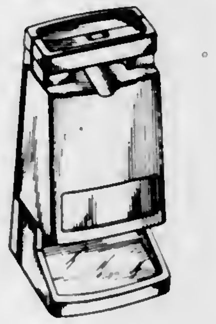
226,281
TIME INDICATOR FOR COOKING
Leroy C. Lowe, P.O. Box 1241, Seattle, Wash. 98111
Filed June 24, 1971, Ser. No. 156,582
Term of patent 14 years
Int. Cl. D10—*99*
U.S. Cl. D52—6 B



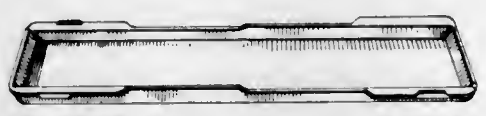
226,282
SPECTACLES
Luc André Marcel Tagnon, Paris, France, assignor to
Societe des Lunetiers, Paris, France
Filed Apr. 19, 1971, Ser. No. 135,514
Claims priority, application France Nov. 6, 1970
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D57—1



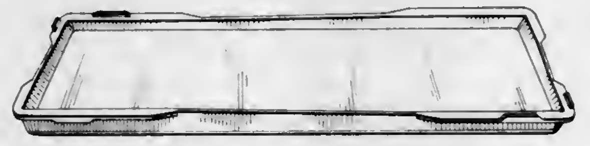
226,283
MICROSCOPE
John George Shield, St. Leonards-on-Sea, England, assignor to The Educational Supply Association Limited, Stevenage, Hertfordshire, England
Filed July 2, 1971, Ser. No. 159,580
Claims priority, application Great Britain Jan. 5, 1971
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D57—1 E



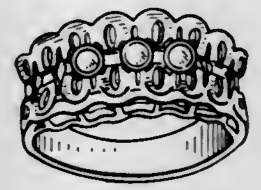
226,284
TRAY
Robert F. Bateman, St. Paul, Minn., assignor to
Plastics, Inc., St. Paul, Minn.
Filed June 9, 1971, Ser. No. 151,625
Term of patent 14 years
Int. Cl. D7—*99*
U.S. Cl. D44—10 E



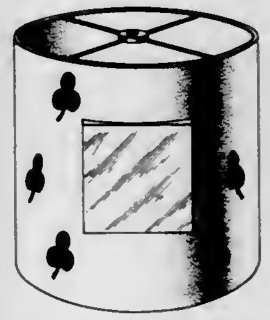
226,285
INTERLOCKING TRAY
Robert F. Bateman, St. Paul, Minn., assignor to
Plastics, Inc., St. Paul, Minn.
Filed June 9, 1971, Ser. No. 151,626
Term of patent 14 years
Int. Cl. D7—*99*
U.S. Cl. D44—10 E



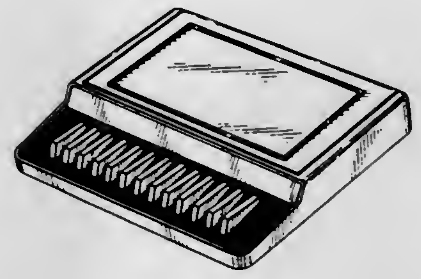
226,286
FINGER RING
Daniel Shiman, Maplewood, N.J., assignor to Shiman
Industries Inc., Newark, N.J.
Filed Apr. 30, 1971, Ser. No. 139,300
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D45—10



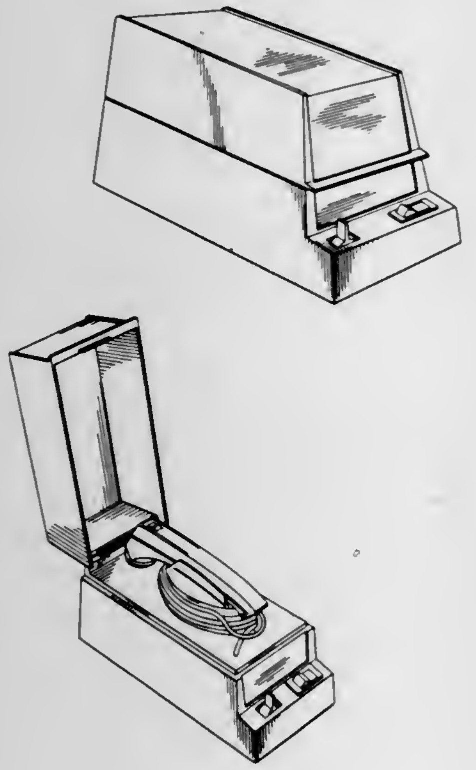
226,287
COMBINED LAMP SHADE AND MIRROR
Aime Trudeau, 227 NE. 26th St., Miami, Fla. 33137
Filed Dec. 14, 1970, Ser. No. 26,490
Term of patent 14 years
The portion of the term of the patent subsequent to
May 10, 1985, has been disclaimed
Int. Cl. D26—*05*
U.S. Cl. D48—16 E



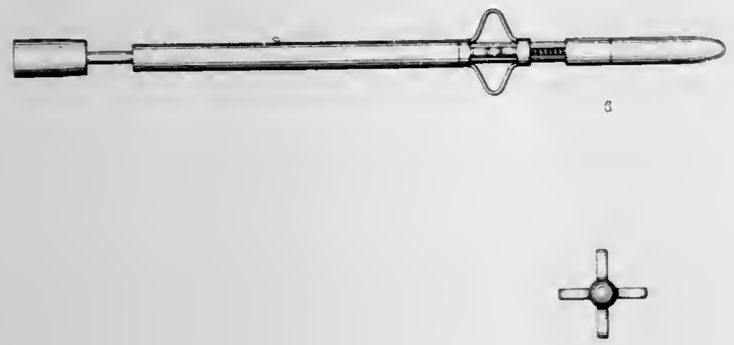
226,288
TELEPHONE INDEX
Francis Greif, London, England, assignor to British &
International Proprietaries Limited, London, England
Filed Feb. 3, 1972, Ser. No. 223,403
Claims priority, application Great Britain Jan. 20, 1972
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D74—1 C



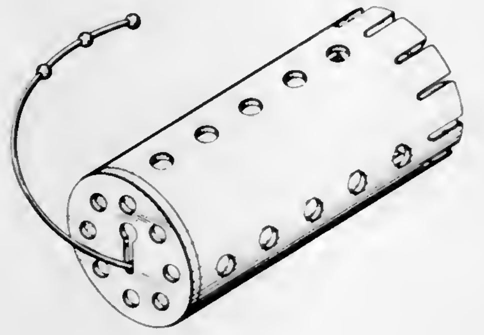
226,289
COMBINED STIMULATING AND CLEANING DEVICE
Medard W. Welch, 1111 Sheridan Road, Winnetka, Ill. 60093
Filed Jan. 20, 1971, Ser. No. 108,254
Term of patent 14 years
Int. Cl. D24—*05, 99*
U.S. Cl. D83—1



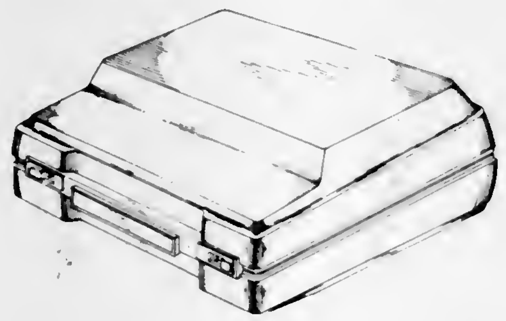
226,290
CATHETER
Charles H. Cohen and Vernon F. Leonard, Denver, Colo., assignors to Goldberg Plastics, Inc., Denver, Colo.
Filed Mar. 15, 1971, Ser. No. 124,648
Term of patent 14 years
Int. Cl. D24—*04*
U.S. Cl. D83—12



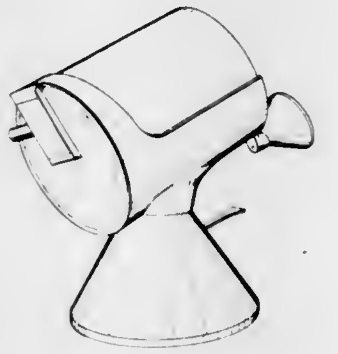
226,291
COMBINED HAIR ROLLER AND ADJUSTABLE HAIR HOLDING BAND
George Gebhart, Seminole, Fla., assignor to Consolidated Foods Corporation, Chicago, Ill.
Filed Oct. 7, 1971, Ser. No. 187,592
Term of patent 7 years
Int. Cl. D28—*03*
U.S. Cl. D86—10



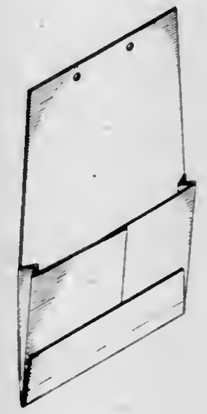
226,292
TYPEWRITER CARRYING CASE
James J. Bienkowski, East Syracuse, and Chester J. Abend, Camillus, N.Y., assignors to SCM Corporation, New York, N.Y.
Filed Apr. 13, 1971, Ser. No. 133,772
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D87—1



226,293
ICE SHAVER
Isamu Kawamata, 18–14 Akatsuka 5-chome, Itabashi-ku, Tokyo, Japan
Filed July 14, 1971, Ser. No. 162,756
Term of patent 14 years
Int. Cl. D7—*04*
U.S. Cl. D89—1



226,294
POCKET INSERT FOR A FILING FOLDER
Rachel Gnader, 4140 Army St., San Francisco, Calif. 94120
Continuation-in-part of design application Ser. No. 15,712, Feb. 10, 1969. This application June 18, 1970, Ser. No. 23,557
Term of patent 14 years
Int. Cl. D19—*99*
U.S. Cl. D74—2



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 6TH DAY OF FEBRUARY, 1973

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

- AAI Corporation: *See—*
  - Young, Robert B., 3,714,896.
- Abbott Laboratories: *See—*
  - De Vault, Robert Larry, 3,715,352.
  - Hirata, Arthur Atsunobu, 3,715,427.
- Abnett, Albert C.; and Foster, George B., to Reliance Electric Company. Inductive non-contact vibration analyzer which is independent of standoff distance. 3,715,659, Cl. 324-34.00d.
- ACF Industries, Incorporated: *See—*
  - Carter, John H., 3,715,053.
- Addressograph-Multigraph Corporation: *See—*
  - Van Dusen, Charles H., Jr.; and Brown, Paul, 3,714,891.
- Adler, Robert, to Zenith Radio Corporation. Electro-optical groove tracking apparatus for video reproducing system. 3,715,524, Cl. 179-100.30v.
- Advanced Digital Systems Inc.: *See—*
  - Polus, Anthony P.; and Scheel, Russell H., 3,715,040.
- Agfa-Gevaert Aktiengesellschaft: *See—*
  - Bestenreiner, Friedrich, 3,715,154.
  - Engelsmann, Dieter; Hackenberg, Hubert; and Karl, Horst, 3,714,874.
  - Hennig, Fridolin; Kellner, Hans-Jurgen; Potz, Klaus; and Gotze, Christian, 3,715,261.
  - Hunicke, Wolfgang; Spohr, Rolf; Schranz, Karl-Wilhelm; Busch, Josef; Schon, Erwin; and Frick, Hans-Dieter, 3,714,883.
  - Kisselmann, Willy; Ruempelein, Fritz; and Kopf, Paul, 3,715,658.
  - Schranz, Karl-Wilhelm; Hunicke, Wolfgang; and Busch, Josef, 3,714,882.
  - Schroder, Rolf, 3,714,877.
- Ahl, Nils Goran; and Larsson, Lars Herbert, to Conrail AB. Weighing device. 3,714,997, Cl. 177-136.000.
- Ainscough, John Brian: *See—*
  - Rigby, Frank; and Ainscough, John Brian, 3,715,273.
- Ainslie, Robert E.: *See—*
  - Herring, Theodore C.; Bracht, Ernest F.; Ainslie, Robert E.; Todd, Eugene M.; and Franz, Joseph J., 3,715,668.
- Ainsworth, Richard: *See—*
  - Stein, Wolfgang J.; Ainsworth, Richard; and Berkner, Horst D., 3,714,779.
- Air Products and Chemicals, Inc.: *See—*
  - Longsworth, Ralph C., 3,714,796.
- Air Reduction Company, Incorporated: *See—*
  - Hoffman, Joseph K., 3,715,413.
- Aitken, James B., to Instant Structures, Inc. Portable building construction. 3,714,749, Cl. 52-70.000.
- Aizawa, Masanobu; and Mori, Kijuu, to Stanley Electric Co., Ltd. Method for producing sheet supported coiled conductors. 3,714,691, Cl. 29-25.150.
- Aizawa, Tatsuo: *See—*
  - Nihyakumen, Kouzi; Yokoyama, Taizo; Ueda, Yasuo; Kamezawa, Yasutoki; and Aizawa, Tatsuo, 3,715,213.
- Ajax Magnethermic Corporation: *See—*
  - Biringer, Paul Peter, 3,715,647.
- Ajinomoto Co., Inc.: *See—*
  - Suzuki, Hiroyuki; Shionoya, Gosaburo; Suzuki, Yoshihisa; and Hirahara, Tsuneo, 3,715,279.
- Akahori, Hiroshi; Kubozoe, Morioki; Furuya, Toshihiro; and Ueno, Sadayasu, to Hitachi, Ltd. Method of and apparatus for attaining focusing following variation in magnification in electron microscope. 3,715,582, Cl. 250-49.50a.
- Akai, Naotoshi: *See—*
  - Yusa, Yasushi; Akai, Naotoshi; Satoh, Kimio; and Sekizawa, Yasuharu, 3,715,431.
- Aktiebolaget Atomenergi: *See—*
  - Hammarlind, Alf Martin, 3,715,561.
- Alburger, James R. Inspection penetrant development process employing fusible waxes. 3,715,227, Cl. 117-37.00r.
- Allen, George W.; and Gray, Charles S. Retractable suspension and running gear for trailers. 3,715,128, Cl. 280-43.220.
- Allen, John Kenneth, to RCA Corporation. Service switch arrangement for improved interlace performance. 3,715,493, Cl. 178-7.30r.
- Allen, Kenneth C.; and Boshinski, Edwin E., to Hobart Manufacturing Company, The. Weighing scale with improved dash pot. 3,714,998, Cl. 177-189.000.
- Allen, Michael George; and Tiers, George Van Dyke, to Minnesota Mining and Manufacturing Company. Preparation of poly(isocyanurate-urethanes) using trithiocarbonates as catalysts. 3,715,337, Cl. 260-77.5nc.
- Allen, Robert D.; and Lysher, Wayne M., to McDonnell Douglas Corporation. Composite thermal insulation. 3,715,265, Cl. 161-125.000.
- Allen, Walter K.: *See—*
  - Laughlin, Charles R.; Hollenbaugh, Roger C.; and Allen, Walter K., 3,715,663.
- Allied Chemical Corporation: *See—*
  - Morgan, Thomas R.; Low, William W.; Wamser, Christian A.; and Bruen, Charles P., 3,715,425.
  - Rumanowski, Edmund J., 3,715,380.
  - Spaunburgh, Richard G.; and Hino, John B., 3,715,381.
  - Truesdell, Robert E.; and Nienstedt, William H., 3,715,256.
- Allis-Chalmers Corporation: *See—*
  - Dreisin, Alexander, 3,714,935.
  - Dreisin, Alexander, 3,714,936.
- Allison, Birt, Jr.: *See—*
  - Brown, Rene Paul; Allison, Birt, Jr.; and D'Ostrowick, Pierre Marie Joseph Ghislain de Radzitzky, 3,715,408.
- Allmanna Svenska Elektriska Aktiebolaget: *See—*
  - Grune, Per-Olof; Pucher, Walter; and Sandkvist, Hugo, 3,715,542.
- Allport, Walter, to Cutler-Hammer, Inc. Film duplicating apparatus. 3,715,159, Cl. 355-110.000.
- Alonso, Gabriel: *See—*
  - Fontaine, Bernard J.; and Alonso, Gabriel, 3,715,728.
- Altman, Leonard F.; and Sharp, Marcus, to General Instrument Corporation, mesne. Aluminum etching solution. 3,715,250, Cl. 156-22.000.
- Alves Photo Service, Inc.: *See—*
  - Lee, Richard G., 3,714,858.
- Amari, Katsutoshi: *See—*
  - Tsuchiya, Noriyuki; Amari, Katsutoshi; Moriya, Takao; and Takahashi, Shideko, 3,715,285.
- Amato, Jack C.; and Sansone, Eugene A., to Singer Company, The. Shuttle boxing detector for fly-shuttle looms. 3,714,972, Cl. 139-336.000.
- AMBAC Industries, Incorporated: *See—*
  - Licht, John J., 3,715,521.
- Americal Corporation: *See—*
  - Minton, Clarence W., 3,714,799.
- American Air Filter Company, Inc.: *See—*
  - Wood, Walter B.; Shuler, Bernard R.; Bromm, Charles A.; and Welch, Wilson A., 3,715,578.
- American Can Company: *See—*
  - Batchelar, Raymond Luscombe; and Heinle, Carl William, 3,715,050.
  - Gedde, Erik, 3,715,054.
  - Hanke, Edward Herman, 3,715,051.
  - Kinkel, Christian Frederick; and Phalin, Thomas Lawrence, 3,715,052.
  - Kubacki, Edward Frank, 3,714,854.
  - Phalin, Thomas Lawrence; and Birkholz, William Stephen, 3,714,755.
  - Van Tilberg, Jan, 3,714,687.
- American Cyanamid Company: *See—*
  - Epstein, Joseph William; and Goldman, Leon, 3,715,361.
  - Mayell, Jaspal Singh, 3,715,238.
  - Sherr, Allan Ellis, 3,715,386.
- American Metal Climax, Inc.: *See—*
  - Brown, Laddie L., 3,714,673.
- American Monitor Corporation: *See—*
  - Denney, Jerry W., 3,715,188.
- American Optical Corporation: *See—*
  - Day, Christopher C.; and Grace, Wesley R., 3,714,939.
  - Young, Charles Gilbert, 3,715,682.
- American Standard, Inc.: *See—*
  - Gerken, Carl F.; and Bales, Emmett R., 3,715,143.
- American Velcro Inc.: *See—*
  - Erb, George H., 3,715,415.
- Amon, Joy Mary: *See—*
  - Amon, Robert, 3,715,429.
- Amon, Robert; deceased (Amon, Joy Mary; Administratrix; and Tobin, Julian Jacob; Joint Administrator). Deformation of hair with thiourea dioxide and activating agents therefor. 3,715,429, Cl. 424-71.000.
- AMP Incorporated: *See—*
  - Hoffman, Joseph Willard, 3,714,712.
  - Hoffman, Norman Edwin, 3,715,459.
  - Swengel, Robert Charles, Sr., 3,715,629.
- AMP Incorporated, mesne: *See—*
  - Teagno, Wladimiro; and Campari, Luigi, 3,715,457.
  - Trevisiol, Franco; and Bergonzi, Mario, 3,715,527.
- Ampeg Company, Inc., The: *See—*
  - Figlin, Murray S.; and Boenisch, John R., 3,715,676.
- Anchor Hocking Corporation: *See—*
  - Roberts, Cecil P.; and Ochs, Charles S., 3,714,760.

- Anderson, Melvin R., to Westinghouse Electric Corporation. Terminal block with snap-in components. 3,715,707, Cl. 339-198.00r.
- Anderson, Philip J.; and Ng, Daniel Y. C., to Institute of Gas Technology. System for increasing the shock loading resistance of structures. 3,714,909, Cl. 109-1.00s.
- Anderson, Ralph; and Beyer, Rodney B., to Future Systems, Inc. Electroplating apparatus including means to disturb the boundary layer adjacent a moving electrode. 3,715,299, Cl. 204-212.000.
- Andrews, David Arthur, to Toms River Chemical Corporation. Preparation of 1,4-diamino-2-alkoxy (phenoxy)-anthraquinones. 3,715,373, Cl. 260-380.000.
- Angeles Metal Trim Co.: *See—*
  - Costruba, Peter, 3,714,748.
- Angelica Corporation: *See—*
  - Hardy, John C., 3,714,947.
  - Mirabella, Anthony C., 3,714,668.
- Angelstrand, Borje; and Mostrom, Ragnar, to Saab Aktiebolag. Film moving means in machine for reading bubble chamber photographs. 3,715,086, Cl. 242-67.300.
- Anninos, Athanasious P., to Emery Industries, Inc. Drycleaning method and detergents therefor. 3,715,186, Cl. 8-142.000.
- Aoki, Masayoshi. Waterproof watch with interlocking crystal support ring and movement support ring. 3,714,775, Cl. 58-90.00r.
- Applebaum, Sidney P.; and Geyer, Bernard H., Jr., to General Electric Company. Coherent range and length resolution. 3,715,753, Cl. 343-17.2pc.
- Aqua-Chem, Inc.: *See—*
  - Gething, Frank, 3,714,764.
- Araki, Shinichi: *See—*
  - Susuki, Rinnosuke; Hoshi, Hiroshi; Araki, Shinichi; and Miyamoto, Shinzo, 3,715,063.
- Arbogast & Bastian, Inc.: *See—*
  - Feely, Robert L., 3,715,218.
- Archer, Donald H., to Raytheon Company. Multi-beam radio frequency system. 3,715,749, Cl. 343-5.00r.
- Archibald, Frederick R.; and Hatch, Gerald G., to Falconbridge Nickel Mines Limited. Electric arc furnace operation. 3,715,200, Cl. 75-10.000.
- Arciprete, Genio R., to Dennison Manufacturing Company, mesne. Data input encoder. 3,715,745, Cl. 340-347.0dd.
- Arcos Corporation: *See—*
  - Norcross, James E.; and Garwood, George, 3,715,559.
- Armco Steel Corporation: *See—*
  - Clements, William C.; and Bootz, William, 3,714,787.
  - Evans, Ralph E.; and Blower, Howard E., 3,714,786.
- Aro Corporation, The: *See—*
  - Hanning, John R., 3,714,969.
- Asahi Kasei Kogyo Kabushiki Kaisha: *See—*
  - Nogami, Sumitaka; Saito, Shizuko; and Okada, Tooru, 3,715,330.
- Ashland Oil, Inc.: *See—*
  - Slagel, Robert C.; and Culbertson, Billy M., 3,715,343.
- Astengo, Ralph A., to Sundstrand Data Control, Inc. Ground proximity warning system utilizing radio and barometric altimeter combination. 3,715,718, Cl. 340-27.00r.
- Atlantic Richfield Company: *See—*
  - Howell, Eddie P.; Hardison, Jack E.; and Campbell, William M., 3,714,832.
  - Meyers, Joseph A., III; and Cahill, Joseph A., 3,715,185.
  - Teeter, Ford C.; Sheldahl, David B.; and Highberg, Carle W., 3,715,312.
  - Wolgemuth, Larry G.; and Fritock, William H., 3,715,385.
- Atwood, George R.: *See—*
  - Dowling, Donald J.; and Atwood, George R., 3,715,655.
- Audesse, Emery G.; Tartakoff, Alexander; and Robertson, John K., to GTE Sylvania Incorporated. Shatter-resistant incandescent lamp. 3,715,232, Cl. 117-72.000.
- Auer, Siegfried O., to United States of America, National Aeronautics and Space Administration. Micrometeroroid analyzer. 3,715,590, Cl. 250-83.30r.
- August Herzog Maschinenfabrik: *See—*
  - Berger, Heinz, 3,714,862.
  - Strangfeld, Reiner, 3,714,861.
- Aupoix, Marcel; and Moisson-Franckhauser, Francois, to Compagnie Generale d'Electricite. Cryogenic connection enclosure. 3,715,453, Cl. 174-15.00c.
- Automata Corporation: *See—*
  - Azure, Leo L., Jr., 3,715,568.
- Avco Corporation: *See—*
  - Setterblade, Earl O., 3,714,920.
  - Stein, Wolfgang J.; Ainsworth, Richard; and Berkner, Horst D., 3,714,779.
- Azure, Leo L., Jr., to Automata Corporation. System for gathering and transmitting source data. 3,715,568, Cl. 235-61.70r.
- Bacskai, Robert, to Chevron Research Company. Linear polyester backbone quaternary ammonium polyelectrolytes. 3,715,335, Cl. 260-75.00n.
- Badische Anilin- & Soda Fabrik Aktiengesellschaft: *See—*
  - Schmid, Hans; Feldhoff, Heinrich; Martin, Wolfgang; Bauer, Wolfgang; and Herion, Dieter, 3,714,686.
- Badische Anilin- Soda-Fabrik Aktiengesellschaft: *See—*
  - Gaeng, Manfred; and Dimroth, Peter, 3,715,360.
- Bahnson Company, The: *See—*
  - Sloan, Donald A., 3,714,676.
- Bahr, Alfred J., to Stanford Research Institute. Electrically controlled reflection of acoustic surface waves. 3,715,674, Cl. 330-12.000.
- Bakelite Xylonite Limited: *See—*
  - Butcher, Edward Peter, 3,715,310.
- Baker Perkins Limited: *See—*
  - Edwards, Albert, 3,715,106.
- Bales, Emmett R.: *See—*
  - Gerken, Carl F.; and Bales, Emmett R., 3,715,143.
- Balling, Theodore Thomas; Leonard, Richard J.; Ponzoni, George Bernard; Protomastro, Michael Gabriel; and Stefanucci, Arthur, to General Foods Corporation. Successive quenching of coffee during roasting. 3,715,215, Cl. 99-68.000.
- Balzer, Norbert R.; and Kasper, Robert J., to Park-Ohio Industries, Inc. Slab heating method and apparatus. 3,715,556, Cl. 219-10.690.
- Bancroft, H. S., Corporation: *See—*
  - Cunnane, Jeffrey B., 3,715,258.
- Bandurco, Victor; Elpern, Bill; and Shroff, James R., to USV Pharmaceutical Corporation. N-amino-benzamidines. 3,715,396, Cl. 260-564.00r.
- Banks, Gary R. Device for displaying sheet members having indicia thereon. 3,714,725, Cl. 40-84.000.
- Barber, Anthony Clifford: *See—*
  - Clayton, Anthony Robert King; and Barber, Anthony Clifford, 3,715,243.
- Barber, Franklin D., to Standard Car Truck Company. Dampened railway car truck. 3,714,905, Cl. 105-195.0db.
- Barlow, Richard A. Expandable A-frame type trailable building structure. 3,714,746, Cl. 52-69.000.
- Barnes, Onald R., to Mohr, John, & Sons. Poultry shackle. 3,715,026, Cl. 198-177.000.
- Barnett, Allen M.; and Galginattis, Simeon V., to General Electric Company. Selective liquid phase epitaxial growth process. 3,715,245, Cl. 148-171.000.
- Barone, Bruno J.: *See—*
  - Croce, Louis J.; and Barone, Bruno J., 3,715,390.
- Barone, Bruno J.; and Croce, Louis J., to Petro-Tex Chemical Corporation. Promotion of the oxidation of mononuclear aromatic compounds. 3,715,391, Cl. 260-523.00a.
- Barthel, Rolf: *See—*
  - Hofmann, Ernst-Gunther; Meyerhoff, Klaus; Offermann, Bernd Peter; and Barthel, Rolf, 3,715,597.
- Bartholomew, Roger F.; and Garfinkel, Harmon M., to Corning Glass Works. Method of removing SO_2 and NO_2 from gases. 3,715,187, Cl. 423-235.000.
- BASF Wyandotte Corporation: *See—*
  - Louvar, Joseph F.; and Nichols, Newlin S., 3,715,402.
- Bastide, Claude, to Etablissements Roffo. Spraying device for a liquid distributing system for agricultural use. 3,715,080, Cl. 239-444.000.
- Batchelar, Raymond Luscombe; and Heinle, Carl William, to American Can Company. Full panel easy open end. 3,715,050, Cl. 220-54.000.
- Battey, Robert F., to FMC Corporation. Apparatus and method for handling volatile liquids. 3,714,790, Cl. 62-54.000.
- Batts, Colossie N. Variable time base integrator circuit for buffet signal measurements. 3,714,827, Cl. 73-147.000.
- Bauer, Wolfgang: *See—*
  - Schmid, Hans; Feldhoff, Heinrich; Martin, Wolfgang; Bauer, Wolfgang; and Herion, Dieter, 3,714,686.
- Bauernfeind, Jacob Christopher; and Mitrovic, Milan, to Hoffmann-La Roche Inc. Growth promotion in swine. 3,715,433, Cl. 424-229.000.
- Baum, Donald J. Golf game device. 3,715,123, Cl. 273-35.00r.
- Baum Electrophysik GmbH: *See—*
  - Baum, Walter; and Still, Michael, 3,715,673.
- Baum, Walter; and Still, Michael, to Baum Electrophysik GmbH. Noise suppresion for communication cables. 3,715,673, Cl. 328-165.000.
- Baumann, Hans D. Adjustable fluid restrictor method and apparatus. 3,715,098, Cl. 251-121.000.
- Bausch & Lomb Incorporated: *See—*
  - Leighty, Clifford A.; Sliwkowski, Joseph J.; and Sullivan, Bernard J., 3,715,166.
- Bayer Aktiengesellschaft: *See—*
  - Bockmann, Walter, 3,715,283.
  - Traubel, Harro; and Oertel, Harald, 3,715,326.
- Bayes, Lowell D.; and Cole, Robert B., to Belden Corporation. Electrical cable structure. 3,715,458, Cl. 174-113.00r.
- Bayless, Jack H., to Esso Production Research Company. Steam oil recovery process. 3,714,985, Cl. 166-303.000.
- Beagles, Robert, to TRW Inc. Intrustion detection system employing triple coincidence space-time logic. 3,715,712, Cl. 340-276.000.
- Beals, Clifford L. Medicine dispensing cabinet. 3,715,148, Cl. 312-209.000.
- Beard, William L., Jr.; and Hahn, Ronald E., to Whirpool Corporation. Knit cycle for clothes dryers. 3,714,717, Cl. 34-45.000.
- Becker, Karl, KG Maschinenfabrik: *See—*
  - Becker, Reinhard, 3,715,057.
- Becker, Reinhard, to Becker, Karl, KG Maschinenfabrik. Apparatus for separating and/or counting individual elements of a plurality. 3,715,057, Cl. 221-211.000.
- Beckman Instruments, Inc.: *See—*
  - Cosgrove, Richard E.; Krull, Irwin H.; and Mask, Charles A., 3,715,297.
  - Gilbert, Paul T., 3,714,829.
- Beeson, Phillip, to United States of America, Air Force. Method for forming thrust chambers. 3,714,695, Cl. 29-157.00c.

- Belardinelli, Giorgio: *See—*
  - Sianesi, Dario; Pasetti, Adolfo; and Belardinelli, Giorgio, 3,715,378.
- Belden Corporation: *See—*
  - Bayes, Lowell D.; and Cole, Robert B., 3,715,458.
- Bell & Howell Company: *See—*
  - Freeland, Stanley R., 3,715,149.
  - Koeber, Henry J., 3,715,161.
- Bell, Allan D., Jr., to Dektor Counterintelligence and Security. Telephone security device. 3,715,514, Cl. 179-81.00e.
- Bell Telephone Laboratories, Inc.: *See—*
  - Lynes, Dennis Joseph, 3,715,732.
- Bell Telephone Laboratories, Incorporated: *See—*
  - Brown, Earl Franklin; and Kaminski, William, 3,715,489.
  - Campbell, Robert Riddle; Honnold, George Herbert; and Lefkowitz, Michael, 3,715,518.
  - Chang, Robert Wu-Lin, 3,715,665.
  - Feiner, Alexander; and Harding, Philip A., 3,715,733.
  - Fleischer, Paul Egon, 3,715,679.
  - Fleischer, Paul Egon, 3,715,680.
  - Gordon, Eugene Irving; and Maydan, Dan, 3,715,685.
  - Gordon, Travis Hill; Marino, Patrick John; and Pilc, Randolph John, 3,715,505.
  - Hirsch, Donald; and Spaulding, David Adams, 3,715,670.
  - Kelly, James Michael, 3,715,512.
  - Kurth, Carl Ferdinand, 3,715,691.
  - Limb, John Ormond; and Pease, Roger Fabian Wedgwood, 3,715,483.
  - Mueller, Kurt Hugo; and Spaulding, David Adams, 3,715,666.
  - Nutt, Wendell Glenn, 3,715,565.
  - Panousis, Peter Theodore; and Waggener, Herbert Atkin, 3,715,249.
  - Sessler, Gerhard Martin; and West, James Edward, 3,715,500.
- Bender, Frederick; Clermont, Louis-Philippe; and Powden, Alan Warren. Delignification of lignocellulosic materials with a solution of nitrogen dioxide in aliphatic hydrocarbon solvent. 3,715,268, Cl. 162-72.000.
- Bendix Corporation, The: *See—*
  - Bobrowicz, Vincent F.; and Henegar, Hubert B., 3,715,644.
  - Braunlich, Peter F., 3,715,583.
  - Carreras, Luis Enrique, 3,715,103.
  - Digby, James J., 3,714,834.
  - Frieder, Marcus A., 3,715,016.
  - Linkroum, Irving E., 3,715,614.
  - Michel, Donald E.; and Komatinsky, Richard R., 3,715,635.
  - Michel, Donald E.; Fairbairn, Le Roy W.; and Cook, James W., 3,715,706.
  - Nalepka, Raymond, 3,715,197.
  - Polye, William Ronald, 3,715,638.
- Beneking, Heinz, to Licentia Patent-Verwaltungs-G.m.b.H. Radiofrequency line. 3,715,631, Cl. 317-234.00r.
- Bennett, Dale E. Vehicle location and heading computer system. 3,715,572, Cl. 235-150.200.
- Bennett, Donald Perry, Jr., 1/2 to Gerry, Martin, E. Propulsion method in an inverse hybrid rocket motor. 3,714,783, Cl. 60-207.000.
- Benson, Gustav Eric Valdemar, to Perpedos AB. Dispensing apparatus. 3,715,060, Cl. 222-207.000.
- Benson, Richard J. Fishing device. 3,714,731, Cl. 43-43.110.
- Bentley, Albert Byron: *See—*
  - Bentley, Clarence H., 3,714,965.
- Bentley, Clarence H., 20% to Bentley, Delbert John, 20% to Bentley, Albert Byron, 20% to Bentley, Rodney Douglas and 20% to Bentley, David Alan. Pressure relief valve. 3,714,965, Cl. 137-541.000.
- Bentley, David Alan: *See—*
  - Bentley, Clarence H., 3,714,965.
- Bentley, Delbert John: *See—*
  - Bentley, Clarence H., 3,714,965.
- Bentley, James Sydney, to Photographic Silver Recovery Limited. Method of recovering silver from waste silver solutions. 3,715,291, Cl. 204-109.000.
- Bentley, Rodney Douglas: *See—*
  - Bentley, Clarence H., 3,714,965.
- Berger, Abe: *See—*
  - Wilkus, Edward V.; and Berger, Abe, 3,715,370.
- Berger, Heinz, to August Herzog Maschinenfabrik. Braiding machine for brading knotless netting. 3,714,862, Cl. 87-8.000.
- Bergonzi, Mario: *See—*
  - Trevisiol, Franco; and Bergonzi, Mario, 3,715,527.
- Berkey, Earl R.; and Keener, Everett L., to United States Steel Corporation. Drift corrector for transducers. 3,714,806, Cl. 72-19.000.
- Berkner, Horst D.: *See—*
  - Stein, Wolfgang J.; Ainsworth, Richard; and Berkner, Horst D., 3,714,779.
- Bernstein, Julius; Schildkraut, Sid I.; and Muller, John P. Unipolar acoustic pulse generator. 3,715,710, Cl. 340-5.00r.
- Berry, Walter L., Jr.; Nisonger, Dan P.; and Craig, Preston S., to Thiokol Chemical Corporation. Process for the manufacture of orthochlorobenzalmalononitrile. 3,715,379, Cl. 260-465.00g.
- Bestenreiner, Friedrich, to Agfa-Gevaert Aktiengesellschaft. Three-dimensional picture projection. 3,715,154, Cl. 352-61.000.
- Bethlehem Corporation, The: *See—*
  - Price, James F.; and Shook, Kenneth, 3,714,944.
- Bethlehem Steel Corporation: *See—*
  - Funk, Robert M., 3,715,083.
- Beyer, Rodney B.: *See—*
  - Anderson, Ralph; and Beyer, Rodney B., 3,715,299.
- Bhikuni, Roop S.; and Cormany, Joseph L., Jr., to Goodyear Tire & Rubber Company, The. Polyamide in combination with polycarbonate, metal complex, polyisocyanating agent for polyester modification and rubber tire structures made therefrom. 3,714,772, Cl. 5-153.000.
- Biet, Jean-Pierre, to Compagnie General d'Electricite. Window for a laser tube end piece. 3,715,684, Cl. 331-94.500.
- Billeter, Henry R., to Sloan Valve Company. Angle cocks with vent valves. 3,714,968, Cl. 137-596.200.
- Billings, Ruth E.: *See—*
  - Sullivan, Hugh R.; and Billings, Ruth E., 3,715,359.
- Biringer, Paul Peter, to Ajax Magnethermic Corporation. Frequency converter for converting multi-phase low frequency alternating current into single-phase higher frequency alternating current. 3,715,647, Cl. 321-7.000.
- Birkholz, William Stephen: *See—*
  - Phalin, Thomas Lawrence; and Birkholz, William Stephen, 3,714,755.
- Birnbaum, Burton H.; and Spier, Daniel J., to Computer Instruments Corporation. Method and apparatus for handling data from a plurality of channels. 3,715,510, Cl. 179-15.0bm.
- Bishop, Walton B., to United States of America, Navy. Omnidirectional reflected interrogation rejector. 3,715,750, Cl. 343-6.8lc.
- Bitko, Sheldon S., to Fifth Dimension Inc. Position insensitive mercury switch having a magnetically actuated slug floating in mercury. 3,715,546, Cl. 200-166.00c.
- Blake, James E., to General Electric Company. Parabola generator moving error corrector. 3,715,487, Cl. 178-7.300.
- Blanch, Charles H.; and Kovacik, James W. Miniaturized electric cord reel. 3,715,526, Cl. 191-12.20r.
- Blanchard, Jack W.: *See—*
  - Tilton, Homer B.; and Blanchard, Jack W., 3,715,617.
- Blasbalg, Herman L., to International Business Machines Corporation. Switching circuits employing orthogonal and quasi-othogonal pseudo-random code sequences. 3,715,508, Cl. 179-15.0bc.
- Blatt, Leland F. Dual grip actuating unit with travel cylinder assembly. 3,714,870, Cl. 92-140.000.
- Blau, Werner; and Gerdes, Theo. Two-part screw closure cover. 3,715,075, Cl. 220-39.00r.
- Blewitt, Donald D., to Westinghouse Electric Corporation. Current limiting fuse. 3,715,698, Cl. 337-166.000.
- Blinow, Igor: *See—*
  - Land, Edwin H.; Blinow, Igor; and Eloránta, Vaito K., 3,714,879.
- Bloch, Gilbert: *See—*
  - Feigel, Harold J.; Reizenstein, Harry S.; and Bloch, Gilbert, 3,714,757.
- Bloch, Martin, to Frequency Electronics, Inc. Contact heaters for quartz crystals in evacuated enclosures. 3,715,563, Cl. 219-210.000.
- Block Engineering, Inc.: *See—*
  - Webb, Robert H., 3,714,819.
- Blower, Howard E.: *See—*
  - Evans, Ralph E.; and Blower, Howard E., 3,714,786.
- Bobrowicz, Vincent F.; and Henegar, Hubert B., to Bendix Corporation, The. Proportional interpolator in multiaxis machines. 3,715,644, Cl. 318-573.000.
- Bobst, J., & Fils, S.A.: *See—*
  - Salvade, Gennaro, 3,715,116.
- Bockmann, Walter, to Bayer Aktiengesellschaft. Process for distilling benzyl chloride or mixtures containing benzyl chloride. 3,715,283, Cl. 203-6.000.
- Boenisch, John R.: *See—*
  - Figlin, Murray S.; and Boenisch, John R., 3,715,676.
- Bohman, Carl E., to Sperry Rand Corporation. Underwater localization system. 3,715,577, Cl. 340-6.00r.
- Boichard, Jacques; Brossard, Bernard Pierre; Gay, Michel Louis Marie Joseph; and Janin, Raymond Marc Clement, to Rhone-Poulenc S.A. Process for the preparation of lactic acid. 3,715,394, Cl. 260-535.00r.
- Bolmer, Perce W.: *See—*
  - Murphy, James M.; and Bolmer, Perce W., 3,714,792.
- Bolt Associates, Inc.: *See—*
  - Chelminski, Stephen V., 3,714,789.
- Bootz, William: *See—*
  - Clements, William C.; and Bootz, William, 3,714,787.
- Borg-Warner Corporation: *See—*
  - Smith, James G., 3,714,849.
- Bortzfield, William C.: *See—*
  - Hicks, John R.; and Bortzfield, William C., 3,715,569.
- Bosch, Robert, Elektronik GmbH: *See—*
  - Prause, Dieter; and Sost, Rolf, 3,715,475.
- Boshinski, Edwin E.: *See—*
  - Allen, Kenneth C.; and Boshinski, Edwin E., 3,714,998.
- Boterweg, Jelle. Watering apparatus for poultry. 3,714,929, Cl. 119-80.000.
- Bowlby, James F. G. Single use film developer and repturable seal therefor. 3,714,881, Cl. 95-89.00r.
- Boyd, Clive Reginald, to Spurway's Industries Pty. Limited. Blind rivet pulling tool. 3,714,810, Cl. 72-391.000.
- Boyle, Ralph C.; and Paulius, Leonard, to International Harvester Company. Reversible power take-off shaft. 3,715,704, Cl. 74-15.400.
- BP Chemicals Limited: *See—*
  - Yeomans, Bertram, 3,715,392.

- Bracey, Robert A. Adjustable latching mechanism. 3,714,843, Cl. 74-527.000.
- Bracht, Ernest F.: *See—*
  - Herring, Theodore C.; Bracht, Ernest F.; Ainslie, Robert E.; Todd, Eugene M.; and Franz, Joseph J., 3,715,668.
- Braddon, Frederick D., to Sperry Rand Corporation. Ship's turn rate control system. 3,715,571, Cl. 235-150.200.
- Bradley, Frank R.: *See—*
  - Drekter, Isaac J.; Bradley, Frank R.; Matthew, Morton P.; and Delaney, Paul, 3,715,761.
- Brands, Henry J.: *See—*
  - Savage, Joseph W.; and Brands, Henry J., 3,715,170.
- Brannen, William T., to Standard Oil Company. Hydrocarbon fuel and lubricating oil solutions of trialkyl phosphite-long chain alkenylsuccinic anhydride reaction. 3,715,311, Cl. 252-49.800.
- Braselmann, Ferd., Firma: *See—*
  - Braselmann, Ferdinand, 3,715,102.
- Braselmann, Ferdinand, to Braselmann, Ferd., Firma. Lifting jack. 3,715,102, Cl. 254-96.000.
- Braun, Paul E. Recoil stock. 3,714,726, Cl. 42-74.000.
- Braunlich, Peter F., to Bendix Corporation, The. Surface imaging utilizing exoelectron emission. 3,715,583, Cl. 250-71.00r.
- Bray, Andrew M., to Magna-Graphics Corporation. Coating mat. 3,714,692, Cl. 29-129.000.
- Bredt, James H.; and Kendall, Louis F., Jr., to General Electric Company. Doped tin telluride brazing material for semiconductive thermoelectric generator elements. 3,715,241, Cl. 136-237.000.
- Bresson, Richard J., to Eastman Kodak Company. Camera apparatus adapted for operation with auxiliary light source. 3,714,871, Cl. 95-10.00c.
- Breuer, David R., to TRW Inc. Integratable high speed reversible shift register. 3,715,030, Cl. 207-221.00r.
- Brey, Hans: *See—*
  - United States of America, National Aeronautics and Space Administration, 3,715,723.
- Bril, Alfred: *See—*
  - De Mesquita, Albert Hijman Gomes; and Bril, Alfred, 3,715,611.
- Brinkman, William Guy, to General Electric Company. Dynamoelectric machine cooled by a rotating heat pipe. 3,715,610, Cl. 310-54.000.
- Bristol, Edgar H., II., to Foxboro Company, The. Method and apparatus for compensatory control of interacting process variables. 3,714,952, Cl. 137-1.000.
- British Ropes Limited: *See—*
  - Paddington, Arthur Loftus, 3,715,135.
- Broadley, Donald. Method of and means for combating sodium fires. 3,714,986, Cl. 169-1.00a.
- Bromm, Charles A.: *See—*
  - Wood, Walter B.; Shuler, Bernard R.; Bromm, Charles A.; and Welch, Wilson A., 3,715,578.
- Brooker, Leslie G S.; and Fumia, Arthur, Jr., to Eastman Kodak Company. Cyanine dyes containing a cyclopentanone nucleus. 3,715,351, Cl. 260-240.400.
- Brossard, Bernard Pierre: *See—*
  - Boichard, Jacques; Brossard, Bernard Pierre; Gay, Michel Louis Marie Joseph; and Janin, Raymond Marc Clement, 3,715,394.
- Broughton, Donald B., to Universal Oil Products Company. Hydrocarbon separation. 3,715,409, Cl. 260-674.0sa.
- Browell, George L.; and Wilson, Leon W., Jr., to United States Steel Corporation. Photochemical process. 3,715,294, Cl. 204-163.00r.
- Brown, Earl Franklin; and Kaminski, William, to Bell Telephone Laboratories, Incorporated. Apparatus for preventing buffer overflow in video encoding systems by increasing the scanning rate of a camera during the time interval of the encoding. 3,715,489, C. 178-7.100.
- Brown, Laddie L., to American Metal Climax, Inc. Retort bumping machine. 3,714,673, Cl. 15-104.10r.
- Brown, Maurice H. Wire terminal making and assembling. 3,714,708, Cl. 29-624.000.
- Brown, Paul: *See—*
  - Van Dusen, Charles H., Jr.; and Brown, Paul, 3,714,891.
- Brown, Rene Paul; Allison, Birt, Jr., and D'Ostrowick, Pierre Marie Joseph Ghislain de Radzitzky, to Cosden Oil & Chemical Company. Separation of diethylbenzene isomers by distillation and dehydrogenation. 3,715,408, Cl. 260-669.00a.
- Brown, Richard M.: *See—*
  - Gunter, William D., Jr.; and Brown, Richard M., 3,715,152.
- Brown, Theodore G. Game table. 3,715,122, Cl. 273-136.00z.
- Brown, Wade E.: *See—*
  - Sears, Bobby Joe; and Brown, Wade E., 3,714,948.
- Bruen, Charles P.: *See—*
  - Morgan, Thomas R.; Low, William W.; Wamser, Christian A.; and Bruen, Charles P., 3,715,425.
- Bruggemann, Hans; and Kulzer, Rudolf, to Pohlig-Heckel-Bleichert Vereinigte Maschinenfabriken Aktiengesellschaft. Arrangement for automatically testing the grip of gripping jaw means of cablecars on a tension cable. 3,714,904, Cl. 104-202.000.
- Brunswick Corporation: *See—*
  - Draxler, James R., 3,715,650.
- Brush, R. John H.; and Singleback, George W., to General Electric Company. Tint control circuit using phase splitter. 3,715,479, Cl. 178-5.4he.
- Bucher, Robert W., to Goodyear Tire & Rubber company, The. Method of inserting flexible strand members through a perforate fitting. 3,714,699, Cl. 29-241.000.
- Bullard, Edward P., III. Drafting machine. 3,714,714, Cl. 33-80.000.
- Bullard, Martin B. Chain saw cutting tooth and method for making it. 3,714,974, Cl. 83-831.000.
- Burkhalter, Robert; and Congdon, George L., to Norland Corporation. Limb holder positioner for bone mineral analyzer. 3,715,587, Cl. 250-50.000.
- Burns, Simon Pierce; and Hartman, Henry Edmund, to Jefferson Chemical Company, Inc. Recovery of propylene oxide from contaminants by distillation in the presence of acetone or acetone-methanol mixtures. 3,715,284, Cl. 203-56.000.
- Burroughs Corporation: *See—*
  - Caspari, Georg K., 3,715,021.
- Burton, Arthur, to Imperial Chemical Industries, Limited. Decorative wall covering. 3,715,264, Cl. 161-82.000.
- Burton, Charles A.: *See—*
  - Davis, Howard C.; Pritz, Howard B.; and Burton, Charles A., 3,715,174.
- Busch, Edward R.; and Wood, Guy B., to Weston Instruments, Inc. Thickness change radiation gauge. 3,715,592, Cl. 250-83.30d.
- Busch, Josef: *See—*
  - Hunicke, Wolfgang; Spohr, Rolf; Schranz, Karl-Wilhelm; Busch, Josef; Schon, Erwin; and Frick, Hans-Dieter, 3,714,883.
  - Schranz, Karl-Wilhelm; Hunicke, Wolfgang; and Busch, Josef, 3,714,882.
- Bush, Clarence C., to United States of America, Army. Apparatus for measuring skin friction. 3,714,824, Cl. 73-117.400.
- Bushick, Ronald D., to Sun Oil Company. Process for producing sym-octahydroanthracene from sym-octahydrophenanthren. 3,715,406, Cl. 260-668.00f.
- Butcher, Edward Peter, to Bakelite Xylonite Limited. Fire-retardant compositions. 3,715,310, Cl. 252-8.100.
- Byram, Robert J.; Culver, Mark N.; and Van Ostrom, David L., to General Motors Corporation. Automatic cranking system for providing power assist upon vehicle engine stall. 3,715,005, Cl. 180-103.000.
- Cahill, Joseph A.: *See—*
  - Meyers, Joseph A., III; and Cahill, Joseph A., 3,715,185.
- Caldwell, Robert H. Tire chain and connector. 3,714,976, Cl. 152-228.000.
- Calfee, Richard W.; and Hopner, Emil, to International Business Machines Corporation. Color video recording and playback system. 3,715,474, Cl. 178-5.400.
- Calrk, Frederick G., to Eastman Machine Company. Knife sharpening mechanism. 3,714,742, Cl. 51-246.000.
- Calvert, Orville M.: *See—*
  - Holcombe, Edward L.; Calvert, Orville M.; and Kessel, William M., 3,714,754.
- Camdex Inc.: *See—*
  - Leich, Robert A., 3,714,860.
- Cameron, Richard William, mesne: *See—*
  - French, Walter K., 3,714,804.
- Campari, Luigi: *See—*
  - Teagno, Wladimiro; and Campari, Luigi, 3,715,457.
- Campbell, Donald A.; Packard, James R.; Tait, William C.; and Weiher, Richard L., to Minnesota Mining and Manufacturing Company. Free exciton indirect transition laser. 3,715,162, Cl. 356-30.000.
- Campbell, Kenneth C.; and Rhinehart, Robert R., Jr., to Celanese Corporation. Filter start-up in dry spinning acrylonitrile copolymer. 3,715,416, Cl. 264-39.000.
- Campbell, Larry E., to Corning Glass Works. Soluble and colloidal silicates. 3,715,224, Cl. 106-74.000.
- Campbell, Robert Riddle; Honnold, George Herbert; and Lefkowitz, Michael, to Bell Telephone Laboratories, Incorporated. Interrupt network to protect a voice frequency signal detector from being talked-off by outgoing speech signals. 3,715,518, Cl. 179-84.0f.
- Campbell, William M.: *See—*
  - Howell, Eddie P.; Hardison, Jack E.; and Campbell, William M., 3,714,832.
- Canadian Fishing Company Limited, The: *See—*
  - Van Snellenberg, Anton P. M., 3,714,681.
- Canon Kabushiki Kaisha: *See—*
  - Hasegawa, Goro; and Iura, Yukio, 3,714,878.
  - Mashimo, Yukio; Mizui, Seiichiro; and Takishima, Yoshiyuki, 3,714,872.
- Canron, Inc.: *See—*
  - Stewart, John Kenneth, 3,714,901.
- Cappel, Marie-Luise: *See—*
  - Frohlich, Alfons; Cappel, Marie-Luise; and Stubiger, Ernst, 3,714,683.
- Carbonnel, Henri, to Groupement Atomique Alsacienne Atlantique. Means for treating a liquid metal and particularly aluminum. 3,715,112, Cl. 266-34.00t.
- Carley-Macauly, Kenneth Wallace; Hitchon, James Witham; and Moulton, Robert James, to United Kingdom Atomic Energy Authority. Electro-hydraulic crushing apparatus. 3,715,082, Cl. 241-1.000.
- Carlisle Chemical Works, Inc.: *See—*
  - Stapfer, Christian H.; and D'Andrea, Richard W., 3,715,328.
- Carls, Glen A.: *See—*
  - Harnish, Wayne N.; Sticker, Robert E.; and Carls, Glen A., 3,715,435.
- Carnahan, George E. Fish cleaning device. 3,715,229, Cl. 17-66.000.

- Carnes, Joseph J.; Green, James H.; and Heller, John H., to New England Institute, Inc., The. Process for increasing sedimentation rate of heterogeneous colloidal suspension systems. 3,715,305, Cl. 210-19.000.
- Carre, Pierre: *See—*
  - Tanguy, Pierre; Carre, Pierre; and Le Boulbouech, Jean, 3,714,888.
- Carreras, Luis Enrique, to Bendix Corporation, The. Gear and capstan guard for flight control servo. 3,715,103, Cl. 254-150.00r.
- Carrier Corporation: *See—*
  - Kerklo, Philip, 3,715,176.
- Carter, John H., to ACF Industries, Incorporated. Cap locking device for pneumatic hopper outlets. 3,715,053, Cl. 220-55.00r.
- Cartwright, Thomas William: *See—*
  - Page, Robert Brian; and Cartwright, Thomas William, 3,715,622.
- Cary, John W. Convertible trailer construction. 3,715,141, Cl. 296-23.00r.
- Caspari, Georg K., to Burroughs Corporation. Variable drive apparatus. 3,715,021, Cl. 197-82.000.
- Casto, John P., to Textron Inc. Cell to cabinet connector. 3,715,455, Cl. 174-48.000.
- CCI Aerospace Corporation: *See—*
  - Johnson, Allan M., 3,715,287.
- Celanese Corporation: *See—*
  - Campbell, Kenneth C.; and Rhinehart, Robert R., Jr., 3,715,416.
  - Jeffries, Samuel B., 3,715,320.
- Central Vac International, Inc.: *See—*
  - Simonelli, Carl L., 3,714,765.
- Chang, Robert Wu-Lin, to Bell Telephone Laboratories, Incorporated. Joint initial setting of attenuator coefficients and sampling time in automatic equalizers for synchronous data transmission systems. 3,715,665, Cl. 325-42.000.
- Chelminski, Stephen V., to Bolt Associates, Inc. Automatically self-regulating variable-stroke, variable-rate and quiet-operating pile driver method and system. 3,714,789, Cl. 61-53.500.
- Chemcell Limited: *See—*
  - Chopra, Sohinder Nath; and Turmel, Hilaire Marcel, 3,715,422.
- Chenenko, Norman. Ski lock. 3,714,803, Cl. 70-58.000.
- Cherry Electrical Products Corporation: *See—*
  - Long, Eric L., 3,715,545.
- Chevron Research Company: *See—*
  - Bacskai, Robert, 3,715,335.
  - Mehmedbasich, Enver, 3,715,368.
- Chibana, Masanobu, to Nippon Gakki Seizo Kabushiki Kaisha. Variable resistor device using a field transistor. 3,715,675, Cl. 330-28.000.
- Chicago Metallic Corporation: *See—*
  - Jahn, Reinhardt H., 3,714,753.
- Chicago Musical Instrument Co.: *See—*
  - Kniepkamp, Alberto E., 3,715,445.
- Choate, William C.: *See—*
  - Smith, Stanley L.; Choate, William C.; and Masten, Michael K., 3,715,730.
- Chopra, Sohinder Nath; and Turmel, Hilaire Marcel, to Chemcell Limited. Process for producing crinkled plastic ribbon. 3,715,422, Cl. 264-168.000.
- Christiansen, Tore, to Munters, Carl George. Device for ventilation systems in spaces. 3,714,884, Cl. 98-40.00d.
- Chugai Denkikogyo Kabushiki Kaisha: *See—*
  - Shibata, Akira, 3,715,070.
- Ciba-Geigy AG: *See—*
  - Fairbairn, Geoffrey, 3,715,252.
  - Janiak, Stefan; and Dittrich, Volker, 3,715,436.
- Ciba-Geigy Corporation: *See—*
  - Huebner, Charles Ferdinand, 3,715,348.
  - Traber, Walter; and Weiss, Anton G., 3,715,315.
- Ciccarelli, Roger N., to Xerox Corporation. Electrostatically deformable thermoplastic layer containing a 1,4-dialkylamino-9,10-anthraquinone dye. 3,715,207, Cl. 96-1.500.
- Ciccone, Thomas Q.: *See—*
  - Perkins, William E.; Schlack, Allen F.; and Ciccone, Thomas Q., 3,714,728.
- Cincinnati Milacron Inc.: *See—*
  - Jankowski, Stanislaw; and Jackson, William John, 3,714,924.
  - Wise, Robert G., 3,715,646.
- Cincinnati Milacron-Heald Corporation: *See—*
  - Uhtenwoldt, Herbert R.; and Deranian, Diran, 3,714,741.
- Cirulis, Uldis: *See—*
  - Zacharias, Ellis M., Jr.; and Cirulis, Uldis, 3,715,709.
- Clark Equipment Company: *See—*
  - Jenney, Asa R., 3,715,017.
- Clarke, Eric Fifield Stuart; Cosier, James Edwin Henry; Kolanowski, Jan; Halls, Peter Seaton; and Laidlaw, Alexander Duncan Lindley, to Post Office, The. Apparatus for the laying or recovery of cables. 3,715,068, Cl. 226-108.000.
- Clayton, Anthony Robert King; and Barber, Anthony Clifford, to Imperial Metal Industries (Kynoch) Limited. Superconductors. 3,715,243, Cl. 148-11.50r.
- Clement, Carl J.: *See—*
  - Horine, David A.; and Clement, Carl J., 3,714,723.
- Clements, Herbert Arthur: *See—*
  - Heybourne, Robert Howard; and Clements, Herbert Arthur, 3,715,019.
- Clements, William C.; and Bootz, William, to Armco Steel Corporation. Energy absorbing device for the connections of segmented drive core. 3,714,787, Cl. 61-53.700.
- Clermont, Louis-Philippe: *See—*
  - Bender, Frederick; Clermont, Louis-Philippe; and Powden, Alan Warren, 3,715,268.
- Cleveland, Hardware & Forging Company: *See—*
  - Koehler, William F., 3,714,842.
- Clymans, Augustien Maria, to U.S. Philips Corporation. Dosing apparatus. 3,715,058, Cl. 222-148.000.
- Coburn, Herbert D.: *See—*
  - Kelly, Gilbert H.; and Coburn, Herbert D., 3,715,007.
- Coe Laboratories: *See—*
  - Molnar, Eugene J., 3,715,331.
- Coes, Loring, Jr., to Norton Company. Grinding control system. 3,714,715, Cl. 33-174.00r.
- Cognigni, Franco: *See—*
  - Dinelli, Dino; and Cognigni, Franco, 3,715,277.
- Cohn, Robert L. Simplified aircraft control system. 3,715,094, Cl. 244-83.00b.
- Cole, Jean R., to Weber Marking Systems, Inc. Rotary label printing machine adjustable rotor cam for separating the printing couple. 3,714,893, Cl. 101-228.990.
- Cole, Robert B.: *See—*
  - Bayes, Lowell D.; and Cole, Robert B., 3,715,458.
- Colitti, Olindo A.: *See—*
  - Swotinsky, Jacob M.; Newman, Stephen; and Colitti, Olindo A., 3,715,248.
- Collins, Henry F. Induction furnace with thermocouple assembly. 3,715,441, Cl. 13-26.000.
- Collins, Neal H.: *See—*
  - Ender, Herman R; and Collins, Neal H., 3,714,766.
- Colomb, Henry Octave, Jr.; and Trecker, David John, to Union Carbide Corporation. Radiation-convertible norbornene polymers. 3,715,342, Cl. 260-80.810.
- Columbia Broadcasting System, Inc.: *See—*
  - Lover, Seth E., 3,715,008.
- Combustion Engineering, Inc.: *See—*
  - Krawiec, Donald M., 3,715,275.
- Comex Systems, Inc.: *See—*
  - Wallin, Gary P.; and Stapleford, Gary N., 3,715,726.
- Commissariat a l'Energie Atomique: *See—*
  - Croso, Hubert; Prost, Gerard; Quefellec, Andre; and Sole, Jean, 3,715,703.
- Commonwealth Scientific and Industrial Research Organization: *See—*
  - Henshaw, David Ernest; Knothe, Werner Emil Otto; and Stern, Lionel, 3,714,771.
- Compagnie General d'Electricite: *See—*
  - Biet, Jean-Pierre, 3,715,684.
- Compagnie Generale d'Electricite: *See—*
  - Aupoix, Marcel; and Moisson-Franckhauser, Francois, 3,715,453.
- Computer Industries, Inc.: *See—*
  - Kan, Philip T., 3,715,731.
- Computer Instruments Corporation: *See—*
  - Birnbaum, Burton H.; and Spier, Daniel J., 3,715,510.
- Conco Inc.: *See—*
  - Latall, Roy C., 3,715,484.
- Condon, Gordon L. Seat device for lifting, moving and lowering an invalid. 3,714,672, Cl. 4-185.001.
- Confer, James O.; and McTaggart, George D., to Corning Glass Works. Ceramic article and method of making it. 3,715,220, Cl. 106-39.0dv.
- Congdon, George L.: *See—*
  - Burkhalter, Robert; and Congdon, George L., 3,715,587.
- Conrail AB: *See—*
  - Ahl, Nils Goran; and Larsson, Lars Herbert, 3,714,997.
- Cook, James W.: *See—*
  - Michel, Donald E.; Fairbairn, Le Roy W.; and Cook, James W., 3,715,706.
- Cooper, Erwin E.; and Kennedy, Howard V., to Texas Instrument, Incorporated. Optical scanner and real time image conversion system. 3,715,497, Cl. 178-6.800.
- Cope, Richard P., Jr., to Stauffer Chemical Company. Brightener compositirn for acid copper electroplating baths. 3,715,289, Cl. 204-52.00r.
- Cordell, Edward Geoffrey, to Normalair-Garrett (Holdings) Limited. Electronic programmer unit for burner control. 3,715,180, Cl. 431-25.000.
- Cormany, Joseph L., Jr.: *See—*
  - Bhikuni, Roop S.; and Cormany, Joseph L., Jr., 3,714,772.
- Corning Glass Works: *See—*
  - Bartholomew, Roger F.; and Garfinkel, Harmon M., 3,715,187.
  - Campbell, Larry E., 3,715,224.
  - Confer, James O.; and McTaggart, George D., 3,715,220.
  - Cotter, Douglas A., 3,715,619.
  - Love, Roy E.; and Westwig, Ralph A., 3,715,150.
  - Montierth, Max R., 3,715,196.
  - Szupillo, Raymond E., 3,715,244.
- Cosden Oil & Chemical Company: *See—*
  - Brown, Rene Paul; Allison, Birt, Jr.; and D'Ostrowick, Pierre Marie Joseph Ghislain de Radzitzky, 3,715,408.
- Cosgrove, Richard E.; Krull, Irwin H.; and Mask, Charles A., to Beckman Instruments, Inc. Method and means for extending life of ion sensing electrode. 3,715,297, Cl. 204-195.00m.
- Cosier, James Edwin Henry: *See—*

- Clarke, Eric Fifield Stuart; Cosier, James Edwin Henry; Kolanowski, Jan; Halls, Peter Seaton; and Laidlaw, Alexander Duncan Lindley, 3,715,068.
- Costruba, Peter, to Angeles Metal Trim Co. Support structure for shelving. 3,714,748, Cl. 52-36.000.
- Cottell, Eric Charles. Apparatus for carrying out ultrasonic agitation of liquid dispersions. 3,715,104, Cl. 259-1.00r.
- Cotter, Douglas A., to Corning Glass Works. Storage cathode ray tube electron beam position indicator. 3,715,619, Cl. 315-10.000.
- Cowans, Kenneth W.: *See—*
  - Fischel, Halbert; Dichiro, Anthony; and Cowans, Kenneth W., 3,714,942.
- Craig, Philip V. C., to Telemation Inc. Color television camera encoder matrix with summation of two color video current signals and a constant current signal. 3,715,470, Cl. 178-5.400r.
- Craig, Preston S.: *See—*
  - Berry, Walter L., Jr.; Nisonger, Dan P.; and Craig, Preston S., 3,715,379.
- Crain, Donald L.: *See—*
  - Ray, Gardner C.; and Crain, Donald L., 3,715,410.
- Craven, Donald: *See—*
  - Glaze, Stanley G.; and Craven, Donald, 3,714,784.
- Crawford Fitting Company: *See—*
  - Shendure, Ashok S., 3,715,099.
- Crenstein & Koppel Aktiengesellschaft: *See—*
  - Kollmann, Wolfgang; and Schwappach, Dieter, 3,715,039.
- Cristofaro, Elvira: *See—*
  - Wuhrmann, Jean-Jacques; and Cristofaro, Elvira, 3,715,216.
- Crivello, James V., to General Electric Company. Nitration of aromatic ring-containing compositions. 3,715,323, Cl. 260-47.0et.
- Croce, Louis J.: *See—*
  - Barone, Bruno J.; and Croce, Louis J., 3,715,391.
- Croce, Louis J.; and Barone, Bruno J., to Petro-Tex Chemical Corporation. Promotion of the oxidation of mononuclear aromatic compounds. 3,715,390, Cl. 260-523.00a.
- Croso, Hubert; Prost, Gerard; Quefellec, Andre; and Sole, Jean, to Commissariat a l'Energie Atomique. Superconducting switch. 3,715,703, Cl. 338-32.00s.
- Crown Zellerbach Corporation: *See—*
  - Muskopf, Billy J.; and Wiemann, Ronald W., 3,715,072.
- CSF-Compagnie Generale de Telegraphie Sans Fil: *See—*
  - Vasseur, Jean-Pierre, 3,715,478.
- Culbertson, Billy M.: *See—*
  - Slagel, Robert C.; and Culbertson, Billy M., 3,715,343.
- Culver, Mark N.: *See—*
  - Byram, Robert J.; Culver, Mark N.; and Van Ostrom, David L., 3,715,005.
- Cunnane, Jeffrey B., to Bancroft, H. S., Corporation. Integrated circuit die bonding apparatus. 3,715,258, Cl. 156-356.000.
- Cunningham, Francis V.; and Miller, Cyril V., to Joslyn Mfg. and Supply Co. Fluid filled high voltage cable terminal apparatus. 3,715,449, Cl. 174-11.0bh.
- Cunningham, Robert E.: *See—*
  - Privott, Wilbur J., Jr.; and Cunningham, Robert E., 3,715,418.
  - Privott, Wilbur J., Jr.; and Cunningham, Robert E., 3,715,419.
- Curran, Bernard Edwin, to Robertson, W. H., Company. Fastening means for double-skin foam core building panel. 3,714,747, Cl. 52-309.000.
- Curtiss-Wright Corporation: *See—*
  - Jones, Charles, 3,715,178.
  - Woodier, George H., 3,715,177.
- Cutler-Hammer, Inc.: *See—*
  - Allport, Walter, 3,715,159.
  - Hyer, Frank S., 3,715,059.
  - Mattes, Lyle T., 3,715,641.
  - Piber, Earl T., 3,715,534.
- Cutter Laboratories, Inc.: *See—*
  - Edwards, William Sterling; Kahn, Paul; and Goodenough, Samuel H., 3,714,671.
- Cutter, Larry I., to Kidde, Walter, & Company, mesne. Vault air valve. 3,714,910, Cl. 109-73.000.
- Da Silva, Miguel. Lock and alarm. 3,714,922, Cl. 116-14.000.
- Dahne, Martin: *See—*
  - Greinacher, Ekkehart; Fischer, Werner; and Dahne, Martin, 3,715,424.
- Daigle, Edwin E.; Luke, Robert R.; Turner, James B.; and Wise, Harold L. (, to Shell Oil Company. Marine mud hydrocarbon surveying. 3,714,811, Cl. 73-19.000.
- Dalton, Thomas B., to Westram Corporation. Actuating device. 3,715,530, Cl. 200-47.000.
- Danckert, Dieter: *See—*
  - Kosmider, Hans; and Danckert, Dieter, 3,715,202.
- D'Andrea, Richard W.: *See—*
  - Stapfer, Christian H.; and D'Andrea, Richard W., 3,715,328.
- Dane, Ernest Blaney, Jr. Undersea coring machine with means for separating samples. 3,714,996, Cl. 175-6.000.
- Daniel, Peter James, to U.S. Philips Corporation. Methods of manufacturing semiconductor devices. 3,715,242, Cl. 148-11.500.
- Daniels, John F.; and Pires, Antonio, to Sperry Rand Corporation. Auxiliary cutter means for an electric dry shaver. 3,714,710, Cl. 30-34.100.
- Daniels, John F., to Sperry Rand Corporation. Cutter drive member means for electric dry shaver. 3,714,711, Cl. 30-43.920.
- Dargent, Bruno M., to Hamilton Watch Company. Solid state watch incorporating large-scale integrated circuits. 3,714,867, Cl. 58-50.00r.
- D'Ausilio, Robert F. Pre-formed electrical wiring system. 3,715,627, Cl. 317-99.000.
- Davidson, Alastair Ritchie; and Percival, Eric Robert, to Reed International Limited. Manhole assemblies. 3,714,961, Cl. 137-363.000.
- Davies, Timothy Muir: *See—*
  - Gibbs, Gilbert Leslie; and Davies, Timothy Muir, 3,715,073.
- Davis, Andrew W.: *See—*
  - Goodson, Louis H.; Jacobs, William B.; and Davis, Andrew W., 3,715,298.
- Davis, Howard C.; Pritz, Howard B.; and Burton, Charles A., to Wooster Brush Company, The. Diaphragm pump. 3,715,174, Cl. 417-311.000.
- Dawson, Edward C., to United States of America, Air Force. Method and means for providing resolution level selection in a spectrum analyzer. 3,715,509, Cl. 179-15.55t.
- Day, Christopher C.; and Grace, Wesley R., to American Optical Corporation. Analog signal selective-peak sampler system for blood pressure signals. 3,714,939, Cl. 128-2.05a.
- Day, Gene F., to Varian Associates. Method for fixing of liquid toner developed electrographic images. 3,715,225, Cl. 117-21.000.
- Day, John; and Thomas, David Kenneth, to United Kingdom of Great Britain and Northern Ireland, Supply Minister of Aviation, in her Britannic Majesty's Government of The. Preparation of nitrile silicone rubber. 3,715,411, Cl. 260-827.000.
- Dayco Corporation: *See—*
  - Kleykamp, Donald L., 3,715,454.
- De Bie, Edouard, to Metallurgie Hoboken-Overpett. Melting of metals. 3,715,203, Cl. 75-76.000.
- De Grazio, Robert P.; and Robinson, Herbert N., to United States of America, Atomic Energy Commission. Separation of plutonium and uranium from holder. 3,715,204, Cl. 75-84.10r.
- De Luca, Hector F., to Wisconsin Alumni Research Foundation, The. 24,25-Dihydro xycholecalciferol. 3,715,374, Cl. 260-397.200.
- De Mesquita, Albert Hijman Gomes; and Bril, Alfred, to U.S. Philips Corporation. Cathode-ray tube containing cerium activated yttrium silicate phosphor. 3,715,611, Cl. 313-92.0ph.
- De Vault, Robert Larry, to Abbott Laboratories. 2-Benzyl-1,4-dimethyl-5-hydroxymethyl-2, 5-epidithiapiperazine-3,6-dione and 2-benzyl-1, 4-dimethyl-5-hydroxymethyl-2,5-epitrithiapiperazine- 3,6-dione useful as anti-fungal agents. 3,715,352, Cl. 260-243.00r
- Dedrick, Dallas S., to Weyerhaeuser Company. Process for kiln drying lumber by means of a predetermined drying rate. 3,714,716, Cl. 34-30.000.
- Deere & Company: *See—*
  - Fletcher, Edward Horton, 3,714,999.
  - Hubbard, Arthur Lowell; and Sanderson, Leon Franklin, 3,714,767.
  - Schafer, Richard Arthur, 3,715,133.
- Degener, Eberthart: *See—*
  - Schmelzer, Hans-Georg; Gruber, Hermann; Degener, Eberthart; and Wagner, Kuno, 3,715,338.
- Dektor Counterintelligence and Security: *See—*
  - Bell, Allan D., Jr., 3,715,514.
- Delaney, Paul: *See—*
  - Drekter, Isaac J.; Bradley, Frank R.; Matthew, Morton P.; and Delaney, Paul, 3,715,761.
- Demag AG: *See—*
  - Raab, Stefan, 3,715,048.
- Dembowski, Ronald J.; and Schuh, Theodore R., to Nalco Chemical Company. Urea- and melamine-formaldehyde bridging agents. 3,715,172, Cl. 260-3.000.
- DeMent, Jack. Tellurian optoexplosive system including nuclear explosive light generator and target irradiation. 3,715,596, Cl. 250-84.000.
- Demonte, Filippo; and Pipino, Luciano, to Olivetti, Ing., C., & C., S.p.A. Apparatus for recognizing graphic symbols. 3,715,724, Cl. 340-146.3ag.
- Dendy, Joe B.; Thomson, Kenneth; and Morrison, Robert F., to Sperry Rand Corporation. Computer for use with ring laser rotational rate sensors. 3,715,562, Cl. 235-150.310.
- Denney, Jerry W., to American Monitor Corporation. Cholesterol assay and reagents therefor. 3,715,188, Cl. 23-230.00b.
- Dennison Manufacturing Company, mesne: *See—*
  - Arciprete, Genio R., 3,715,745.
- Denny, Donald I. Load supporting carriage structure for trailers. 3,715,132, Cl. 280-405.00r.
- Denton, Howard P., to Simplex Time Recorder Company. Alarm signalling apparatus. 3,715,743, Cl. 340-303.000.
- Denton, Ronald T., to Ford Motor Company. Staged single venturi carburetor. 3,715,108, Cl. 261-50.00a.
- Deranian, Diran: *See—*
  - Uhtenwoldt, Herbert R.; and Deranian, Diran, 3,714,741.
- Detroit Edison Company, The: *See—*
  - Elliott, Ernest A.; and Pasen, Randolph A., 3,715,460.
- Deutsche Gold- und Silber-Scheideanstalt vormal Roessler: *See—*
  - Junkermann, Helmut; and Klotzer, Erhard, 3,715,332.
- Di Fulvio, Anthony P.; and Wilson, William C., to Eastman Kodak Company. Adjustable sheet guide apparatus. 3,715,117, Cl. 271-61.000.
- Dichiro, Anthony: *See—*
  - Fischel, Halbert; Dichiro, Anthony; and Cowans, Kenneth W., 3,714,942.
- Dick, A. B., Company: *See—*
  - Kievit, James M.; and Howe, James L., 3,715,725.

- Diekman, John D., to Zoecon Corporation. Certain 2-aliphatic-thiobenzothiazoles. 3,715,363, Cl. 260-306.000.
- Diersbock, Gunther Rudolph, to Timex Corporation. Amplitude control means for balance wheel oscillator. 3,714,773, Cl. 58-28.00b.
- Diery, Helmut: *See—*
  - Kuhne, Rudolf; Diery, Helmut; and Rittner, Siegbert, 3,715,319.
- Digby, James J., to Bendix Corporation, The. Engine starting gearing. 3,714,834, Cl. 74-6.000.
- Diletti, Friedhelm: *See—*
  - Schneiders, Albert M.; Schiller, Peter; Hollebeck, Gustave L.; and Diletti, Friedhelm, 3,714,814.
- Dimroth, Peter: *See—*
  - Gaeng, Manfred; and Dimroth, Peter, 3,715,360.
- Dinelli, Dino; and Cognigni, Franco. Preparation of fibers containing fibers. 3,715,277, Cl. 195-63.000.
- Dion, Paul A.; and Hagarman, Paul O., to Polymetallurgical Corporation. Manufacture of clad metals. 3,714,701, Cl. 29-474.100.
- Dischert, Robert Adams: *See—*
  - Olson, Charles Langdon; Monahan, John Francis; and Dischert, Robert Adams, 3,715,477.
  - Wright, Harry Gilbert; and Dischert, Robert Adams, 3,715,486.
- Dittrich, Volker: *See—*
  - Janiak, Stefan; and Dittrich, Volker, 3,715,436.
- Dixon, Arthur B.: *See—*
  - Shelley, George R.; Shelley, Robert J., Jr.; Dixon, Arthur B.; and House, Bruce, 3,715,119.
- DND Electronics: *See—*
  - Miller, Louis A., 3,715,513.
- Dobson, John C., to Formmet Corporation. Process of making a composite bearing race or the like. 3,714,694, Cl. 29-148.40r.
- Docutel Corporation: *See—*
  - Hicks, John R.; and Bortzfield, William C., 3,715,569.
- Dolan, Daniel D. Door for box lockers and the like. 3,714,739, Cl. 49-501.000.
- Dominianni, Samuel J., to Lilly, Eli, and Company. Tetracyclic aziridine and method for its preparation. 3,715,362, Cl. 260-293.540.
- Dorn, Conrad P., Jr.: *See—*
  - Witzel, Bruce E.; Dorn, Conrad P., Jr.; and Shen, Tsung-Ying, 3,715,358.
- Dorn, William E. Sewage disposal device. 3,714,914, Cl. 110-8.00r.
- Dornemann, Peter L.; Radcliffe, Milton R.; Newton, Albert E.; and Eaton, Samuel E., Jr., to USM Corporation. Apparatus for binding sheets. 3,715,260, Cl. 156-477.00b.
- D'Ostrowick, Pierre Marie Joseph Ghislain de Radzitzky: *See—*
  - Brown, Rene Paul; Allison, Birt, Jr.; and D'Ostrowick, Pierre Marie Joseph Ghislain de Radzitzky, 3,715,408.
- Dow Chemical Company, The: *See—*
  - Martin, Fred D., 3,714,813.
  - Nowak, Robert M.; Woo, James T. K.; and Heinert, Dietrich H., 3,715,336.
  - White, Halbert C.; Strycker, Stanley J.; and Wysong, Don V., 3,715,367.
- Dow Corning Corporation: *See—*
  - Pierce, Ogden R.; and Kim, Yung Ki, 3,715,387.
- Dowling, Donald J.; and Atwood, George R., to Texaco Inc. Induction logging apparatus having a common series element for nulling. 3,715,655, Cl. 324-6.000.
- Drablowski, William J., to Wolverine Industries, Inc. Adjustable Christmas tree stand. 3,715,095, Cl. 248-46.000.
- Draxler, James R., to Brunswick Corporation. Pulse generator for ignition systems. 3,715,650, Cl. 322-51.000.
- Drebes, Friedrich-Wilhelm: *See—*
  - Pries, Erich E.; Errgang, Karl; and Drebes, Friedrich-Wilhelm, 3,715,282.
- Dreisin, Alexander, to Allis-Chalmers Corporation. Multiple plunger fuel injection pump. 3,714,935, Cl. 123-140.00r.
- Dreisin, Alexander, to Allis-Chalmers Corporation. Multiple plunger fuel control linkage. 3,714,936, Cl. 123-140.00r.
- Drekter, Isaac J.; Bradley, Frank R.; Matthew, Morton P.; and Delaney, Paul, to Sedriter Corporation. Sedimentation rate test instrument. 3,715,761, Cl. 346-33.00a.
- Dresser Industries, Inc.: *See—*
  - Read, Norman W., 3,714,984.
- Drinkwater, John W.; and Evans, Albert, to Shell Oil Company. Electron capture identification apparatus. 3,714,812, Cl. 73-23.100.
- Driscoll, Gary L.: *See—*
  - Haseltine, Marcus W., Jr.; and Driscoll, Gary L., 3,715,313.
- Drohan, William A.; Valge, Juri; and Warner, David A., to United States of America, Air Force. Space vehicle system for determining earth's ultraviolet radiation limb. 3,715,594, Cl. 250-83.3uv.
- Drost, Adrian D.; and Glanz, Ronald P., to Kimberly-Clark Corporation. Apparatus for cooling a traveling web of material. 3,714,720, Cl. 34-120.000.
- Druth Packaging Corporation: *See—*
  - Notkr, Michael, 3,714,908.
- Du Pont of Canada Limited: *See—*
  - Pope, Kenneth W., 3,715,417.
- Dubuis, Robert: *See—*
  - Lindlar, Herbert; and Dubuis, Robert, 3,715,404.
- Ducellier & Cie: *See—*
  - Habert, Roger, 3,715,528.
- Dulat, Joseph, to United States Borax & Chemical Corporation. Method for treating surfaces of building materials. 3,715,228, Cl. 117-46.0fc.
- Dunaway, Jack W.; Woodland, Michael W.; and Johnson, Bernard H., to Potlatch Forests, Inc. Method for producing a flat particle-faced plywood panel. 3,715,257, Cl. 156-299.000.
- Dunlop Holdings Limited & Battelle Memorial Institute: *See—*
  - Zuppiger, Paul, 3,714,902.
- Dunn, Thomas A., to Motorola Inc. Plastic encapsulation of semiconductor devices. 3,715,423, Cl. 264-250.000.
- Durkan, Gerald. Fluidic digital pneumotachometer. 3,714,828, Cl. 73-194.00r.
- Duve, John P., to Sunbeam Corporation. Electric toothbrush. 3,715,544, Cl. 200-157.000.
- Eastman Kodak Company: *See—*
  - Bresson, Richard J., 3,714,871.
  - Brooker, Leslie G S.; and Fumia, Arthur, Jr., 3,715,351.
  - Di Fulvio, Anthony P.; and Wilson, William C., 3,715,117.
  - Ernisse, Paul J.; and Reynolds, Robert L., 3,714,873.
  - Greco, Edgar J., 3,715,221.
  - Herford, John; Mosman, Richard R.; Vieira, Thomas L.; and Wallace, Robert G., 3,714,761.
  - Kostusiak, Karl H.; and Selke, Lynn A., 3,715,090.
  - Lestina, Gregory J.; Kent, Frank W.; and Holtz, Carl F., 3,715,208.
  - Nerwin, Hubert, 3,714,876.
  - Rissberger, Arthur C., Jr., 3,715,088.
- Eastman Machine Company: *See—*
  - Calrk, Frederick G., 3,714,742.
- Eaton Corporation: *See—*
  - Liddell, Arlyn G., 3,715,628.
  - Lyth, William; and Smith, Roy, 3,715,013.
- Eaton, Samuel E., Jr.: *See—*
  - Dornemann, Peter L.; Radcliffe, Milton R.; Newton, Albert E.; and Eaton, Samuel E., Jr., 3,715,260.
- Eaton Yale & Towne, Inc.: *See—*
  - Meacham, George B. K.; and Nagel, William S., 3,714,932.
  - Walsh, William J.; Livers, Joseph A.; Mueller, Robert S.; and Hill, Warren R., 3,715,006.
- Eblovi, Roger, to General Signal Corporation. Rate decoder with active filters. 3,715,579, Cl. 246-187.00a.
- Ebrahimi, Jalal, to Northern Electric Company Limited. Line circuit for key telephone system. 3,715,516, Cl. 179-18.0fa.
- Ecodyne Corporation: *See—*
  - Soriente, Alfonse J., 3,715,033.
- Economics Laboratory Inc.: *See—*
  - Johnson, Dwight; and Mizuno, William G., 3,715,307.
- Edeus, James A., to National Manufacturing Co. Bifold door hardware. 3,714,679, Cl. 16-131.000.
- Edwards, Albert, to Baker Perkins Limited. Feed arrangements for a mixer or mixer-conveyor unit. 3,715,106, Cl. 259-25.000.
- Edwards, John Duncan: *See—*
  - Pianka, Max; and Edwards, John Duncan, 3,715,384.
- Edwards, William Sterling; Kahn, Paul; and Goodenough, Samuel H., to Cutter Laboratories, Inc. Tissue-type heart valve with a graft support ring or stent. 3,714,671, Cl. 3-1.000.
- Ehlers, Kenneth W., to United States of America, Atomic Energy Commission. Plasma generator. 3,715,625, Cl. 317-4.000.
- Ehrenfellner, Hubert, to MacMillan Bloedel Limited. Apparatus for orienting slender particles. 3,714,700, Cl. 29-419.000.
- Eigenbrod, Lester Hurt, to Union Carbide Corporation. Intransit liquefied gas refrigeration system. 3,714,793, Cl. 62-62.000.
- Elba Corporation: *See—*
  - Grupp, Walter Daniel, 3,715,155.
- Electrohome Limited: *See—*
  - Szabo, John, 3,715,623.
- Elfe, Thomas B., Jr., to Sperry Rand Corporation. High-impedance slow-wave propagation circuit having band width extension means. 3,715,616, Cl. 315-3.500.
- Elgar Corporation: *See—*
  - Elliston, Robert O., 3,715,652.
- Elks, Joseph, to Glaxo Laboratories Limited. Novel process for the preparation of 17α-hydroxy-pregna-1,4,9,(11)-triene-3,20-dione. 3,715,376, Cl. 260-397.450.
- Elliott, Ernest A.; and Pasen, Randolph A., to Detroit Edison Company, The. Tubular deadend supports. 3,715,460, Cl. 174-158.00r.
- Elliston, Robert O., to Elgar Corporation. High speed buck-boost alternating current regulator. 3,715,652, Cl. 323-45.000.
- Eloranta, Vaito K.: *See—*
  - Land, Edwin H.; Blinow, Igor; and Eloranta, Vaito K., 3,714,879.
- Elpern, Bill: *See—*
  - Bandurco, Victor; Elpern, Bill; and Shroff, James R., 3,715,396.
- Eltra Corporation: *See—*
  - Wright, Edmund S., 3,715,223.
- Emdeko International, Inc.: *See—*
  - Seaton, William Joe, 3,715,533.
- Emerson Electric Co.: *See—*
  - Kieffer, Vernon E.; and Korski, Frank S., 3,714,973.
  - Lewis, John G., 3,714,705.
- Emery Industries, Inc.: *See—*
  - Anninos, Athanasious P., 3,715,186.
- Emmerson, John O. Welding programmer. 3,715,560, Cl. 219-131.00r.
- Ender, Herman R; and Collins, Neal H. Machine for combining hay windrows. 3,714,766, Cl. 56-364.00.

- Endo, Gen: *See—*
  - Kiyono, Hiroshi; Nakashima, Unichi; Fujisaki, Yasuyuki; Ishigaki, Yukio; and Endo, Gen, 3,715,420.
- Endo Laboratories, Inc.: *See—*
  - Schoen, Karl; and Pachter, Irwin J., 3,715,354.
- Energy Conversion Devices, Inc.: *See—*
  - Fleming, Gordon R., 3,715,607.
  - Ovshinsky, Stanford R., 3,715,634.
- Engelhard Minerals & Chemicals Corporation: *See—*
  - Rylander, Paul N.; Karpenko, Irene M.; and Pond, George R., 3,715,397.
- Engelsmann, Dieter; Hackenberg, Hubert; and Karl, Horst, to Agfa-Gevaert Aktiengesellschaft. Photographic apparatus for use with light generating devices which are responsive to mechanical impulses. 3,714,874, Cl. 95-11.50r.
- Enrich: *See—*
  - Horine, David A.; and Clement, Carl J., 3,714,723.
- Enthone, Incorporated: *See—*
  - Wieczorek, Theophil J., 3,715,292.
- Entz, Alexis Charles: *See—*
  - Hammer, Alfred Paul; Entz, Alexis Charles; and Levaire, Claude, 3,715,451.
- Epstein, Joseph William; and Goldman, Leon, to American Cyanamid Company. Acyl derivatives of 10-methoxyibogamine. 3,715,361, Cl. 260-293.530.
- Erb, George H., to American Velcro Inc. Method for the manufacture of a separable fastener. 3,715,415, Cl. 264-25.000.
- Ernisse, Paul J.; and Reynolds, Robert L., to Eastman Kodak Company. Shutter control apparatus for photographic cameras. 3,714,873, Cl. 95-10.0ct.
- Ernsberger, Glenn W.: *See—*
  - Kernick, Andress; Ernsberger, Glenn W.; Vonderembse, John F.; and Geyer, Manvel A., 3,715,648.
- Ernst, Max. Outboard driving device for toy and model ships. 3,714,919, Cl. 115-17.000.
- Errgang, Karl: *See—*
  - Pries, Erich E.; Errgang, Karl; and Drebes, Friedrich-Wilhelm, 3,715,282.
- ESB Incorporated: *See—*
  - Hamel, David O., 3,715,240.
- Esposito, Frank J.; Pallas, Michael J.; and Martin, Robert W., to United States of America, Air Force. Unfurlable isotropic antenna. 3,715,759, Cl. 343-792.500.
- Esso Production Research Company: *See—*
  - Bayless, Jack H., 3,714,985.
- Esso Research and Engineering Company: *See—*
  - Hu, Shih-en; and Geyer, Jerome, 3,715,037.
  - Prentice, James S., 3,715,251.
- Etablissements Roffo: *See—*
  - Bastide, Claude, 3,715,080.
- Eubank, George S.: *See—*
  - North, William L.; and Eubank, George S., 3,715,064.
- European Atomic Energy Community (Euratom): *See—*
  - Schneiders, Albert M.; Schiller, Peter; Hollebeck, Gustave L.; and Diletti, Friedhelm, 3,714,814.
- Evans, Albert: *See—*
  - Drinkwater, John W.; and Evans, Albert, 3,714,812.
- Evans, Ralph E.; and Blower, Howard E., to Armco Steel Corporation. Drainage culvert. 3,714,786, Cl. 61-11.000.
- Faccou, Armand L., to FMC Corporation. Pipe swivel joint with a cartridge-type packing unit. 3,715,134, Cl. 285-276.000.
- Factory Mutual Research Corporation: *See—*
  - Livingston, William L., 3,714,964.
  - Livingston, William L., 3,714,988.
- Fader, Seymour J. Copying and photographic contact printing machines. 3,715,160, Cl. 355-113.000.
- Fairbairn, Geoffrey, to Ciba-Geigy AG. Method and apparatus for forming filament-wound articles. 3,715,252, Cl. 156-162.000.
- Fairbairn, Le Roy W.: *See—*
  - Michel, Donald E.; Fairbairn, Le Roy W.; and Cook, James W., 3,715,706.
- Fajans, Jack. Memory storage device and method of making the same. 3,715,734, Cl. 340-173.0lm.
- Falconbridge Nickel Mines Limited: *See—*
  - Archibald, Frederick R.; and Hatch, Gerald G., 3,715,200.
- Farbenfabriken Bayer Aktiengesellschaft: *See—*
  - Schmelzer, Hans-Georg; Gruber, Hermann; Degener, Eberthart; and Wagner, Kuno, 3,715,338.
- Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning: *See—*
  - Kuhne, Rudolf; Diery, Helmut; and Rittner, Siegbert, 3,715,319.
- Farmer, John J., III, to United States of America, Health, Education, and Welfare. Mini-test dish. 3,715,280, Cl. 195-103.500.
- Fasco Industries, Inc.: *See—*
  - Hire, Charles John, 3,715,699.
- Faulkner, Arthur M., to Plessey Company Limited, The. Jointing clips for insulated electric wires. 3,715,456, Cl. 174-84.00c.
- Fedco, Inc.: *See—*
  - Morine, Richard L.; and Hokes, James J., 3,715,061.
- Feely, Robert L., to Arbogast & Bastian, Inc. Bacon container. 3,715,218, Cl. 99-174.000.
- Feigel, Harold J.; Reizenstein, Harry S.; and Bloch, Gilbert, to FMC Corporation, mesne. Device for feeding and folding the trailing top flap of a container for closing the container. 3,714,757, Cl. 53-75.000.
- Feiner, Alexander; and Harding, Philip A., to Bell Telephone Laboratories, Incorporated. Error compensating optical detector apparatus and method. 3,715,733, Cl. 340-173.0lm.
- Feit, Leo. Water resistant and water repellent paint compositions containing a latex of a vinyl ester polymer. 3,715,327, Cl. 260-17.00r.
- Feldhoff, Heinrich: *See—*
  - Schmid, Hans; Feldhoff, Heinrich; Martin, Wolfgang; Bauer, Wolfgang; and Herion, Dieter, 3,714,686.
- Feldmann, Fritz K., to Pacific Technica Corporation. Discarding sabot projectiles. 3,714,900, Cl. 102-93.000.
- Ferguson, Lyndel G.: *See—*
  - Kendrick, William D.; Frazier, Bruce J.; Freeman, Norman L.; and Ferguson, Lyndel G., 3,715,055.
- Fernseh GmbH: *See—*
  - Krause, Gerhard, 3,715,462.
- Ferris, De Lacy F., to United States of America, Navy. Pressure differential limiter. 3,714,777, Cl. 60-39.480.
- Fichter, Barry S. Fluidic flushing mechanism. 3,714,954, Cl. 137-829.000.
- Fielding, Gordon Wilder. Telephone handset shutter attachment. 3,715,525, Cl. 179-187.000.
- Fifth Dimension Inc.: *See—*
  - Bitko, Sheldon S., 3,715,546.
- Figlin, Murray S.; and Boenisch, John R., to Ampeg Company, Inc., The. Clamp for a reverberation unit. 3,715,676, Cl. 333-30.00r.
- Filbert, Wilbur C. Article support. 3,715,096, Cl. 248-223.000.
- Filippi, Ernest A., to Special Devices, Inc. Scoring module. 3,714,899, Cl. 102-90.000.
- Fillies, Friedrich; and Urban, Gunter, to Fried. Krupp Gesellschaft mit beschrankter Haftung. Electrofilter insulator without damaging dust deposits. 3,714,762, Cl. 55-5.000.
- Fillion, Paul-Henri; and Guay, Viateur, to Hoplab Inc. Operating mechanism for vertically sliding door. 3,714,737, Cl. 49-360.000.
- Finch, Derek James, to Marconi Company Limited, The. Television camera tube cooling arrangements. 3,715,491, Cl. 178-7.250.
- Fine, Samuel: *See—*
  - Whetstone, Albert; Fine, Samuel; and Phillips, Stanley, 3,714,689.
- Finestone, Arnold B.; and Sims, Willard M., to Foster Grant Co., Inc. Process for preparing polyamides. 3,715,340, Cl. 260-78.00l.
- Finestone, Paul Ian. Table units. 3,714,906, Cl. 108-64.000.
- Finkle, Milton. Resilient firangible bumper guard. 3,715,138, Cl. 293-1.000.
- Finsilver, Devora: *See—*
  - Pollack, Shirley; and Finsilver, Devora, 3,714,670.
- Fiore, Jack C., to Motorola, Inc. Tuner pushbutton system with automatic band memory. 3,714,835, Cl. 74-10.330.
- Fischel, Halbert; Dichiro, Anthony; and Cowans, Kenneth W., to Sub-Marine Systems, Incorporated. Cryogenic gas processing system. 3,714,942, Cl. 128-142.000.
- Fischer, Werner: *See—*
  - Greinacher, Ekkehart; Fischer, Werner; and Dahne, Martin, 3,715,424.
- Fish, Richard D.: *See—*
  - Wertheimer, Donald J.; Fish, Richard D.; and Holmes, Ralph A., 3,714,885.
- Fisher, Leslie George, to GKN Birfield Transmissions Limited. Universal joints. 3,714,797, Cl. 64-8.000.
- Fitzgerald, William Vincent, Jr., to RCA Corporation. High voltage protection circuit. 3,715,492, Cl. 178-7.30r.
- Fleischer, Paul Egon, to Bell Telephone Laboratories, Incorporated. Active RC delay equalizer. 3,715,679, Cl. 330-107.000.
- Fleischer, Paul Egon, to Bell Telephone Laboratories, Incorporated. Active RC loss equalizer. 3,715,680, Cl. 330-107.000.
- Fleming, Gordon R., to Energy Conversion Devices, Inc. Electroluminescent circuit or the like. 3,715,607, Cl. 307-287.000.
- Fletcher, Edward Horton, to Deere & Company. Hydrostatic drive for vehicle. 3,714,999, Cl. 180-6.480.
- Florjancic, Dusan, to Sulzer Brothers Ltd. Boiling water reactor plant. 3,715,271, Cl. 176-54.000.
- Flory, Darrell L.: *See—*
  - Jackson, Dean B.; Stork, Edward S.; and Flory, Darrell L., 3,715,023.
- Flory, Donald M.; Moyer, Elton S.; and Naismith, Thomas D., to General Motors Corporation. Hydraulic power brake unit. 3,714,869, Cl. 91-434.000.
- Flowtron Industries Inc.: *See—*
  - Wilkens, Henry W.; and Sabatino, Daniel D., 3,714,823.
- Fluck, Josef: *See—*
  - Zaugg, Roland; Glanzmann, Werner; and Fluck, Josef, 3,714,774.
- Flynn, Stanley F. Protective article tray. 3,715,071, Cl. 229-2.500.
- FMC Corporation: *See—*
  - Battey, Robert F., 3,714,790.
  - Faccou, Armand L., 3,715,134.
  - Harnish, Wayne N.; Sticker, Robert E.; and Carls, Glen A., 3,715,435.
  - Mumma, Harold J., 3,715,024.
  - Patterson, Joseph M., 3,714,768.
  - Rosenberger, Chester A., Jr.; and Swartz, Horace M., 3,714,903.
  - Sears, Bobby Joe; and Brown, Wade E., 3,714,948.
  - Weir, Stanley M., 3,715,043.
- FMC Corporation, mesne: *See—*
  - Feigel, Harold J.; Reizenstein, Harry S.; and Bloch, Gilbert, 3,714,757.
- FMCCorporation: *See—*
  - Uplnd, Calif., 371,479,002.

- Fontaine, Bernard J.; and Alonso, Gabriel, to International Standard Electric Corporation. Simulation timing control system. 3,715,728, Cl. 340-172.500.
- Ford Motor Company: *See—*
  - Denton, Ronald T., 3,715,108.
  - Husch, Albert; Kemenes, Franz; and Pregel, Ludwig, 3,715,536.
  - Pierce, Stanley L., Jr.; and Winn, William C., 3,714,836.
- Fordice, Michael W.: *See—*
  - Shen, Tsung-Ying; Ruyle, William V.; Fordice, Michael W.; and Jensen, Norman P., 3,715,375.
- Forenta, Limited: *See—*
  - North, William L.; and Eubank, George S., 3,715,064.
- Formmet Corporation: *See—*
  - Dobson, John C., 3,714,694.
- Foseco International Limited: *See—*
  - Robiette, Alfred Gordon Evans, 3,715,440.
- Foster, George B.: *See—*
  - Abnett, Albert C.; and Foster, George B., 3,715,659.
- Foster Grant Co., Inc.: *See—*
  - Finestone, Arnold B.; and Sims, Willard M., 3,715,340.
- Foster Wheeler Corporation: *See—*
  - Kunsagi, Laszlo, 3,714,970.
- Fowell, Andrew J.; and Knebusch, George R., said Fowell assor. to Tappan Company, The, mesne. Outdoor refrigerant apparatus. 3,714,795, Cl. 62-508.000.
- Foxboro Company, The: *See—*
  - Bristol, Edgar H., II., 3,714,952.
- Franz, Joseph J.: *See—*
  - Herring, Theodore C.; Bracht, Ernest F.; Ainslie, Robert E.; Todd, Eugene M.; and Franz, Joseph J., 3,715,668.
- Frazier, Alvin W.: *See—*
  - Wennerberg, Arnold N.; and Frazier, Alvin W., 3,715,303.
- Frazier, Bruce J.: *See—*
  - Kendrick, William D.; Frazier, Bruce J.; Freeman, Norman L.; and Ferguson, Lyndel G., 3,715,055.
- Freeland, Stanley R., to Bell & Howell Company. Convertible sunshade and lens cap. 3,715,149, Cl. 350-58.000.
- Freeman, Alfred B. Chord tone generator control system. 3,715,442, Cl. 84-1.010.
- Freeman, Norman L.: *See—*
  - Kendrick, William D.; Frazier, Bruce J.; Freeman, Norman L.; and Ferguson, Lyndel G., 3,715,055.
- French, Walter K., to Cameron, Richard William, mesne. Shutter structure. 3,714,804, Cl. 70-419.000.
- Frequency Electronics, Inc.: *See—*
  - Bloch, Martin, 3,715,563.
- Frick, Hans-Dieter: *See—*
  - Hunicke, Wolfgang; Spohr, Rolf; Schranz, Karl-Wilhelm; Busch, Josef; Schon, Erwin; and Frick, Hans-Dieter, 3,714,883.
- Fried. Krupp Gesellschaft mit beschrankter Haftung: *See—*
  - Fillies, Friedrich; and Urban, Gunter, 3,714,762.
- Frieder, Marcus A., to Bendix Corporation, The. Rotational rate regulator. 3,715,016, Cl. 188-184.000.
- Fritock, William H.: *See—*
  - Wolgemuth, Larry G.; and Fritock, William H., 3,715,385.
- Froeschner, Herbert F. Pump controller. 3,715,173, Cl. 417-37.000.
- Frohlich, Alfons; Cappel, Marie-Luise; and Stubiger, Ernst, to Opti-Holding A.G. Slide-fastener stringer with stitched-on coupling element. 3,714,683, Cl. 24-205.10c.
- Fucci, Nicola J.: *See—*
  - Mazzola, Russell E.; and Fucci, Nicola J., 3,714,889.
- Fuchs, Hans: *See—*
  - Rix, Albert; Werner, Georg; and Fuchs, Hans, 3,715,022.
- Fuji Photo Film Co., Ltd.: *See—*
  - Sato, Masamichi, 3,715,640.
- Fujimoto, Sakae, to Kabushiki Kaisha Ricoh. Device for correcting the deflection of a large wide endless belt. 3,715,027, Cl. 198-184.000.
- Fujisaki, Yasuyuki: *See—*
  - Kiyono, Hiroshi; Nakashima, Unichi; Fujisaki, Yasuyuki; Ishigaki, Yukio; and Endo, Gen, 3,715,420.
- Fujisawa, Seiji: *See—*
  - Nakabe, Ryuhei; Fujisawa, Seiji; Sugihara, Yasuhiro; and Meki, Nori, 3,715,471.
- Fujita, Mitsuo, to Victor Company of Japan, Ltd. Color video signal recording and reproducing system. 3,715,468, Cl. 178-5.4cd.
- Fukata, Yasuo: *See—*
  - Oshima, Shintaro; Nakagome, Yukio; and Fukata, Yasuo, 3,715,507.
- Fukui, Saburo; Yamazaki, Tsunehiro; Yamamoto, Masato; Miyake, Masuichi; and Okumoto, Masanori, to Mitsubishi Jukogyo Kabushiki Kaisha. Descaling method for steel. 3,715,236, Cl. 134-2.000.
- Fukuroi, Takeo, to Yoshida Kogyo Kabushiki Kaisha. Method and machine for assembling slide fasteners of separable type. 3,714,698, Cl. 29-408.000.
- Fumia, Arthur, Jr.: *See—*
  - Brooker, Leslie G S.; and Fumia, Arthur, Jr., 3,715,351.
- Funk, Robert M., to Bethlehem Steel Corporation. Method for controlling the grind in a single stage autogenous grinding mill. 3,715,083, Cl. 241-24.000.
- Furbeck, Warren R.: *See—*
  - Lee, Charles A.; and Furbeck, Warren R., 3,715,255.
- Furukawa Electric Company Limited, The: *See—*
  - Tsuchiya, Seiji; Yabuki, Minoru; and Takada, Yoshinori, 3,714,769.
- Furuya, Toshihiro: *See—*
  - Akahori, Hiroshi; Kubozoe, Morioki; Furuya, Toshihiro; and Ueno, Sadayasu, 3,715,582.
- Future Systems, Inc.: *See—*
  - Anderson, Ralph; and Beyer, Rodney B., 3,715,299.
- Gaeng, Manfred; and Dimroth, Peter, to Badische Anilin- Soda-Fabrik Aktiengesellschaft. Dyes of the 2,4-dihydroxyquinoline series. 3,715,360, Cl. 260-288.00a.
- Gafa, Salvatore: *See—*
  - Ribaldone, Giuseppe; and Gafa, Salvatore, 3,715,393.
- Gaines, George L.; and Legrand, Donald G. Electrical apparatus containing dielectric solution. 3,715,639, Cl. 317-258.000.
- Gainesville Machine Company, Inc.: *See—*
  - Harben, Grover S., Jr., 3,714,682.
- Galginattis, Simeon V.: *See—*
  - Barnett, Allen M.; and Galginattis, Simeon V., 3,715,245.
- Gandrud, Ebenhard S. Chemical applicator assembly for a row crop planter. 3,714,913, Cl. 111-73.000.
- Gardner, Frederick H.: *See—*
  - Jungbluth, Ernest J.; Kavanaugh, Paul K.; and Gardner, Frederick H., 3,715,503.
- Gardner-Denver Company: *See—*
  - Zoerner, Richard L.; and Ruiter, Larry D., 3,714,994.
- Garfinkel, Harmon M.: *See—*
  - Bartholomew, Roger F.; and Garfinkel, Harmon M., 3,715,187.
- Garrett, Patrick H., to Ohio University, The President and Board of Trustees of the. Structure for and method of aircraft guidance. 3,715,752, Cl. 343-7.300.
- Garwood, George: *See—*
  - Norcross, James E.; and Garwood, George, 3,715,559.
- Gates Rubber Company, The: *See—*
  - Walker, Douglas W.; Gilman, Leland M; and Stark, Robert E., 3,715,239.
- Gay, Michel Louis Marie Joseph: *See—*
  - Boichard, Jacques; Brossard, Bernard Pierre; Gay, Michel Louis Marie Joseph; and Janin, Raymond Marc Clement, 3,715,394.
- Gearhart, Robert E., to General Electric Company. Disc winding with integral load current carrying rib shielding. 3,715,696, Cl. 336-70.000.
- Gedde, Erik, to American Can Company. Can end closure curl. 3,715,054, Cl. 220-67.000.
- General Acoustics Corporation: *See—*
  - Smith, Cloyd D.; and Schmidt, James H., 3,715,009.
- General Electric Company: *See—*
  - Applebaum, Sidney P.; and Geyer, Bernard H., Jr., 3,715,753.
  - Barnett, Allen M.; and Galginattis, Simeon V., 3,715,245.
  - Blake, James E., 3,715,487.
  - Bredt, James H.; and Kendall, Louis F., Jr., 3,715,241.
  - Brinkman, William Guy, 3,715,610.
  - Brush, R. John H.; and Singleback, George W., 3,715,479.
  - Crivello, James V., 3,715,323.
  - Gearhart, Robert E., 3,715,696.
  - Glaister, Frank J., 3,715,329.
  - Goodson, Larry Eugene, 3,715,467.
  - Harnden, John D., Jr.; and Kornrumpf, William P., 3,715,550.
  - Howald, Werner E., 3,714,778.
  - Jaffe, Mary S.; and Potter, Ralph M., 3,715,636.
  - Karstedt, Bruce D., 3,715,334.
  - Olsen, Arthur A., 3,715,626.
  - Perlowski, Edward F., Jr., 3,715,494.
  - Relles, Howard M., 3,715,407.
  - Savage, Joseph W.; and Brands, Henry J., 3,715,170.
  - Schroeter, Siegfried H., 3,715,401.
  - Siciliano, George R., 3,715,377.
  - Stott, Ronald A., 3,715,234.
  - Venier, Dominic A.; Smith, Bart A.; and Lass, James L., 3,715,274.
  - Warburton, William, 3,715,632.
  - Weinbaum, Sheldon; and Liner, Robert T., Jr., 3,714,782.
  - Wilkus, Edward V.; and Berger, Abe, 3,715,370.
  - Worcester, Joseph A., 3,715,671.
  - Ziemba, Richard T., 3,714,898.
- General Foods Corporation: *See—*
  - Balling, Theodore Thomas; Leonard, Richard J.; Ponzoni, George Bernard; Protomastro, Michael Gabriel; and Stefanucci, Arthur, 3,715,215.
- General Industries Inc.: *See—*
  - Grenier, Wilfred J., 3,715,077.
- General Instrument Corporation, mesne: *See—*
  - Altman, Leonard F.; and Sharp, Marcus, 3,715,250.
- General Motors Corporation: *See—*
  - Byram, Robert J.; Culver, Mark N.; and Van Ostrom, David L., 3,715,005.
  - Flory, Donald M.; Moyer, Elton S.; and Naismith, Thomas D., 3,714,869.
  - Harned, John L.; and Stewart, Edwin E., 3,715,145.
  - Helm, Eugene C., 3,714,925.
  - Lackey, Ronald H., 3,714,751.
  - McMullen, Wesley W.; and Miller, Tom B., 3,715,049.
  - Mooney, James J., Jr., 3,714,845.
  - Pasek, James E.; Rehfeld, Frederick L. J.; and Thompson, William B., 3,715,004.
  - Shellhause, Ronald L., 3,714,780.
  - Thorsby, Claude A.; and White, Robert L., 3,715,114.
  - Tuggle, Robert E., 3,715,139.
- General Signal Corporation: *See—*

Eblovi, Roger, 3,715,579.
La Forest, John P., 3,715,669.
General Tire & Rubber Company, The: *See—*
Uelzmann, Heinz, 3,715,341.
Gerdes, Theo: *See—*
Blau, Werner; and Gerdes, Theo, 3,715,075.
Gerken, Carl F.; and Bales, Emmett R., to American Standard, Inc. Folding table and seat support structure. 3,715,143, Cl. 297-159.000.
Gerry, Martin, E.: *See—*
Bennett, Donald Perry, Jr., 3,714,783.
Gesellschaft fur Kernforschung m.b.H.: *See—*
Ritz, Rudolf, 3,715,272.
Gething, Frank, to Aqua-Chem, Inc. Boiler flue gas scrubber. 3,714,764, Cl. 55-235.000.
Gewerkschaft Eisenhutte Westfalia: *See—*
Temme, Helmut, 3,715,025.
Geyer, Bernard H., Jr.: *See—*
Applebaum, Sidney P.; and Geyer, Bernard H., Jr., 3,715,753.
Geyer, Jerome: *See—*
Hu, Shih-en; and Geyer, Jerome, 3,715,037.
Geyer, Manvel A.: *See—*
Kernick, Andress; Ernsberger, Glenn W.; Vonderembse, John F.; and Geyer, Manvel A., 3,715,648.
Giangrasso, Joseph A. Power transfer device. 3,714,852, Cl. 81-57.300.
Gibbs, Gilbert Leslie; and Davies, Timothy Muir, to Robinson, E S & A Limited. Decorated or printed containers. 3,715,073, Cl. 229-43.000.
Gibel, Stephen J. Multiple collimator muffler. 3,715,010, Cl. 181-50.000.
Gibson, Stan. Water float with paddle extension means. 3,714,921, Cl. 115-28.00r.
Gilbert, Dixie E., to Phillips Petroleum Company. Rapid heating of parison preforms. 3,715,109, Cl. 432-122.000.
Gilbert, Paul T., to Beckman Instruments, Inc. Pressure measuring system. 3,714,829, Cl. 73-398.00r.
Gillette Company, The: *See—*
McGill, Thomas Alan, 3,715,558.
Quasius, Alan R.; and Shiman, Paul J., 3,715,428.
Tolgyesi, William S., 3,715,254.
Gilley, Paul J., to United States of America, National Aeronautics and Space Administration. Material fatigue testing system. 3,714,821, Cl. 73-90.000.
Gilman, Leland M: *See—*
Walker, Douglas W.; Gilman, Leland M; and Stark, Robert E., 3,715,239.
Gilson, Robert E. Sheave for ratchet block. 3,714,838, Cl. 74-230.240.
GKN Birfield Transmissions Limited: *See—*
Fisher, Leslie George, 3,714,797.
Macielinski, Jerzy Witold, 3,714,798.
Glaister, Frank J., to General Electric Company. Heat vulcanizable polysiloxane compositions containing asbestos. 3,715,329, Cl. 260-37.0sb.
Glanz, Ronald P.: *See—*
Drost, Adrian D.; and Glanz, Ronald P., 3,714,720.
Glanzmann, Werner: *See—*
Zaugg, Roland; Glanzmann, Werner; and Fluck, Josef, 3,714,774.
Glaxo Laboratories Limited: *See—*
Elks, Joseph, 3,715,376.
Glaze, Stanley G.; and Craven, Donald, to Hobson, H. M., Limited. Fuel supply systems for jet aircraft engines. 3,714,784, Cl. 60-241.000.
Gley, Paul R., to Rex Chainbelt Inc. Ski safety strap latch. 3,714,684, Cl. 24-230.000.
Gloeckler, Fred A., to Star Sprinkler Corporation. Flush type sprinkler. 3,714,989, Cl. 169-19.000.
Gloeckler, Fred A., to Star Sprinkler Corporation of Florida. Automatic heat detector. 3,715,700, Cl. 337-407.000.
Glorioso, Charles A., to Teletype Corporation. Programmable circuit and method. 3,715,608, Cl. 307-308.000.
Glutz, Bernhard: *See—*
Martin, Horst G.; Glutz, Bernhard; and Linz, Hans, 3,715,421.
Goldan, Theodore J., to International Telephone and Telegraph Corporation. Repetitive pulse generating system. 3,715,755, Cl. 343-18.00e.
Goldman, Leon: *See—*
Epstein, Joseph William; and Goldman, Leon, 3,715,361.
Gono, Kiyoshi: *See—*
Ogawa, Morimasa; and Gono, Kiyoshi, 3,715,553.
Goodenough, Samuel H.: *See—*
Edwards, William Sterling; Kahn, Paul; and Goodenough, Samuel H., 3,714,671.
Goodnight, Hershel: *See—*
Zink, John Smith; Goodnight, Hershel; and Reed, Robert D., 3,715,181.
Goodson, Larry Eugene, to General Electric Company. Tint control for color television receiver. 3,715,467, Cl. 178-5.4he.
Goodson, Louis H.; Jacobs, William B.; and Davis, Andrew W., to United States of America, Army. Air pollution monitoring system. 3,715,298, Cl. 204-195.00b.
Goodyear Tire & Rubber Company, The: *See—*
Bhikuni, Roop S.; and Cormany, Joseph L., Jr., 3,714,772.
Bucher, Robert W., 3,714,699.
Gordon, Eugene Irving; and Maydan, Dan, to Bell Telephone Laboratories, Incorporated. High efficiency injection laser cavities. 3,715,685, Cl. 331-94.50c.
Gordon, Frank. Means for applying glue to articles. 3,715,259, Cl. 156-363.000.
Gordon, Travis Hill; Marino, Patrick John; and Pilc, Randolph John, to Bell Telephone Laboratories, Incorporated. Time-division switch providing time and space switching. 3,715,505, Cl. 179-15.0aq.
Goto, Muneharu: *See—*
Wakamori, Shigeki; Yoshida, Yoshio; Yamauchi, Sanji; Ishii, Yoshio; and Goto, Muneharu, 3,715,199.
Gotze, Christian: *See—*
Hennig, Fridolin; Kellner, Hans-Jurgen; Potz, Klaus; and Gotze, Christian, 3,715,261.
Gowan, Richard L., to United States of America, Navy. Interface converter for feeding high frequency signals into low frequency circuits. 3,715,574, Cl. 235-154.000.
Grace, W. R., & Co.: *See—*
Holcombe, Edward L.; Calvert, Orville M.; and Kessel, William M., 3,714,754.
Grace, Wesley R.: *See—*
Day, Christopher C.; and Grace, Wesley R., 3,714,939.
Gray, Charles S.: *See—*
Allen, George W.; and Gray, Charles S., 3,715,128.
Greco, Edgar J., to Eastman Kodak Company. Optical glass. 3,715,221, Cl. 106-47.00q.
Green, Edward H. Aerosol valve and sprayhead. 3,715,081, Cl. 239-573.000.
Green, James H.: *See—*
Carnes, Joseph J.; Green, James H.; and Heller, John H., 3,715,305.
Greinacher, Ekkehart; Fischer, Werner; and Dahne, Martin. Process of separating yttrium and lanthanum through lutetium from mixtures of such elements. 3,715,424, Cl. 423-21.000.
Grenier, Wilfred J., to General Industries Inc. Sheet metal two-part sprinkler head and apparatus and process for making. 3,715,077, Cl. 289-200.000.
Griffin, Thomas Reuben, to Imperial Chemical Industries Limited. Homogenising. 3,715,105, Cl. 259-2.000.
Grobman, William, to Harris-Intertype Corporation. Sheet feeding apparatus. 3,715,115, Cl. 271-44.00a.
Grosseau, Albert, to Societe Anonyme Automobiles. Telescopic device for transmitting rotary movement. 3,714,841, Cl. 74-492.000.
Groupement Atomique Alsacienne Atlantique: *See—*
Carbonnel, Henri, 3,715,112.
Gruber, Hermann: *See—*
Schmelzer, Hans-Georg; Gruber, Hermann; Degener, Eberthart; and Wagner, Kuno, 3,715,338.
Grunberger, Sigrot, to U.S. Philips Corporation, mesne. Process of making a cutter foil for dry shaving apparatus. 3,714,807, Cl. 72-55.000.
Grundig: *See—*
Raebiger, Wolfgang, 3,714,781.
Grundy, Gary L., to Sperry Rand Corporation. Memory array readout with leading and trailing edges of the read signal. 3,715,737, Cl. 340-174.00m.
Grune, Per-Olof; Pucher, Walter; and Sandkvist, Hugo, to Allmanna Svenska Elektriska Aktiebolaget. Control means for pneumatically operated high voltage switching device. 3,715,542, Cl. 200-148.00r.
Grupp, Walter Daniel, to Elba Corporation. Audio visual display device. 3,715,155, Cl. 353-15.000.
GTE Sylvania Incorporated: *See—*
Audesse, Emery G.; Tartakoff, Alexander; and Robertson, John K., 3,715,232.
Solender, Peter E., 3,715,687.
Guay, Viateur: *See—*
Fillion, Paul-Henri; and Guay, Viateur, 3,714,737.
Gulf & Western Industries, Inc., mesne: *See—*
Kosinski, Frank Joseph, 3,715,446.
Gulf Oil Corporation: *See—*
Rawson, Donald E., 3,714,895.
Gulf-Western Industrial Products Company: *See—*
McWade, John E.; Keizer, Jan; Moore, Wilcy I.; and Purcell, Ernest M., 3,715,741.
Gull, Frank Arthur, to Hawker Siddeley Dynamics Limited. Optical scanning equipment. 3,715,591, Cl. 250-83.30h.
Gundlach, Robert W., to Xerox Corporation. Electrical color masking for a photo electrophoretic imaging process. 3,715,209, Cl. 96-1.200.
Gunter, William D., Jr.; and Brown, Richard M. Multiple-pass reimaging optical system. 3,715,152, Cl. 350-202.000.
Haag, Herman; and Muller, Willy, said Haag assor. to said Muller, Willy. Remote call back telephone answering apparatus. 3,715,506, Cl. 179-6.00e.
Habert, Roger, to Ducellier & Cie. Centrifugal advance device for an ignition distributor. 3,715,528, Cl. 200-19.00r.
Hackenberg, Hubert: *See—*
Engelsmann, Dieter; Hackenberg, Hubert; and Karl, Horst, 3,714,874.
Hafele, Carl Heinz. Spring loaded safety valve. 3,714,963, Cl. 137-487.500.
Hagan, James P.: *See—*
Le Fevre, Clyde E.; Hagan, James P.; and Owens, Ben H., 3,715,158.

Hagarman, Paul O.: *See—*
Dion, Paul A.; and Hagarman, Paul O., 3,714,701.
Hager, C., & Sons Hinge Manufacturing Company: *See—*
Peterson, Francis C., 3,715,537.
Hahn, Ronald E.: *See—*
Beard, William L., Jr.; and Hahn, Ronald E., 3,714,717.
Haines, Kenneth A.; and Hildebrand, Bernard P. Holographic imaging by simultaneous source and receiver scanning. 3,715,482, Cl. 178-6.70r.
Hajtomu es Felvonogyar: *See—*
Kenderi, Tibor, 3,715,076.
Halcon International, Inc.: *See—*
Hoch, Robert; and Kollar, John, 3,715,389.
Valbert, Jon R., 3,715,388.
Hall, Marchand B.; Handler, Irving; and Kelly, Calvin E., to United States Steel Corporation. Siding cutter. 3,714,856, Cl. 83-453.000.
Hall, Richard E., to International Business Machines Corporation. Data normalization system. 3,715,722, Cl. 340-146.30h.
Hall, Ronald B. Square edge sanding tool. 3,714,743, Cl. 51-392.000.
Hallen, Thor Oscar, to Tektronix, Inc. Temperature compensation of voltage controlled resistor. 3,715,609, Cl. 307-310.000.
Halliburton Company: *See—*
Kendrick, William D.; Frazier, Bruce J.; Freeman, Norman L.; and Ferguson, Lyndel G., 3,715,055.
Halls, Lawrence M.; and Seymour, Shaun A., to Sperry Rand Corporation. Suburban tractor and controls. 3,715,002, Cl. 180-82.000.
Halls, Peter Seaton: *See—*
Clarke, Eric Fifield Stuart; Cosier, James Edwin Henry; Kolanowski, Jan; Halls, Peter Seaton; and Laidlaw, Alexander Duncan Lindley, 3,715,068.
Halpern, Alfred; and Sasmor, Ernest J. Method of achieving an antipeptic action in animals with bi-metallic compounds. 3,715,437, Cl. 424-317.000.
Hamashima, Yoshio, to Shionogi & Co., Ltd. Novel method for the preparation of 2 alpha, 3 alpha-epithio-alpha-steroids. 3,715,350, Cl. 260-239.500.
Hamazaki, Masabumi: *See—*
Harada, Tkuo; Hamazaki, Masabumi; and Isawa, Nobuyuki, 3,715,130.
Hamblin, Robert J. J., to Universal Oil Products Company. Continuous process for scrubbing H2S from a gas stream and selectively producing elemental sulfur using four recycle water streams. 3,715,426, Cl. 423-234.000.
Hamel, David O., to ESB Incorporated. Contact assembly for dry cell battery. 3,715,240, Cl. 136-134.00p.
Hamer, Edward A. G. Tubular osmotic membrane. 3,715,036, Cl. 210-321.000.
Hamilton Cosco, Inc.: *See—*
Lay, Ralph B.; and Olsen, Ogden R., 3,715,142.
Hamilton Watch Company: *See—*
Dargent, Bruno M., 3,714,867.
Hammarlind, Alf Martin, to Aktiebolaget Atomenergi. Non-consumable electrode configuration having increased arc starting capabilities. 3,715,561, Cl. 219-145.000.
Hammer, Alfred Paul; Entz, Alexis Charles; and Levaire, Claude. Superconductor structure, and method of making the same. 3,715,451, Cl. 174-15.00c.
Hammond, Joseph P., to United States of America, Atomic Energy Commission. Method for diffusion bonding refractory metals and alloys. 3,714,702, Cl. 29-494.000.
Hampson, Peter Samuel: *See—*
Stirling, Harold James; Williams, Roger Morley; Hampson, Peter Samuel; and Price, James Kenneth, 3,715,515.
Han, Wyong S.: *See—*
Winters, Michael E.; and Han, Wyong S., 3,715,266.
Handler, Irving: *See—*
Hall, Marchand B.; Handler, Irving; and Kelly, Calvin E., 3,714,856.
Hanes, James W. E.; and Larralde, Edward, to Vetco Offshore Industries, Inc. Motion compensating apparatus. 3,714,995, Cl. 175-5.000.
Hanke, Edward Herman, to American Can Company. Easy opening container. 3,715,051, Cl. 220-54.000.
Hanlon, Thomas F. Color information on black and white film. 3,715,461, Cl. 178-5.20r.
Hanning, John R., to Aro Corporation, The. Sequential valve for rotary vane air motors. 3,714,969, Cl. 137-630.150.
Hanson, Charles Christian; Liong Ho, Joseph Ping; and Houdek, Merle Edward, to International Business Machines Corporation. Capacitive deyboard electronics. 3,715,747, Cl. 340-365.000.
Harada, Tkuo; Hamazaki, Masabumi; and Isawa, Nobuyuki. Shock absorbing device for protecting a rider in a high speed vehicle such as automobile. 3,715,130, Cl. 280-150.0ab.
Harben, Grover S., Jr., to Gainesville Machine Company, Inc. Method and apparatus for removing oil glands from fowl. 3,714,682, Cl. 17-11.000.
Harding, Philip A.: *See—*
Feiner, Alexander; and Harding, Philip A., 3,715,733.
Hardison, Jack E.: *See—*
Howell, Eddie P.; Hardison, Jack E.; and Campbell, William M., 3,714,832.
Hardy, John C., to Angelica Corporation. Hypothermia baby bunting. 3,714,947, Cl. 128-400.000.
Harnden, John D., Jr.; and Kornrumpf, William P., to General Electric Company. Induction cooking/warming appliance including vessel supporting means having an undulant surface and temperature sensing means associated with said surface. 3,715,550, Cl. 219-1.490.
Harned, John L.; and Stewart, Edwin E., to General Motors Corporation. Hydraulic anti-lock brake control system. 3,715,145, Cl. 303-21.00f.
Harnessed Energies, Inc.: *See—*
Silberg, Paul A.; and Lewis, John R., 3,715,539.
Harnish, Wayne N.; Sticker, Robert E.; and Carls, Glen A., to FMC Corporation. Phenylazoalkenoate fungicidal compositions. 3,715,435, Cl. 424-226.000.
Harr, Jerome D., to International Business Machines Corporation. Magnetic recording and reproduction apparatus for single picture video with audio. 3,715,481, Cl. 178-6.6fs.
Harrick, Nicolas J. Fluorescence spectrophotometry using multiple reflections to enhance sample absorption and fluorescence collection. 3,715,585, Cl. 250-71.00r.
Harrier, Jack L., to Standard Oil Company (Indiana). Process for preparing fiberglass preforms. 3,715,233, Cl. 117-126.0gb.
Harris-Intertype Corporation: *See—*
Grobman, William, 3,715,115.
Hartert, Hellmut, to Hellige, Fritz, & Co., G.m.b.H. Means for simulating the natural flow of blood. 3,714,815, Cl. 73-64.100.
Hartman, Henry Edmund: *See—*
Burns, Simon Pierce; and Hartman, Henry Edmund, 3,715,284.
Hasegawa, Goro; and Iura, Yukio, to Canon Kabushiki Kaisha. Single-lens reflex camera having interchangeable lenses. 3,714,878, Cl. 95-42.000.
Haseltine, Marcus W., Jr.; and Driscoll, Gary L., to Sun Oil Company of Pennsylvania, mesne. Traction transmission containing lubricant comprising gem-structured polar compound. 3,715,313, Cl. 252-52.000.
Hashimura, Tetsuo: *See—*
Umezu, Shiro; Takeda, Sadao; Mitsudome, Kaoru; and Hashimura, Tetsuo, 3,715,552.
Umezu, Shiro; Takeda, Sadao; Mitsudome, Kaoru; and Hashimura, Tetsuo, 3,715,554.
Hashirizaki, Shinya: *See—*
Watanabe, Tetsuo; and Hashirizaki, Shinya, 3,715,476.
Hatand, Isao, to Omron Tateisi Electronics Co. Keyboard input device. 3,715,746, Cl. 340-365.00s.
Hatch, Gerald G.: *See—*
Archibald, Frederick R.; and Hatch, Gerald G., 3,715,200.
Hatta, Takeshi: *See—*
Yokozeki, Zenzo; and Hatta, Takeshi, 3,715,290.
Hauser, Raimund: *See—*
Maszumanski, Trude; and Wendisch, Irmgard, 3,715,151.
Hawker Siddeley Dynamics Limited: *See—*
Gull, Frank Arthur, 3,715,591.
Haynes, Harold E., to RCA Corporation. Scanning system which includes means for controlling picture sampling density. 3,715,498, Cl. 178-69.50f.
Hefermehl, Hans-Peter Karl. Method of controlling the temperature in a sewage treatment system, and apparatus therefor. 3,715,304, Cl. 210-3.000.
Heflinger, Lee O., to TRW Inc. Four beam holographic interferometry. 3,715,164, Cl. 356-109.000.
Heinert, Dietrich H.: *See—*
Nowak, Robert M.; Woo, James T. K.; and Heinert, Dietrich H., 3,715,336.
Heinle, Carl William: *See—*
Batchelar, Raymond Luscombe; and Heinle, Carl William, 3,715,050.
Heitland, Hans-Joachim: *See—*
Kuhling, Dieter; and Heitland, Hans-Joachim, 3,715,184.
Heller, John H.: *See—*
Carnes, Joseph J.; Green, James H.; and Heller, John H., 3,715,305.
Hellige, Fritz, & Co., G.m.b.H.: *See—*
Hartert, Hellmut, 3,714,815.
Helm, Eugene C., to General Motors Corporation. Vaccum processing machine. 3,714,925, Cl. 118-49.000.
Henckels, J. A., Zwillingswerk, Firma: *See—*
Peters, Hans, 3,714,850.
Henegar, Hubert B.: *See—*
Bobrowicz, Vincent F.; and Henegar, Hubert B., 3,715,644.
Henkel & Cie G.m.b.H.: *See—*
Kuhling, Dieter; and Heitland, Hans-Joachim, 3,715,184.
Hennig, Fridolin; Kellner, Hans-Jurgen; Potz, Klaus; and Gotze, Christian, to Agfa-Gevaert Aktiengesellschaft. Apparatus for opening and marking the contents of film cassettes. 3,715,261, Cl. 156-552.000.
Henry, David W.; Hoff, Dale R.; and Patchett, Arthur A., to Merck & Co., Inc. N-(morpholino carbonyl)-1-lower alkyl-5-nitroimidazole-2-carboxamides. 3,715,355, Cl. 260-247.20a.
Henshaw, David Ernest; Knothe, Werner Emil Otto; and Stern, Lionel, to Commonwealth Scientific and Industrial Research Organization. Roller twisting apparatus. 3,714,771, Cl. 57-77.420.
Hercules Incorporated: *See—*
Hurley, Eldon K.; Maule, Robert S.; Musso, Rocco C.; and Smith, Lowell E., 3,715,131.
Thomson, J. Brent, 3,715,371.

- Herford, John; Mosman, Richard R.; Vieira, Thomas L.; and Wallace, Robert G., to Eastman Kodak Company. Apparatus for canning film magazines. 3,714,761, Cl. 53-118.000.
- Hergeth KG. Maschinenfabrik und Apparatebau: *See*—
  - Peters, Franz, 3,715,041.
- Herion, Dieter: *See*—
  - Schmid, Hans; Feldhoff, Heinrich; Martin, Wolfgang; Bauer, Wolfgang; and Herion, Dieter, 3,714,686.
- Herman, Fred W. Electronic chance circuit. 3,715,624, Cl. 315-209.000.
- Herring, Theodore C.; Bracht, Ernest F.; Ainslie, Robert E.; Todd, Eugene M.; and Franz, Joseph J., to United States of America, Army. Air-launched radio apparatus. 3,715,668, Cl. 325-112.000.
- Herron, William L.: *See*—
  - Weisz, William; and Herron, William L., 3,714,678.
- Heybourne, Robert Howard; and Clements, Herbert Arthur, to S.S.S. Patents Limited. Synchronous self-shifting clutches. 3,715,019, Cl. 192-67.00a.
- Hiab-Foco Aktiebolag: *See*—
  - Marklund, Karl Georg Erland, 3,715,046.
- Hicks, John J., to United States of America, Navy. Method and apparatus for measuring the intensity of atmospheric turbulence. 3,715,748, Cl. 343-5.00w.
- Hicks, John R.; and Bortzfield, William C., to Docutel Corporation. Credit card automatic currency dispenser. 3,715,569, Cl. 235-61.11d.
- Hieb, Harry L., to Kaiser Aluminum & Chemical Corporation. Basic refractory. 3,715,222, Cl. 106-58.000.
- Highberg, Carle W.: *See*—
  - Teeter, Ford C.; Sheldahl, David B.; and Highberg, Carle W., 3,715,312.
- Hildebrand, Bernard P.: *See*—
  - Haines, Kenneth A.; and Hildebrand, Bernard P., 3,715,482.
- Hill, Warren R.: *See*—
  - Walsh, William J.; Livers, Joseph A.; Mueller, Robert S.; and Hill, Warren R., 3,715,006.
- Himeno, Kinya: *See*—
  - Ohoshima, Nobumasa; Himeno, Kinya; and Tani, Norihiro, 3,715,589.
- Hino, John B.: *See*—
  - Spaunburgh, Richard G.; and Hino, John B., 3,715,381.
- Hirahara, Tsuneo: *See*—
  - Suzuki, Hiroyuki; Shionoya, Gosaburo; Suzuki, Yoshihisa; and Hirahara, Tsuneo, 3,715,279.
- Hirata, Arthur Atsunobu, to Abbott Laboratories. Stabilized erythroctes and methods therefor. 3,715,427, Cl. 424-3.000.
- Hire, Charles John, to Fasco Industries, Inc. Thermostat with reset pin. 3,715,699, Cl. 337-348.000.
- Hirsch, Donald; and Spaulding, David Adams, to Bell Telephone Laboratories, Incorporated. Adaptive DC restoration in single-sideband data systems. 3,715,670, Cl. 325-331.000.
- Hiruma, Kenji; and Sugaya, Inawo, to Ricoh Co. Ltd. Printing head for thermal printer and method for manufacturing same. 3,715,564, Cl. 219-216.000.
- Hitachi, Ltd.: *See*—
  - Akahori, Hiroshi; Kubozoe, Morioki; Furuya, Toshihiro; and Ueno, Sadayasu, 3,715,582.
  - Maekawa, Akiji; Munakata, Chusuke; and Saitou, Norio, 3,715,580.
- Hitchon, James Witham: *See*—
  - Carley-Macauly, Kenneth Wallace; Hitchon, James Witham; and Moulton, Robert James, 3,715,082.
- Hitzel, Hans: *See*—
  - Moebes, Erich; and Hitzel, Hans, 3,715,235.
- Hobart Manufacturing Company, The: *See*—
  - Allen, Kenneth C.; and Boshinski, Edwin E., 3,714,998.
- Hobdell, Michael R.: *See*—
  - Salzano, Francis J.; Hobdell, Michael R.; Minushkin, Bertram; Kalinowski, Walter; and Newman, Leonard, 3,715,296.
- Hobson, H. M., Limited: *See*—
  - Glaze, Stanley G.; and Craven, Donald, 3,714,784.
- Hoch, Robert; and Kollar, John, to Halcon International, Inc. Process for preparing glycol esters from olefinically unsaturated compounds. 3,715,389, Cl. 260-497.00r.
- Hochmair, Erwin S.: *See*—
  - United States of America, National Aeronautics and Space Administration, 3,715,693.
- Hoff, Dale R.: *See*—
  - Henry, David W.; Hoff, Dale R.; and Patchett, Arthur A., 3,715,355.
  - Mrozik, Helmut; and Hoff, Dale R., 3,715,395.
- Hoff, Dale R., to Merck & Co., Inc. Nitroimidazole carboxamides. 3,715,364, Cl. 260-309.000.
- Hoffman, Joseph K., to Air Reduction Company, Incorporated. Vinyl chloride-propylene copolymer grafted with butadiene, α-methacrylonitrile and optionally styrene. 3,715,413, Cl. 260-878.00r.
- Hoffman, Joseph Willard, to AMP Incorporated. Cutting or grooving tool. 3,714,712, Cl. 30-95.000.
- Hoffman, Norman Edwin, to AMP Incorporated. Cable coupling covering and moisture barrier. 3,715,459, Cl. 174-138.00f.
- Hoffmann-La Roche Inc.: *See*—
  - Bauernfeind, Jacob Christopher; and Mitrovic, Milan, 3,715,433.
  - Kierstead, Richard Wightman; and Lemahieu, Ronald Andrew, 3,715,400.
  - Lindlar, Herbert; and Dubuis, Robert, 3,715,404.
  - Rey-Bellet, Gerald; Schwartz, Daniel Ernest; and Reiner, Roland, 3,715,357.
  - Stempel, Arthur; and Westley, John, 3,715,372.
- Hofman, Wytze, to U.S. Philips Corporation. Electromagnetic switch having a flexible permanent magnet armature. 3,715,695, Cl. 335-229.000.
- Hofmann, Detlef. Step-by-step transmission. 3,714,848, Cl. 74-822.000.
- Hofmann, Ernst-Gunther; Meyerhoff, Klaus; Offermann, Bernd Peter; and Barthel, Rolf, to Licentia Patent-Verwaltungs-G.m.b.H. Rotatable neutron therapy irradiating apparatus. 3,715,597, Cl. 250-105.000.
- Hogg, George W., to United States of America, Atomic Energy Commission. Fluidized bed production of uranium monocarbide and uranium monocarbide-uranium aluminide mixtures. 3,715,318, Cl. 252-301.10r.
- Hokes, James J.: *See*—
  - Morine, Richard L.; and Hokes, James J., 3,715,061.
- Holcombe, Edward L.; Calvert, Orville M.; and Kessel, William M., to Grace, W. R., & Co. Vacuumizing system. 3,714,754, Cl. 53-22.00b.
- Hollebeck, Gustave L.: *See*—
  - Schneiders, Albert M.; Schiller, Peter; Hollebeck, Gustave L.; and Diletti, Friedhelm, 3,714,814.
- Hollenbaugh, Roger C.: *See*—
  - Laughlin, Charles R.; Hollenbaugh, Roger C.; and Allen, Walter K., 3,715,663.
- Holmes, Ralph A.: *See*—
  - Wertheimer, Donald J.; Fish, Richard D.; and Holmes, Ralph A., 3,714,885.
- Holtz, Carl F.: *See*—
  - Lestina, Gregory J.; Kent, Frank W.; and Holtz, Carl F., 3,715,208.
- Honda Giken Kogyo Kabushiki Kaisha: *See*—
  - Ozaki, Masaaki, 3,714,933.
- Honeywell Inc.: *See*—
  - Nicholas, Merle E., 3,715,702.
  - Schmit, Francis M., 3,715,740.
  - Yu, Frank K., 3,715,727.
- Honnold, George Herbert: *See*—
  - Campbell, Robert Riddle; Honnold, George Herbert; and Lefkowitz, Michael, 3,715,518.
- Hoplab Inc.: *See*—
  - Fillion, Paul-Henri; and Guay, Viateur, 3,714,737.
- Hopner, Emil: *See*—
  - Calfee, Richard W.; and Hopner, Emil, 3,715,474.
- Horine, David A.; and Clement, Carl J., to Enrich. Hand held teaching machine. 3,714,723, Cl. 35-9.00a.
- Horizons Incorporated: *See*—
  - Quaintance, Harold J., 3,715,211.
- Horvath, Bertalan, to Phillips Petroleum Company. Chromium oxide polymerization catalyst. 3,715,321, Cl. 252-441.000.
- Horwath, Tibor G., to United States of America, Army. Porous pipe acoustic sensor. 3,715,714, Cl. 340-15.000.
- Hoshi, Hiroshi: *See*—
  - Susuki, Rinnosuke; Hoshi, Hiroshi; Araki, Shinichi; and Miyamoto, Shinzo, 3,715,063.
- Houdek, Merle Edward: *See*—
  - Hanson, Charles Christian; Liong Ho, Joseph Ping; and Houdek, Merle Edward, 3,715,747.
- Houghton, George L.: *See*—
  - Montell, Joseph J.; and Houghton, George L., 3,714,915.
- Houlihan, William J., to Sander-Wander, Inc. Diarylimidazo[2,1-a]isoindoles. 3,715,366, Cl. 260-309.000.
- House, Bruce: *See*—
  - Shelley, George R.; Shelley, Robert J., Jr.; Dixon, Arthur B.; and House, Bruce, 3,715,119.
- Howald, Werner E., to General Electric Company. Annular combustor systems. 3,714,778, Cl. 60-39.74r.
- Howe, James L.: *See*—
  - Kievit, James M.; and Howe, James L., 3,715,725.
- Howell, Eddie P.; Hardison, Jack E.; and Campbell, William M., to Atlantic Richfield Company. Geothermal exploration. 3,714,832, Cl. 73-432.00r.
- Howson-Algraphy Limited: *See*—
  - Watkinson, Leonard J.; and Service, Anthony Peter, 3,715,210.
- Hu, Shih-en; and Geyer, Jerome, to Esso Research and Engineering Company. Novel lubricating oil system and oil filter for internal combustion engines. 3,715,037, Cl. 210-501.000.
- Hubbard, Arthur Lowell; and Sanderson, Leon Franklin, to Deere & Company. Crop harvester. 3,714,767, Cl. 56-208.000.
- Huebner, Charles Ferdinand, to Ciba-Geigy Corporation. Spiro aziridine-ethenoanthracene compounds. 3,715,348, Cl. 260-239.00e.
- Huggett, Clayton M., to Susquehanna Corporation, The. Habitable combustion-suppressant atmosphere comprising air, a perfluoroalkane and optionally make-up oxygen. 3,715,438, Cl. 424-366.000.
- Hughes Tool Company: *See*—
  - Nolley, Robert H., 3,714,993.
- Hugle Industries, Inc.: *See*—
  - Moore, Arthur H., 3,714,704.
- Hunicke, Wolfgang: *See*—
  - Schranz, Karl-Wilhelm; Hunicke, Wolfgang; and Busch, Josef, 3,714,882.

- Hunicke, Wolfgang; Spohr, Rolf; Schranz, Karl-Wilhelm; Busch, Josef; Schon, Erwin; and Frick, Hans-Dieter, to Agfa-Gevaert Aktiengesellschaft. Machine for wet treatment of elongated strip-shaped carriers for light sensitive material. 3,714,883, Cl. 95-94.0r.
- Hunsinger, Peter; and White, James C., to Propper Manufacturing Company, Inc. Apparatus for manufacturing slide covers. 3,715,067, Cl. 225-96.500.
- Hurley, Eldon K.; Maule, Robert S.; Musso, Rocco C.; and Smith, Lowell E., to Hercules Incorporated. Chemical gas generating device for an automobile safety system. 3,715,131, Cl. 280-150.0ab.
- Husch, Albert; Kemenes, Franz; and Pregel, Ludwig, to Ford Motor Company. Switch within a motor vehicle door lock mechanism. 3,715,536, Cl. 200-64.640.
- Hyde, Peter John; and Reddish, Wilson, to Imperial Chemical Industries Limited. Method and apparatus for measuring the charge-time response of materials by applying a voltage step across the same. 3,715,656, Cl. 324-61.00r.
- Hyer, Frank S., to Cutler-Hammer, Inc. Agitator assembly for particulate material hopper. 3,715,059, Cl. 222-199.000.
- Hynes, Barry T.; Krall, George S.; and Krall, Michael G. Novel cleaning composition. 3,715,324, Cl. 252-529.000.
- Iacobellis, Sam F., to North American Rockwell Corporation. Rocket engine nozzle with gas spike. 3,714,785, Cl. 60-258.000.
- Ichikawa, Kiyoshi: *See*—
  - Nakahara, Yasuji; Ichikawa, Kiyoshi; and Kondo, Kunio, 3,715,412.
- ICI America Inc.: *See*—
  - Wade, Charles G., 3,715,247.
- Iino, Hideo, to SKB Arms Company. Gun barrel. 3,714,727, Cl. 42-79.000.
- Ikrath, Kurt, to United States of America, Army. Method of repeating RF-borne signal across an earth barrier. 3,715,664, Cl. 325-9.000.
- Imperial Chemical Industries, Limited: *See*—
  - Burton, Arthur, 3,715,264.
  - Griffin, Thomas Reuben, 3,715,105.
  - Hyde, Peter John; and Reddish, Wilson, 3,715,656.
- Imperial Metal Industries (Kynoch) Limited: *See*—
  - Clayton, Anthony Robert King; and Barber, Anthony Clifford, 3,715,243.
  - Sindall, John Henry, 3,714,863.
- Industrial Science & Technology, Agency of: *See*—
  - Takasaki, Yoshiyuki; and Kamibayashi, Akira, 3,715,276.
- Instant Structures, Inc.: *See*—
  - Aitken, James B., 3,714,749.
- Institute of Gas Technology: *See*—
  - Anderson, Philip J.; and Ng, Daniel Y. C., 3,714,909.
- Interatom Internationale Atomreaktorbau GmbH: *See*—
  - Mehren, Franz, 3,715,269.
- International Business Machines Corporation: *See*—
  - Blasbalg, Herman L., 3,715,508.
  - Calfee, Richard W.; and Hopner, Emil, 3,715,474.
  - Hall, Richard E., 3,715,722.
  - Hanson, Charles Christian; Liong Ho, Joseph Ping; and Houdek; Merle Edward, 3,715,747.
  - Harr, Jerome D., 3,715,481.
  - Jones, Gardner D., Jr., 3,715,496.
  - Magill, Peter J.; McCurry, Robert E.; and Speicher, Charles A., 3,715,762.
  - Mercy, Brian R., 3,715,729.
  - Vogelsberg, Robert E., 3,715,573.
- International Harvester Company: *See*—
  - Boyle, Ralph C.; and Paulius, Leonard, 3,715,704.
  - Rieser, Donald E., 3,714,991.
- International Nickel Company, Inc., The: *See*—
  - Knapp, Burton Bower, 3,715,286.
- International Paper Company, mesne: *See*—
  - Lee, Charles A.; and Furbeck, Warren R., 3,715,255.
- International Standard Electric Corporation: *See*—
  - Fontaine, Bernard J.; and Alonso, Gabriel, 3,715,728.
- International Telephone and Telegraph Corporation: *See*—
  - Goldan, Theodore J., 3,715,755.
  - Levine, Arnold M., 3,715,480.
- Intertechnique S.A.: *See*—
  - Rosenstingl, Emmanuel, 3,715,584.
  - Thomas, Edward W.; and Rapkin, Edward, 3,715,586.
- Irving, Alexander; and Priest, Reginald Alfred Francis, to National Research Development Corporation. Vehicle station keeping device. 3,715,721, Cl. 340-62.000.
- Isawa, Nobuyuki: *See*—
  - Harada, Tkuo; Hamazaki, Masabumi; and Isawa, Nobuyuki, 3,715,130.
- Ishigaki, Yoshio: *See*—
  - Tamaru, Hideshi; and Ishigaki, Yoshio, 3,715,469.
- Ishigaki, Yukio: *See*—
  - Kiyono, Hiroshi; Nakashima, Unichi; Fujisaki, Yasuyuki; Ishigaki, Yukio; and Endo, Gen, 3,715,420.
- Ishii, Yoshio: *See*—
  - Wakamori, Shigeki; Yoshida, Yoshio; Yamauchi, Sanji; Ishii, Yoshio; and Goto, Muneharu, 3,715,199.
- Ishimura, Kazukiyo, to Nippon Gakki Seizo Kabushiki Kaisha. Wiring system between sound source circuits and keyer circuits in an electronic musical instrument. 3,715,443, Cl. 84-1.010.
- Ishizuka, Hiroshi. Method for reducing chlorides and a device therefor. 3,715,205, Cl. 75-84.500.
- Itek Corporation: *See*—
  - Kane, John R.; and Morse, Harry G., 3,715,214.
  - Marro, Dominic P., 3,715,620.
- Ito, Shinya, to Kabushiki Kaisha Tokai Rika Denki Seisakusho. Hydraulic pressure differential switch with snap over leaf contact. 3,715,538, Cl. 200-82.00d.
- Ito, Takamasa; and Makino, Tsutomu, to Sony Corporation. Graphic symbol display system including plural storage means and shared signal converter. 3,715,744, Cl. 340-336.000.
- Ito, Takuo: *See*—
  - Komatsu, Noboru; Suzuki, Takatoshi; and Ito, Takuo, 3,715,206.
- Itoh, Masaji, to Nippon Gakki Seizo Kabushiki Kaisha. Keyboard type wind msical instrument having removable mouthpiece securing removable air filter. 3,715,448, Cl. 84-375.000.
- Iura, Yukio: *See*—
  - Hasegawa, Goro; and Iura, Yukio, 3,714,878.
- Ivanhoe Research Corporation: *See*—
  - Saray, George B., 3,714,916.
- Ivanoff, Alexander. Device for removing oil slicks. 3,715,034, Cl. 210-242.000.
- Iwatsu Electric Co., Ltd.: *See*—
  - Kobayashi, Akira; Koike, Toshio; and Sato, Keiichi, 3,715,085.
- Jackson, Dean B.; Stork, Edward S.; and Flory, Darrell L., to National Cash Register Company, The. Cam-and-linkage arrangement for simultaneous movement of multiple keystems connected to a common key. 3,715,023, Cl. 197-98.000.
- Jackson, George Oliver, to United Kingdom Atomic Energy Authority. Nuclear reactors. 3,715,270, Cl. 176-38.000.
- Jackson, William John: *See*—
  - Jankowski, Stanislaw; and Jackson, William John, 3,714,924.
- Jacobs, William B.: *See*—
  - Goodson, Louis H.; Jacobs, William B.; and Davis, Andrew W., 3,715,298.
- Jadow, B., and Sons, Inc.: *See*—
  - Jadow, Henry C., 3,714,713.
- Jadow, Henry C., to Jadow, B., and Sons, Inc. Device for circular engraving. 3,714,713, Cl. 33-23.00k.
- Jaffe, Mary S.; and Potter, Ralph M., to General Electric Company. Silicon carbide lamp mounted on a ceramic of poor thermal conductivity. 3,715,636, Cl. 317-234.00r.
- Jahn, Reinhardt H., to Chicago Metallic Corporation. Concealed grid system. 3,714,753, Cl. 52-484.000.
- Janda, Richard M., to North American Rockwell Corporation. Stocking and method of making same. 3,714,801, Cl. 66-170.000.
- Janiak, Stefan; and Dittrich, Volker, to Ciba-Geigy AG. Formimide-esters and pesticidal preparations containing them. 3,715,436, Cl. 424-304.000.
- Janin, Raymond Marc Clement: *See*—
  - Boichard, Jacques; Brossard, Bernard Pierre; Gay, Michel Louis Marie Joseph; and Janin, Raymond Marc Clement, 3,715,394.
- Jankowski, Stanislaw; and Jackson, William John, to Cincinnati Milacron Inc. Dimension conversion indicator. 3,714,924, Cl. 116-115.500.
- Jeddeloh Bros. Sweed Mills, Inc.: *See*—
  - Larson, Charles L., 3,715,118.
- Jefferson Chemical Company, Inc.: *See*—
  - Burns, Simon Pierce; and Hartman, Henry Edmund, 3,715,284.
  - Schulze, Heinz, 3,715,365.
- Jeffries, Samuel B., to Celanese Corporation. Reduction of nitrate ion concentration by formaldehyde treatment in the recovery of oxidation catalyst metals. 3,715,320, Cl. 423-24.000.
- Jehle, Frederick S. Apparatus for determining an underinflated condition in pneumatic tires. 3,715,720, Cl. 340-58.000.
- Jekat, Walter K., to Klein, Schanzlin & Becker Aktiengesellschaft. Drive shaft. 3,714,840, Cl. 74-421.00a.
- Jenkner, Herbert: *See*—
  - Praetzel, Hans Eberhard; Neukirchen, Ernst; and Jenkner, Herbert, 3,715,383.
- Jenney, Asa R., to Clark Equipment Company. Inching valve with bypass valve for rilling clutches. 3,715,017, Cl. 192-4.00a.
- Jensen, Carl A.; and Wood, Lowell L., Jr. Radiant heating of gas streams. 3,715,110, Cl. 432-29.000.
- Jensen, Norman P.: *See*—
  - Shen, Tsung-Ying; Ruyle, William V.; Fordice, Michael W.; and Jensen, Norman P., 3,715,375.
- Jensen, Ole R.; and Jensen, Preben W. Indexible clutch mechanism. 3,714,837, Cl. 74-125.500.
- Jensen, Preben W.: *See*—
  - Jensen, Ole R.; and Jensen, Preben W., 3,714,837.
- Johns-Manville Corporation: *See*—
  - Sadler, Thomas Harry, 3,715,230.
- Johnson, Allan M., to CCI Aerospace Corporation. Ion exchange demineralizing system. 3,715,287, Cl. 204-301.000.
- Johnson, Bernard H.: *See*—
  - Dunaway, Jack W.; Woodland, Michael W.; and Johnson, Bernard H., 3,715,257.
- Johnson, Dwight; and Mizuno, William G., to Economics Laboratory Inc. Treatment of water used in heat transfer equipment. 3,715,307, Cl. 210-58.000.
- Johnson, Joe L.: *See*—
  - Johnson, Tom W.; and Johnson, Joe L., 3,714,958.
- Johnson, Ray M. Circular waveguide microwave applicator. 3,715,555, Cl. 219-10.550.
- Johnson, Tom W.; and Johnson, Joe L., to Sajar Plastics, Inc. Mixing valve assembly. 3,714,958, Cl. 137-315.000.

- Johnson, Wallace J. S. Appratus for crushing fruit in an inert gas. 3,714,887, Cl. 99-239.000.
- Jones, Charles, to Curtiss-Wright Corporation. Doweling construction for rotary engine housing. 3,715,178, Cl. 418-83.000.
- Jones, Gardner D., Jr., to International Business Machines Corporation. Digital band-pass filter for a single-circuit full duplex transmission system. 3,715,496, Cl. 178-58.000.
- Josephson, Vernal, to United States of America, Air Force. Pulsed neutron source. 3,715,595, Cl. 250-84.500.
- Joslyn Mfg. and Supply Co.: *See—*
  - Cunningham, Francis V.; and Miller, Cyril V., 3,715,449.
- Jubenville, Arthur R. Trailer anti-fishtail control system. 3,715,003, Cl. 180-103.000.
- Jungbluth, Ernest J.; Kavanaugh, Paul K.; and Gardner, Frederick H., to Stromberg-Carlson Corporation. Automatic transfer arrangement for telephone system. 3,715,503, Cl. 179-15.0bf.
- Junkermann, Helmut; and Klotzer, Erhard, to Deutsche Gold- und Silber-Scheideanstalt vormal Roessler. Rubber stock composition for bonding to textile reinforcement containing a phenol-formaldehyde precursor wherein the formaldehyde percursor consists of alinear polyoxymethylene. 3,715,332, Cl. 260-41.50r.
- Kabushiki Kaisha Ricoh: *See—*
  - Fujimoto, Sakae, 3,715,027.
  - Kadowaki, Tatsusuki; and Kurasawa, Makoto, 3,715,018.
- Kabushiki Kaisha Tokai Rika Denki Seisakusho: *See—*
  - Ito, Shinya, 3,715,538.
- Kabushiki Kaisha Toyoda Jidoshokki Seisakusho: *See—*
  - Ohta, Shuji, 3,715,014.
- Kabushiki Kaisha Toyota Chuo Kenkyusho: *See—*
  - Komatsu, Noboru; Suzuki, Takatoshi; and Ito, Takuo, 3,715,206.
- Kadowaki, Tatsusuki; and Kurasawa, Makoto, to Kabushiki Kaisha Ricoh. Clutch engaging and disengaging device. 3,715,018, Cl. 192-24.000.
- Kahn, Paul: *See—*
  - Edwards, William Sterling; Kahn, Paul; and Goodenough, Samuel H., 3,714,671.
- Kaiser Aluminum & Chemical Corporation: *See—*
  - Hieb, Harry L., 3,715,222.
  - Murphy, James M.; and Bolmer, Perce W., 3,714,792.
- Kalajian, John. Adjustable easel. 3,715,097, Cl. 248-449.000.
- Kalinowski, Walter: *See—*
  - Salzano, Francis J.; Hobdell, Michael R.; Minushkin, Bertram; Kalinowski, Walter; and Newman, Leonard, 3,715,296.
- Kalle Aktiengesellschaft: *See—*
  - Michel, Wolfgang, 3,715,074.
- Kamezawa, Yasutoki: *See—*
  - Nihyakumen, Kouzi; Yokoyama, Taizo; Ueda, Yasuo; Kamezawa, Yasutoki; and Aizawa, Tatsuo, 3,715,213.
- Kamibayashi, Akira: *See—*
  - Takasaki, Yoshiyuki; and Kamibayashi, Akira, 3,715,276.
- Kaminski, William: *See—*
  - Brown, Earl Franklin; and Kaminski, William, 3,715,489.
- Kan, Philip T., to Computer Industries, Inc. Microfilm plotter system. 3,715,731, Cl. 340-172.500.
- Kane, John R.; and Morse, Harry G., to Itek Corporation. Rapid development process. 3,715,214, Cl. 96-66.0hd.
- Karady, Sandor; Pines, Seemon H.; Ly, Manuel G.; and Sletzinger, Meyer, to Merck & Co., Inc. N-acyl-α-hydrazino-β-(phenyl) hydrazino-propionitriles. 3,715,382, Cl. 260-465.00d.
- Karato, Yoshiteru, to Shiba Electric Co., Ltd. Color television camera equipment. 3,715,466, Cl. 178-5.4st.
- Karl, Horst: *See—*
  - Engelsmann, Dieter; Hackenberg, Hubert; and Karl, Horst, 3,714,874.
- Karpenko, Irene M.: *See—*
  - Rylander, Paul N.; Karpenko, Irene M.; and Pond, George R., 3,715,397.
- Karstedt, Bruce D., to General Electric Company. Platinum-vinylsiloxanes. 3,715,334, Cl. 260-46.5ua.
- Kasper, Robert J.: *See—*
  - Balzer, Norbert R.; and Kasper, Robert J., 3,715,556.
- Katzer, Johannes: *See—*
  - Sauer, Roland; Katzer, Johannes; and Stephany, Christian, 3,714,962.
- Kaufman, Martin H., to United States of America, Navy. Process for recrystallizing diaminotrinitrobenzene. 3,715,398, Cl. 260-582.000.
- Kavanaugh, Paul K.: *See—*
  - Jungbluth, Ernest J.; Kavanaugh, Paul K.; and Gardner, Frederick H., 3,715,503.
- Kay, Charles. Building construction assembling and positioning apparatus. 3,714,696, Cl. 29-200.00p.
- Keeley, Gordon, to Lucas, Joseph, (Industries) Limited. Distributor housing and plate assembly with rotatable clamping means. 3,715,531, Cl. 200-19.00r.
- Keener, Everett L.: *See—*
  - Berkey, Earl R.; and Keener, Everett L., 3,714,806.
- Kehoe, James M. Incinerator. 3,714,912, Cl. 110-8.00a.
- Keir, Robin S., to United States of America, Navy. Water sampling device. 3,714,830, Cl. 73-425.40r.
- Keizer, Jan: *See—*
  - McWade, John E.; Keizer, Jan; Moore, Wilcy I.; and Purcell, Ernest M., 3,715,741.
- Kellner, Hans-Jurgen: *See—*
  - Hennig, Fridolin; Kellner, Hans-Jurgen; Potz, Klaus; and Gotze, Christian, 3,715,261.
- Kelly, Calvin E.: *See—*
  - Hall, Marchand B.; Handler, Irving; and Kelly, Calvin E., 3,714,856.
- Kelly, Calvin E., to United States Steel Corporation. Apparatus for printing and dispensing labels. 3,715,262, Cl. 156-541.000.
- Kelly, Gilbert H.; and Coburn, Herbert D., to Texas Instruments, Incorporated. Gas cushion control for seismic gas explorer. 3,715,007, Cl. 181-.5nc.
- Kelly, James Michael, to Bell Telephone Laboratories, Incorporated. Adaptive predictive speech signal coding system. 3,715,512, Cl. 179-1.0sa.
- Kelson, Malcolm J., Sr. Rotary engine. 3,714,930, Cl. 123-8.270.
- Kemenes, Franz: *See—*
  - Husch, Albert; Kemenes, Franz; and Pregel, Ludwig, 3,715,536.
- Kendall, Louis F., Jr.: *See—*
  - Bredt, James H.; and Kendall, Louis F., Jr., 3,715,241.
- Kenderi, Tibor, to Hajtomu es Felvonogyar. Method and apparatus for spraying powdered thermoplastic substances. 3,715,076, Cl. 239-8.000.
- Kendrick, William D.; Frazier, Bruce J.; Freeman, Norman L.; and Ferguson, Lyndel G., to Halliburton Company. Apparatus for injecting one or more articles individually into a tubular flow path. 3,715,055, Cl. 221-75.000.
- Kennedy, Howard V.: *See—*
  - Cooper, Erwin E.; and Kennedy, Howard V., 3,715,497.
- Kent, Frank W.: *See—*
  - Lestina, Gregory J.; Kent, Frank W.; and Holtz, Carl F., 3,715,208.
- Kerklo, Philip, to Carrier Corporation. Turbo machine rotor structure. 3,715,176, Cl. 416-198.000.
- Kernick, Andress; Ernsberger, Glenn W.; Vonderembse, John F.; and Geyer, Manvel A., to Westinghouse Electric Corporation. Technique for use of controlled current feedback transformers in power inverter apparatus. 3,715,648, Cl. 321-11.000.
- Kessel, William M.: *See—*
  - Holcombe, Edward L.; Calvert, Orville M.; and Kessel, William M., 3,714,754.
- Keto, August I.; and Manes, Robert J., to Westinghouse Electric Corporation. Rotary electrical switching contact assembly with hollow insulating arc barrier. 3,715,543, Cl. 200-151.000.
- Kettner, Robert E., to Michigan Wheel Corporation. Foldable propeller. 3,715,171, Cl. 416-142.000.
- Kidde, Walter, & Company, mesne: *See—*
  - Cutter, Larry I., 3,714,910.
- Kieffer, Vernon E.; and Korski, Frank S., to Emerson Electric Co. Coil transfer and storage tool and machine for winding same. 3,714,973, Cl. 140-92.100.
- Kierstead, Richard Wightman; and Lemahieu, Ronald Andrew, to Hoffmann-La Roche, Inc. Synthesis of hydroxycyclopenten-1-ones. 3,715,400, Cl. 260-586.00r.
- Kievit, James M.; and Howe, James L., to Dick, A. B., Company. Address responsive controller for computer handling of peripheral equipment. 3,715,725, Cl. 340-147.000.
- Kim, Yung Ki: *See—*
  - Pierce, Ogden R.; and Kim, Yung Ki, 3,715,387.
- Kimberly-Clark Corporation: *See—*
  - Drost, Adrian D.; and Glanz, Ronald P., 3,714,720.
- King, David M. Cigarette filter. 3,714,949, Cl. 131-10.500.
- King-Seeley Thermos Co.: *See—*
  - Linstead, Robert S., 3,714,937.
- Kinkel, Christian Frederick; and Phalin, Thomas Lawrence, to American Can Company. Full panel self-opening end closure. 3,715,052, Cl. 220-54.000.
- Kipling, Barry John, to Pye Limited. Medical respirators. 3,714,941, Cl. 128-145.800.
- Kisselmann, Willy; Ruempelein, Fritz; and Kopf, Paul, to Agfa-Gevaert Aktiengesellschaft. Rotary coil assembly with counter-balance for a electrical measuring instrument and method of making the same. 3,715,658, Cl. 324-154.0pb.
- Kitai, Kiyoshi. Electric shutter operating mechanism. 3,714,880, Cl. 95-63.000.
- Kiyono, Hiroshi; Nakashima, Unichi; Fujisaki, Yasuyuki; Ishigaki, Yukio; and Endo, Gen, to Sekisui Kagoku Kogyo Kabushiki Kaisha. Process for producing a thermoplastic resin sheet having a color band. 3,715,420, Cl. 264-171.000.
- Klein, Schanzlin & Becker Aktiengesellschaft: *See—*
  - Jekat, Walter K., 3,714,840.
- Kleist, Robert A.; and Thorne, Robert L., to Peripheral Business Equipment, Inc. Data detection system. 3,715,738, Cl. 340-174.10h.
- Kleykamp, Donald L., to Dayco Corporation. Hose construction. 3,715,454, Cl. 174-47.000.
- Klippan GmbH: *See—*
  - Minolla, Horst, 3,715,144.
- Klockner-Werke Aktiengesellschaft: *See—*
  - Kosmider, Hans; and Danckert, Dieter, 3,715,202.
- Klotzer, Erhard: *See—*
  - Junkermann, Helmut; and Klotzer, Erhard, 3,715,332.
- Knapp, Burton Bower, to International Nickel Company, Inc., The. Electrorefined nickel of controlled size. 3,715,286, Cl. 204-12.000.
- Knebusch, George R.: *See—*
  - Fowell, Andrew J.; and Knebusch, George R., 3,714,795.
- Kniepkamp, Alberto E., to Chicago Musical Instrument Co. Musical instrument having DC-keying circuit. 3,715,445, Cl. 84-1.130.
- Knothe, Werner Emil Otto: *See—*

  - Henshaw, David Ernest; Knothe, Werner Emil Otto; and Stern, Lionel, 3,714,771.
- Kobayashi, Akira; Koike, Toshio; and Sato, Keiichi, to Iwatsu Electric Co., Ltd. Device for supplying continuous sheet of paper from a rolled package used in a copying apparatus. 3,715,085, Cl. 242-56.00r.
- Kobayashi, Shigehiko; Miyazaki, Kazuhide; and Yamamoto, Michiaki, to Mitsui Mining & Smelting Co., Ltd. Exhaust gas catalyst. 3,715,322, Cl. 252-454.000.
- Koeber, Henry J., to Bell & Howell Company. Lens focusing mechanism with manual control. 3,715,161, Cl. 356-3.000.
- Koehler, William F., to Cleveland, Hardware & Forging Company. Pivot mounting for bar of hand brake mechanism. 3,714,842, Cl. 74-505.000.
- Koenig, Robert H., to Tapeswitch Corporation of America. Cushion seat switch sensor means. 3,715,541, Cl. 200-86.00r.
- Kohmoto, Kohtaro: *See—*
  - Someya, Akira; and Kohmoto, Kohtaro, 3,715,612.
- Koike, Toshio: *See—*
  - Kobayashi, Akira; Koike, Toshio; and Sato, Keiichi, 3,715,085.
- Kokusai Denshin Denwa Kabushiki Kaisha: *See—*
  - Oshima, Shintaro; Nakagome, Yukio; and Fukata, Yasuo, 3,715,507.
- Kolanowski, Jan: *See—*
  - Clarke, Eric Fifield Stuart; Cosier, James Edwin Henry; Kolanowski, Jan; Halls, Peter Seaton; and Laidlaw, Alexander Duncan Lindley, 3,715,068.
- Kollar, John: *See—*
  - Hoch, Robert; and Kollar, John, 3,715,389.
- Kollmann, Wolfgang; and Schwappach, Dieter, to Crenstein & Koppel Aktiengesellschaft. Telescopic boom. 3,715,039, Cl. 212-55.000.
- Komatinsky, Richard R.: *See—*
  - Michel, Donald E.; and Komatinsky, Richard R., 3,715,635.
- Komatsu, Noboru; Suzuki, Takatoshi; and Ito, Takuo, to Kabushiki Kaisha Toyota Chuo Kenkyusho. Heat resisting alloys. 3,715,206, Cl. 75-170.000.
- Kondo, Kunio: *See—*
  - Nakahara, Yasuji; Ichikawa, Kiyoshi; and Kondo, Kunio, 3,715,412.
- Kopf, Paul: *See—*
  - Kisselmann, Willy; Ruempelein, Fritz; and Kopf, Paul, 3,715,658.
- Koptelow, Leonid. Line drawing paint applicator. 3,714,675, Cl. 15-244.0ch.
- Kornrumpf, William P.: *See—*
  - Harnden, John D., Jr.; and Kornrumpf, William P., 3,715,550.
- Korski, Frank S.: *See—*
  - Kieffer, Vernon E.; and Korski, Frank S., 3,714,973.
- Kosinski, Frank Joseph, to Gulf & Western Industries, Inc., mesne. Magnetic pickup for stringed musical instrument. 3,715,446, Cl. 84-1.150.
- Koslow, Sidney; and Malone, James P. Sliding glass door retainer means. 3,714,738, Cl. 49-404.000.
- Kosmider, Hans; and Danckert, Dieter, to Klockner-Werke Aktiengesellschaft. Method for desulphurizing pig iron. 3,715,202, Cl. 75-58.000.
- Kostusiak, Karl H.; and Selke, Lynn A., to Eastman Kodak Company. Device for advancing a web of flexible strip material. 3,715,090, Cl. 242-188.000.
- Kovacik, James W.: *See—*
  - Blanch, Charles H.; and Kovacik, James W., 3,715,526.
- Kowalski, Slawomir; and Worden, Donald A., to Marotta Scientific Controls, Inc. Valve system for proportional flow control for fluid-operated motor. 3,714,868, Cl. 91-420.000.
- Koziarz, Joseph J. Electrical fixture hanger. 3,714,744, Cl. 52-28.000.
- Kraff, Lillian G. Musical water closet. 3,715,549, Cl. 200-172.00a.
- Krall, George S.: *See—*
  - Hynes, Barry T.; Krall, George S.; and Krall, Michael G., 3,715,324.
- Krall, Michael G.: *See—*
  - Hynes, Barry T.; Krall, George S.; and Krall, Michael G., 3,715,324.
- Krapcho, John, to Squibb, E. R., & Sons, Inc. (Aminoalkoxy-benzylidene)-2H-benzothiazine-3(4H)-ones and related compounds. 3,715,353, Cl. 260-243.00r.
- Krause, Gerhard, to Fernseh GmbH. Method and circuit arrangement for regulating the amplitude of the color synchronising signal. 3,715,462, Cl. 178-5.4cr.
- Krawiec, Donald M., to Combustion Engineering, Inc. Bimetallic spacer grid arrangement. 3,715,275, Cl. 176-78.000.
- Krogel, Christopher John, to Western Electric Company, Incorporated. Apparatus for surface dyeing the pulp insulation of wire. 3,714,927, Cl. 118-612.000.
- Kruger, Peter, to Max-Planck-Gesellschaft zur Forderung der Wissenschaften e.V. Solenoid switch, particularly cryogenic switch. 3,715,694, Cl. 335-177.000.
- Krull, Irwin H.: *See—*
  - Cosgrove, Richard E.; Krull, Irwin H.; and Mask, Charles A., 3,715,297.
- Kubacki, Edward Frank, to American Can Company. Machine for performing an operation on articles. 3,714,854, Cl. 82-101.00r.
- Kubo, Keishi; Sakai, Kiyoshi; Sato, Takashi; and Nakamura, Itaru, to Ricoh Co., Ltd. Heat-sensitive stencil sheet. 3,715,263, Cl. 161-33.000.
- Kubo, Keishi; Sakai, Kiyoshi; and Sato, Takashi, to Ricoh Co., Ltd. Heat-sensitive stencil sheet. 3,715,267, Cl. 161-165.000.
- Kubozoe, Morioki: *See—*
  - Akahori, Hiroshi; Kubozoe, Morioki; Furuya, Toshihiro; and Ueno, Sadayasu, 3,715,582.
- Kuhl, Virgil F., to Motorola, Inc. Electronic chassis frame assembly with cabling for printed circuit boards. 3,715,630, Cl. 317-122.000.
- Kuhling, Dieter; and Heitland, Hans-Joachim, to Henkel & Cie G.m.b.H. Method of activating per-compounds and solid activated per-compound compositions. 3,715,184, Cl. 8-111.000.
- Kuhn, Russell P. Die stock (holder) and extension. 3,715,168, Cl. 408-239.000.
- Kuhne, Rudolf; Diery, Helmut; and Rittner, Siegbert, to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning. Agent for the dispelling of fog and process for their preparation. 3,715,319, Cl. 252-319.000.
- Kulzer, Rudolf: *See—*
  - Bruggemann, Hans; and Kulzer, Rudolf, 3,714,904.
- Kumiai Chemical Industry Co., Ltd.: *See—*
  - Wakamori, Shigeki; Yoshida, Yoshio; Yamauchi, Sanji; Ishii, Yoshio; and Goto, Muneharu, 3,715,199.
- Kunsagi, Laszlo, to Foster Wheeler Corporation. Large ducts. 3,714,970, Cl. 138-109.000.
- Kuo, Lai Che, to Thomas & Betts Corporation. Multicompartment connector. 3,715,705, Cl. 339-98.000.
- Kurasawa, Makoto: *See—*
  - Kadowaki, Tatsusuki; and Kurasawa, Makoto, 3,715,018.
- Kurita Water Industries Ltd.: *See—*
  - Yokozeki, Zenzo; and Hatta, Takeshi, 3,715,290.
- Kurth, Carl Ferdinand, to Bell Telephone Laboratories, Incorporated. Adjustable equalizer having means responsive to the input and output signals of each equalizer section. 3,715,691, Cl. 333-18.000.
- Kurz, Philip F.; and Nash, Leonard A., to Teletype Corporation. Electrostatically improvement in electro static printing. 3,715,219, Cl. 106-22.000.
- La Forest, John P., to General Signal Corporation. Receiver for a frequency modulated overlay track circuit. 3,715,669, Cl. 325-320.000.
- Lackey, Ronald H., to General Motors Corporation. Window assembly. 3,714,751, Cl. 52-400.000.
- Laidlaw, Alexander Duncan Lindley: *See—*
  - Clarke, Eric Fifield Stuart; Cosier, James Edwin Henry; Kolanowski, Jan; Halls, Peter Seaton; and Laidlaw, Alexander Duncan Lindley, 3,715,068.
- L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude: *See—*
  - Zumbrunn, Jean-Pierre, 3,715,309.
- Lambrou, Nicholas S. Telephone dialing apparatus. 3,715,520, Cl. 179-90.00a.
- Lancia, Frederick N.; and Liebert, Ralph C., to Liebert Corporation. Air control system. 3,714,980, Cl. 165-11.000.
- Land, Edwin H.; Blinow, Igor; and Eloranta, Vaito K., to Polaroid Corporation. Reflex camera. 3,714,879, Cl. 95-42.000.
- Lange, Gerhard, to Wafios Maschinenfabrik Wagner, Ficker & Schmid GmbH. Apparatus for producing chain links. 3,714,776, Cl. 59-23.000.
- Larikka, Leo. Means for forming a hole in a tube or pipe wall and deforming the edge of the hole into an upstanding flange. 3,714,808, Cl. 72-325.000.
- Larkin, William A., to M&T Chemicals Inc. Polyvinylchloride stabilization with mixtures of tin salts. 3,715,333, Cl. 260-45.75r.
- Larralde, Edward: *See—*
  - Hanes, James W. E.; and Larralde, Edward, 3,714,995.
- Larson, Charles L., to Jeddeloh Bros. Sweed Mills, Inc. Sheet separator and feeder assembly. 3,715,118, Cl. 271-26.00r.
- Larson, Willis A., to Magic Dot, Inc. Touch sensitive electronic switch. 3,715,540, Cl. 200-159.00r.
- Larsson, Lars Herbert: *See—*
  - Ahl, Nils Goran; and Larsson, Lars Herbert, 3,714,997.
- Lass, James L.: *See—*
  - Venier, Dominic A.; Smith, Bart A.; and Lass, James L., 3,715,274.
- Latall, Roy C., to Conco Inc. Duct scanning apparatus. 3,715,484, Cl. 178-6.800.
- Latrobe Steel Company: *See—*
  - Schlatter, Rene, 3,715,201.
- Laughlin, Charles R.; Hollenbaugh, Roger C.; and Allen, Walter K., to United States of America, National Aeronautics and Space Administration. Doppler compensation by shifting transmitted object frequency within limits. 3,715,663, Cl. 325-4.000.
- Laughlin, Gordon J., to United States of America, Army. Wideband microwave power divider. 3,715,689, Cl. 333-9.000.
- Lavering, Gordon R., to Varian Associates. Electrode support for arc lamps. 3,715,615, Cl. 313-204.000.
- Lay, Ralph B.; and Olsen, Ogden R., to Hamilton Cosco, Inc. Folding high chair. 3,715,142, Cl. 297-39.000.
- Le Boulbouech, Jean: *See—*
  - Tanguy, Pierre; Carre, Pierre; and Le Boulbouech, Jean, 3,714,888.
- Le Fevre, Clyde E.; Hagan, James P.; and Owens, Ben H., to Micrographic Technology Corporation. Microfiche camera processor. 3,715,158, Cl. 355-27.000.
- Le Peuvedic, Jean-Pierre: *See—*

  - Quichaud, Claude; Le Peuvedic, Jean-Pierre; and Tinchon, Jacques, 3,714,831.
- Lechot, Andre. Automatic lathes. 3,714,853, Cl. 82-2.500.
- Lee, Charles A.; and Furbeck, Warren R., to International Paper Company, mesne. Method of and apparatus for bas laying with flat mandrel. 3,715,255, Cl. 156-189.000.
- Lee, Raymond, Organization, Inc., The: *See—*
  - O'Leary, Timothy J., 3,715,519.
- Lee, Richard G., to Alves Photo Service, Inc. Strip cutter. 3,714,858, Cl. 83-211.000.
- Lefkowitz, Michael: *See—*
  - Campbell, Robert Riddle; Honnold, George Herbert; and Lefkowitz, Michael, 3,715,518.
- Legrand, Donald G.: *See—*
  - Gaines, George L.; and Legrand, Donald G., 3,715,639.
- Lehman, William F.: *See—*
  - Ng, Wahling H.; Lehman, William F.; and Young, John P., 3,715,231.
- Leich, Robert A., to Camdex Inc. Primer metering apparatus for ammunition loading machines. 3,714,860, Cl. 86-23.000.
- Leighty, Clifford A.; Sliwkowski, Joseph J.; and Sullivan, Bernard J., to Bausch & Lomb Incorporated. Apparatus for locating a variable optical focal point. 3,715,166, Cl. 356-125.000.
- Lemahieu, Ronald Andrew: *See—*
  - Kierstead, Richard Wightman; and Lemahieu, Ronald Andrew, 3,715,400.
- Leonard, Richard J.: *See—*
  - Balling, Theodore Thomas; Leonard, Richard J.; Ponzoni, George Bernard; Protomastro, Michael Gabriel; and Stefanucci, Arthur, 3,715,215.
- Lerch, Joseph B., to RCA Corporation. Threshold gate circuits employing field-effect transistors. 3,715,603, Cl. 307-211.000.
- Lester, Arzell: *See—*
  - Martin, John E., Jr.; and Lester, Arzell, 3,715,281.
- Lestina, Gregory J.; Kent, Frank W.; and Holtz, Carl F., to Eastman Kodak Company. Film containing bleach inhibitor and process therefor for producing color film with silver sound record. 3,715,208, Cl. 96-4.000.
- Leuze, Rex E.: *See—*
  - Lloyd, Milton H.; Tallent, Othar K.; and Leuze, Rex E., 3,715,317.
- Levaire, Claude: *See—*
  - Hammer, Alfred Paul; Entz, Alexis Charles; and Levaire, Claude, 3,715,451.
- Levine, Arnold M., to International Telephone and Telegraph Corporation. Motion detection system. 3,715,480, Cl. 178-6.000.
- Levy, Raymond L., to Varian Associates. Imaging device having a pivoting pressure pad for engaging and disengaging a web medium. 3,715,156, Cl. 355-16.000.
- Lewis, John G., to Emerson Electric Co. Method of assembling a dynamo-electric machine. 3,714,705, Cl. 29-596.000.
- Lewis, John R.: *See—*
  - Silberg, Paul A.; and Lewis, John R., 3,715,539.
- Lewis, Tony E.; and Rodriguez, George, said Lewis assor. to said Rodriguez, George. Rotary stamping machine. 3,714,809, Cl. 72-326.000.
- Libbey-Owens-Ford Company: *See—*
  - Wheat, Lawrence C.; and Tary, Orville L., 3,715,198.
- Licentia Patent-Verwaltungs-G.m.b.H.: *See—*
  - Beneking, Heinz, 3,715,631.
  - Hofmann, Ernst-Gunther; Meyerhoff, Klaus; Offermann, Bernd Peter; and Barthel, Rolf, 3,715,597.
  - Putz, Ulrich, 3,715,602.
- Licht, John J., to AMBAC Industries, Incorporated. Recorder apparatus using fluid support. 3,715,521, Cl. 179-100.20p.
- Liddell, Arlyn G., to Eaton Corporation. Card mounting chassis. 3,715,628, Cl. 317-101.0dh.
- Liebert Corporation: *See—*
  - Lancia, Frederick N.; and Liebert, Ralph C., 3,714,980.
- Liebert, Ralph C.: *See—*
  - Lancia, Frederick N.; and Liebert, Ralph C., 3,714,980.
- Liederbach, William Herman, to RCA Corporation. Method of manufacturing thick-film hybrid integrated circuits. 3,714,709, Cl. 29-626.000.
- Lilly, Eli, and Company: *See—*
  - Dominianni, Samuel J., 3,715,362.
  - Smith, Milton R., 3,715,345.
  - Spry, Douglas O.; and Wright, Ian G., 3,715,347.
  - Sullivan, Hugh R.; and Billings, Ruth E., 3,715,359.
- Limb, John Ormond; and Pease, Roger Fabian Wedgwood, to Bell Telephone Laboratories Incorporated. Bandwidth reduction system for use with video signals. 3,715,483, Cl. 178-6.800.
- Lin, Chao-Han, to National Cash Register Company, The. Mark-forming record materials. 3,715,226, Cl. 117-36.200.
- Lindlar, Herbert; and Dubuis, Robert, to Hoffmann-La Roche, Inc. Process for selective hydrogenation. 3,715,404, Cl. 260-642.000.
- Lindstrand, Bengt: *See—*
  - Netterstedt, Sture; and Lindstrand, Bengt, 3,715,557.
- Liner, Robert T., Jr.: *See—*
  - Weinbaum, Sheldon; and Liner, Robert T., Jr., 3,714,782.
- Linkroum, Irving E., to Bendix Corporation, The. Three electrode spark gap apparatus. 3,715,614, Cl. 313-183.000.
- Linoli, Gianni; and Mannucci, Enzo Sergio, to Miles Laboratories, Inc. Insoluble polymeric diazonium salt chromogen. 3,715,325, Cl. 260-2.20r.
- Linstead, Robert S., to King-Seeley Thermos Co. Barbecue grill assembly. 3,714,937, Cl. 126-25.00r.
- Linstromberg, William J.; and Nichols, Duane C., to Whirlpool Corporation. Drive motor-defrost timer for refrigerator. 3,714,794, Cl. 62-137.000.
- Linz, Hans: *See—*
  - Martin, Horst G.; Glutz, Bernhard; and Linz, Hans, 3,715,421.
- Liong Ho, Joseph Ping: *See—*
  - Hanson, Charles Christian; Liong Ho, Joseph Ping; and Houdek, Merle Edward, 3,715,747.
- Little, Carl H., to Weber-Knapp Company. Counter-balance support. 3,714,680, Cl. 16-190.000.
- Little, Samuel Woodrow. Apparatus for disengaging a fishhook. 3,714,732, Cl. 43-53.500.
- Livers, Joseph A.: *See—*
  - Walsh, William J.; Livers, Joseph A.; Mueller, Robert S.; and Hill, Warren R., 3,715,006.
- Livingston, John Edwin. Toy aircraft. 3,714,734, Cl. 46-76.00r.
- Livingston, William L., to Factory Mutual Research Corporation. Double rate flow controller. 3,714,964, Cl. 137-513.300.
- Livingston, William L., to Factory Mutual Research Corporation. Additive injection system. 3,714,988, Cl. 169-13.000.
- Lloyd, Allen H., to Tech-Art, Inc. Switch device for counting flat articles. 3,715,529, Cl. 200-46.000.
- Lloyd, Kenneth R. Fishing lead. 3,714,730, Cl. 43-17.200.
- Lloyd, Milton H.; Tallent, Othar K.; and Leuze, Rex E., to United States of America, Atomic Energy Commission. Solvent extraction process for producing low-nitrate and large-crystal-size PuO_2 sols. 3,715,317, Cl. 252-301.10s.
- Lloyd, Richard E.; and Wallgren, Linus E., to Pace, Incorporated. Electrical connector. 3,715,708, Cl. 339-177.00e.
- Long, Eric L., to Cherry Electrical Products Corporation. Momentary push button switch with improved non-conductive cam for normally retaining movable leaf spring contacts in a non-operative position. 3,715,545, Cl. 200-159.00a.
- Long, F. S., Manufacturing Company: *See—*
  - Wertheimer, Donald J.; Fish, Richard D.; and Holmes, Ralph A., 3,714,885.
- Long, Hugh M., to Union Carbide Corporation. Porous fluid cooled electrical conductors. 3,715,452, Cl. 174-15.00c.
- Longsworth, Ralph C., to Air Products and Chemicals, Inc. Cryogenic refrigeration system with dual circuit heat exchanger. 3,714,796, Cl. 62-514.000.
- Loral Corporation, and: *See—*
  - Paley, Alfred I.; Newman, Leonard; Seats, Peter; and Waxenbaum, Bernard M., 3,715,618.
- Louis, Joseph E.; and Schauer, George A., to Sundstrand Corporation. Hydrostatic-differential transmission. 3,714,846, Cl. 74-687.000.
- Louvar, Joseph F.; and Nichols, Newlin S., to BASF Wyandotte Corporation. Removal of catalysts from polyols. 3,715,402, Cl. 260-613.00b.
- Love, Roy E.; and Westwig, Ralph A., to Corning Glass Works. Photochromic fiber optic plate. 3,715,150, Cl. 350-96.00b.
- Lover, Seth E., to Columbia Broadcasting System, Inc. Loudspeaker cabinet assembly and method. 3,715,008, Cl. 181-31.00b.
- Low, William W.: *See—*
  - Morgan, Thomas R.; Low, William W.; Wamser, Christian A.; and Bruen, Charles P., 3,715,425.
- Lucas, Joseph, (Industries) Limited: *See—*
  - Keeley, Gordon, 3,715,531.
  - Tregurthia, Steven John, 3,715,547.
- Luke, Robert R.: *See—*
  - Daigle, Edwin E.; Luke, Robert R.; Turner, James B.; and Wise, Harold L. (, 3,714,811.
- Lundahl, Ezra C., Inc.: *See—*
  - Lundahl, Ezra Cordell, 3,715,129.
- Lundahl, Ezra Cordell, to Lundahl, Ezra C., Inc. Suspension system. 3,715,129, Cl. 280-104.50r.
- Lundman, Philip L. Conduit flusher. 3,714,951, Cl. 134-167.00c.
- Lutz, Jean, to Societe Nationale des Petroles d'Aquitaine. Process for measuring wear on a drilling tool. 3,714,822, Cl. 73-104.000.
- Ly, Manuel G.: *See—*
  - Karady, Sandor; Pines, Seemon H.; Ly, Manuel G.; and Sletzinger, Meyer, 3,715,382.
- Lynes, Dennis Joseph, to Bell Telephone Laboratories, Inc. Two-terminal NPN-PNP transistor memory cell. 3,715,732, Cl. 340-173.00r.
- Lysher, Wayne M.: *See—*
  - Allen, Robert D.; and Lysher, Wayne M., 3,715,265.
- Lyth, William; and Smith, Roy, to Eaton Corporation. Lubricant injector. 3,715,013, Cl. 184-7.00d.
- M&T Chemicals Inc.: *See—*
  - Larkin, William A., 3,715,333.
- Macielinski, Jerzy Witold, to GKN Birfield Transmissions Limited. Constant velocity universal joints. 3,714,798, Cl. 64-21.000.
- MacInnes, John M.; and Saumsiegle, Robert W., to Owens-Illinois, Inc. Machine for assembling groups of containers. 3,714,756, Cl. 53-48.000.
- Mackie, William L., to United States of America, Navy. Moistureproof microwave antenna. 3,715,756, Cl. 343-873.000.
- MacMillan Bloedel Limited: *See—*
  - Ehrenfellner, Hubert, 3,714,700.
- Madert, Franz Peter, to United States of America, Army. Frequency discriminator with variable center frequency. 3,715,681, Cl. 331-11.000.

- Madonna, Michael A. Insect guard for sewer and drain openings. 3,714,733, Cl. 43-121.000.
- Maekawa, Akiji; Munakata, Chusuke; and Saitou, Norio, to Hitachi, Ltd. Multi electron beam apparatus. 3,715,580, Cl. 250-49.5te.
- Magerlein, Barney J., to Upjohn Company, The. Process for the preparation of lincomycin compounds. 3,715,346, Cl. 260-210.00r.
- Magic Dot, Inc.: *See—*
  - Larson, Willis A., 3,715,540.
- Magill, Peter J.; McCurry, Robert E.; and Speicher, Charles A., to International Business Machines Corporation. Method and apparatus for generating electrostatic images using ionized fluid stream. 3,715,762, Cl. 346-74.0es.
- Magna-Graphics Corporation: *See—*
  - Bray, Andrew M., 3,714,692.
- Makino, Tsutomu: *See—*
  - Ito, Takamasa; and Makino, Tsutomu, 3,715,744.
- Malone, James P.: *See—*
  - Koslow, Sidney; and Malone, James P., 3,714,738.
- Manassen, Joost; Vofsi, David; and Martan, Michael, to Yeda Research and Development Co., Ltd. Separation of alpha-naphthol. 3,715,403, Cl. 260-621.00a.
- Mandiziak, Ronald S. Liquid skating assembly. 3,715,567, Cl. 219-437.000.
- Manes, Robert J.: *See—*
  - Keto, August I.; and Manes, Robert J., 3,715,543.
- Manifold & Phalor Machine Co.: *See—*
  - Manifold, Richard W., 3,715,183.
- Manifold, Richard W., to Manifold & Phalor Machine Co. Gas burner especially useful for glazing glassware. 3,715,183, Cl. 431-328.000.
- Mannucci, Enzo Sergio: *See—*
  - Linoli, Gianni; and Mannucci, Enzo Sergio, 3,715,325.
- Maples, Travis N. Bowling ball refinishing machine. 3,714,703, Cl. 29-560.000.
- Mar, Michael W. Process for separating water from pollutants in water. 3,715,306, Cl. 210-21.000.
- Marconi Company Limited, The: *See—*
  - Finch, Derek James, 3,715,491.
- Marcy, Raymond, to Thomson-CSF. Electro-optical system for controlling the attitude of a stage mounted on a carriage sliding along a parallel bench. 3,715,599, Cl. 250-231.00r.
- Mariani, Louis J. Depth marker for a fish line. 3,714,923, Cl. 116-114.000.
- Marino, Patrick John: *See—*
  - Gordon, Travis Hill; Marino, Patrick John; and Pilc, Randolph John, 3,715,505.
- Marklund, Karl Georg Erland, to Hiab-Foco Aktiebolag. Carriage with vertically and horizontally shiftable mast and carrier. 3,715,046, Cl. 214-674.000.
- Marotta Scientific Controls, Inc.: *See—*
  - Kowalski, Slawomir; and Worden, Donald A., 3,714,868.
- Marro, Dominic P., to Itek Corporation. Compensation device for nonlinear electromagnetic systems. 3,715,620, Cl. 315-27.000.
- Martan, Michael: *See—*
  - Manassen, Joost; Vofsi, David; and Martan, Michael, 3,715,403.
- Martin, Fred D., to Dow Chemical Company, The. Apparatus for stabilizing component elution times in gas chromatographic. 3,714,813, Cl. 73-23.100.
- Martin, Harold W., to Thomas & Betts Corporation. Junction box. 3,715,450, Cl. 174-59.000.
- Martin, Horst G.; Glutz, Bernhard; and Linz, Hans, to Societe de la Viscose Suisse. Process for the preparation of polyethylene terephthalate filaments. 3,715,421, Cl. 264-130.000.
- Martin, John E., Jr.; and Lester, Arzell, to United States of America, Health, Education, and Welfare. Transgrow. 3,715,281, Cl. 195-104.000.
- Martin, Robert W.: *See—*
  - Esposito, Frank J.; Pallas, Michael J.; and Martin, Robert W., 3,715,759.
- Martin, Stephen J., to Robertshaw Controls Company. Alarm coupler. 3,715,502, Cl. 179-2.00c.
- Martin, Wolfgang: *See—*
  - Schmid, Hans; Feldhoff, Heinrich; Martin, Wolfgang; Bauer, Wolfgang; and Herion, Dieter, 3,714,686.
- Martorano, Sam: *See—*
  - Stuertz, William D.; and Martorano, Sam, 3,714,857.
- Masakazu Inagaki & Tsuda, Jo.: *See—*
  - Tsuda, Jo, 3,714,844.
- Masaki, Kazumi, to Yamato Mishin Seizo Kabushiki Kaisha. Electrically driven motor. 3,715,643, Cl. 318-466.000.
- Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft: *See—*
  - Neitz, Alfred; and Pickel, Hans, 3,714,931.
- Mashimo, Yukio; Mizui, Seiichiro; and Takishima, Yoshiyuki, to Canon Kabushiki Kaisha. Photographic flash exposure control system. 3,714,872, Cl. 95-10.0ce.
- Mask, Charles A.: *See—*
  - Cosgrove, Richard E.; Krull, Irwin H.; and Mask, Charles A., 3,715,297.
- Massa Division, Dynamics Corporation of America: *See—*
  - Massa, Frank, 3,715,711.
  - Massa, Frank, 3,715,713.
- Massa, Frank, to Massa Division, Dynamics Corporation of America. High power, low frequency underwater transducer. 3,715,711, Cl. 340-9.000.
- Massa, Frank, to Massa Division, Dynamics Corporation of America. Pressure gradient transducer. 3,715,713, Cl. 340-10.000.
- Massachusetts Institute of Technology: *See—*
  - Merrill, Edward W., 3,715,432.
- Masten, Michael K.: *See—*
  - Smith, Stanley L.; Choate, William C.; and Masten, Michael K., 3,715,730.
- Maszumanski, Trude; and Wendisch, Irmgard, to Vockenhuber, Karl and Hauser, Raimund. Pancratic lens. 3,715,151, Cl. 350-184.000.
- Matsuda, Hisashi, to Nihon Denshi Kabushiki Kaisha. Rapid scanning double focussing mass spectrometer. 3,715,581, Cl. 250-41.9me.
- Matsushita Electric Industrial Co., Ltd.: *See—*
  - Nakabe, Ryuhei; Fujisawa, Seiji; Sugihara, Yasuhiro; and Meki, Nori, 3,715,471.
  - Ogawa, Morimasa; and Gono, Kiyoshi, 3,715,553.
  - Ohoshima, Nobumasa; Himeno, Kinya; and Tani, Norihiro, 3,715,589.
  - Takezaki, Tsuneo; and Miki, Sukeichi, 3,715,495.
- Mattes, Lyle T., to Cutler-Hammer, Inc. Film support system. 3,715,641, Cl. 318-7.000.
- Matthew, Morton P.: *See—*
  - Drekter, Isaac J.; Bradley, Frank R.; Matthew, Morton P.; and Delaney, Paul, 3,715,761.
- Mattson, Larry L. Helicopter supported aerial fire suppressant applicator. 3,714,987, Cl. 169-2.00a.
- Matzek, Lester Tucker, to Warwick Electronics Inc. Tracking control circuits using a common potentiometer. 3,715,463, Cl. 178-5.4mc.
- Maule, Robert S.: *See—*
  - Hurley, Eldon K.; Maule, Robert S.; Musso, Rocco C.; and Smith, Lowell E., 3,715,131.
- Max-Planck-Gesellschaft zur Forderung der Wissenschaften e.V.: *See—*
  - Kruger, Peter, 3,715,694.
- Maydan, Dan: *See—*
  - Gordon, Eugene Irving; and Maydan, Dan, 3,715,685.
- Mayell, Jaspal Singh, to American Cyanamid Company. Method of making a porous catalytic electrode. 3,715,238, Cl. 136-120.0fc.
- Mazzanti, Giorgio: *See—*
  - Natta, Giulio; Pino, Piero; and Mazzanti, Giorgio, 3,715,344.
- Mazzi, Aramis, to Solis S.r.L. Shearing device for circular knitting machines. 3,714,800, Cl. 66-147.000.
- Mazzola, Russell E.; and Fucci, Nicola J. Outdoor deep fryer. 3,714,889, Cl. 99-411.000.
- Mc Gunigle, Richard D., to RdF West. Automatically adjustable radioactive radiation detector circuit. 3,715,593, Cl. 250-83.60r.
- Mc Taggart, James E., to Teledyne, Inc. Color emphasis circuit for TV receivers. 3,715,472, Cl. 178-5.4he.
- McCurry, Robert E.: *See—*
  - Magill, Peter J.; McCurry, Robert E.; and Speicher, Charles A., 3,715,762.
- McDonnell Douglas Corporation: *See—*
  - Allen, Robert D.; and Lysher, Wayne M., 3,715,265.
  - Perkinson, Robert E., 3,715,717.
  - Van Dyke, Roscoe H., 3,715,093.
  - Walker, James V., 3,715,113.
- McGill, Thomas Alan, to Gillette Company, The. Welding apparatus. 3,715,558, Cl. 219-82.000.
- McGrath, John W.; and Repsher, Dennis E., to Western Electric Company, Incorporated. Synchronized illumination for operations on light sensitive articles. 3,715,576, Cl. 240-2.00r.
- McGraw, Robert B., Jr.: *See—*
  - Reizman, Fremont; and McGraw, Robert B., Jr., 3,714,706.
- McGraw-Edison Company: *See—*
  - Spotts, J. Willard, 3,714,938.
- McIntosh Laboratory,Inc.: *See—*
  - Russell, Roger Howard, 3,715,501.
- McMann, Renville H., Jr. Apparatus for developing simultaneous color television signals including a striped color filter constructed to generate a pilot signal for component video signal separation. 3,715,465, Cl. 178-5.4st.
- McMullen, Wesley W.; and Miller, Tom B., to General Motors Corporation. Radiator pressure cap. 3,715,049, Cl. 220-44.00r.
- McQuay-Perfex Inc.: *See—*
  - Wilson, Harry R., 3,715,001.
- McTaggart, George D.: *See—*
  - Confer, James O.; and McTaggart, George D., 3,715,220.
- McWade, John E.; Keizer, Jan; Moore, Wilcy I.; and Purcell, Ernest M., to Gulf-Western Industrial Products Company. Airport lighting monitoring system and system components. 3,715,741, Cl. 340-251.000.
- Meacham, George B. K.; and Nagel, William S., to Eaton Yale & Towne, Inc. Emissions control system. 3,714,932, Cl. 123-75.00e.
- Mead Corporation, The: *See—*
  - Taylor, Richard P., 3,714,928.
  - Wood, Prentice J., 3,715,029.
- Mead, George S., to Raytheon Company. Digital speed gate for doppler radar. 3,715,751, Cl. 343-7.00a.
- Mehmedbasich, Enver, to Chevron Research Company. Sulfonyl substituted terpolymer fuel detergents. 3,715,368, Cl. 260-326.5sm.
- Mehren, Franz, to Interatom Internationale Atomreaktorbau GmbH. Control rod drive units for nuclear reactors. 3,715,269, Cl. 176-36.00r.
- Meier, Leon G. Stubble mulcher device. 3,714,992, Cl. 172-175.000.
- Meiji Seika Kaisha, Ltd.: *See—*

- Yusa, Yasushi; Akai, Naotoshi; Satoh, Kimio; and Sekizawa, Yasuharu, 3;715,431.
- Meki, Nori: *See—*
  - Nakabe, Ryuhei; Fujisawa, Seiji; Sugihara, Yasuhiro; and Meki, Nori, 3,715,471.
- Melchiore, John J.: *See—*
  - Mills, Ivor W.; and Melchiore, John J., 3,715,302.
- Melvin, William W. Instrument flight system. 3,714,825, Cl. 73-178.00t.
- Mende, Thomas J., to Research Corporation. Iodopeptide anticoagulants. 3,715,434, Cl. 424-177.000.
- Mennesson, Francois, to Societe Industrielle de Brevets et d'Etudes S.I.B.E. Fuel feed devices for internal combustion engines. 3,714,934, Cl. 123-139.0aw.
- Merck & Co., Inc.: *See—*
  - Henry, David W.; Hoff, Dale R.; and Patchett, Arthur A., 3,715,355.
  - Hoff, Dale R., 3,715,364.
  - Karady, Sandor; Pines, Seemon H.; Ly, Manuel G.; and Sletzinger, Meyer, 3,715,382.
  - Mrozik, Helmut; and Hoff, Dale R., 3,715,395.
  - Shen, Tsung-Ying; Ruyle, William V.; Fordice, Michael W.; and Jensen, Norman P., 3,715,375.
  - Witzel, Bruce E.; Dorn, Conrad P., Jr.; and Shen, Tsung-Ying, 3,715,358.
- Merck Patent Gesellschaft mit beschrankter Haftung: *See—*
  - Wenz, Adolf; Stein, Alfred; and Schmitt, Dieter, 3,715,192.
- Mercy, Brian R., to International Business Machines Corporation. Timing control for a multiprocessor system. 3,715,729, Cl. 340-172.500.
- Merrill, Edward W., to Massachusetts Institute of Technology. Submicron aqueous aerosols containing lecithin. 3,715,432, Cl. 424-199.000.
- Messrs., Jupex AG: *See—*
  - Sauer, Roland; Katzer, Johannes; and Stephany, Christian, 3,714,962.
- Metallurgie Hoboken-Overpett: *See—*
  - De Bie, Edouard, 3,715,203.
- Meyerhoff, Klaus: *See—*
  - Hofmann, Ernst-Gunther; Meyerhoff, Klaus; Offermann, Bernd Peter; and Barthel, Rolf, 3,715,597.
- Meyers, Joseph A., III; and Cahill, Joseph A., to Atlantic Richfield Company. Compositions for flame-proofing cellulosic materials. 3,715,185, Cl. 8-194.000.
- Michael, David, & Co.: *See—*
  - Rosenbaum, Edward W.; and Schoen, Kurt L., 3,715,217.
- Michel, Donald E.; and Komatinsky, Richard R., to Bendix Corporation, The. High frequency matched impedance microcircuit holder. 3,715,635, Cl. 317-234.00r.
- Michel, Donald E.; Fairbairn, Le Roy W.; and Cook, James W., to Bendix Corporation, The. Right angle electrical connector. 3,715,706, Cl. 339-156.00r.
- Michel, Wolfgang, to Kalle Aktiengesellschaft. Standable bag made from flesible film material. 3,715,074, Cl. 229-57.000.
- Michieli, Roy E. Ceramic tile shelf and form for making it. 3,714,907, Cl. 108-152.000.
- Michigan Wheel Corporation: *See—*
  - Kettner, Robert E., 3,715,171.
- Micrographic Technology Corporation: *See—*
  - Le Fevre, Clyde E.; Hagan, James P.; and Owens, Ben H., 3,715,158.
- Miki, Sukeichi: *See—*
  - Takezaki, Tsuneo; and Miki, Sukeichi, 3,715,495.
- Miles Laboratories, Inc.: *See—*
  - Linoli, Gianni; and Mannucci, Enzo Sergio, 3,715,325.
- Miller, Cyril V.: *See—*
  - Cunningham, Francis V.; and Miller, Cyril V., 3,715,449.
- Miller, Darrow L., to North American Rockwell Corporation. Acoustical transducer with rotary pulse coupler. 3,714,817, Cl. 73-71.500.
- Miller, Dorrow L., to North American Rockwell Corporation. Tubular transducer and dry couplant therefor. 3,714,816, Cl. 73-71.500.
- Miller, Louis A., to DND Electronics. PABX-interface interconnection device. 3,715,513, Cl. 179-18.0ad.
- Miller, Max W., to Pfizer Inc. 1-Phenyl-6-azacytosines as coccidiostats. 3,715,356, Cl. 260-249.500.
- Miller, Robert E., to Monsanto Company. Enzyme-polymer product attached to surface of siliceous materials thereof. 3,715,278, Cl. 195-63.000.
- Miller, Tom B.: *See—*
  - McMullen, Wesley W.; and Miller, Tom B., 3,715,049.
- Mills, Ivor W.; and Melchiore, John J., to Sun Oil Company. Refrigeration oil composition having wide boiling range. 3,715,302, Cl. 208-14.000.
- Minnesota Mining and Manufacturing Company: *See—*
  - Allen, Michael George; and Tiers, George Van Dyke, 3,715,337.
  - Campbell, Donald A.; Packard, James R.; Tait, William C.; and Weiher, Richard L., 3,715,162.
  - Peterson, Stanley G., 3,714,693.
- Minolla, Horst, to Klippan GmbH. Safety belt construction. 3,715,144, Cl. 297-386.000.
- Minton, Clarence W., to Americal Corporation. Yarn control apparatus and method for circular hosiery knitting machines. 3,714,799, Cl. 66-140.00s.
- Minushkin, Bertram: *See—*
  - Salzano, Francis J.; Hobdell, Michael R.; Minushkin, Bertram; Kalinowski, Walter; and Newman, Leonard, 3,715,296.
- Mirabella, Anthony C., to Angelica Corporation. Protective helmet. 3,714,668, Cl. 2-3.00c.
- Miska, Aivars; and Selman, Howard L., to Sperry Rand Corporation. Spray apparatus. 3,714,950, Cl. 132-112.000.
- Misono, Akira; and Ogata, Ikuei, to Nippon Oil Company, Limited. Process for selective hydrogenation highly unsaturated compounds. 3,715,405, Cl. 260-666.00a.
- Mita Industrial Company Limited: *See—*
  - Nihyakumen, Kouzi; Yokoyama, Taizo; Ueda, Yasuo; Kamezawa, Yasutoki; and Aizawa, Tatsuo, 3,715,213..
- Mitchell, Douglas, to Technicon Instruments Corporation. Apparatus for simultaneous multielement analysis by atomic fluorescence spectroscopy. 3,715,163, Cl. 356-85.000.
- Mitrovic, Milan: *See—*
  - Bauernfeind, Jacob Christopher; and Mitrovic, Milan, 3,715,433.
- Mitsubishi Jukogyo Kabushiki Kaisha: *See—*
  - Fukui, Saburo; Yamazaki, Tsunehiro; Yamamoto, Masato; Miyake, Masuichi; and Okumoto, Masanori, 3,715,236.
- Mitsudome, Kaoru: *See—*
  - Umezu, Shiro; Takeda, Sadao; Mitsudome, Kaoru; and Hashimura, Tetsuo, 3,715,552.
  - Umezu, Shiro; Takeda, Sadao; Mitsudome, Kaoru; and Hashimura, Tetsuo, 3,715,554.
- Mitsui Mining & Smelting Co., Ltd.: *See—*
  - Kobayashi, Shigehiko; Miyazaki, Kazuhide; and Yamamoto, Michiaki, 3,715,322.
- Miyake, Masuichi: *See—*
  - Fukui, Saburo; Yamazaki, Tsunehiro; Yamamoto, Masato; Miyake, Masuichi; and Okumoto, Masanori, 3,715,236.
- Miyamoto, Shinzo: *See—*
  - Susuki, Rinnosuke; Hoshi, Hiroshi; Araki, Shinichi; and Miyamoto, Shinzo, 3,715,063.
- Miyazaki, Kazuhide: *See—*
  - Kobayashi, Shigehiko; Miyazaki, Kazuhide; and Yamamoto, Michiaki, 3,715,322.
- Mizui, Seiichiro: *See—*
  - Mashimo, Yukio; Mizui, Seiichiro; and Takishima, Yoshiyuki, 3,714,872.
- Mizuno, William G.: *See—*
  - Johnson, Dwight; and Mizuno, William G., 3,715,307.
- Mobil Oil Corporation: *See—*
  - Ruehle, William H., 3,715,715.
- Moebes, Erich; and Hitzel, Hans, to Sugar Chemical Co., Etablissement. Process for the removal of impurities from technical sugar solutions. 3,715,235, Cl. 127-46.00a.
- Mohr, John, & Sons: *See—*
  - Barnes, Onald R., 3,715,026.
- Moise, John R. Fish harvesting method and apparatus. 3,714,729, Cl. 43-4.500.
- Moisson-Franckhauser, Francois: *See—*
  - Aupoix, Marcel; and Moisson-Franckhauser, Francois, 3,715,453.
- Molins Machine Company Limited: *See—*
  - Preston, Edward George, 3,715,056.
- Molis, John. Spring-liquamatic press O-ring plastic roto seal for rotary pump shafts. 3,715,169, Cl. 415-170.000.
- Molnar, Eugene J., to Coe Laboratories. Monomer soluble X-ray opaque methacrylate particles. 3,715,331, Cl. 260-41.00b.
- Monahan, John Francis: *See—*
  - Olson, Charles Langdon; Monahan, John Francis; and Dischert, Robert Adams, 3,715,477.
- Monolithic Memories, Inc.: *See—*
  - Moss, William E., 3,715,735.
- Monsanto Company: *See—*
  - Miller, Robert E., 3,715,278.
  - Privott, Wilbur J., Jr.; and Cunningham, Robert E., 3,715,418.
  - Privott, Wilbur J., Jr.; and Cunningham, Robert E., 3,715,419.
- Montecatini Edison S.p.A.: *See—*
  - Natta, Giulio; Pino, Piero; and Mazzanti, Giorgio, 3,715,344.
  - Ribaldone, Giuseppe; and Gafa, Salvatore, 3,715,393.
  - Sianesi, Dario; Pasetti, Adolfo; and Belardinelli, Giorgio, 3,715,378.
- Montell, Joseph J.; and Houghton, George L., to Rug Crafters. Hooking needle. 3,714,915, Cl. 112-80.000.
- Montierth, Max R., to Corning Glass Works. Low-expansion glass-ceramic cementing method. 3,715,196, Cl. 65-33.000.
- Moon, Jerry W. Refuse compactor. 3,714,890, Cl. 100-229.00a.
- Mooney, James J., Jr., to General Motors Corporation. Hydromechanical transmission. 3,714,845, Cl. 74-687.000.
- Moore, Arthur H., to Hugle Industries, Inc. Wafer spreader. 3,714,704, Cl. 29-569.000.
- Moore, Wilcy I.: *See—*
  - McWade, John E.; Keizer, Jan; Moore, Wilcy I.; and Purcell, Ernest M., 3,715,741.
- Morey, Woodruff A.: *See—*
  - Rushton, William E.; Seavoy, Gordon E.; and Morey, Woodruff A., 3,715,191.
- Morgan, Thomas R.; Low, William W.; Wamser, Christian A.; and Bruen, Charles P., to Allied Chemical Corporation. Process for the manufacture of chrome chemicals. 3,715,425, Cl. 423-61.000.
- Morgenstern, Arthur Stanley, to Procter & Gamble Company, The. Scouring cleanser composition. 3,715,314, Cl. 252-95.000.
- Mori, Kijuu: *See—*
  - Aizawa, Masanobu; and Mori, Kijuu, 3,714,691.
- Morine, Richard L.; and Hokes, James J., to Fedco, Inc. Dispensing pump assembly for bakery materials. 3,715,061, Cl. 222-334.000.

- Moriya, Takao: *See—*
  - Tsuchiya, Noriyuki; Amari, Katsutoshi; Moriya, Takao; and Takahashi, Shideko, 3,715,285.
- Morris, Arthur L. Brake for rollable platform. 3,715,015, Cl. 188-5.000.
- Morrison, Robert F.: *See—*
  - Dendy, Joe B.; Thomson, Kenneth; and Morrison, Robert F., 3,715,562.
- Morse, Harry G.: *See—*
  - Kane, John R.; and Morse, Harry G., 3,715,214.
- Morse, Lynn H.; and Nielsen, Anker J., Jr. Locking bolts for shut-off valves and switches. 3,714,802, Cl. 70-34.000.
- Morva, Tibor, to Sprecher & Schuh AG. Encapsulated high voltage-switching installation. 3,715,532, Cl. 174-28.000.
- Mosman, Richard R.: *See—*
  - Herford, John; Mosman, Richard R.; Vieira, Thomas L.; and Wallace, Robert G., 3,714,761.
- Moss, William E., to Monolithic Memories, Inc. Segmentized memory module and method of making same. 3,715,735, Cl. 340-173.00r.
- Mostrom, Ragnar: *See—*
  - Angelstrand, Borje; and Mostrom, Ragnar, 3,715,086.
- Motorola Inc.: *See—*
  - Dunn, Thomas A., 3,715,423.
  - Fiore, Jack C., 3,714,835.
  - Kuhl, Virgil F., 3,715,630.
  - Rapshys, William, 3,715,604.
- Mott, George E., to Texaco Inc. Platform buoyant understructure. 3,714,788, Cl. 61-46.500.
- Moulton, Robert James: *See—*
  - Carley-Macauly, Kenneth Wallace; Hitchon, James Witham; and Moulton, Robert James, 3,715,082.
- Moyer, Elton S.: *See—*
  - Flory, Donald M.; Moyer, Elton S.; and Naismith, Thomas D., 3,714,869.
- Moyer, Xopher W.; and Webb, John B., to United States of America, National Aeronautics and Space Administration. Delayed simultaneous release mechanism. 3,715,092, Cl. 244-1.0ss.
- Mrozik, Helmut; and Hoff, Dale R., to Merck & Co., Inc. Substituted thiobenzanilides. 3,715,395, Cl. 260-551.00s.
- Mueller, Kurt Hugo; and Spaulding, David Adams, to Bell Telephone Laboratories, Incorporated. Fast start-up system for transversal equalizers. 3,715,666, Cl. 325-42.000.
- Mueller, Robert S.: *See—*
  - Walsh, William J.; Livers, Joseph A.; Mueller, Robert S.; and Hill, Warren R., 3,715,006.
- Muller, Anton, to Pistor-Kette GmbH. Connecting link for tire anti-skid chains. 3,714,975, Cl. 152-243.000.
- Muller, John P.: *See—*
  - Bernstein, Julius; Schildkraut, Sid I.; and Muller, John P., 3,715,710.
- Muller, Willy: *See—*
  - Haag, Herman; and Muller, Willy, 3,715,506.
- Mumma, Harold J., to FMC Corporation. Fruit orienting apparatus. 3,715,024, Cl. 198-33.0aa.
- Munakata, Chusuke: *See—*
  - Maekawa, Akiji; Munakata, Chusuke; and Saitou, Norio, 3,715,580.
- Munters, Carl George: *See—*
  - Christiansen, Tore, 3,714,884.
- Murphy, James M.; and Bolmer, Perce W., to Kaiser Aluminum & Chemical Corporation. Freezing and melting treatment of red mud slurries to aid solid separation. 3,714,792, Cl. 62-58.000.
- Muskopf, Billy J.; and Wiemann, Ronald W., to Crown Zellerbach Corporation. Multiple-cell box for flowable material. 3,715,072, Cl. 229-15.000.
- Musso, Rocco C.: *See—*
  - Hurley, Eldon K.; Maule, Robert S.; Musso, Rocco C.; and Smith, Lowell E., 3,715,131.
- Naber, John S. Control circuit for single stroke electrical tools. 3,715,605, Cl. 307-246.000.
- Nagel, William S.: *See—*
  - Meacham, George B. K.; and Nagel, William S., 3,714,932.
- Naismith, Thomas D.: *See—*
  - Flory, Donald M.; Moyer, Elton S.; and Naismith, Thomas D., 3,714,869.
- Nakabe, Ryuhei; Fujisawa, Seiji; Sugihara, Yasuhiro; and Meki, Nori, to Matsushita Electric Industrial Co., Ltd. Color television receiver. 3,715,471, Cl. 178-5.4he.
- Nakagome, Yukio: *See—*
  - Oshima, Shintaro; Nakagome, Yukio; and Fukata, Yasuo, 3,715,507.
- Nakahara, Yasuji; Ichikawa, Kiyoshi; and Kondo, Kunio. Stabilized polyurethane elastomer composition. 3,715,412, Cl. 260-835.000.
- Nakamura, Itaru: *See—*
  - Kubo, Keishi; Sakai, Kiyoshi; Sato, Takashi; and Nakamura, Itaru, 3,715,263.
- Nakashima, Unichi: *See—*
  - Kiyono, Hiroshi; Nakashima, Unichi; Fujisaki, Yasuyuki; Ishigaki, Yukio; and Endo, Gen, 3,715,420.
- Nalco Chemical Company: *See—*
  - Dembowski, Ronald J.; and Schuh, Theodore R., 3,715,172.
- Nalepka, Raymond, to Bendix Corporation, The. Method and preform for reshaping glass tubing. 3,715,197, Cl. 65-54.000.
- Nash, Leonard A.: *See—*
  - Kurz, Philip F.; and Nash, Leonard A., 3,715,219.
- National Cash Register Company, The: *See—*
  - Jackson, Dean B.; Stork, Edward S.; and Flory, Darrell L., 3,715,023.
  - Lin, Chao-Han, 3,715,226.
- National Manufacturing Co.: *See—*
  - Edeus, James A., 3,714,679.
- National Research Development Corporation: *See—*
  - Irving, Alexander; and Priest, Reginald Alfred Francis, 3,715,721.
  - Tucker, James Henry, 3;715,601.
- National Water-Blast Inc.: *See—*
  - Solvang, Paul O., 3,714,953.
- Natta, Giulio; Pino, Piero; and Mazzanti, Giorgio, to Montecatini Edison S.p.A. Regular linear head-to-tail polymerizates of certain unsaturated hydrocarbons and filaments comprising said polymerizates. 3,715,344, Cl. 260-93.700.
- Neitz, Alfred; and Pickel, Hans, to Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft. Cylinder with dry cylinder sleeve. 3,714,931, Cl. 123-41.790.
- Nelson, Philip E., to Purdue Research Foundation. Aseptic storage and valving system. 3,714,956, Cl. 137-238.000.
- Nerwin, Hubert, to Eastman Kodak Company. Photographic cartridge. 3,714,876, Cl. 95-13.000.
- Netterstedt, Sture; and Lindstrand, Bengt, to Rostfria Tak AB. Method of, and apparatus for spirally winding strip metal about a pipe, and securing adjacent strips by welding. 3,715,557, Cl. 219-62.000.
- Neukirchen, Ernst: *See—*
  - Praetzel, Hans Eberhard; Neukirchen, Ernst; and Jenkner, Herbert, 3,715,383.
- New England Institute, Inc., The: *See—*
  - Carnes, Joseph J.; Green, James H.; and Heller, John H., 3,715,305.
- Newman, Dewey F., to United States of America, National Aeronautics and Space Administration. Test stand system for vacuum chambers. 3,714,833, Cl. 73-432.0sd.
- Newman, Leonard: *See—*
  - Paley, Alfred I.; Newman, Leonard; Seats, Peter; and Waxenbaum, Bernard M., 3,715,618.
  - Salzano, Francis J.; Hobdell, Michael R.; Minushkin, Bertram; Kalinowski, Walter; and Newman, Leonard, 3,715,296.
- Newman, Stephen: *See—*
  - Swotinsky, Jacob M.; Newman, Stephen; and Colitti, Olindo A., 3,715,248.
- Newton, Albert E.: *See—*
  - Dornemann, Peter L.; Radcliffe, Milton R.; Newton, Albert E.; and Eaton, Samuel E., Jr., 3,715,260.
- Ng, Daniel Y. C.: *See—*
  - Anderson, Philip J.; and Ng, Daniel Y. C., 3,714,909.
- Ng, Wahling H.; Lehman, William F.; and Young, John P., to United States of America, Army. Storage of liquid hydrazine rocket fuels. 3,715,231, Cl. 117-71.00m.
- Nicholas, Merle E., to Honeywell Inc. Relative humidity sensor. 3,715,702, Cl. 338-35.000.
- Nichols, Duane C.: *See—*
  - Linstromberg, William J.; and Nichols, Duane C., 3,714,794.
- Nichols, Newlin S.: *See—*
  - Louvar, Joseph F.; and Nichols, Newlin S., 3,715,402.
- Nicko, Stanley. Fluid treatment devices. 3,715,032, Cl. 210-133.000.
- Nicolson, Alexander M., to Sperry Rand Corporation. Non-destructive electromagnetic energy testing of web material. 3,715,667, Cl. 324-58.50b.
- Nielsen, Anker J., Jr.: *See—*
  - Morse, Lynn H.; and Nielsen, Anker J., Jr., 3,714,802.
- Nienstedt, William H.: *See—*
  - Truesdell, Robert E.; and Nienstedt, William H., 3,715,256.
- Nier, Johannes. Semiconductor unit with integrated circuit. 3,715,633, Cl. 317-234.00r.
- Nighohossian, Sarkie; and Tobin, John J., Jr., to United States of America, Treasury. Qualitative analysis device. 3,715,189, Cl. 23-259.000.
- Nihon Denshi Kabushiki Kaisha: *See—*
  - Matsuda, Hisashi, 3,715,581.
- Nihyakumen, Kouzi; Yokoyama, Taizo; Ueda, Yasuo; Kamezawa, Yasutoki; and Aizawa, Tatsuo, to Mita Industrial Company Limited. Diazo-type multicolor reproduction. 3,715,213, Cl. 96-49.000.
- Nippon Gakki Seizo Kabushiki Kaisha: *See—*
  - Chibana, Masanobu, 3,715,675.
  - Ishimura, Kazukiyo, 3,715,443.
  - Itoh, Masaji, 3,715,448.
  - Ohno, Junji, 3,715,447.
- Nippon Oil Company, Limited: *See—*
  - Misono, Akira; and Ogata, Ikuei, 3,715,405.
- Nippon Steel Corporation: *See—*
  - Watanabe, Tetsuo; and Hashirizaki, Shinya, 3,715,476.
- Nisonger, Dan P.: *See—*
  - Berry, Walter L., Jr.; Nisonger, Dan P.; and Craig, Preston S., 3,715,379.
- Nix, Andrew B.: *See—*
  - Schultz, Seiford F.; and Nix, Andrew B., 3,715,414.
- Nogami, Sumitaka; Saito, Shizuko; and Okada, Tooru, to Asahi Kasei Kogyo Kabushiki Kaisha. Self-thermoset unsaturated polyesters and method for preparation thereof. 3,715,330, Cl. 260-40.00r.
- Nolley, Robert H., to Hughes Tool Company. Valving tube subassembly for percussion bit. 3,714,993, Cl. 173-78.000.
- Noordenbos, Pieter Klaas. Process and apparatus for setting a flexible elongate body in a particular form. 3,714,855, Cl. 83-1.000.

Norcross, James E.; and Garwood, George, to Arcos Corporation. Vertical welding machine having swinging equipment head. 3,715,559, Cl. 219-126.000.
Nordin, Robert W., to Teletype Corporation. Wire recording and mechanism therefor. 3,715,020, Cl. 197-1.00r.
Noren, Don W., to Noren Products Inc. Heat shield assembly. 3,714,981, Cl. 165-47.000.
Noren Products Inc.: *See—*
Noren, Don W., 3,714,981.
Norland Corporation: *See—*
Burkhalter, Robert; and Congdon, George L., 3,715,587.
Rose, Frederick A., 3,715,588.
Normalair-Garrett (Holdings) Limited: *See—*
Cordell, Edward Geoffrey, 3,715,180.
North American Rockwell Corporation: *See—*
Iacobellis, Sam F., 3,714,785.
Janda, Richard M., 3,714,801.
Miller, Darrow L., 3,714,817.
Miller, Dorrow L., 3,714,816.
O'Donnell, Cedric F.; and Pulliam, George R., 3,715,736.
Shaheen, Joseph M.; and Simone, John, 3,714,707.
North, William L.; and Eubank, George S., to Forenta, Limited. Garment finishing apparatus. 3,715,064, Cl. 223-57.000.
Northern Electric Company Limited: *See—*
Ebrahimi, Jalal, 3,715,516.
Norton Company: *See—*
Coes, Loring, Jr., 3,714,715.
Notkr, Michael, to Druth Packaging Corporation. Fiber board table. 3,714,908, Cl. 108-157.000.
Nowak, Robert M.; Woo, James T. K.; and Heinert, Dietrich H., to Dow Chemical Company, The. Copolymers of vinyl amine and vinyl alcohol as flocculants. 3,715,336, Cl. 260-77.5bb.
Nukem Nuklear-Chemie und- Metallurgie, GmbH: *See—*
Pirk, Hans; and Tillessen, Ulrich, 3,714,978.
Nusonics, Inc., mesne: *See—*
Zacharias, Ellis M., Jr.; and Cirulis, Uldis, 3,715,709.
Nutt, Wendell Glenn, to Bell Telephone Laboratories, Incorporated. System for maintaining low relative humidity in closures. 3,715,565, Cl. 219-274.000.
Ochs, Charles S.: *See—*
Roberts, Cecil P.; and Ochs, Charles S., 3,714,760.
O'Connor, Robert F., to Textron Inc. Pneumatically actuated fastener driving device with improved sleeve valve for controlling the pressure beneath the drive piston. 3,715,069, Cl. 227-130.000.
Odec Computer Systems, Inc.: *See—*
Perry, Richard Anthony, 3,714,892.
O'Donnell, Cedric F.; and Pulliam, George R., to North American Rockwell Corporation. Magnetic bubble domain system. 3,715,736, Cl. 340-174.0tf.
Oertel, Harald: *See—*
Traubel, Harro; and Oertel, Harald, 3,715,326.
Offermann, Bernd Peter: *See—*
Hofmann, Ernst-Gunther; Meyerhoff, Klaus; Offermann, Bernd Peter; and Barthel, Rolf, 3,715,597.
Ofner, Max, to SFB Spezial-Filterbau M. Ofner K.G. Apparatus for electrostatically coating the surfaces of articles with pulverulent materials. 3,714,926, Cl. 118-603.000.
Ogata, Ikuei: *See—*
Misono, Akira; and Ogata, Ikuei, 3,715,405.
Ogawa, Morimasa; and Gono, Kiyoshi, to Matsushita Electric Industrial Co. Ltd. High-frequency heating equipment. 3,715,553, Cl. 219-10.550.
Ohio University, The President and Board of Trustees of the: *See—*
Garrett, Patrick H., 3,715,752.
Ohno, Junji, to Nippon Gakki Seizo Kabushiki Kaisha. Electronic musical instrument with a keyboard device capable of producing special musical effects upon key depression. 3,715,447, Cl. 84-1.240.
Ohoshima, Nobumasa; Himeno, Kinya; and Tani, Norihiro, to Matsushita Electric Industrial Co., Ltd. Electromagnetic radiation image displaying panel. 3,715,589, Cl. 250-80.000.
Ohta, Shuji, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. Industrial truck. 3,715,014, Cl. 187-9.000.
Okada, Takashi: *See—*
Takise, Tadashi; and Okada, Takashi, 3,715,488.
Okada, Takashi, to Sony Corporation. Camera tube residual smage elimination apparatus. 3,715,490, Cl. 178-7.200.
Okada, Tooru: *See—*
Nogami, Sumitaka; Saito, Shizuko; and Okada, Tooru, 3,715,330.
Okkonen, Oliver G., to Rowe International Inc. Post validator for bill acceptor. 3,715,031, Cl. 209-75.000.
Okumoto, Masanori: *See—*
Fukui, Saburo; Yamazaki, Tsunehiro; Yamamoto, Masato; Miyake, Masuichi; and Okumoto, Masanori, 3,715,236.
Olcott, Eugene L., to Susquehanna Corporation, The. Composite materials. 3,715,253, Cl. 156-175.000.
O'Leary, Timothy J., to Lee, Raymond, Organization, Inc., The. Device for converting table telephone to wall telephone. 3,715,519, Cl. 179-100.00c.
Olivetti, Ing., C., & C., S.p.A.: *See—*
Demonte, Filippo; and Pipino, Luciano, 3,715,724.
Ollearo, Giorgio, 3,715,167.
Ollearo, Giorgio, to Olivetti, Ing., C., & C., S.p.A. Control device for a boring tool holder of machine tools. 3,715,167, Cl. 408-149.000.
Olsen, Arthur A., to General Electric Company. Spring plate contact and support for a lightning arrester sparkgap assembly and associated grading resistors. 3,715,626, Cl. 317-68.000.
Olsen, Ogden R.: *See—*
Lay, Ralph B.; and Olsen, Ogden R., 3,715,142.
Olson, Charles Langdon; Monahan, John Francis; and Dischert, Robert Adams, to RCA Corporation. Video signal noise-limiting apparatus. 3,715,477, Cl. 178-5.40r.
Olson, Glenn V. Punch riveter for joining metals. 3,714,688, Cl. 29-21.100.
Olympia Werke AG: *See—*
Rix, Albert; Werner, Georg; and Fuchs, Hans, 3,715,022.
Omark Industries, Inc.: *See—*
Sandberg, Gary K., 3,715,137.
Tupper, Myron D., 3,714,859.
Omron Tateisi Electronics Co.: *See—*
Hatand, Isao, 3,715,746.
O'Neal, Larry. Inflatable dock seal. 3,714,745, Cl. 52-2.000.
Opti-Holding A.G.: *See—*
Frohlich, Alfons; Cappel, Marie-Luise; and Stubiger, Ernst, 3,714,683.
Orbit Manufacturing Company: *See—*
Shriver, Charles S., 3,714,982.
Orser, Harvey E. Plug insertion tool. 3,714,851, Cl. 81-15.700.
Osborn, Claiborn Lee: *See—*
Sandner, Michael Ray; and Osborn, Claiborn Lee, 3,715,293.
Oshima, Shintaro; Nakagome, Yukio; and Fukata, Yasuo, to Kokusai Denshin Denwa Kabushiki Kaisha. Bilateral start-stop transmission system for digital information. 3,715,507, Cl. 179-15.0by.
Ott, C. Dr., & Comp. G.m.b.H.: *See—*
Pries, Erich E.; Errgang, Karl; and Drebes, Friedrich-Wilhelm, 3,715,282.
Ott, Erich. Analog-type constant-current regulator. 3,715,651, Cl. 323-4.000.
Ottaway, Herbert J. Engine powered jumping stick. 3,715,000, Cl. 180-8.00r.
Ottestad, Jack B. Tool fixture. 3,714,866, Cl. 91-216.00r.
Ovshinsky, Stanford R., to Energy Conversion Devices, Inc. Switchable current controlling device with inactive material dispersed in the active semiconductor material. 3,715,634, Cl. 317-234.00r.
Owen, Charles L. Handy tire rack. 3,715,066, Cl. 224-42.240.
Owen, Robert E. Hydraulically operated railroad car door. 3,714,735, Cl. 49-220.000.
Owens, Ben H.: *See—*
Le Fevre, Clyde E.; Hagan, James P.; and Owens, Ben H., 3,715,158.
Owens-Illinois, Inc.: *See—*
MacInnes, John M.; and Saumsiegle, Robert W., 3,714,756.
Oxy Metal Finishing Corporation: *See—*
Sulfaro, Andrew N.; and Stein, Alfred H., 3,715,308.
Ozaki, Masaaki, to Honda Giken Kogyo Kabushiki Kaisha. Automatic temperature control device for intake air of an internal combustion engine. 3,714,933, Cl. 123-122.000.
Pace, Incorporated: *See—*
Lloyd, Richard E.; and Wallgren, Linus E., 3,715,708.
Pachter, Irwin J.: *See—*
Schoen, Karl; and Pachter, Irwin J., 3,715,354.
Pacific Lighting Service Company: *See—*
Peck, Ralph E., 3,714,791.
Pacific Technica Corporation: *See—*
Feldmann, Fritz K., 3,714,900.
Packard, James R.: *See—*
Campbell, Donald A.; Packard, James R.; Tait, William C.; and Weiher, Richard L., 3,715,162.
Paddington, Arthur Loftus, to British Ropes Limited. Sealing means for pipes. 3,715,135, Cl. 285-379.000.
Pagdin, William G.; and Risley, Robert F., to Schiltz, Jos., Brewing Company. Open flap detector for filled cartons. 3,714,759, Cl. 53-78.000.
Page, Robert Brian; and Cartwright, Thomas William, to Thorn Electrical Industries Limited. Metal-halide discharge lamps. 3,715,622, Cl. 315-60.000.
Paley, Alfred I.; Newman, Leonard; Seats, Peter; and Waxenbaum, Bernard M., to Loral Corporation, and and Thomas Electronics, Inc. Vidicon viewed storage tube in which the newest line of information is displayed on the upper most portion of the tube. 3,715618, Cl. 315-10.000.
Pallas, Michael J.: *See—*
Esposito, Frank J.; Pallas, Michael J.; and Martin, Robert W., 3,715,759.
Pallotto, Nicholas. Covering for riser or the like. 3,714,750, Cl. 52-728.000.
Palmer, Robert M. Hand brace. 3,714,940, Cl. 128-77.000.
Palmer, William B., to TRW Inc. Rigid collapsible dish structure. 3,715,760, Cl. 343-915.000.
Panousis, Peter Theodore; and Waggener, Herbert Atkin, to Bell Telephone Laboratories, Incorporated. Etching Si_3N_4. 3,715,249, Cl. 156-17.000.
Pansky, Ben: *See—*
Yanof, Howard M.; Pansky, Ben; and Poff, James S., 3,714,943.
Parenti, Joseph A. Belt hole cutter. 3,714,690, Cl. 29-105.00a.
Paris, Hugh P. Transit concrete mixer and method of mixing concrete components. 3,715,107, Cl. 259-148.000.

Park, Won Kil; and Regoli, Domenico, to University de Sherbrooke. System for the solid-phase peptide synthesis. 3,715,190, Cl. 23-252.00r.
Park-Ohio Industries, Inc.: *See—*
Balzer, Norbert R.; and Kasper, Robert J., 3,715,556.
Parker, Leland L., to United States of America, Navy. Directed warhead. 3,714,897, Cl. 102-56.000.
Parkman, Malcolm F., to Varian Associates. Sealed high-pressure arc lamp and socket therefor. 3,715,613, Cl. 313-113.000.
Parry, John F. W., to United States of America, Air Force. Tethered chaff strand countermeasure with trailing end kite. 3,715,754, Cl. 343-18.00b.
Pasek, James E.; Rehfeld, Frederick L. J.; and Thompson, William B., to General Motors Corporation. Automatic engine cranking system. 3,715,004, Cl. 180-103.000.
Pasen, Randolph A.: *See—*
Elliott, Ernest A.; and Pasen, Randolph A., 3,715,460.
Pasetti, Adolfo: *See—*
Sianesi, Dario; Pasetti, Adolfo; and Belardinelli, Giorgio, 3,715,378.
Patchett, Arthur A.: *See—*
Henry, David W.; Hoff, Dale R.; and Patchett, Arthur A., 3,715,355.
Patterson, Joseph M., to FMC Corporation. Pickup and separating machine. 3,714,768, Cl. 56-328.00r.
Paulius, Leonard: *See—*
Boyle, Ralph C.; and Paulius, Leonard, 3,715,704.
Payne, William E. Linkage mechanism for rider propelled toys. 3,715,125, Cl. 280-1.194.
Pearlman, Alan R., to Tonus, Inc. Switching system for keyboard. 3,715,444, Cl. 84-1.010.
Pease, Roger Fabian Wedgwood: *See—*
Limb, John Ormond; and Pease, Roger Fabian Wedgwood, 3,715,483.
Peck, Edmond C. Device for putting on stockings and socks. 3,715,065, Cl. 223-111.000.
Peck, Ralph E., to Pacific Lighting Service Company. Vapor freezing type desalination method and apparatus. 3,714,791, Cl. 62-58.000.
Pellerin, Roy F.: *See—*
Strickler, Melvin D.; and Pellerin, Roy F., 3,714,820.
Peltola, Fred R. Child's slide. 3,715,120, Cl. 272-56.50r.
Pennsylvania Engineering Corporation: *See—*
Persson, John A., 3,715,439.
Percival, Eric Robert: *See—*
Davidson, Alastair Ritchie; and Percival, Eric Robert, 3,714,961.
Peripheral Business Equipment, Inc.: *See—*
Kleist, Robert A.; and Thorne, Robert L., 3,715,738.
Perkin-Elmer Corporation, The: *See—*
Reizman, Fremont; and McGraw, Robert B., Jr., 3,714,706.
Perkins, William E.; Schlack, Allen F.; and Ciccone, Thomas Q., to United States of America, Army. Compressible primer contact and fixed firing pin assembly. 3,714,728, Cl. 42-84.000.
Perkinson, Robert E., to McDonnell Douglas Corporation. Means for handling altitude information in collision avoidance systems. 3,715,717, Cl. 340-27.000.
Perlman, Barry Stuart, to RCA Corporation. Paired nonlinear active elements in a waveguide cavity adapted to support orthogonal TE$_{10}$ mode waves and TE$_{01}$ mode waves. 3,715,686, Cl. 331-96.000.
Perlowski, Edward F., Jr., to General Electric Company. Projection system. 3,715,494, Cl. 178-7.50d.
Perpedos AB: *See—*
Benson, Gustav Eric Valdemar, 3,715,060.
Perry, Adelbert W. Safety ladder brace. 3,715,012, Cl. 182-107.000.
Perry, Richard Anthony, to Odec Computer Systems, Inc. Impact hammer for liner printer. 3,714,892, Cl. 101-93.00c.
Persson, John A., to Pennsylvania Engineering Corporation. Electric smelting furnace electrode having a wooden core. 3,715,439, Cl. 13-18.000.
Peters, Franz, to Hergeth KG. Maschinenfabrik und Apparatebau. Regulator for feeding material to a processing machine. 3,715,041, Cl. 214-17.0ca.
Peters, Hans, to Henckels, J. A., Zwillingswerk, Firma. Method of manufacturing of knives. 3,714,850, Cl. 76-104.000.
Peterson, Francis C., to Hager, C., & Sons Hinge Manufacturing Company. Hinge mounted microswitch with adjustable actuator pin mounted on adjacent leaf. 3,715,537, Cl. 200-61.700.
Peterson, Robert A., to Raytheon Company. Twisted waveguide applicator. 3,715,551, Cl. 219-10.550.
Peterson, Stanley G., to Minnesota Mining and Manufacturing Company. Inking cover. 3,714,693, Cl. 29-132.000.
Petro-Tex Chemical Corporation: *See—*
Barone, Bruno J.; and Croce, Louis J., 3,715,391.
Croce, Louis J.; and Barone, Bruno J., 3,715,390.
Pettavel, Jacques: *See—*
Viret, Robert; and Pettavel, Jacques, 3,715,645.
Pfizer Inc.: *See—*
Miller, Max W., 3,715,356.
Phalin, Thomas Lawrence: *See—*
Kinkel, Christian Frederick; and Phalin, Thomas Lawrence, 3,715,052.
Phalin, Thomas Lawrence; and Birkholz, William Stephen, to American Can Company. Method and aparatus for supporting flexible container bodies in a closing machine. 3,714,755, Cl. 53-42.000.
Phillips Petroleum Company: *See—*
Gilbert, Dixie E., 3,715,109.
Horvath, Bertalan, 3,715,321.
Ray, Gardner C.; and Crain, Donald L., 3,715,410.
Venable, Charles R., Jr., 3,714,971.
Phillips, Stanley: *See—*
Whetstone, Albert; Fine, Samuel; and Phillips, Stanley, 3,714,689.
Photographic Silver Recovery Limited: *See—*
Bentley, James Sydney, 3,715,291.
Pianka, Max; and Edwards, John Duncan. Pesticidal esters of 2,6-dinitro-4-alkyl phenols. 3,715,384, Cl. 260-479.00r.
Piber, Earl T., to Cutler-Hammer Inc. Miniature multi-pole toggle switch with momentary action. 3,715,534, Cl. 200-67.00g.
Pickel, Hans: *See—*
Neitz, Alfred; and Pickel, Hans, 3,714,931.
Pierce, Ogden R.; and Kim, Yung Ki, to Dow Corning Corporation. Fluoroalkylene alcohols and esters. 3,715,387, Cl. 260-488.00h.
Pierce, Stanley L., Jr.; and Winn, William C., to Ford Motor Company. Automatic transmission controls for an automotive vehicle driveline. 3,714,836, Cl. 74-752.00c.
Pignataro, Tony, Jr., to Robinair Manufacturing Corporation. Permanent piercing access valve. 3,714,959, Cl. 137-318.000.
Pilc, Randolph John: *See—*
Gordon, Travis Hill; Marino, Patrick John; and Pilc, Randolph John, 3,715,505.
Pines, Seemon H.: *See—*
Karady, Sandor; Pines, Seemon H.; Ly, Manuel G.; and Sletzinger, Meyer, 3,715,382.
Pino, Piero: *See—*
Natta, Giulio; Pino, Piero; and Mazzanti, Giorgio, 3,715,344.
Pioneer Electronic Corporation: *See—*
Tsukagoshi, Tsunehiro, 3,715,522.
Piott, Chester J. Automatic telephone answering and recording system. 3,715,504, Cl. 179-6.0ac.
Pipino, Luciano: *See—*
Demonte, Filippo; and Pipino, Luciano, 3,715,724.
Pires, Antonio: *See—*
Daniels, John F.; and Pires, Antonio, 3,714,710.
Pirk, Hans; and Tillessen, Ulrich, to Nukem Nuklear-Chemie und-Metallurgie, GmbH. Apparatus for handling uranium hexafluoride at elevated pressure. 3,714,978, Cl. 165-1.000.
Pistor-Kette GmbH: *See—*
Muller, Anton, 3,714,975.
Plastic Rotational Moulding Limited: *See—*
Westbrook, Aubrey Joseph; and Thomson, Ian David Mac Knight, 3,715,179.
Plessey Company Limited, The: *See—*
Faulkner, Arthur M., 3,715,456.
Plessey Handel und Investments A.G.: *See—*
Stirling, Harold James; Williams, Roger Morley; Hampson, Peter Samuel; and Price, James Kenneth, 3,715,515.
Plooster, Myron N., to Union Carbide Corporation. Melt grown alumina crystals and process therefor. 3,715,194, Cl. 23-301.0sp.
Poff, James S.: *See—*
Yanof, Howard M.; Pansky, Ben; and Poff, James S., 3,714,943.
Pohlig-Heckel-Bleichert Vereinigte Maschinenfabriken Aktiengesellschaft: *See—*
Bruggemann, Hans; and Kulzer, Rudolf, 3,714,904.
Poirier, Raymond, to Societe Europeenne de Semiconducteurs et de Miroelectronique. Logic circuits employing complementary field-effect transistors in which the gate is insulated from the substrate. 3,715,637, Cl. 317-235.00r.
Polaroid Corporation: *See—*
Land, Edwin H.; Blinow, Igor; and Eloranta, Vaito K., 3,714,879.
Pollack, Shirley; and Finsilver, Devora. Hand shapable cap with adjustable headband. 3,714,670, Cl. 2-197.000.
Polus, Anthony P.; and Scheel, Russell H., to Advanced Digital Systems Inc. Data accessing system. 3,715,040, Cl. 214-16.40r.
Polye, William Ronald, to Bendix Corporation, The. Temperature compensator for capacitive pressure transducers. 3,715,638, Cl. 317-256.000.
Polymetallurgical Corporation: *See—*
Dion, Paul A.; and Hagarman, Paul O., 3,714,701.
Pond, George R.: *See—*
Rylander, Paul N.; Karpenko, Irene M.; and Pond, George R., 3,715,397.
Ponzoni, George Bernard: *See—*
Balling, Theodore Thomas; Leonard, Richard J.; Ponzoni, George Bernard; Protomastro, Michael Gabriel; and Stefanucci, Arthur, 3,715,215.
Pope, Kenneth W., to Du Pont of Canada Limited. Method of fabricating a building panel containing cellular polyurethane. 3,715,417, Cl. 264-45.000.
Posey, Alfred Henry; and Quick, Harry Clifford, Jr., to Sigma Instruments, Inc. Indicating meter with visual alarm. 3,715,661, Cl. 324-115.000.
Posselt, Klaus; and Thiele, Kurt. 2(3-Phenyl-3-hydroxypropyl 1-2 amino) ethyl-thienyl-(3)-ketone. 3,715,369, Cl. 260-332.30c.
Post Office, The: *See—*
Clarke, Eric Fifield Stuart; Cosier, James Edwin Henry; Kolanowski, Jan; Halls, Peter Seaton; and Laidlaw, Alexander Duncan Lindley, 3,715,068.
Potlatch Forests, Inc.: *See—*
Dunaway, Jack W.; Woodland, Michael W.; and Johnson, Bernard H., 3,715,257.
Potter, Ralph M.: *See—*

Jaffe, Mary S.; and Potter, Ralph M., 3,715,636.

Potz, Klaus: *See*—
Hennig, Fridolin; Kellner, Hans-Jurgen; Potz, Klaus; and Gotze, Christian, 3,715,261.

Powden, Alan Warren: *See*—
Bender, Frederick; Clermont, Louis-Philippe; and Powden, Alan Warren, 3,715,268.

Pradt, Louis A., to Sterling Drug Inc. Method of treatment of alkaline pulping black liquors by wet air oxidation. 3,714,911, Cl. 110-7.00r.

Praetzel, Hans Eberhard; Neukirchen, Ernst; and Jenkner, Herbert. Purification of tetrabromophthalic anhydride. 3,715,383, Cl. 260-475.0pr.

Prakla Gesellschaft fur Praktische Lagerstattenforschung GmbH: *See*—
Sender, Friedhelm K., 3,715,758.

Prather, Alfred G. B. Gravity escape means. 3,715,011, Cl. 182-100.000.

Prause, Dieter; and Sost, Rolf, to Bosch, Robert, Elektronik GmbH. Method and apparatus for electrically transmitting pictures. 3,715,475, Cl. 178-5.000.

Pregel, Ludwig: *See*—
Husch, Albert; Kemenes, Franz; and Pregel, Ludwig, 3,715,536.

Prentice, James S., to Esso Research and Engineering Company. Laminated non-woven sheet. 3,715,25F, Cl. 156-62.800.

Preston, Edward George, to Molins Machine Company Limited. Handling apparatus for rod-like articles. 3,715,056, Cl. 221-211.000.

Price, James F.; and Shook, Kenneth, to Bethlehem Corporation, The. Mixing and humidification apparatus for breathing devices. 3,714,944, Cl. 128-209.000.

Price, James Kenneth: *See*—
Stirling, Harold James; Williams, Roger Morley; Hampson, Peter Samuel; and Price, James Kenneth, 3,715,515.

Pries, Erich E.; Errgang, Karl; and Drebes, Friedrich-Wilhelm, to Ott, C. Dr., & Comp. G.m.b.H. Coke car with fume-collecting hood. 3,715,282, Cl. 202-263.000.

Priest, Reginald Alfred Francis: *See*—
Irving, Alexander; and Priest, Reginald Alfred Francis, 3,715,721.

Prieur, Lucien Robert: *See*—
Rousseau, Hubert Cecyl Albert; and Prieur, Lucien Robert, 3,715,523.

Princeton Applied Research Corporation: *See*—
Reichard, Harry S., 3,715,678.

Pritz, Howard B.: *See*—
Davis, Howard C.; Pritz, Howard B.; and Burton, Charles A., 3,715,174.

Privott, Wilbur J., Jr.; and Cunningham, Robert E., to Monsanto Company. Low viscosity melt spinning process. 3,715,418, Cl. 264-82.000.

Privott, Wilbur J., Jr.; and Cunningham, Robert E., to Monsanto Company. Drag stabilized low viscosity melt spinning process. 3,715,419, Cl. 264-82.000.

Procter & Gamble Company, The: *See*—
Morgenstern, Arthur Stanley, 3,715,314.

Production, Inc.: *See*—
Schmidt, Gunter, 3,714,697.

Productron, Inc.: *See*—
Schmidt, Gunter, 3,715,087.

Propper Manufacturing Company, Inc.: *See*—
Hunsinger, Peter; and White, James C., 3,715,067.

Prost, Gerard: *See*—
Croso, Hubert; Prost, Gerard; Quefellec, Andre; and Sole, Jean, 3,715,703.

Protomastro, Michael Gabriel: *See*—
Balling, Theodore Thomas; Leonard, Richard J.; Ponzoni, George Bernard; Protomastro, Michael Gabriel; and Stefanucci, Arthur, 3,715,215.

Pucher, Walter: *See*—
Grune, Per-Olof; Pucher, Walter; and Sandkvist, Hugo, 3,715,542.

Puhringer, Othmar, to Vereinigte Osterreichische Eisen- und Stahlwerk Aktiengesellschaft. Converter handling vehicle. 3,715,101, Cl. 254-87.000.

Pulliam, George R.: *See*—
O'Donnell, Cedric F.; and Pulliam, George R., 3,715,736.

Purcell, Ernest M.: *See*—
McWade, John E.; Keizer, Jan; Moore, Wilcy I.; and Purcell, Ernest M., 3,715,741.

Purdue Research Foundation: *See*—
Nelson, Philip E., 3,714,956.

Putz, Ulrich, to Licentia Patent-Verwaltungs-G.m.b.H. Circuit arrangement for braking a vehicle. 3,715,602, Cl. 307-9.000.

Pye Limited: *See*—
Kipling, Barry John, 3,714,941.

Quaintance, Harold J., to Horizons Incorporated. Process and product of cold sealing an anodized aluminum article by a photo-polymerization process. 3,715,211, Cl. 96-35.100.

Quasius, Alan R.; and Shiman, Paul J., to Gillette Company, The. Hair spray unit containing a solution of a polymeric quaternary cellulose ether salt. 3,715,428, Cl. 424-47.000.

Quefellec, Andre: *See*—
Croso, Hubert; Prost, Gerard; Quefellec, Andre; and Sole, Jean, 3,715,703.

Quichaud, Claude; Le Peuvedic, Jean-Pierre; and Tinchon, Jacques, to Societe Nationale des Petroles d'Aquitaine. Device for suspending measuring instruments inside drilling assembly. 3,714,831, Cl. 73-431.000.

Quick, Harry Clifford, Jr.: *See*—
Posey, Alfred Henry; and Quick, Harry Clifford, Jr., 3,715,661.

Raab, Stefan, to Demag AG. Combined gripping and lifting mechanism for handling anode plates in an anode plate casting plant. 3,715,048, Cl. 214-16.00b.

Radcliffe, Milton R.: *See*—
Dornemann, Peter L.; Radcliffe, Milton R.; Newton, Albert E.; and Eaton, Samuel E., Jr., 3,715,260.

Radler, Frederick J.: *See*—
Young, Robert W.; and Radler, Frederick J., 3,715,690.

Raebiger, Wolfgang, to Grundig. Device for examining the piston rings in free-floating piston engines. 3,714,781, Cl. 60-54.50r.

Rainer, Norman B., to Seekay Chemical Co., Inc. Chelation polymer from nitrilo compound and ethylene imine compound. 3,715,339, Cl. 260-78.00a.

Raion Yushi Kabushiki Kaisha: *See*—
Susuki, Rinnosuke; Hoshi, Hiroshi; Araki, Shinichi; and Miyamoto, Shinzo, 3,715,063.

Randow, Albert: *See*—
Schunck, Gunter; Speeter, Winfried; and Randow, Albert, 3,715,153.

Rapaille, Jean Rodolphe: *See*—
Yperman, Jean Michel Baudry Ghislain; and Rapaille, Jean Rodolphe, 3,715,701.

Rapkin, Edward: *See*—
Thomas, Edward W.; and Rapkin, Edward, 3,715,586.

Rapshys, William, to Motorola, Inc. Integrated circuit frequency divider having low power consumption. 3,715,604, Cl. 307-220.000.

Ratliff, George D., Jr., to United States Steel Corporation. Reinforcing and supporting saddle for C-shaped sheet-metal beams. 3,714,752, Cl. 52-665.000.

Ravas, Richard J., to Westinghouse Electric Corporation. Staggered phase pulse width modulated inverter apparatus. 3,715,649, Cl. 321-45.00r.

Rawson, Donald E., to Gulf Oil Corporation. Method for excavating by explosions. 3,714,895, Cl. 102-23.000.

Rax Corporation: *See*—
Spencer, Calvin D., 3,715,100.

Ray, Gardner C.; and Crain, Donald L., to Phillips Petroleum Company. Conversion of cyclic olefins to acyclic polyenes. 3,715,410, Cl. 260-680.00r.

Raytheon Company: *See*—
Archer, Donald H., 3,715,749.
Mead, George S., 3,715,751.
Peterson, Robert A., 3,715,551.
Weber, Marvin J., 3,715,683.

RCA Corporation: *See*—
Allen, John Kenneth, 3,715,493.
Fitzgerald, William Vincent, Jr., 3,715,492.
Haynes, Harold E., 3,715,498.
Lerch, Joseph B., 3,715,603.
Liederbach, William Herman, 3,714,709.
Olson, Charles Langdon; Monahan, John Francis; and Dischert, Robert Adams, 3,715,477.
Perlman, Barry Stuart, 3,715,686.
Ross, Daniel Louis, 3,715,212.
Schiess, George, 3,715,621.
Sendelweck, Gene Karl, 3,715,464.
Steckler, Steven Alan, 3,715,499.
Weimer, Paul Kessler, 3,715,485.
Woodward, Oakley McDonald, 3,715,688.
Wright, Harry Gilbert; and Dischert, Robert Adams, 3,715,486.

RdF West: *See*—
Mc Gunigle, Richard D., 3,715,593.

Read, Norman W., to Dresser Industries, Inc. Well tools and gripping members therefor. 3,714,984, Cl. 166-134.000.

Reddish, Wilson: *See*—
Hyde, Peter John; and Reddish, Wilson, 3,715,656.

Reed International Limited: *See*—
Davidson, Alastair Ritchie; and Percival, Eric Robert, 3,714,961.

Reed, Robert D.: *See*—
Zink, John Smith; Goodnight, Hershel; and Reed, Robert D., 3,715,181.

Regoli, Domenico: *See*—
Park, Won Kil; and Regoli, Domenico, 3,715,190.

Rehfeld, Frederick L. J.: *See*—
Pasek, James E.; Rehfeld, Frederick L. J.; and Thompson, William B., 3,715,004.

Reichard, Harry S., to Princeton Applied Research Corporation. Active electrical filter. 3,715,678, Cl. 330-86.000.

Reiner, Roland: *See*—
Rey-Bellet, Gerald; Schwartz, Daniel Ernest; and Reiner, Roland, 3,715,357.

Reizenstein, Harry S.: *See*—
Feigel, Harold J.; Reizenstein, Harry S.; and Bloch, Gilbert, 3,714,757.

Reizman, Fremont; and McGraw, Robert B., Jr., to Perkin-Elmer Corporation, The. Array of conductors fixed through dielectric plate. 3,714,706, Cl. 29-624.000.

Reliance Electric Company: *See*—
Abnett, Albert C.; and Foster, George B., 3,715,659.

Relles, Howard M., to General Electric Company. Chlorination of ketonic acetyl groups. 3,715,407, Cl. 260-668.00r.

Rellinger, Oscar A. Truck retriever hoist. 3,715,042, Cl. 214-86.00a.

Relph, Warren L. Method and means of measuring the moisture content of grain. 3,714,818, Cl. 73-73.000.

Renn, Madeline S.: *See*—
Renn, Neil R.; and Renn, Madeline S., 3,715,121.

Renn, Neil R.; and Renn, Madeline S. Target and projecting apparatus including a balanced projectile. 3,715,121, Cl. 273-101.000.

Repsher, Dennis E.: *See*—
McGrath, John W.; and Repsher, Dennis E., 3,715,576.

Republic Corporation: *See*—
Richelmann, Bernd H., 3,715,662.

Research Corporation: *See*—
Mende, Thomas J., 3,715,434.

Reuss, Max L., Jr., to United States of America, Army. Microstrip-slot line phase shifter. 3,715,692, Cl. 333-24.100.

Rex Chainbelt Inc.: *See*—
Gley, Paul R., 3,714,684.

Rey-Bellet, Gerald; Schwartz, Daniel Ernest; and Reiner, Roland, to Hoffmann-La Roche Inc. N-oxides of benzylpyrimidnes. 3,715,357, Cl. 260-256.40n.

Reynolds, Elmer N. Water sprinkler device. 3,715,078, Cl. 239-206.000.

Reynolds Metals Company: *See*—
Vogeleer, George B., 3,714,758.

Reynolds, Robert L.: *See*—
Ernisse, Paul J.; and Reynolds, Robert L., 3,714,873.

Rhinehart, Robert R., Jr.: *See*—
Campbell, Kenneth C.; and Rhinehart, Robert R., Jr., 3,715,416.

Rhone-Poulenc S.A.: *See*—
Boichard, Jacques; Brossard, Bernard Pierre; Gay, Michel Louis Marie Joseph; and Janin, Raymond Marc Clement, 3,715,394.

Ribaldone, Giuseppe; and Gafa, Salvatore, to Montecatini Edison S.p.A. Method of preparing sodium nitrilotriacetate. 3,715,393, Cl. 260-534.00e.

Richelmann, Bernd H., to Republic Corporation. Test contactor head for circuit modules. 3,715,662, Cl. 324-158.00f.

Ricoh Co. Ltd.: *See*—
Hiruma, Kenji; and Sugaya, Inawo, 3,715,564.
Kubo, Keishi; Sakai, Kiyoshi; Sato, Takashi; and Nakamura, Itaru, 3,715,263.
Kubo, Keishi; Sakai, Kiyoshi; and Sato, Takashi, 3,715,267.

Rieser, Donald E., to International Harvester Company. Alternating mechanism for hydraulic markers. 3,714,991, Cl. 172-130.000.

Rigby, Frank; and Ainscough, John Brian, to United Kingdom Atomic Energy Authority. Nuclear fuel element containing sintered uranium dioxide fuel with a fine particulate dispersion of an oxide additive therein and method of making same. 3,715,273, Cl. 176-7.000.

Risgin, Ojars, to Sensors, Inc. Method of fabricating film type sensing structures. 3,715,288, Cl. 204-38.00a.

Risley, Robert F.: *See*—
Pagdin, William G.; and Risley, Robert F., 3,714,759.

Rissberger, Arthur C., Jr., to Eastman Kodak Company. Strip storage device. 3,715,088, Cl. 242-74.000.

Rittner, Siegbert: *See*—
Kuhne, Rudolf; Diery, Helmut; and Rittner, Siegbert, 3,715,319.

Ritz, Rudolf, to Gesellschaft fur Kernforschung m.b.H. Method of operating a nuclear reactor facility with a steam cooled fast breeder reactor as the heat source. 3,715,272, Cl. 176-60.000.

Rix, Albert; Werner, Georg; and Fuchs, Hans, to Olympia Werke AG. Apparatus for postponing and storing key controlled functions of a typewriter. 3,715,022, Cl. 197-98.000.

Roberts, Cecil P.; and Ochs, Charles S., to Anchor Hocking Corporation. High speed rotary container sealing machine with inclined sealing heads. 3,714,760, Cl. 53-112.00r.

Robertshaw Controls Company: *See*—
Martin, Stephen J., 3,715,502.

Robertson, John K.: *See*—
Audesse, Emery G.; Tartakoff, Alexander; and Robertson, John K., 3,715,232.

Robertson, W. H., Company: *See*—
Curran, Bernard Edwin, 3,714,747.

Robertson, William Lauchlin. Snow cleat and track for tracked vehicle. 3,715,146, Cl. 305-35.0eb.

Robiette, Alfred Gordon Evans, to Foseco International Limited. Electric arc stabilization in electric arc melting using carbon electrodes. 3,715,440, Cl. 13-18.000.

Robinair Manufacturing Corporation: *See*—
Pignataro, Tony, Jr., 3,714,959.

Robinson, E S & A Limited: *See*—
Gibbs, Gilbert Leslie; and Davies, Timothy Muir, 3,715,073.

Robinson, Gerald P. Reciprocating handstamp with magnetic plate holding means for removing the plate. 3,714,894, Cl. 101-382.0mv.

Robinson, Herbert N.: *See*—
De Grazio, Robert P.; and Robinson, Herbert N., 3,715,204.

Rodriguez, George: *See*—
Lewis, Tony E.; and Rodriguez, George, 3,714,809.

Rose, Frederick A., to Norland Corporation. Bone mineral analyzer. 3,715,588, Cl. 250-71.50s.

Rosenbaum, Edward W.; and Schoen, Kurt L., to Michael, David, & Co. Method of making free-flowing flavoring powders of high flavor-concentration and products thereof. 3,715,217, Cl. 99-140.00r.

Rosenberger, Chester A., Jr.; and Swartz, Horace M., to FMC Corporation. Takeup apparatus for truck tow conveyor system. 3,714,903, Cl. 104-196.000.

Rosenstingl, Emmanuel, to Intertechnique S.A. Method and apparatus for evaluating the degree of quenching in scintillation spectrometry. 3,715,584, Cl. 250-71.50r.

Ross, Daniel Louis, to RCA Corporation. Photochromic display and storage device and method of operation thereof. 3,715,212, Cl. 96-48.000.

Rostfria Tak AB: *See*—
Netterstedt, Sture; and Lindstrand, Bengt, 3,715,557.

Rothke, Ernst, to Zinser-Textilmaschinen Gesellschaft mit beschrankter Haftung. Inflatable gripper for handling spools of textile machines. 3,714,770, Cl. 57-52.000.

Rousseau, Hubert Cecyl Albert; and Prieur, Lucien Robert, to Societe Industrielle Honeywell Bull (Societe Anonyme). Positioning mechanism for magnetic head. 3,715,523, Cl. 179-100.2ca.

Rowe International Inc.: *See*—
Okkonen, Oliver G., 3,715,031.

Rudes, Harry L. Garment with absorbent front and crotch pad pockets. 3,714,946, Cl. 128-295.000.

Ruehle, William H., to Mobil Oil Corporation. Apparatus for and method of treating seismic data to obtain a wide band representation. 3,715,715, Cl. 340-15.5dp.

Ruempelein, Fritz: *See*—
Kisselmann, Willy; Ruempelein, Fritz; and Kopf, Paul, 3,715,658.

Rug Crafters: *See*—
Montell, Joseph J.; and Houghton, George L., 3,714,915.

Ruhnke, Lothar H., to United States of America, National Aeronautics and Space Administration. Determining distance to lightning strokes from a single station. 3,715,660, Cl. 324-72.00r.

Ruiter, Larry D.: *See*—
Zoerner, Richard L.; and Ruiter, Larry D., 3,714,994.

Rumanowski, Edmund J., to Allied Chemical Corporation. Alkyl-N-alkyl-chlorophenoxythioacetimidates. 3,715,380, Cl. 260-453.00r.

Rushton, William E.; Seavoy, Gordon E.; and Morey, Woodruff A., to Whiting Corporation. Apparatus for making wet process phosphoric acid. 3,715,191, Cl. 23-260.000.

Russell, Roger Howard, to McIntosh Laboratory,Inc. Loudspeaker system. 3,715,501, Cl. 179-1.00d.

Ruyle, William V.: *See*—
Shen, Tsung-Ying; Ruyle, William V.; Fordice, Michael W.; and Jensen, Norman P., 3,715,375.

Ryan, Edmond J. Purified oxygen gas containing ozone and higher oxygen polymers. 3,715,430, Cl. 424-127.000.

Rylander, Paul N.; Karpenko, Irene M.; and Pond, George R., to Engelhard Minerals & Chemicals Corporation. Process for preparing para-aminophenol. 3,715,397, Cl. 260-575.000.

Saab Aktiebolag: *See*—
Angelstrand, Borje; and Mostrom, Ragnar, 3,715,086.

Sabatino, Daniel D.: *See*—
Wilkens, Henry W.; and Sabatino, Daniel D., 3,714,823.

Sadler, Thomas Harry, to Johns-Manville Corporation. Dual treatment of asbestos fibers. 3,715,230, Cl. 117-70.00s.

Sado, Ryoichi, to Shinetsu Chemical Company. Silicone stopper for a sterile container. 3,715,047, Cl. 215-47.000.

Saito, Shizuko: *See*—
Nogami, Sumitaka; Saito, Shizuko; and Okada, Tooru, 3,715,330.

Saitou, Norio: *See*—
Maekawa, Akiji; Munakata, Chusuke; and Saitou, Norio, 3,715,580.

Sajar Plastics, Inc.: *See*—
Johnson, Tom W.; and Johnson, Joe L., 3,714,958.

Sakai, Kiyoshi: *See*—
Kubo, Keishi; Sakai, Kiyoshi; Sato, Takashi; and Nakamura, Itaru, 3,715,263.
Kubo, Keishi; Sakai, Kiyoshi; and Sato, Takashi, 3,715,267.

Salvade, Gennaro, to Bobst, J., & Fils, S.A. Leveling device for sheet material feeding mechanism. 3,715,116, Cl. 271-44.00a.

Salzano, Francis J.; Hobdell, Michael R.; Minushkin, Bertram; Kalinowski, Walter; and Newman, Leonard, to United States of America, Atomic Energy Commission. Electrochemical carbon activity meter. 3,715,296, Cl. 204-195.00r.

Sampson, Robert W., to Universal Oil Products Company. Transducer for converting selected environmental parameter differentials to frequency differentials. 3,715,657, Cl. 324-140.00r.

Sandberg, Curt Ove Bille, to Telefonaktiebolaget L M Ericsson. Tripping arrangement for ringing current signals in telephone exchanges. 3,715,517, Cl. 179-18.0hb.

Sandberg, Gary K., to Omark Industries, Inc. Energy absorbing structures. 3,715,137, Cl. 293-1.000.

Sander-Wander, Inc.: *See*—
Houlihan, William J., 3,715,366.

Sanderson, Leon Franklin: *See*—
Hubbard, Arthur Lowell; and Sanderson, Leon Franklin, 3,714,767.

Sandkvist, Hugo: *See*—
Grune, Per-Olof; Pucher, Walter; and Sandkvist, Hugo, 3,715,542.

Sandner, Michael Ray; and Osborn, Claiborn Lee, to Union Carbide Corporation. Acetophenone-type photosensitizers for radiation curable coatings. 3,715,293, Cl. 204-159.140.

Sansone, Eugene A.: *See*—
Amato, Jack C.; and Sansone, Eugene A., 3,714,972.

Saray, George B., to Ivanhoe Research Corporation. Thread monitoring device. 3,714,916, Cl. 112-218.00r.

Sasmor, Ernest J.: *See*—
Halpern, Alfred; and Sasmor, Ernest J., 3,715,437.

- Sato, Keiichi: *See—*
  - Kobayashi, Akira; Koike, Toshio; and Sato, Keiichi, 3,715,085.
- Sato, Masamichi, to Fuji Photo Film Co., Ltd. Corona charging process and apparatus in electrophotography. 3,715,640, Cl. 317-262.00a.
- Sato, Takashi: *See—*
  - Kubo, Keishi; Sakai, Kiyoshi; Sato, Takashi; and Nakamura, Itaru, 3,715,263.
  - Kubo, Keishi; Sakai, Kiyoshi; and Sato, Takashi, 3,715,267.
- Satoh, Kimio: *See—*
  - Yusa, Yasushi; Akai, Naotoshi; Satoh, Kimio; and Sekizawa, Yasuharu, 3,715,431.
- Sauer, Roland; Katzer, Johannes; and Stephany, Christian, to Messrs., Jupex AG. Pipeline systems. 3,714,962, Cl. 137-371.000.
- Saumsiegle, Robert W.: *See—*
  - MacInnes, John M.; and Saumsiegle, Robert W., 3,714,756.
- Sauter, William D., to Schlumberger Technology Corporation. Well logging methods and apparatus for converting spatial derivatives measurements to time derivative measurements. 3,715,653, Cl. 324-1.000.
- Savage, Joseph W.; and Brands, Henry J., to General Electric Company. Cooled turbine blade. 3,715,170, Cl. 416-97.000.
- Sayles, David C., to United States of America, Army. Propellants derived from crosslinking of polybutadiene elastomers. 3,715,246, Cl. 149-19.000.
- Scarzello, John F., to United States of America, Navy. Crystal magnetometer and gradiometer. 3,715,654, Cl. 324-.50r.
- Schadow, Rudolf H. Push button switch position indicator. 3,715,548, Cl. 200-167.00r.
- Schafer, Richard Arthur, to Deere & Company. Attachments permitting a vehicle tongue to be lifted by actuation of tractor draft links. 3,715,133, Cl. 280-479.00a.
- Schauer, George A.: *See—*
  - Louis, Joseph E.; and Schauer, George A., 3,714,846.
- Scheel, Russell H.: *See—*
  - Polus, Anthony P.; and Scheel, Russell H., 3,715,040.
- Schiess, George, to RCA Corporation. Transistor deflection circuits utilizing a class B, push-pull output stage. 3,715,621, Cl. 315-27.0td.
- Schild, A., S.A.: *See—*
  - Zaugg, Roland; Glanzmann, Werner; and Fluck, Josef, 3,714,774.
- Schildkraut, Sid I.: *See—*
  - Bernstein, Julius; Schildkraut, Sid I.; and Muller, John P., 3,715,710.
- Schiller, Peter: *See—*
  - Schneiders, Albert M.; Schiller, Peter; Hollebeck, Gustave L.; and Diletti, Friedhelm, 3,714,814.
- Schiltz, Jos., Brewing Company: *See—*
  - Pagdin, William G.; and Risley, Robert F., 3,714,759.
- Schlack, Allen F.: *See—*
  - Perkins, William E.; Schlack, Allen F.; and Ciccone, Thomas Q., 3,714,728.
- Schlatter, Rene, to Latrobe Steel Company. Apparatus for electroslag melting. 3,715,201, Cl. 75-10.000.
- Schlinger, Warren G.: *See—*
  - Tassoney, Joseph P.; and Schlinger, Warren G., 3,715,195.
  - Tassoney, Joseph P.; and Schlinger, Warren G., 3,715,301.
- Schlumberger Technology Corporation: *See—*
  - Sauter, William D., 3,715,653.
  - Wilson, Gerald E., 3,714,983.
- Schmelzer, Hans-Georg; Gruber, Hermann; Degener, Eberthart; and Wagner, Kuno, to Farbenfabriken Bayer Aktiengesellschaft. Sealing compositions from polyketimines or polyenamines. 3,715,338, Cl. 260-77.5am.
- Schmid, Hans; Feldhoff, Heinrich; Martin, Wolfgang; Bauer, Wolfgang; and Herion, Dieter, to Badische Anilin- & Soda Fabrik Aktiengesellschaft. Process and apparatus for texturing filaments. 3,714,686, Cl. 28-1.400.
- Schmid, Jakob. Door closing mechanism with fluid brake. 3,714,677, Cl. 16-62.000.
- Schmidt, Gunter, to Production, Inc. Film chip stripper. 3,714,697, Cl. 29-239.000.
- Schmidt, Gunter, to Productron, Inc. Sheet film storage magazine. 3,715,087, Cl. 242-67.30r.
- Schmidt, James H.: *See—*
  - Smith, Cloyd D.; and Schmidt, James H., 3,715,009.
- Schmit, Francis M., to Honeywell Inc. Optical mass memory. 3,715,740, Cl. 340-174.10m.
- Schmitt, Dieter: *See—*
  - Wenz, Adolf; Stein, Alfred; and Schmitt, Dieter, 3,715,192.
- Schneiders, Albert M.; Schiller, Peter; Hollebeck, Gustave L.; and Diletti, Friedhelm, to European Atomic Energy Community (Euratom). Tight viscosimeter working in aggressive media. 3,714,814, Cl. 73-54.000.
- Schoeffler, William N. Self-cleaning storm choke. 3,714,957, Cl. 137-244.000.
- Schoen, Karl; and Pachter, Irwin J., to Endo Laboratories, Inc. Oxoisoindoles. 3,715,354, Cl. 260-247.50b.
- Schoen, Kurt L.: *See—*
  - Rosenbaum, Edward W.; and Schoen, Kurt L., 3,715,217.
- Schon, Erwin: *See—*
  - Hunicke, Wolfgang; Spohr, Rolf; Schranz, Karl-Wilhelm; Busch, Josef; Schon, Erwin; and Frick, Hans-Dieter, 3,714,883.
- Schranz, Karl-Wilhelm: *See—*
  - Hunicke, Wolfgang; Spohr, Rolf; Schranz, Karl-Wilhelm; Busch, Josef; Schon, Erwin; and Frick, Hans-Dieter, 3,714,883.
- Schranz, Karl-Wilhelm; Hunicke, Wolfgang; and Busch, Josef, to Agfa-Gevaert Aktiengesellschaft. Apparatus for developing exposed light-sensitiv sheets. 3,714,882, Cl. 95-89.00r.
- Schroder, Rolf, to Agfa-Gevaert Aktiengesellschaft. Photographic still camera. 3,714,877, Cl. 95-31.0fm.
- Schroeter, Siegfried H., to General Electric Company. Process for producing 3-hydroxyalkyl ethers. 3,715,401, Cl. 260-611.00r.
- Schuh, Theodore R.: *See—*
  - Dembowski, Ronald J.; and Schuh, Theodore R., 3,715,172.
- Schultz, Seiford F.; and Nix, Andrew B., to United States of America, Army. Method for production of composite and modified double base reinforced carpet roll grain. 3,715,414, Cl. 264-3.00r.
- Schulze, Heinz, to Jefferson Chemical Company, Inc. Imidazole synthesis. 3,715,365, Cl. 260-309.000.
- Schumer, Louis. Wig and wiglet carrying case. 3,715,028, Cl. 206-8.000.
- Schunck, Gunter; Speeter, Winfried; and Randow, Albert, to Siemens Aktiengesellschaft. Single-wing light chopper for infrared gas analyzers. 3,715,153, Cl. 350-273.000.
- Schwappach, Dieter: *See—*
  - Kollmann, Wolfgang; and Schwappach, Dieter, 3,715,039.
- Schwartz, Daniel Ernest: *See—*
  - Rey-Bellet, Gerald; Schwartz, Daniel Ernest; and Reiner, Roland, 3,715,357.
- Schwarz, Gunter. Device for catching a runaway ski. 3,715,126, Cl. 280-11.13b.
- Schweitzer, E. O., Manufacturing Co., Inc.: *See—*
  - Schweitzer, Edmund O., Jr., 3,715,742.
- Schweitzer, Edmund O., Jr., to Schweitzer, E. O., Manufacturing Co., Inc. Alternating current fault indicating means. 3,715,742, Cl. 340-253.00a.
- Science Accessories Corporation: *See—*
  - Whetstone, Albert; Fine, Samuel; and Phillips, Stanley, 3,714,689.
- Scoggins, Cecil W.: *See—*
  - Todd, Donald L.; and Scoggins, Cecil W., 3,715,062.
- Searle, G. D. & Co.: *See—*
  - Sollman, Paul B., 3,715,349.
- Searle Medidator Inc.: *See—*
  - Worthington, Harvey R., Jr., 3,715,157.
- Sears, Bobby Joe; and Brown, Wade E., to FMC Corporation. Brush back roller. 3,714,948, Cl. 130-5.00r.
- Seaton, William Joe, to Emdeko International, Inc. Vehicle pendulum alarm switch. 3,715,533, Cl. 200-61.520.
- Seats, Peter: *See—*
  - Paley, Alfred I.; Newman, Leonard; Seats, Peter; and Waxenbaum, Bernard M., 3,715,618.
- Seavoy, Gordon E.: *See—*
  - Rushton, William E.; Seavoy, Gordon E.; and Morey, Woodruff A., 3,715,191.
- Sedriter Corporation: *See—*
  - Drekter, Isaac J.; Bradley, Frank R.; Matthew, Morton P.; and Delaney, Paul, 3,715,761.
- Seekay Chemical Co., Inc.: *See—*
  - Rainer, Norman B., 3,715,339.
- Seiden, Steven Arnold. Infant head support. 3,715,140, Cl. 294-25.000.
- Sekisui Kagoku Kogyo Kabushiki Kaisha: *See—*
  - Kiyono, Hiroshi; Nakashima, Unichi; Fujisaki, Yasuyuki; Ishigaki, Yukio; and Endo, Gen, 3,715,420.
- Sekizawa, Yasuharu: *See—*
  - Yusa, Yasushi; Akai, Naotoshi; Satoh, Kimio; and Sekizawa, Yasuharu, 3,715,431.
- Selke, Lynn A.: *See—*
  - Kostusiak, Karl H.; and Selke, Lynn A., 3,715,090.
- Selman, Howard L.: *See—*
  - Miska, Aivars; and Selman, Howard L., 3,714,950.
- Sendelweck, Gene Karl, to RCA Corporation. High voltage hold-down circuit. 3,715,464, Cl. 178-5.40r.
- Sender, Friedhelm K., to Prakla Gesellschaft fur Praktische Lagerstattenforschung GmbH. Methods and apparatus for precise positioning of locations. 3,715,758, Cl. 343-112.00r.
- Sensors, Inc.: *See—*
  - Risgin, Ojars, 3,715,288.
- Service, Anthony Peter: *See—*
  - Watkinson, Leonard J.; and Service, Anthony Peter, 3,715,210.
- Sessler, Gerhard Martin; and West, James Edward, to Bell Telephone Laboratories Incorporated. Unidirectional microphones. 3,715,500, Cl. 179-1.0dm.
- Setterblade, Earl O., to Avco Corporation. Marine propulsion unit. 3,714,920, Cl. 115-18.00r.
- Seymour, Shaun A.: *See—*
  - Halls, Lawrence M.; and Seymour, Shaun A., 3,715,002.
- SFB Spezial-Filterbau M. Ofner K.G.: *See—*
  - Ofner, Max, 3,714,926.
- Shaffer, William E., to Stromberg-Carlson Corporation. Telephone pulsing circuit. 3,715,511, Cl. 179-16.00e.
- Shaheen, Joseph M.; and Simone, John, to North American Rockwell Corporation. Method of making interstitial conductors between plated memory wires. 3,714,707, Cl. 29-604.000.
- Sharp, Marcus: *See—*
  - Altman, Leonard F.; and Sharp, Marcus, 3,715,250.
- Shaw & Slavsky, Inc.: *See—*
  - Slavsky, Robert J., 3,714,724.

- Shawcroft, John B. Apparatus for handling baled hay. 3,715,045, Cl. 214-655.000.
- Sheldahl, David B.: *See—*
  - Teeter, Ford C.; Sheldahl, David B.; and Highberg, Carle W., 3,715,312.
- Shell Oil Company: *See—*
  - Daigle, Edwin E.; Luke, Robert R.; Turner, James B.; and Wise, Harold L. (, 3,714,811.
  - Drinkwater, John W.; and Evans, Albert, 3,714,812.
- Shelley, George R.; Shelley, Robert J., Jr.; Dixon, Arthur B.; and House, Bruce. Automatic ice dispenser. 3,715,119, Cl. 222-241.000.
- Shelley, Robert J., Jr.: *See—*
  - Shelley, George R.; Shelley, Robert J., Jr.; Dixon, Arthur B.; and House, Bruce, 3,715,119.
- Shellhause, Ronald L., to General Motors Corporation. Vehicle brake control module and mounting means. 3,714,780, Cl. 60-54.60r.
- Shen, Tsung-Ying: *See—*
  - Witzel, Bruce E.; Dorn, Conrad P., Jr.; and Shen, Tsung-Ying, 3,715,358.
- Shen, Tsung-Ying; Ruyle, William V.; Fordice, Michael W.; and Jensen, Norman P., to Merck & Co., Inc. Diphenyl sulfones. 3,715,375, Cl. 260-397.600.
- Shendure, Ashok S., to Crawford Fitting Company. Valved quick-disconnect coupling. 3,715,099, Cl. 251-149.100.
- Sherr, Allan Ellis, to American Cyanamid Company. Aminium and diimonium salts used as polymerization inhibitors of acrylates and carbonates. 3,715,386, Cl. 260-486.00r.
- Sherwood Medical Industries Inc.: *See—*
  - Weichselbaum, Theodore E.; and Wilhelmson, Jack L., 3,715,570.
- Shiba Electric Co., Ltd.: *See—*
  - Karato, Yoshiteru, 3,715,466.
- Shibata, Akira, to Chugai Denkikogyo Kabushiki Kaisha. Cold welding machine. 3,715,070, Cl. 228-44.000.
- Shiman, Paul J.: *See—*
  - Quasius, Alan R.; and Shiman, Paul J., 3,715,428.
- Shinetsu Chemical Company: *See—*
  - Sado, Ryoichi, 3,715,047.
- Shionogi & Co., Ltd.: *See—*
  - Hamashima, Yoshio, 3,715,350.
- Shionoya, Gosaburo: *See—*
  - Suzuki, Hiroyuki; Shionoya, Gosaburo; Suzuki, Yoshihisa; and Hirahara, Tsuneo, 3,715,279.
- Shook, Kenneth: *See—*
  - Price, James F.; and Shook, Kenneth, 3,714,944.
- Shoults, Royland D., to United States of America, Army, mesne. 2,2,4,4-Tetrakis (difluoroamino) pentane process. 3,715,399, Cl. 260-583.0nh.
- Shriver, Charles S., to Orbit Manufacturing Company. Clean-operating baseboard heater. 3,714,982, Cl. 165-55.000.
- Shroff, James R.: *See—*
  - Bandurco, Victor; Elpern, Bill; and Shroff, James R., 3,715,396.
- Shuler, Bernard R.: *See—*
  - Wood, Walter B.; Shuler, Bernard R.; Bromm, Charles A.; and Welch, Wilson A., 3,715,578.
- Sianesi, Dario; Pasetti, Adolfo; and Belardinelli, Giorgio, to Montecatini Edison S.p.A. Fluorinated peroxy polyether copolymers and method for preparing them from tetrafluoroethylene. 3,715,378, Cl. 260-463.000.
- Siciliano, George R., to General Electric Company. Preparation of organosilicone esters. 3,715,377, Cl. 260-448.20e.
- Siemens Aktiengesellschaft: *See—*
  - Schunck, Gunter; Speeter, Winfried; and Randow, Albert, 3,715,153.
- Sigma Instruments, Inc.: *See—*
  - Posey, Alfred Henry; and Quick, Harry Clifford, Jr., 3,715,661.
- Silberg, Paul A.; and Lewis, John R., to Harnessed Energies, Inc. Fluid level monitoring system. 3,715,539, Cl. 200-84.00c.
- Simoncioni, Otello M. Roller paint applicator. 3,714,674, Cl. 15-230.110.
- Simone, John: *See—*
  - Shaheen, Joseph M.; and Simone, John, 3,714,707.
- Simonelli, Carl L., to Central Vac International, Inc. Wall-mounted vacuum cleaner. 3,714,765, Cl. 55-472.000.
- Simons, Gary A. Roof mounted carrier for automotive vehicles. 3,715,044, Cl. 214-450.000.
- Simplex Time Recorder Company: *See—*
  - Denton, Howard P., 3,715,743.
- Sims, Willard M.: *See—*
  - Finestone, Arnold B.; and Sims, Willard M., 3,715,340.
- Sindall, John Henry, to Imperial Metal Industries (Kynoch) Limited. Gas pressure actuators. 3,714,863, Cl. 89-1.000.
- Singer Company, The: *See—*
  - Amato, Jack C.; and Sansone, Eugene A., 3,714,972.
  - Weisz, William; and Herron, William L., 3,714,678.
- Singer Company, The, mesne: *See—*
  - Walter, Heinz E., 3,715,642.
- Singleback, George W.: *See—*
  - Brush, R. John H.; and Singleback, George W., 3,715,479.
- SKB Arms Company: *See—*
  - Iino, Hideo, 3,714,727.
- Slagel, Robert C.; and Culbertson, Billy M., to Ashland Oil, Inc. Polymers of vinyl aminimides. 3,715,343, Cl. 260-88.1pn.
- Slavsky, Robert J., to Shaw & Slavsky, Inc. Display marker clip. 3,714,724, Cl. 40-11.000.
- Sletzinger, Meyer: *See—*
  - Karady, Sandor; Pines, Seemon H.; Ly, Manuel G.; and Sletzinger, Meyer, 3,715,382.
- Sliwkowski, Joseph J.: *See—*
  - Leighty, Clifford A.; Sliwkowski, Joseph J.; and Sullivan, Bernard J., 3,715,166.
- Sloan, Donald A., to Bahnson Company, The. Automatic control system for traveling cleaners. 3,714,676, Cl. 15-312.00r.
- Sloan Valve Company: *See—*
  - Billeter, Henry R., 3,714,968.
- Smith, A. O., Corporation: *See—*
  - Wasson, Loerwood C., 3,715,566.
- Smith, Bart A.: *See—*
  - Venier, Dominic A.; Smith, Bart A.; and Lass, James L., 3,715,274.
- Smith, Cloyd D.; and Schmidt, James H., to General Acoustics Corporation. Jet engine noise suppression system. 3,715,009, Cl. 181-33.0hc.
- Smith, Francis Hughes, to Vickers Limited. Investigating the topgraphy of reflecting surfaces. 3,715,165, Cl. 356-120.000.
- Smith, James G., to Borg-Warner Corporation. Automotive transmission. 3,714,849, Cl. 74-869.000.
- Smith, Lowell E.: *See—*
  - Hurley, Eldon K.; Maule, Robert S.; Musso, Rocco C.; and Smith, Lowell E., 3,715,131.
- Smith, Milton R., to Lilly, Eli, and Company. Glucagon separation process. 3,715,345, Cl. 260-112.500.
- Smith, Roy: *See—*
  - Lyth, William; and Smith, Roy, 3,715,013.
- Smith, Stanley L.; Choate, William C.; and Masten, Michael K., to Texas Instruments, Incorporated. Multi-criteria search procedure for trainable processors. 3,715,730, Cl. 340-172.500.
- Sobek, Felix. Shaft lime kiln. 3,715,111, Cl. 432-4.000.
- Societe Anonyme Automobiles: *See—*
  - Grosseau, Albert, 3,714,841.
- Societe d'Assistance Technique pour Produits Nestle S.A.: *See—*
  - Wuhrmann, Jean-Jacques; and Cristofaro, Elvira, 3,715,216.
- Societe de la Viscose Suisse: *See—*
  - Martin, Horst G.; Glutz, Bernhard; and Linz, Hans, 3,715,421.
- Societe Europeenne de Semiconducteurs et de Miroelectronique: *See—*
  - Poirier, Raymond, 3,715,637.
- Societe Genevoise d'Instruments de Physique: *See—*
  - Viret, Robert; and Pettavel, Jacques, 3,715,645.
- Societe Industrielle de Brevets et d'Etudes S.I.B.E.: *See—*
  - Mennesson, Francois, 3,714,934.
- Societe Industrielle Honeywell Bull (Societe Anonyme): *See—*
  - Rousseau, Hubert Cecyl Albert; and Prieur, Lucien Robert, 3,715,523.
- Societe Nationale des Petroles d'Aquitaine: *See—*
  - Lutz, Jean, 3,714,822.
  - Quichaud, Claude; Le Peuvedic, Jean-Pierre; and Tinchon, Jacques, 3,714,831.
- Soldano, Benadetto A., to United States of America, Atomic Energy Commission. Reactor safety spray solution base-borate. 3,715,316, Cl. 252-188.000.
- Sole, Jean: *See—*
  - Croso, Hubert; Prost, Gerard; Quefellec, Andre; and Sole, Jean, 3,715,703.
- Solender, Peter E., to GTE Sylvania Incorporated. Non-linear voltage generating apparatus. 3,715,687, Cl. 331-179.000.
- Solis S.r.L.: *See—*
  - Mazzi, Aramis, 3,714,800.
- Sollman, Paul B., to Searle, G. D. & Co. 17-Hydroxy-7 (-Hydroxy-7 alpha-mercapto-3-oxo-17alpha-pregn-4- ene-21-carboxylic acid gamma-lactone. 3,715,349, Cl. 260-239.570.
- Solvang, Paul O., to National Water-Blast Inc. Pressure relief valve. 3,714,953, Cl. 137-14.000.
- Someya, Akira; and Kohmoto, Kohtaro, to Tokyo Shibaura Electric Co., Ltd. Low pressure mercury vapour discharge lamp radiating germicidal and erythemal rays in ratio of less than 1.5. 3,715,612, Cl. 313-109.000.
- Sonnabend, Nancy L. Children's game apparatus. 3,714,722, Cl. 35-8.000.
- Sony Corporation: *See—*
  - Ito, Takamasa; and Makino, Tsutomu, 3,715,744.
  - Okada, Takashi, 3,715,490.
  - Takise, Tadashi; and Okada, Takashi, 3,715,488.
  - Tamaru, Hideshi; and Ishigaki, Yoshio, 3,715,469.
  - Tsuchiya, Noriyuki; Amari, Katsutoshi; Moriya, Takao; and Takahashi, Shideko, 3,715,285.
- Soriente, Alfonse J., to Ecodyne Corporation. Filter cartridge. 3,715,033, Cl. 210-193.000.
- Sost, Rolf: *See—*
  - Prause, Dieter; and Sost, Rolf, 3,715,475.
- Spaulding, David Adams: *See—*
  - Hirsch, Donald; and Spaulding, David Adams, 3,715,670.
  - Mueller, Kurt Hugo; and Spaulding, David Adams, 3,715,666.
- Spaunburgh, Richard G.; and Hino, John B., to Allied Chemical Corporation. Polyisocyanate compositions stabilized against discoloration. 3,715,381, Cl. 260-453.00p.
- Special Devices, Inc.: *See—*
  - Filippi, Ernest A., 3,714,899.
- Spectral Data Corporation: *See—*
  - Yost, Edward F., Jr., 3,714,875.

- Speeter, Winfried: *See—*
  - Schunck, Gunter; Speeter, Winfried; and Randow, Albert, 3,715,153.
- Speicher, Charles A.: *See—*
  - Magill, Peter J.; McCurry, Robert E.; and Speicher, Charles A., 3,715,762.
- Spencer, Calvin D., to Rax Corporation. Support rack for camper bodies. 3,715,100, Cl. 254-49.000.
- Sperry Rand Corporation: *See—*
  - Bohman, Carl E., 3,715,577.
  - Braddon, Frederick D., 3,715,571.
  - Daniels, John F.; and Pires, Antonio, 3,714,710.
  - Daniels, John F., 3,714,711.
  - Dendy, Joe B.; Thomson, Kenneth; and Morrison, Robert F., 3,715,562.
  - Elfe, Thomas B., Jr., 3,715,616.
  - Grundy, Gary L., 3,715,737.
  - Halls, Lawrence M.; and Seymour, Shaun A., 3,715,002.
  - Miska, Aivars; and Selman, Howard L., 3,714,950.
  - Nicolson, Alexander M., 3,715,667.
  - Tilton, Homer B.; and Blanchard, Jack W., 3,715,617.
- Spier, Daniel J.: *See—*
  - Birnbaum, Burton H.; and Spier, Daniel J., 3,715,510.
- Spohr, Rolf: *See—*
  - Hunicke, Wolfgang; Spohr, Rolf; Schranz, Karl-Wilhelm; Busch, Josef; Schon, Erwin; and Frick, Hans-Dieter, 3,714,883.
- Spotts, J. Willard, to McGraw-Edison Company. Camp stove. 3,714,938, Cl. 126-38.000.
- Sprecher & Schuh AG: *See—*
  - Morva, Tibor, 3,715,532.
- Spry, Douglas O.; and Wright, Ian G., to Lilly, Eli, and Company. Process for acetylation. 3,715,347, Cl. 260-239.100.
- Spurway's Industries Pty. Limited: *See—*
  - Boyd, Clive Reginald, 3,714,810.
- Spuv, Valentin Georgievich: *See—*
  - Travin, Lev Viktorovich; and Spuv, Valentin Georgievich, 3,715,606.
- Squibb, E. R., & Sons, Inc.: *See—*
  - Krapcho, John, 3,715,353.
- S.S.S. Patents Limited: *See—*
  - Heybourne, Robert Howard; and Clements, Herbert Arthur, 3,715,019.
- Standard Car Truck Company: *See—*
  - Barber, Franklin D., 3,714,905.
- Standard Oil Company: *See—*
  - Brannen, William T., 3,715,311.
  - Wennerberg, Arnold N.; and Frazier, Alvin W., 3,715,303.
- Standard Oil Company (Indiana): *See—*
  - Harrier, Jack L., 3,715,233.
- Stanford Research Institute: *See—*
  - Bahr, Alfred J., 3,715,674.
- Stanley Electric Co., Ltd.: *See—*
  - Aizawa, Masanobu; and Mori, Kijuu, 3,714,691.
- Stanley, Vayden F., to Vicra Sterile, Inc. Digit manipulable quick release cannula insertion device. 3,714,945, Cl. 128-214.400.
- Stapfer, Christian H.; and D'Andrea, Richard W., to Carlisle Chemical Works, Inc. Cobalt II halide hydrazine complexes. 3,715,328, Cl. 260-22.0ca.
- Stapleford, Gary N.: *See—*
  - Wallin, Gary P.; and Stapleford, Gary N., 3,715,726.
- Star Sprinkler Corporation: *See—*
  - Gloeckler, Fred A., 3,714,989.
- Star Sprinkler Corporation of Florida: *See—*
  - Gloeckler, Fred A., 3,715,700.
- Stark, Robert E.: *See—*
  - Walker, Douglas W.; Gilman, Leland M; and Stark, Robert E., 3,715,239.
- Stauffer Chemical Company: *See—*
  - Cope, Richard P., Jr., 3,715,289.
- Steckler, Steven Alan, to RCA Corporation. Dual mode automatic frequency controlled oscillator system. 3,715,499, Cl. 178-69.5rv.
- Stefanucci, Arthur: *See—*
  - Balling, Theodore Thomas; Leonard, Richard J.; Ponzoni, George Bernard; Protomastro, Michael Gabriel; and Stefanucci, Arthur, 3,715,215.
- Stein, Alfred: *See—*
  - Wenz, Adolf; Stein, Alfred; and Schmitt, Dieter, 3,715,192.
- Stein, Alfred H.: *See—*
  - Sulfaro, Andrew N.; and Stein, Alfred H., 3,715,308.
- Stein, Wolfgang J.; Ainsworth, Richard; and Berkner, Horst D., to Avco Corporation. Gas turbine engine having a horizontal accessory gear box. 3,714,779, Cl. 60-39.310.
- Steinhardt, Frank J. Gear desurring device. 3,714,740, Cl. 51-33.000.
- Stempel, Arthur; and Westley, John, to Hoffmann-La Roche, Inc. Derivatives of antibiotic X-537A. 3,715,372, Cl. 260-345.800.
- Stephany, Christian: *See—*
  - Sauer, Roland; Katzer, Johannes; and Stephany, Christian, 3,714,962.
- Sterling Drug Inc.: *See—*
  - Pradt, Louis A., 3,714,911.
- Stern, Lionel: *See—*
  - Henshaw, David Ernest; Knothe, Werner Emil Otto; and Stern, Lionel, 3,714,771.
- Stevens, Clifford A., to Texaco Inc. Cleaning aluminum heat exchange surfaces. 3,714,979, Cl. 165-1.000.
- Stevens, Howard A., 1/2 to Stevens, Stanley H. Spin off wheel for crocheting. 3,715,089, Cl. 242-129.500.
- Stevens, J. P., & Co., Inc.: *See—*
  - Yarber, Harold Dean, 3,714,685.
- Stevens, Stanley H.: *See—*
  - Stevens, Howard A., 3,715,089.
- Stewart, Edwin E.: *See—*
  - Harned, John L.; and Stewart, Edwin E., 3,715,145.
- Stewart, John Kenneth, to Canron, Inc. Tie tamper. 3,714,901, Cl. 104-12.000.
- Stewart-Warner Corporation: *See—*
  - Zupan, Frank M.; and Zurek, Jerome N., 3,714,967.
- Sticker, Robert E.: *See—*
  - Harnish, Wayne N.; Sticker, Robert E.; and Carls, Glen A., 3,715,435.
- Stiegemeier, Jean R. Progressive display screen. 3,715,716, Cl. 340-23.000.
- Still, Michael: *See—*
  - Baum, Walter; and Still, Michael, 3,715,673.
- Stirling, Harold James; Williams, Roger Morley; Hampson, Peter Samuel; and Price, James Kenneth, to Plessey Handel und Investments A.G. Shift-register re-entry scanner with confirmation scan for detected disparity. 3,715,515, Cl. 179-18.0ff.
- Stone, Morris Denor, to Wean United, Inc. Control system and method for concurrent automatic gage and crown control of a rolling mill. 3,714,805, Cl. 72-8.000.
- Stork, Edward S.: *See—*
  - Jackson, Dean B.; Stork, Edward S.; and Flory, Darrell L., 3,715,023.
- Stott, Ronald A., to General Electric Company. Non-rectifying composite contact for semiconductor devices. 3,715,234, Cl. 117-217.000.
- Strangfeld, Reiner, to August Herzog Maschinenfabrik. Apparatus for reversing the bobbins in a braiding machine. 3,714,861, Cl. 87-51.000.
- Strelzoff, Samuel. Catalyst support. 3,715,193, Cl. 23-288.00r.
- Strickler, Melvin D.; and Pellerin, Roy F., to Washington State University Research Foundation. Combined tensile E measurement and proof loading of lumber. 3,714,820, Cl. 73-89.000.
- Stromberg-Carlson Corporation: *See—*
  - Jungbluth, Ernest J.; Kavanaugh, Paul K.; and Gardner, Frederick H., 3,715,503.
  - Shaffer, William E., 3,715,511.
- Strycker, Stanley J.: *See—*
  - White, Halbert C.; Strycker, Stanley J.; and Wysong, Don V., 3,715,367.
- Stubiger, Ernst: *See—*
  - Frohlich, Alfons; Cappel, Marie-Luise; and Stubiger, Ernst, 3,714,683.
- Stuertz, William D.; and Martorano, Sam, to Swingline Inc. Punch. 3,714,857, Cl. 83-468.000.
- Sub-Marine Systems, Incorporated: *See—*
  - Fischel, Halbert; Dichiro, Anthony; and Cowans, Kenneth W., 3,714,942.
- Sugar Chemical Co., Etablissement: *See—*
  - Moebes, Erich; and Hitzel, Hans, 3,715,235.
- Sugaya, Inawo: *See—*
  - Hiruma, Kenji; and Sugaya, Inawo, 3,715,564.
- Sugihara, Yasuhiro: *See—*
  - Nakabe, Ryuhei; Fujisawa, Seiji; Sugihara, Yasuhiro; and Meki, Nori, 3,715,471.
- Sugiyama, Uichiro. Tire pressure indication system. 3,715,719, Cl. 340-58.000.
- Sukup, Eugene G. Control system for grain drying bin. 3,714,718, Cl. 34-56.000.
- Sulfaro, Andrew N.; and Stein, Alfred H., to Oxy Metal Finishing Corporation. Apparatus and process for treating toxic waste materials. 3,715,308, Cl. 210-60.000.
- Sullivan, Bernard J.: *See—*
  - Leighty, Clifford A.; Sliwkowski, Joseph J.; and Sullivan, Bernard J., 3,715,166.
- Sullivan, Hugh R.; and Billings, Ruth E., to Lilly, Eli, and Company. Hydroxylated acronycine. 3,715,359, Cl. 260-279.00r.
- Sulzer Brothers Ltd.: *See—*
  - Florjancic, Dusan, 3,715,271.
- Sun Oil Company: *See—*
  - Bushick, Ronald D., 3,715,406.
  - Mills, Ivor W.; and Melchiore, John J., 3,715,302.
- Sun Oil Company of Pennsylvania, mesne: *See—*
  - Haseltine, Marcus W., Jr.; and Driscoll, Gary L., 3,715,313.
- Sunbeam Corporation: *See—*
  - Duve, John P., 3,715,544.
- Sundstrand Corporation: *See—*
  - Louis, Joseph E.; and Schauer, George A., 3,714,846.
- Sundstrand Data Control, Inc.: *See—*
  - Astengo, Ralph A., 3,715,718.
- Supernaw, Dwight L., to United States of America, Navy. Apparatus for steering a torpedo. 3,714,917, Cl. 114-20.000.
- Susquehanna Corporation, The: *See—*
  - Huggett, Clayton M., 3,715,438.
  - Olcott, Eugene L., 3,715,253.
- Susuki, Rinnosuke; Hoshi, Hiroshi; Araki, Shinichi; and Miyamoto, Shinzo, to Raion Yushi Kabushiki Kaisha. Cap structure holding an inner closure. 3,715,063, Cl. 222-545.000.

- Suter, Henry, to United States of America, Navy. Sonic detection apparatus. 3,715,672, Cl. 328-150.000.
- Suzuki, Hiroyuki; Shionoya, Gosaburo; Suzuki, Yoshihisa; and Hirahara, Tsuneo, to Ajinomoto Co., Inc. Recovery of protease values from fermentation broths. 3,715,279, Cl. 195-68.000.
- Suzuki, Kenichiro. Dehumidifying device for an air brake. 3,714,763, Cl. 55-163.000.
- Suzuki, Takatoshi: *See—*
  - Komatsu, Noboru; Suzuki, Takatoshi; and Ito, Takuo, 3,715,206.
- Suzuki, Yoshihisa: *See—*
  - Suzuki, Hiroyuki; Shionoya, Gosaburo; Suzuki, Yoshihisa; and Hirahara, Tsuneo, 3,715,279.
- Swartz, George A. Simulated ball game apparatus. 3,715,124, Cl. 273-93.00r.
- Swartz, Horace M.: *See—*
  - Rosenberger, Chester A., Jr.; and Swartz, Horace M., 3,714,903.
- Swengel, Robert Charles, Sr., to AMP Incorporated. Wiring device for interconnecting module circuit units. 3,715,629, Cl. 317-101.00r.
- Swingline Inc.: *See—*
  - Stuertz, William D.; and Martorano, Sam, 3,714,857.
- Swotinsky, Jacob M.; Newman, Stephen; and Colitti, Olindo A., to United States of America, Army. Castable metallic illuminant fuel containing nitrocellulose plasticized binder. 3,715,248, Cl. 149-39.000.
- Szabo, John, to Electrohome Limited. Network for varying current through a load. 3,715,623, Cl. 315-194.000.
- Szupillo, Raymond E., to Corning Glass Works. Chromium film microcircuit mask. 3,715,244, Cl. 148-31.500.
- Tait, William C.: *See—*
  - Campbell, Donald A.; Packard, James R.; Tait, William C.; and Weiher, Richard L., 3,715,162.
- Takada, Yoshinori: *See—*
  - Tsuchiya, Seiji; Yabuki, Minoru; and Takada, Yoshinori, 3,714,769.
- Takahashi, Shideko: *See—*
  - Tsuchiya, Noriyuki; Amari, Katsutoshi; Moriya, Takao; and Takahashi, Shideko, 3,715,285.
- Takamatu, Shigeyuki: *See—*
  - Tsunoda, Yorio; and Takamatu, Shigeyuki, 3,714,826.
- Takasaki, Yoshiyuki; and Kamibayashi, Akira, to Industrial Science & Technology, Agency of. Enzymatic method for manufacture of fructose from glucose. 3,715,276, Cl. 195-31.00f.
- Takeda, Sadao: *See—*
  - Umezu, Shiro; Takeda, Sadao; Mitsudome, Kaoru; and Hashimura, Tetsuo, 3,715,552.
  - Umezu, Shiro; Takeda, Sadao; Mitsudome, Kaoru; and Hashimura, Tetsuo, 3,715,554.
- Takezaki, Tsuneo; and Miki, Sukeichi, to Matsushita Electric Industrial Co., Ltd. Signal seeking type auto-tuning television receiver. 3,715,495, Cl. 178-5.80a.
- Takise, Tadashi; and Okada, Takashi, to Sony Corporation. Noise cancellation circuit. 3,715,488, Cl. 178-7.30s.
- Takishima, Yoshiyuki: *See—*
  - Mashimo, Yukio; Mizui, Seiichiro; and Takishima, Yoshiyuki, 3,714,872.
- Tallent, Othar K.: *See—*
  - Lloyd, Milton H.; Tallent, Othar K.; and Leuze, Rex E., 3,715,317.
- Tamaru, Hideshi; and Ishigaki, Yoshio, to Sony Corporation. Color televeision receiver. 3,715,469, Cl. 178-5.40p.
- Tan, Sing Liong, to U.S. Philips Corporation. Field-sequential colour television camera including a colour filter and one camera tube. 3,715,473, Cl. 178-5.4st.
- Tanguy, Pierre; Carre, Pierre; and Le Boulbouech, Jean. Machine for cooking eggs and minced meats. 3,714,888, Cl. 99-355.000.
- Tani, Norihiro: *See—*
  - Ohoshima, Nobumasa; Himeno, Kinya; and Tani, Norihiro, 3,715,589.
- Tapeswitch Corporation of America: *See—*
  - Koenig, Robert H., 3,715,541.
- Tappan Company, The, mesne: *See—*
  - Fowell, Andrew J.; and Knebusch, George R. (said Fowell assor. to), 3,714,795.
- Tartakoff, Alexander: *See—*
  - Audesse, Emery G.; Tartakoff, Alexander; and Robertson, John K., 3,715,232.
- Tary, Orville L.: *See—*
  - Wheat, Lawrence C.; and Tary, Orville L., 3,715,198.
- Tassoney, Joseph P.; and Schlinger, Warren G. Multi-hydrotorting of coal. 3,715,195, Cl. 48-197.00r.
- Tassoney, Joseph P.; and Schlinger, Warren G., to Texaco Inc. Multi-hydrotorting of coal. 3,715,301, Cl. 208-8.000.
- Taylor, Richard P., to Mead Corporation, The. Multiple jet channel. 3,714,928, Cl. 118-624.000.
- Teagno, Wladimiro; and Campari, Luigi, to AMP Incorporated, mesne. Two piece flat cable connector. 3,715,457, Cl. 174-88.00r.
- Tech-Art, Inc.: *See—*
  - Lloyd, Allen H., 3,715,529.
- Technicon Instruments Corporation: *See—*
  - Mitchell, Douglas, 3,715,163.
- Teeple, Gifford H., Jr.; and Welsh, James W. High capacity portable water purifier. 3,715,035, Cl. 210-249.000.
- Teeter, Ford C.; Sheldahl, David B.; and Highberg, Carle W., to Atlantic Richfield Company. Product. 3,715,312, Cl. 252-49.500.
- Tektronix, Inc.: *See—*
  - Hallen, Thor Oscar, 3,715,609.
- Teledyne, Inc.: *See—*
  - Mc Taggart, James E., 3,715,472.
  - Van Vonderen, Jacobus, 3,715,091.
- Telefonaktiebolaget L M Ericsson: *See—*
  - Sandberg, Curt Ove Bille, 3,715,517.
- Telemation Inc.: *See—*
  - Craig, Philip V. C., 3,715,470.
- Teletype Corporation: *See—*
  - Glorioso, Charles A., 3,715,608.
  - Kurz, Philip F.; and Nash, Leonard A., 3,715,219.
  - Nordin, Robert W., 3,715,020.
- Temme, Helmut, to Gewerkschaft Eisenhutte Westfalia. Scraper chain conveyors and scraper elements. 3,715,025, Cl. 198-171.000.
- Terkelsen, Bruce E., to United Aircraft Corporation. Method and apparatus for the production of directionally solidified castings. 3,714,977, Cl. 164-60.000.
- Texaco Inc.: *See—*
  - Dowling, Donald J.; and Atwood, George R., 3,715,655.
  - Mott, George E., 3,714,788.
  - Stevens, Clifford A., 3,714,979.
  - Tassoney, Joseph P.; and Schlinger, Warren G., 3,715,301.
- Texas Instrument, Incorporated: *See—*
  - Cooper, Erwin E.; and Kennedy, Howard V., 3,715,497.
- Texas Instruments, Incorporated: *See—*
  - Kelly, Gilbert H.; and Coburn, Herbert D., 3,715,007.
  - Smith, Stanley L.; Choate, William C.; and Masten, Michael K., 3,715,730.
- Textron Inc.: *See—*
  - Casto, John P., 3,715,455.
  - O'Connor, Robert F., 3,715,069.
- Them, Edward G., to Therm-O-Disc, Incorporated. Thermal fuse. 3,715,697, Cl. 337-157.000.
- Therm-O-Disc, Incorporated: *See—*
  - Them, Edward G., 3,715,697.
- Thiele, Kurt: *See—*
  - Posselt, Klaus; and Thiele, Kurt, 3,715,369.
- Thierry, Robert J., to United States of America, Army. Muzzle attachment for reducing the recoil and blast effect of guns. 3,714,864, Cl. 89-14.00c.
- Thiokol Chemical Corporation: *See—*
  - Berry, Walter L., Jr.; Nisonger, Dan P.; and Craig, Preston S., 3,715,379.
- Thomas & Betts Corporation: *See—*
  - Kuo, Lai Che, 3,715,705.
  - Martin, Harold W., 3,715,450.
- Thomas, David Kenneth: *See—*
  - Day, John; and Thomas, David Kenneth, 3,715,411.
- Thomas, Edward W.; and Rapkin, Edward, to Intertechnique S.A. Liquid scintillation spectrometry system for sample analysis. 3,715,586, Cl. 250-71.50r.
- Thomas Electronics, Inc.: *See—*
  - Paley, Alfred I.; Newman, Leonard; Seats, Peter; and Waxenbaum, Bernard M., 3,715,618.
- Thompson, Charles L., to United Aircraft Corporation. Blow-in-door actuation for after burner nozzle. 3,715,079, Cl. 239-265.170.
- Thompson, William B.: *See—*
  - Pasek, James E.; Rehfeld, Frederick L. J.; and Thompson, William B., 3,715,004.
- Thomson, Ian David Mac Knight: *See—*
  - Westbrook, Aubrey Joseph; and Thomson, Ian David Mac Knight, 3,715,179.
- Thomson, J. Brent, to Hercules Incorporated. Adhesion promoting agents. 3,715,371, Cl. 260-349.000.
- Thomson, Kenneth: *See—*
  - Dendy, Joe B.; Thomson, Kenneth; and Morrison, Robert F., 3,715,562.
- Thomson-CSF: *See—*
  - Marcy, Raymond, 3,715,599.
  - Vergnolle, Claude, 3,715,677.
- Thorn Electrical Industries Limited: *See—*
  - Page, Robert Brian; and Cartwright, Thomas William, 3,715,622.
- Thorne, Robert L.: *See—*
  - Kleist, Robert A.; and Thorne, Robert L., 3,715,738.
- Thorsby, Claude A.; and White, Robert L., to General Motors Corporation. Shock absorbing bumper. 3,715,114, Cl. 267-140.000.
- Tiers, George Van Dyke: *See—*
  - Allen, Michael George; and Tiers, George Van Dyke, 3,715,337.
- Tillessen, Ulrich: *See—*
  - Pirk, Hans; and Tillessen, Ulrich, 3,714,978.
- Tilley, Charles L. Educational and amusement devices. 3,714,721, Cl. 35-9.00r.
- Tilton, Homer B.; and Blanchard, Jack W., to Sperry Rand Corporation. Optical probe for cathode ray tubes. 3,715,617, Cl. 315-10.000.
- Timex Corporation: *See—*
  - Diersbock, Gunther Rudolph, 3,714,773.
- Tinchon, Jacques: *See—*
  - Quichaud, Claude; Le Peuvedic, Jean-Pierre; and Tinchon, Jacques, 3,714,831.
- TLC Corporation: *See—*
  - Tocci, Paul M., 3,715,295.
- Tobin, John J., Jr.: *See—*
  - Nighohossian, Sarkie; and Tobin, John J., Jr., 3,715,189.
- Tobin, Julian Jacob: *See—*

  - Amon, Robert, 3,715,429.
- Tocci, Paul M., to TLC Corporation. Disposable electrophoresis unit. 3,715,295, Cl. 204-180.00g.
- Todd, Donald L.; and Scoggins, Cecil W. Method and apparatus for dispensing material. 3,715,062, Cl. 222-340.000.
- Todd, Eugene M.: *See—*
  - Herring, Theodore C.; Bracht, Ernest F.; Ainslie, Robert E.; Todd, Eugene M.; and Franz, Joseph J., 3,715,668.
- Tokyo Shibaura Electric Co., Ltd.: *See—*
  - Someya, Akira; and Kohmoto, Kohtaro, 3,715,612.
  - Tsunoda, Yorio; and Takamatu, Shigeyuki, 3,714,826.
  - Umezu, Shiro; Takeda, Sadao; Mitsudome, Kaoru; and Hashimura, Tetsuo, 3,715,552.
  - Umezu, Shiro; Takeda, Sadao; Mitsudome, Kaoru; and Hashimura, Tetsuo, 3,715,554.
- Tolgyesi, William S., to Gillette Company, The. Composite fibrous writing instrument elements and their manufacture. 3,715,254, Cl. 156-180.000.
- Toman, Donald J., to Tull Aviation Corporation. Radio guidance system with separate transmission of a standard frequency signal to enhance the discrimination of the receiver. 3,715,757, Cl. 343-108.00r.
- Tomik, George A. Auger plow. 3,714,990, Cl. 172-58.000.
- Tomlin, Garland L., Jr. Integral fault detection system for operating electronics equipment. 3,715,598, Cl. 250-106.00t.
- Toms River Chemical Corporation: *See—*
  - Andrews, David Arthur, 3,715,373.
- Tonus, Inc.: *See—*
  - Pearlman, Alan R., 3,715,444.
- Toyota Jidosha Kogyo Kabushiki Kaisha: *See—*
  - Ushijima, Fmihiro, 3,714,847.
- Traber, Walter; and Weiss, Anton G., to Ciba-Geigy Corporation. Bis-(phenoxyphenyl) carbonates. 3,715,315, Cl. 252-106.000.
- Trask, Roland Pierce, II., to United States of America, Army. Side wall separator fluidic logic device. 3,714,955, Cl. 137-839.000.
- Traubel, Harro; and Oertel, Harald, to Bayer Aktiengesellschaft. Using monoisocyanates to prepare microporous polyurethanes. 3,715,326, Cl. 260-2.5ay.
- Travin, Lev Viktorovich; and Spuv, Valentin Georgievich. Method of pulse control of high-voltage rectifiers, for example thyristors, operating in a polyphase converter, and a control system to realize said method. 3,715,606, Cl. 307-252.00q.
- Trecker, David John: *See—*
  - Colomb, Henry Octave, Jr.; and Trecker, David John, 3,715,342.
- Tregurthia, Steven John, to Lucas, Joseph, (Industries) Limited. Electrical switch having an obliquely orientated roller contact. 3,715,547, Cl. 200-166.0bb.
- Trevisiol, Franco; and Bergonzi, Mario, to AMP Incorporated, mesne. Rotary switch with double nosed contacts fixedly secured to stator section. 3,715,527, Cl. 200-11.00k.
- Truesdell, Robert E.; and Nienstedt, William H., to Allied Chemical Corporation. Method of making an embossed panel. 3,715,256, Cl. 156-244.000.
- TRW Inc.: *See—*
  - Beagles, Robert, 3,715,712.
  - Breuer, David R., 3,715,030.
  - Heflinger, Lee O., 3,715,164.
  - Palmer, William B., 3,715,760.
  - Young, Robert W.; and Radler, Frederick J., 3,715,690.
- Tsuchiya, Noriyuki; Amari, Katsutoshi; Moriya, Takao; and Takahashi, Shideko, to Sony Corporation. Process of electrodepositing magnetic metal layer on electrically conductive substrate. 3,715,285, Cl. 204-12.000.
- Tsuchiya, Seiji; Yabuki, Minoru; and Takada, Yoshinori, to Furukawa Electric Company Limited, The. Method and apparatus for continuously winding tape onto elongated body. 3,714,769, Cl. 57-3.000.
- Tsuda, Jo, to Masakazu Inagaki & Tsuda, Jo. Steering wheel consisting of a light frame integrally moulding, processed from a flat plate. 3,714,844, Cl. 74-552.000.
- Tsukagoshi, Tsunehiro, to Pioneer Electronic Corporation. Multi-track magnetic hall head. 3,715,522, Cl. 179-100.2ch.
- Tsunoda, Yorio; and Takamatu, Shigeyuki, to Tokyo Shibaura Electric Co., Ltd. Induction liquid flow meter and method of electromagnetically determining the flow rate of liquid. 3,714,826, Cl. 73-194.0em.
- Tucker, James Henry, to National Research Development Corporation. Apparatus for detecting irregularities in the light transmission properties of materials. 3,715,601, Cl. 250-222.00r.
- Tuggle, Robert E., to General Motors Corporation. Shock absorbing bumper. 3,715,139, Cl. 293-70.000.
- Tull Aviation Corporation: *See—*
  - Toman, Donald J., 3,715,757.
- Tupper, Myron D., to Omark Industries, Inc. Energy absorbing structures. 3,714,859, Cl. 85-1.00r.
- Turmel, Hilaire Marcel: *See—*
  - Chopra, Sohinder Nath; and Turmel, Hilaire Marcel, 3,715,422.
- Turner, James B.: *See—*
  - Daigle, Edwin E.; Luke, Robert R.; Turner, James B.; and Wise, Harold L. (, 3,714,811.
- Ueda, Yasuo: *See—*
  - Nihyakumen, Kouzi; Yokoyama, Taizo; Ueda, Yasuo; Kamezawa, Yasutoki; and Aizawa, Tatsuo, 3,715,213.
- Uelzmann, Heinz, to General Tire & Rubber Company, The. Modification of carboxyl group containing polymer with aziridinyl substituted unsaturated long chain acyclic. 3,715,341, Cl. 260-78.40d.
- Ueno, Sadayasu: *See—*
  - Akahori, Hiroshi; Kubozoe, Morioki; Furuya, Toshihiro; and Ueno, Sadayasu, 3,715,582.
- Uhtenwoldt, Herbert R.; and Deranian, Diran, to Cincinnati Milacron-Heald Corporation. Grinding machine with SiZe controlled dressing means. 3,714,741, Cl. 51-165.910.
- Umezu, Shiro; Takeda, Sadao; Mitsudome, Kaoru; and Hashimura, Tetsuo, to Tokyo Shibaura Electric Co., Ltd. High frequency heating apparatus. 3,715,552, Cl. 219-10.550.
- Umezu, Shiro; Takeda, Sadao; Mitsudome, Kaoru; and Hashimura, Tetsuo, to Tokyo Shibaura Electric Co., Ltd. High frequency heating apparatus. 3,715,554, Cl. 219-10.550.
- Union Carbide Corporation: *See—*
  - Colomb, Henry Octave, Jr.; and Trecker, David John, 3,715,342.
  - Eigenbrod, Lester Hurt, 3,714,793.
  - Long, Hugh M., 3,715,452.
  - Plooster, Myron N., 3,715,194.
  - Sandner, Michael Ray; and Osborn, Claiborn Lee, 3,715,293.
- Uniroyal Inc.: *See—*
  - Winters, Michael E.; and Han, Wyong S., 3,715,266.
- United Aircraft Corporation: *See—*
  - Terkelsen, Bruce E., 3,714,977.
  - Thompson, Charles L., 3,715,079.
- United Kingdom Atomic Energy Authority: *See—*
  - Carley-Macauly, Kenneth Wallace; Hitchon, James Witham; and Moulton, Robert James, 3,715,082.
  - Jackson, George Oliver, 3,715,270.
  - Rigby, Frank; and Ainscough, John Brian, 3,715,273.
- United Kingdom of Great Britain and Northern Ireland, Supply Minister of Aviation, in her Britannic Majesty's Government of The: *See—*
  - Day, John; and Thomas, David Kenneth, 3,715,411.
- United States Borax & Chemical Corporation: *See—*
  - Dulat, Joseph, 3,715,228.
- United States of America
  - Air Force: *See—*
    - Beeson, Phillip, 3,714,695.
    - Dawson, Edward C., 3,715,509.
    - Drohan, William A.; Valge, Juri; and Warner, David A., 3,715,594.
    - Esposito, Frank J.; Pallas, Michael J.; and Martin, Robert W., 3,715,759.
    - Josephson, Vernal, 3,715,595.
    - Parry, John F. W., 3,715,754.
  - Army: *See—*
    - Bush, Clarence C., 3,714,824.
    - Goodson, Louis H.; Jacobs, William B.; and Davis, Andrew W., 3,715,298.
    - Herring, Theodore C.; Bracht, Ernest F.; Ainslie, Robert E.; Todd, Eugene M.; and Franz, Joseph J., 3,715,668.
    - Horwath, Tibor G., 3,715,714.
    - Ikrath, Kurt, 3,715,664.
    - Laughlin, Gordon J., 3,715,689.
    - Madert, Franz Peter, 3,715,681.
    - Ng, Wahling H.; Lehman, William F.; and Young, John P., 3,715,231.
    - Perkins, William E.; Schlack, Allen F.; and Ciccone, Thomas Q., 3,714,728.
    - Reuss, Max L., Jr., 3,715,692.
    - Sayles, David C., 3,715,246.
    - Schultz, Seiford F.; and Nix, Andrew B., 3,715,414.
    - Swotinsky, Jacob M.; Newman, Stephen; and Colitti, Olindo A., 3,715,248.
    - Thierry, Robert J., 3,714,864.
    - Trask, Roland Pierce, II., 3,714,955.
  - Army, mesne: *See—*
    - Shoults, Royland D., 3,715,399.
  - Atomic Energy Commission: *See—*
    - De Grazio, Robert P.; and Robinson, Herbert N., 3,715,204.
    - Ehlers, Kenneth W., 3,715,625.
    - Hammond, Joseph P., 3,714,702.
    - Hogg, George W., 3,715,318.
    - Lloyd, Milton H.; Tallent, Othar K.; and Leuze, Rex E., 3,715,317.
    - Salzano, Francis J.; Hobdell, Michael R.; Minushkin, Bertram; Kalinowski, Walter; and Newman, Leonard, 3,715,296.
    - Soldano, Benadetto A., 3,715,316.
    - Urenda, Ruben S., 3,715,535.
  - Health, Education, and Welfare: *See—*
    - Farmer, John J., III, 3,715,280.
    - Martin, John E., Jr.; and Lester, Arzell, 3,715,281.
  - National Aeronautics and Space Administration: *See—*
    - Auer, Siegfried O., 3,715,590.
    - Gilley, Paul J., 3,714,821.
    - Laughlin, Charles R.; Hollenbaugh, Roger C.; and Allen, Walter K., 3,715,663.
    - Moyer, Xopher W.; and Webb, John B., 3,715,092.
    - Newman, Dewey F., 3,714,833.
    - Ruhnke, Lothar H., 3,715,660.
  - National Aeronautics and Space Administration; Administrator; with respect to an invention of;:
    - Brey, Hans. Frequency division multiplex technique. 3,715,723, Cl. 340-146.10c.
    - Hochmair, Erwin S. Gyrator employing field effect transistors. 3,715,693, Cl. 333-80.00t.

    - Weingart, Jerome M.; and Yasui, Robert K. Stacked solar cell arrays. 3,715,600, Cl. 250-212.000.
  - Navy: *See—*
    - Bishop, Walton B., 3,715,750.
    - Ferris, De Lacy F., 3,714,777.
    - Gowan, Richard L., 3,715,574.
    - Hicks, John J., 3,715,748.
    - Kaufman, Martin H., 3,715,398.
    - Keir, Robin S., 3,714,830.
    - Mackie, William L., 3,715,756.
    - Parker, Leland L., 3,714,897.
    - Scarzello, John F., 3,715,654.
    - Supernaw, Dwight L., 3,714,917.
    - Suter, Henry, 3,715,672.
  - Treasury: *See—*
    - Nighohossian, Sarkie; and Tobin, John J., Jr., 3,715,189.
- United States Steel Corporation: *See—*
  - Berkey, Earl R.; and Keener, Everett L., 3,714,806.
  - Browell, George L.; and Wilson, Leon W., Jr., 3,715,294.
  - Hall, Marchand B.; Handler, Irving; and Kelly, Calvin E., 3,714,856.
  - Kelly, Calvin E., 3,715,262.
  - Ratliff, George D., Jr., 3,714,752.
- Universal Oil Products Company: *See—*
  - Broughton, Donald B., 3,715,409.
  - Hamblin, Robert J. J., 3,715,426.
  - Sampson, Robert W., 3,715,657.
- University de Sherbrooke: *See—*
  - Park, Won Kil; and Regoli, Domenico, 3,715,190.
- Upjohn Company, The: *See—*
  - Magerlein, Barney J., 3,715,346.
- Uplnd, Calif., to FMCCorporation. Apparatus and method for handling volatile liquids. 371,479,002, Cl. 62-54.000.
- Urban, Gunter: *See—*
  - Fillies, Friedrich; and Urban, Gunter, 3,714,762.
- Urenda, Ruben S., to United States of America, Atomic Energy Commission. Acceleration actuated switch. 3,715,535, Cl. 200-61.530.
- U.S. Philips Corporation: *See—*
  - Clymans, Augustien Maria, 3,715,058.
  - Daniel, Peter James, 3,715,242.
  - De Mesquita, Albert Hijman Gomes; and Bril, Alfred, 3,715,611.
  - Hofman, Wytze, 3,715,695.
  - Tan, Sing Liong, 3,715,473.
  - Van Acker, Paul Antonius Ferdinana, 3,715,739.
  - Yperman, Jean Michel Baudry Ghislain; and Rapaille, Jean Rodolphe, 3,715,701.
- U.S. Philips Corporation, mesne: *See—*
  - Grunberger, Sigrot, 3,714,807.
- Ushijima, Fmihiro, to Toyota Jidosha Kogyo Kabushiki Kaisha. Hydraulic control system for automatic transmissions. 3,714,847, Cl. 74-753.000.
- USM Corporation: *See—*
  - Dornemann, Peter L.; Radcliffe, Milton R.; Newton, Albert E.; and Eaton, Samuel E., Jr., 3,715,260.
- USV Pharmaceutical Corporation: *See—*
  - Bandurco, Victor; Elpern, Bill; and Shroff, James R., 3,715,396.
- Valbert, Jon R., to Halcon International Inc. Process for preparing glycol esters from ethylene and propylene. 3,715,388, Cl. 260-497.00r.
- Valge, Juri: *See—*
  - Drohan, William A.; Valge, Juri; and Warner, David A., 3,715,594.
- Van Acker, Paul Antonius Ferdinana, to U.S. Philips Corporation. Data processing cassette and spindle. 3,715,739, Cl. 340-174.10c.
- Van Dusen, Charles H., Jr.; and Brown, Paul, to Addressograph-Multigraph Corporation. Process of using multi-purpose lithographic solution. 3,714,891, Cl. 101-451.000.
- Van Dyke, Roscoe H., to McDonnell Douglas Corporation. Auto-advance throttle control. 3,715,093, Cl. 244-76.00b.
- Van Ostrom, David L.: *See—*
  - Byram, Robert J.; Culver, Mark N.; and Van Ostrom, David L., 3,715,005.
- Van Snellenberg, Anton P. M., to Canadian Fishing Company Limited, The. Cutting apparatus for tissue-like material. 3,714,681, Cl. 17-1.000.
- Van Tilberg, Jan, to American Can Company. Method of biaxially deforming sheet material. 3,714,687, Cl. 28-72.100.
- Van Veldhuizen, John. Air boat with air cushion. 3,714,918, Cl. 114-67.00a.
- Van Vonderen, Jacobus, to Teledyne Inc. Film tension sensing system for use especially in electrically driven automatic step and repeat cameras. 3,715,091, Cl. 242-191.000.
- Varian Associates: *See—*
  - Day, Gene F., 3,715,225.
  - Lavering, Gordon R., 3,715,615.
  - Levy, Raymond L., 3,715,156.
  - Parkman, Malcolm F., 3,715,613.
- Vasseur, Jean-Pierre, to CSF-Compagnie Generale de Telegraphie Sans Fil. Secrecy facsimile system. 3,715,478, Cl. 178-5.100.
- Venable, Charles R., Jr., to Phillips Petroleum Company. High temperature refractory lining. 3,714,971, Cl. 138-143.000.
- Venier, Dominic A.; Smith, Bart A.; and Lass, James L., to General Electric Company. Nuclear fuel assembly with reinforced flow channel. 3,715,274, Cl. 176-78.000.
- Vereinigte Osterreichische Eisen- und Stahlwerk Aktiengesellschaft: *See—*
  - Puhringer, Othmar, 3,715,101.
- Vergnolle, Claude, to Thomson-CSF. Amplifiers of hybrid integrated subminiaturised circuit design. 3,715,677, Cl. 330-31.000.
- Vetco Offshore Industries, Inc.: *See—*
  - Hanes, James W. E.; and Larralde, Edward, 3,714,995.
- Vickers Limited: *See—*
  - Smith, Francis Hughes, 3,715,165.
- Vicra Sterile, Inc.: *See—*
  - Stanley, Vayden F., 3,714,945.
- Victor Company of Japan, Ltd.: *See—*
  - Fujita, Mitsuo, 3,715,468.
- Vieira, Thomas L.: *See—*
  - Herford, John; Mosman, Richard R.; Vieira, Thomas L.; and Wallace, Robert G., 3,714,761.
- Villano, John A. Apparatus for milling cams and the like, as for swiss-type screw machine cams. 3,714,865, Cl. 90-13.00c.
- Viret, Robert; and Pettavel, Jacques, to Societe Genevoise d'Instruments de Physique. High precision reading device of the graduation of a precision ruler. 3,715,645, Cl. 318-603.000.
- Vockenhuber, Karl: *See—*
  - Maszumanski, Trude; and Wendisch, Irmgard, 3,715,151.
- Vofsi, David: *See—*
  - Manassen, Joost; Vofsi, David; and Martan, Michael, 3,715,403.
- Vogeleer, George B., to Reynolds Metals Company. Method and apparatus for forming a depression in a cover member of a container construction. 3,714,758, Cl. 53-39.000.
- Vogelsberg, Robert E., to International Business Machines Corporation. Failure activity determination technique in fault simulation. 3,715,573, Cl. 235-153.0ac.
- Vonderembse, John F.: *See—*
  - Kernick, Andress; Ernsberger, Glenn W.; Vonderembse, John F.; and Geyer, Manvel A., 3,715,648.
- Vorbau, Roger C. Four-in-hand tie shield. 3,714,669, Cl. 2-46.000.
- Wade, Charles G., to ICI America Inc. Water-in-oil emulsion explosive containing entrapped gas. 3,715,247, Cl. 149-21.000.
- Wafios Maschinenfabrik Wagner, Ficker & Schmid GmbH: *See—*
  - Lange, Gerhard, 3,714,776.
- Waggener, Herbert Atkin: *See—*
  - Panousis, Peter Theodore; and Waggener, Herbert Atkin, 3,715,249.
- Wagner, Kuno: *See—*
  - Schmelzer, Hans-Georg; Gruber, Hermann; Degener, Eberthart; and Wagner, Kuno, 3,715,338.
- Wakamori, Shigeki; Yoshida, Yoshio; Yamauchi, Sanji; Ishii, Yoshio; and Goto, Muneharu, to Kumiai Chemical Industry Co., Ltd. Method of killing weeds in rice crops utilizing benzyl N,N-dialkyldithiocarbamates. 3,715,199, Cl. 71-101.000.
- Walker, Douglas W.; Gilman, Leland M; and Stark, Robert E., to Gates Rubber Company, The. Electrochemical cell closure and method of making. 3,715,239, Cl. 136-133.000.
- Walker, James V., to McDonnell Douglas Corporation. Piston ring expander. 3,715,113, Cl. 267-65.000.
- Walker, John B. Variable electric current generating device. 3,715,237, Cl. 136-89.000.
- Wallace, Robert G.: *See—*
  - Herford, John; Mosman, Richard R.; Vieira, Thomas L.; and Wallace, Robert G., 3,714,761.
- Wallgren, Linus E.: *See—*
  - Lloyd, Richard E.; and Wallgren, Linus E., 3,715,708.
- Wallin, Gary P.; and Stapleford, Gary N., to Comex Systems, Inc. Selective tone signalling apparatus. 3,715,726, Cl. 340-171.0pf.
- Walsh, William J.; Livers, Joseph A.; Mueller, Robert S.; and Hill, Warren R., to Eaton Yale & Towne, Inc. Vehicle speed control. 3,715,006, Cl. 180-105.00e.
- Walter, Heinz E., to Singer Company, The, mesne. DC control circuits for direct drive motors continuously coupled to sewing machines for controlling sewing functions. 3,715,642, Cl. 318-269.000.
- Walton, John Hugh Davey. Analog computer for solving sets of simultaneous relations. 3,715,575, Cl. 235-180.000.
- Wamser, Christian A.: *See—*
  - Morgan, Thomas R.; Low, William W.; Wamser, Christian A.; and Bruen, Charles P., 3,715,425.
- Warburton, William, to General Electric Company. Liquid cooled semiconductor device clamping assembly. 3,715,632, Cl. 317-234.00r.
- Ward, John C. Gas appliance igniter for a mobile living unit. 3,715,182, Cl. 431-264.000.
- Warner, David A.: *See—*
  - Drohan, William A.; Valge, Juri; and Warner, David A., 3,715,594.
- Warwick Electronics Inc.: *See—*
  - Matzek, Lester Tucker, 3,715,463.
- Washington State University Research Foundation: *See—*
  - Strickler, Melvin D.; and Pellerin, Roy F., 3,714,820.
- Wasson, Loerwood C., to Smith, A. O., Corporation. Corrosion guard system for electric water heater. 3,715,566, Cl. 219-322.000.
- Watanabe, Tetsuo; and Hashirizaki, Shinya, to Nippon Steel Corporation. Method and apparatus for detecting pinholes on sheet articles. 3,715,476, Cl. 178-6.000.
- Watkinson, Leonard J.; and Service, Anthony Peter, to Howson-Algraphy Limited. Lithographic printing plates. 3,715,210, Cl. 96-33.000.

Watson, Timothy. Pulley with belt clamping means. 3,714,839, Cl. 74-230.240.

Waxenbaum, Bernard M.: *See—*
Paley, Alfred I.; Newman, Leonard; Seats, Peter; and Waxenbaum, Bernard M., 3,715,618.

Wayne, Truman B. Apparatus for desolventizing solvent extracted milled rice and rice bran. 3,714,719, Cl. 34-74.000.

Wean United, Inc.: *See—*
Stone, Morris Denor, 3,714,805.

Weaver, George D. Gate structure. 3,714,736, Cl. 49-237.000.

Webb, John B.: *See—*
Moyer, Xopher W.; and Webb, John B., 3,715,092.

Webb, Robert H., to Block Engineering, Inc. Applanation tonometer comprising porous air bearing support for applanating piston. 3,714,819, Cl. 73-80.000.

Weber Marking Systems, Inc.: *See—*
Cole, Jean R., 3,714,893.

Weber, Marvin J., to Raytheon Company. Coupled ion eye-safe laser. 3,715,683, Cl. 331-94.500.

Weber-Knapp Company: *See—*
Little, Carl H., 3,714,680.

Weichselbaum, Theodore E.; and Wilhelmson, Jack L., to Sherwood Medical Industries Inc. Identification system. 3,715,570, Cl. 235-61.12m.

Weiher, Richard L.: *See—*
Campbell, Donald A.; Packard, James R.; Tait, William C.; and Weiher, Richard L., 3,715,162.

Weimer, Paul Kessler, to RCA Corporation. Radiation sensing and signal transfer circuits. 3,715,485, Cl. 178-7.100.

Weinbaum, Sheldon; and Liner, Robert T., Jr., to General Electric Company. Gaseous nuclear rocket engine. 3,714,782, Cl. 60-203.000.

Weingart, Jerome M.: *See—*
United States of America, National Aeronautics and Space Administration, 3,715,600.

Weir, Stanley M., to FMC Corporation. Loading and unloading conveyor. 3,715,043, Cl. 214-38.00b.

Weiss, Anton G.: *See—*
Traber, Walter; and Weiss, Anton G., 3,715,315.

Weiss, Joseph, Jr. Quick dump hoist. 3,715,084, Cl. 242-54.000.

Weisz, William; and Herron, William L., to Singer Company, The. Ball hinges. 3,714,678, Cl. 16-128.00r.

Welch, Wilson A.: *See—*
Wood, Walter B.; Shuler, Bernard R.; Bromm, Charles A.; and Welch, Wilson A., 3,715,578.

Welsh, James W.: *See—*
Teeple, Gifford H., Jr.; and Welsh, James W., 3,715,035.

Wendisch, Irmgard: *See—*
Maszumanski, Trude; and Wendisch, Irmgard, 3,715,151.

Wennerberg, Arnold N.; and Frazier, Alvin W., to Standard Oil Company. Hydrotreatment of fossil fuels. 3,715,303, Cl. 208-112.000.

Wenz, Adolf; Stein, Alfred; and Schmitt, Dieter, to Merck Patent Gesellschaft mit beschrankter Haftung. Indicator strip. 3,715,192, Cl. 23-253.0tp.

Werner, Georg: *See—*
Rix, Albert; Werner, Georg; and Fuchs, Hans, 3,715,022.

Wertheimer, Donald J.; Fish, Richard D.; and Holmes, Ralph A., to Long, F. S., Manufacturing Company. Broiler-grill cooking appliance. 3,714,885, Cl. 99-425.000.

West, James Edward: *See—*
Sessler, Gerhard Martin; and West, James Edward, 3,715,500.

Westbrook, Aubrey Joseph; and Thomson, Ian David Mac Knight, to Plastic Rotational Moulding Limited. Moulding apparatus. 3,715,179, Cl. 425-86.000.

Western Electric Company, Incorporated: *See—*
Krogel, Christopher John, 3,714,927.
McGrath, John W.; and Repsher, Dennis E., 3,715,576.

Westinghouse Electric Corporation: *See—*
Anderson, Melvin R., 3,715,707.
Blewitt, Donald D., 3,715,698.
Kernick, Andress; Ernsberger, Glenn W.; Vonderembse, John F.; and Geyer, Manvel A., 3,715,648.
Keto, August I.; and Manes, Robert J., 3,715,543.
Ravas, Richard J., 3,715,649.

Westley, John: *See—*
Stempel, Arthur; and Westley, John, 3,715,372.

Weston Instruments, Inc.: *See—*
Busch, Edward R.; and Wood, Guy B., 3,715,592.

Westram Corporation: *See—*
Dalton, Thomas B., 3,715,530.

Westwig, Ralph A.: *See—*
Love, Roy E.; and Westwig, Ralph A., 3,715,150.

Weyerhaeuser Company: *See—*
Dedrick, Dallas S., 3,714,716.

Wheat, Lawrence C.; and Tary, Orville L., to Libbey-Owens-Ford Company. Apparatus for producing all-glass multiple sheet glazing units. 3,715,198, Cl. 65-152.000.

Whetstone, Albert; Fine, Samuel; and Phillips, Stanley, to Science Accessories Corporation. Apparatus for making spark chamber wire arrays. 3,714,689, Cl. 29-25.200.

Whirlpool Corporation: *See—*
Linstromberg, William J.; and Nichols, Duane C., 3,714,794.

Whirpool Corporation: *See—*
Beard, William L., Jr.; and Hahn, Ronald E., 3,714,717.

White, Halbert C.; Strycker, Stanley J.; and Wysong, Don V., to Dow Chemical Company, The. Substituted 2-(2-imidazolin-2-ylthio) acetophenones. 3,715,367, Cl. 260-309.600.

White, James C.: *See—*
Hunsinger, Peter; and White, James C., 3,715,067.

White, Robert L.: *See—*
Thorsby, Claude A.; and White, Robert L., 3,715,114.

Whiting Corporation: *See—*
Rushton, William E.; Seavoy, Gordon E.; and Morey, Woodruff A., 3,715,191.

Wieczorek, Theophil J., to Enthone, Incorporated. Method for deoxidizing and descaling ferrous metals. 3,715,292, Cl. 204-145.00r.

Wiemann, Ronald W.: *See—*
Muskopf, Billy J.; and Wiemann, Ronald W., 3,715,072.

Wilhelmson, Jack L.: *See—*
Weichselbaum, Theodore E.; and Wilhelmson, Jack L., 3,715,570.

Wilkens, Henry W.; and Sabatino, Daniel D., to Flowtron Industries Inc. Fuel consumption meter. 3,714,823, Cl. 73-113.000.

Wilkus, Edward V.; and Berger, Abe, to General Electric Company. Xanthenyl ketone containing organosilicon materials. 3,715,370, Cl. 260-335.000.

Williams, Ralph L. Electrical discharge apparatus. 3,715,300, Cl. 204-312.000.

Williams, Roger Morley: *See—*
Stirling, Harold James; Williams, Roger Morley; Hampson, Peter Samuel; and Price, James Kenneth, 3,715,515.

Wilson, Gerald E., to Schlumberger Technology Corporation. Retrievable well packer. 3,714,983, Cl. 166-120.000.

Wilson, Harry R., to McQuay-Perfex Inc. Engine cooling system for vehicles. 3,715,001, Cl. 180-68.00r.

Wilson, Leon W., Jr.: *See—*
Browell, George L.; and Wilson, Leon W., Jr., 3,715,294.

Wilson, William C.: *See—*
Di Fulvio, Anthony P.; and Wilson, William C., 3,715,117.

Winkler, Frederic V. Hair stylists accessory tray or the like. 3,715,038, Cl. 211-128.000.

Winn, William C.: *See—*
Pierce, Stanley L., Jr.; and Winn, William C., 3,714,836.

Winters, Michael E.; and Han, Wyong S., to Uniroyal Inc. Wire reinforced rubber product. 3,715,266, Cl. 161-140.000.

Wisconsin Alumni Research Foundation, The: *See—*
De Luca, Hector F., 3,715,374.

Wise, Harold L. (: *See—*
Daigle, Edwin E.; Luke, Robert R.; Turner, James B.; and Wise, Harold L. (, 3,714,811.

Wise, Robert G., to Cincinnati Milacron Inc. Tracing feed rate steering control. 3,715,646, Cl. 318-632.000.

With, Bror. Ski binding with clamping bail. 3,715,127, Cl. 280-11.35b.

Witzel, Bruce E.; Dorn, Conrad P., Jr.; and Shen, Tsung-Ying, to Merck & Co., Inc. Method of treating inflammation. 3,715,358, Cl. 260-263.000.

Wolgemuth, Larry G.; and Fritock, William H., to Atlantic Richfield Company. Process for the preparation of N-vinyl carbamic acid esters. 3,715,385, Cl. 260-482.00c.

Wolverine Industries, Inc.: *See—*
Drablowski, William J., 3,715,095.

Woo, James T. K.: *See—*
Nowak, Robert M.; Woo, James T. K.; and Heinert, Dietrich H., 3,715,336.

Wood, Guy B.: *See—*
Busch, Edward R.; and Wood, Guy B., 3,715,592.

Wood, Lowell L., Jr.: *See—*
Jensen, Carl A.; and Wood, Lowell L., Jr., 3,715,110.

Wood, Prentice J., to Mead Corporation, The. Article carrier. 3,715,029, Cl. 206-65.00e.

Wood, Walter B.; Shuler, Bernard R.; Bromm, Charles A.; and Welch, Wilson A., to American Air Filter Company, Inc. Light and filter assembly for ceiling structure. 3,715,578, Cl. 240-9.00r.

Woodier, George H., to Curtiss-Wright Corporation. Fluid metering apparatus. 3,715,177, Cl. 418-171.000.

Woodland, Michael W.: *See—*
Dunaway, Jack W.; Woodland, Michael W.; and Johnson, Bernard H., 3,715,257.

Woodling, George V. Rotary valve component means. 3,715,175, Cl. 418-61.000.

Woodward, Oakley McDonald, to RCA Corporation. TM_{01} mode exciter and a multimode exciter using same. 3,715,688, Cl. 333-1.000.

Wooster Brush Company, The: *See—*
Davis, Howard C.; Pritz, Howard B.; and Burton, Charles A., 3,715,174.

Worcester, Joseph A., to General Electric Company. Multiple spreadband tuning in a varactor tuned radio receiver. 3,715,671, Cl. 325-468.000.

Worden, Donald A.: *See—*
Kowalski, Slawomir; and Worden, Donald A., 3,714,868.

Worden, William W. Means and method of producing an expanded cereal product. 3,714,886, Cl. 99-238.000.

Worthington, Harvey R., Jr., to Searle Medidator Inc. Projection apparatus for multiple-sector slide transparencies. 3,715,157, Cl. 353-25.000.

Wright, Edmund S., to Eltra Corporation. Production of basic refractories. 3,715,223, Cl. 106-59.000.

Wright, Harry Gilbert; and Dischert, Robert Adams, to RCA Corporation. Shuttering apparatus for television cameras. 3,715,486, Cl. 178-7.200.

Wright, Ian G.: *See—*
Spry, Douglas O.; and Wright, Ian G., 3,715,347.

Wuhrmann, Jean-Jacques; and Cristofaro, Elvira, to Societe d'Assistance Technique pour Produits Nestle S.A. Beverage composition. 3,715,216, Cl. 99-78.000.

Wysong, Don V.: *See—*
White, Halbert C.; Strycker, Stanley J.; and Wysong, Don V., 3,715,367.

Xerox Corporation: *See—*
Ciccarelli, Roger N., 3,715,207.
Gundlach, Robert W., 3,715,209.

Yabuki, Minoru: *See—*
Tsuchiya, Seiji; Yabuki, Minoru; and Takada, Yoshinori, 3,714,769.

Yamada, Kiichi. Special thermal electric power generating unit using pressurized hot air together with superheated steam. 3,714,960, Cl. 137-340.000.

Yamamoto, Masato: *See—*
Fukui, Saburo; Yamazaki, Tsunehiro; Yamamoto, Masato; Miyake, Masuichi; and Okumoto, Masanori, 3,715,236.

Yamamoto, Michiaki: *See—*
Kobayashi, Shigehiko; Miyazaki, Kazuhide; and Yamamoto, Michiaki, 3,715,322.

Yamato Mishin Seizo Kabushiki Kaisha: *See—*
Masaki, Kazumi, 3,715,643.

Yamauchi, Sanji: *See—*
Wakamori, Shigeki; Yoshida, Yoshio; Yamauchi, Sanji; Ishii, Yoshio; and Goto, Muneharu, 3,715,199.

Yamazaki, Tsunehiro: *See—*
Fukui, Saburo; Yamazaki, Tsunehiro; Yamamoto, Masato; Miyake, Masuichi; and Okumoto, Masanori, 3,715,236.

Yanof, Howard M.; Pansky, Ben; and Poff, James S., said Poff assor. to said Yanof Pansky, Ben. Medicament injectors. 3,714,943, Cl. 128-173.00h.

Yarber, Harold Dean, to Stevens, J. P., & Co., Inc. Crimping rolls for thermoplastic materials. 3,714,685, Cl. 28-1.200.

Yasui, Robert K.: *See—*
United States of America, National Aeronautics and Space Administration, 3,715,600.

Yeda Research and Development Co., Ltd.: *See—*
Manassen, Joost; Vofsi, David; and Martan, Michael, 3,715,403.

Yeomans, Bertram, to BP Chemicals Limited. Production of dineodicarboxylic acids. 3,715,392, Cl. 260-537.00r.

Yokoyama, Taizo: *See—*
Nihyakumen, Kouzi; Yokoyama, Taizo; Ueda, Yasuo; Kamezawa, Yasutoki; and Aizawa, Tatsuo, 3,715,213.

Yokozeki, Zenzo; and Hatta, Takeshi, to Kurita Water Industries Ltd. Method and apparatus for preparation of aluminum coagulating agent. 3,715,290, Cl. 204-96.000.

Yoshida Kogyo Kabushiki Kaisha: *See—*
Fukuroi, Takeo, 3,714,698.

Yoshida, Tsukasa. Thickness-adjustable joint assembly for building use. 3,715,136, Cl. 287-189.36d.

Yoshida, Yoshio: *See—*
Wakamori, Shigeki; Yoshida, Yoshio; Yamauchi, Sanji; Ishii, Yoshio; and Goto, Muneharu, 3,715,199.

Yost, Edward F., Jr., to Spectral Data Corporation. Method of multispectral photography and protector. 3,714,875, Cl. 95-12.200.

Young, Charles Gilbert, to American Optical Corporation. Rectangular disc laser. 3,715,682, Cl. 331-94.50p.

Young, John P.: *See—*
Ng, Wahling H.; Lehman, William F.; and Young, John P., 3,715,231.

Young, Robert B., to AAI Corporation. Projectile, cartridge, and method. 3,714,896, Cl. 102-41.000.

Young, Robert W.; and Radler, Frederick J., to TRW Inc. Electric tuning electric wave filter. 3,715,690, Cl. 333-17.000.

Yperman, Jean Michel Baudry Ghislain; and Rapaille, Jean Rodolphe, to U.S. Philips Corporation. Non-linear resistance element. 3,715,701, Cl. 338-20.000.

Yu, Frank K., to Honeywell Inc. Control mechanism and bus for a data processing pooler system. 3,715,727, Cl. 340-172.500.

Yusa, Yasushi; Akai, Naotoshi; Satoh, Kimio; and Sekizawa, Yasuharu, to Meiji Seika Kaisha, Ltd. Parasiticide for animals. 3,715,431, Cl. 424-181.000.

Zacharias, Ellis M., Jr.; and Cirulis, Uldis, to Nusonics, Inc., mesne. Sing-around velocimeter. 3,715,709, Cl. 340-3.00e.

Zahn, Gunter, to Ziller & Co. Sealing ring arrangement for anti-friction bearings. 3,715,147, Cl. 308-187.200.

Zaugg, Roland; Glanzmann, Werner; and Fluck, Josef, to Schild, A., S.A. Correction mechanism for calendar watches. 3,714,774, Cl. 58-58.000.

Zenith Radio Corporation: *See—*
Adler, Robert, 3,715,524.

Ziemba, Richard T., to General Electric Company. Fuze actuating system. 3,714,898, Cl. 102-70.20r.

Ziller & Co.: *See—*
Zahn, Gunter, 3,715,147.

Zink, John, Company: *See—*
Zink, John Smith; Goodnight, Hershel; and Reed, Robert D., 3,715,181.

Zink, John Smith; Goodnight, Hershel; and Reed, Robert D., to Zink, John, Company. Fuel burner assembly. 3,715,181, Cl. 431-184.000.

Zinser-Textilmaschinen Gesellschaft mit beschrankter Haftung: *See—*
Rothke, Ernst, 3,714,770.

Zobler, Joy: *See—*
Zobler, Melvyn N.; and Zobler, Joy, 3,714,966.

Zobler, Melvyn N.; and Zobler, Joy. Flexible high pressure gas line connector for bunsen burners and the like. 3,714,966, Cl. 137-560.000.

Zoecon Corporation: *See—*
Diekman, John D., 3,715,363.

Zoerner, Richard L.; and Ruiter, Larry D., to Gardner-Denver Company. Fluid actuated impact mechanism. 3,714,994, Cl. 173-93.000.

Zumbrunn, Jean-Pierre, to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude. Process for detoxicating waste waters charged with organic cyanide impurities. 3,715,309, Cl. 210-63.000.

Zupan, Frank M.; and Zurek, Jerome N., to Stewart-Warner Corporation. Siphon paint spray cup assembly. 3,714,967, Cl. 137-588.000.

Zuppiger, Paul, to Dunlop Holdings Limited & Battelle Memorial Institute. Conveyor handrails. 3,714,902, Cl. 104-25.000.

Zurek, Jerome N.: *See—*
Zupan, Frank M.; and Zurek, Jerome N., 3,714,967.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 6TH DAY OF FEBRUARY, 1973

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Ackerman, Bernard, to Electro-Catheter Corp. Cardiac electrode catheter and heart stimulation method. Re. 27,569, 2–6–73, Cl. 128—418.
Austin, George E.: *See*—
    Rawlings, Richard F., and Austin. Re. 27,577.
Ball, Jay H.: *See*—
    Rawson, Edward B., Schwarzkopf, Ferguson, and Ball. Re. 27,580.
Balon Corp.: *See*—
    Scaramucci, Domer. Re. 27,570.
Brody, Donald E.: *See*—
    Cain, Clifford W., Jr., and Brody. Re. 27,572.
Cain, Clifton W., Jr., and D. E. Brody, to Johns-Manville Corp. Diatomaceous silica pigments and the like. Re. 27,572, 2–6–73, Cl. 106—288.
Ditz-Crane: *See*—
    Kough, John K. and B. B. Re. 27,574.
Dresser Industries, Inc.: *See*—
    Youmans, Arthur H. Re. 27,579.
Electro-Catheter Corp.: *See*—
    Ackerman, Bernard. R. 27,569.
Esso Research and Engineering Co.: *See*—
    Kahn, Donald J., Robbins, and Furer. Re. 27,582.
Farbewerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning: *See*—
    Ribka, Joachim, and Pretzer. Re. 27,575.
    Ribka, Joachim. Re. 27,576.
Ferguson, Joseph B.: *See*—
    Rawson, Edward B., Schwarzkopf, Ferguson, and Ball. Re. 27,580.
Furer, Frieder S.: *See*—
    Kahn, Donald J., Robbins, and Furer. Re. 27,582.
Graham, James F. Surgical dressing. Re. 27,571, 2–6–73, Cl. 128—156.
Hjermstad, Erling T., L. C. Martin, and K. W. Kirby, to Penick & Ford, Ltd. Monofunctionally substituted hydrophobic starch and film-forming dispersions prepared therefrom. Re. 27,581, 2–6–73, Cl. 106—213.
Johns-Manville Corp.: *See*—
    Cain, Clifford W., Jr., and Brody. Re. 27,572.
Kahn, Donald J., M. L. Robbins, and F. S. Furer, to Esso Research and Engineering Co. Metal-containing detergent-dispersants for lubricants. Re. 27,582, 2–6–73, Cl. 252—32.7.
Keeton, Eugene G. Seed planter. Re. 27,578, 2–6–73, Cl. 221—219.
Kirby, Kenneth W.: *See*—
    Hjermstad, Erling T., Martin, and Kirby. Re. 27,581.
Kough, Blair B.: *See*—
    Kough, John K. and B. B. Re. 27,574.
Kough, John K. and B. B., to Ditz-Crane. Blowback seal for building panels. Re. 27,574, 2–6–73, Cl. 52—541.
Kucera, Joseph B.; assignor of a fractional part interest to Rudolf L. Lowell. Machine and method for drying. Re. 27,573, 2–6–73, Cl. 34—20.
Lowell, Rudolf L.: *See*—
    Kucera, Joseph B. Re. 27,573.
Martin, Larry C.: *See*—
    Hjermstad, Erling T., Martin, and Kirby. Re. 27,581.
Penick & Ford, Ltd.: *See*—
    Hjermstad, Erling T., Martin, and Kirby. Re. 27,581.
Pretzer, Wolfgang: *See*—
    Ribka, Joachim, and Pretzer. Re. 27,575.
Rawlings, Richard F., and G. E. Austin; said Austin assignor to said Rawlings. Shell stringer apparatus. Re. 27,577, 2–6–73, Cl. 83—95.
Rawson, Edward B., D. B. Schwarzkopf, J. B. Ferguson, and J. H. Ball, to Searle Medidata Inc. Multiphasic medical screening system. Re. 27,580, 2–6–73, Cl. 340—172.5.
Ribka, Joachim, to Farbewerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning. Water-insoluble benzimidazolone containing monoazo dyestuffs. Re. 27,576, 2–6–73, Cl. 260—157.
Ribka, Joachim, and W. Pretzer, to Farbewerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning. Water-insoluble benzimidazolone containing monoazo dyestuffs. Re. 27,575, 2–6–73, Cl. 260—157.
Robbins, Max L.: *See*—
    Kahn, Donald J., Robbins and Furer. Re. 27,582.
Scaramucci, Domer, to Balon Corp. Ball valve for use between flanges. Re. 27,570, 2–6–73, Cl. 251—151.
Schwarzkopf, Daniel B.: *See*—
    Rawson, Edward B., Schwarzkopf, Ferguson, and Ball. Re. 27,580.
Searle Medidata Inc.: *See*—
    Rawson, Edward B., Schwarzkopf, Ferguson, and Ball. Re. 27,580.
Youmans, Arthur H., to Dresser Industries, Inc. Method of core analysis using thermal neutron capture cross section. Re. 27,579, 2–6–73, Cl. 250—83.1.

LIST OF PLANT PATENTEES

Duffett, William E.: *See*—
    Maton, Arthur, Jessel, and Duffett. 3,300.
Duffett, William E., to Yoder Brothers, Inc. Carnation plant. 3,299, 2–6–73, Cl. 70.
Hawes, Ralph E. Carnation plant. 3,301, 2–6–73, Cl. 70.
Jessel, Walter H., Jr.: *See*—
    Maton, Arthur, Jessel, and Duffett. 3,300.
Maton, Arthur, W. H. Jessel, Jr., and W. E. Duffett, to Webb Greenhouses, Inc. Chrysanthemum plant. 3,300, 2–6–73, Cl. 81.
Merrill, Grant. Peach tree. 3,298, 2–6–73, Cl. 43.
Sumruld, Roy. Plum tree. 3,297, 2–6–73, Cl. 38.
Webb Greenhouses, Inc.: *See*—
    Maton, Arthur, Jessel, and Duffett. 3,300.
Yoder Brothers, Inc.: *See*—
    Duffett, William E. 3,299.

LIST OF DESIGN PATENTEES

Abend, Chester J.: *See*—
    Bienkowski, James J., and Abend. 226,292.
Anthony, David W., and R. C. Urie, to Stanley Home Products, Inc. Combination handle and hanger for a broom or brush. 226,252, 2–6–73, Cl. D4—4.
Anthony, David W., and R. C. Urie, to Stanley Home Products, Inc. Hairbrush. 226,253, 2–6–73, Cl. D4—31.
Bateman, Robert F., to Plastics, Inc. Tray. 226,284, 2–6–73, Cl. D44—10.
Bateman, Robert F., to Plastics, Inc. Interlocking tray. 226,285, 2–6–73, Cl. D44—10.
Bee, James W. M.: *See*—
    Tyson, John F., and Bee. 226,273.
Bienkowski, James J., and C. J. Abend, to SCM Corp. Typewriter carrying case. 226,292, 2–6–73, Cl. D87—1.
Bizzaro, William, Jr. Mobile home. 226,263, 2–6–73, Cl. D14—3.
British & International Proprietaries Ltd.: *See*—
    Greif, Francis. 226,288.
Bullard, E. D., Co.: *See*—
    Raschke, Herbert A. 226,251.
Callaghan, John D., and R. Kaysen, to RCA Corp. Indoor antenna or similar article. 226,274, 2–6–73, Cl. D26—14.
Cohen, Charles H., and V. F. Leonard, to Goldberg Plastics, Inc. Catheter. 226,290, 2–6–73, Cl. D83—12.
Consolidated Foods Corp.: *See*—
    Gebhart, George. 226,291.
Educational Supply Association, Ltd., The: *See*—
    Shield, John G. 226,283.
Eyerly, Eugene B., to Law Hammer, Inc. Disassemblable tree ball transporter. 226,279, 2–6–73, Cl. D35—1.
Gebhart, George, to Consolidated Foods Corp. Combined hair roller and adjustable hair holding band. 226,291, 2–6–73, Cl. D86—10.
Gilbrech, Donald A. Fork lift vehicle. 226,264, 2–6–73, Cl. D14—3.
Gnader, Rachel. Pocket insert for filing folder. 226,294, 2–6–73, Cl. D74—2.
Goldberg Plastics, Inc.: *See*—
    Cohen, Charles H., and Leonard. 226,290.
Grief, Francis, to British & International Proprietaries Ltd. Telephone index. 226,288, 2–6–73, Cl. D74—1.
Guhl, Jay R.; assignor of a fractional part interest to Dean W. Park. Bale wire tying and cinching tool. 226,256, 2–6–73, Cl. D8—44.
Hanamura, Kenji, to Tancho Co., Ltd. Squeeze tube or the like. 226,260, 2–6–73, Cl. D9—194.
Hanson-Hawk, Inc.: *See*—
    Holtzman, Norman. 226,271.

Heinz, Richard: *See*—
    Spellier, Roland. 226,267.
Henney, Alma A. Toy clown figure. 226,276, 2–6–73, Cl. D34—4.
Holtzman, Norman, to Hanson-Hawk, Inc. Multimeter casing. 226,271, 2–6–73, Cl. D26—1.
Horgan, William J., Jr. Door. 226,261, 2–6–73, Cl. D13—1.
Ishii, Hideki, to Kabushiki Kaisha Ricoh. Electronic calculator. 226,272, 2–6–73, Cl. D26—5.
Kabushiki Kaisha Ricoh: *See*—
    Sakuma, Masayuki. 226,270.
    Ishii, Hideki. 226,272.
Kawamata, Isamu. Ice shaver. 226,293, 2–6–73, Cl. D89—1.
Kaysen, Raymond: *See*—
    Callaghan, John D., and Kaysen. 226,274.
Kubick, Mark: *See*—
    Melnick, Dennis M., and Kubick. 226,265.
Law Hammer, Inc.: *See*—
    Eyerly, Eugene B. 226,279.
Leonard, Vernon F.: *See*—
    Cohen, Charles H., and Leonard. 226,290.
Lisk Enterprises Corp.: *See*—
    Lisk, Leard E., Jr. 226,259.
Lisk, Leard E., Jr., to Lisk Enterprises Corp. Container for liquids. 226,259, 2–6–73, Cl. D9—175.
Lombardo, Samuel. Golf club. 226,278, 2–6–73, Cl. D34—5.
Lowe, Leroy C. Time indicator for cooking. 226,281, 2–6–73, Cl. D52—6.
Melnick, Dennis M., and M. Kubick, to Pallet Development, Inc. Pallet. 226,265, 2–6–73, Cl. D14—3.
Minter, Alan H. Broock or similar article. 226,280, 2–6–73, Cl. D45—19.
National Machine Products Ltd.: *See*—
    Williamson, John K. 226,255.
Northern Electric Co., Ltd.: *See*—
    Tyson, John F., and Bee. 226,273.
Pallet Development, Inc.: *See*—
    Melnick, Dennis M., and Kubick. 226,265.
Park, Dean W.: *See*—
    Guhl, Jay R. 226,256.
Plastics, Inc.: *See*—
    Bateman, Robert F. 226,284.
    Bateman, Robert F. 226,285.
RCA Corp.: *See*—
    Callaghan, John D., and Kaysen. 226,274.
Raschke, Herbert A., to Bullard, E. D., Co. Head protective hood. 226,251, 2–6–73, Cl. D2—232.
Rem, Douglas J., and D. H. Smith. Instrument tray for use in hospitals or the like. 226,266, 2–6–73, Cl. D16—1.
Robnett, Clifton E. Upholstery staple extractor pliers. 226,257, 2–6–73, Cl. D8—52.
Rotheiser, Jordan I., to Selfix, Inc. Hook. 226,258, 2–6–73, Cl. D8—246.
SCM Corp.: *See*—
    Bienkowski, James J., and Abend. 226,292.
Sakuma, Masayuki, to Kabushiki Kaisha Ricoh. Teaching machine. 226,270, 2–6–73, Cl. D25—1.
Sanford, Willard D. Pool table attachment for protecting cue balls. 226,275, 2–6–73, Cl. D34—3.
Sarandos, George A. Dispenser for toilet tanks or the like. 226,269, 2–6–73, Cl. D23—3.
Selfix, Inc.: *See*—
    Rotheiser, Jordan I. 226,258.
Shield, John G., to Educational Supply Association, Ltd., The, Microscope. 226,283, 2–6–73, Cl. D57—1.
Shiman Industries, Inc.: *See*—
    Shiman, Daniel. 226,286.
Shiman, Daniel, to Shiman Industries, Inc. Finger ring. 226,286, 2–6–73, Cl. D45—10.
Smith, David H.: *See*—
    Rem, Douglas J., and Smith. 226,266.
Smith, Karl S. Winetree. 226,254, 2–6–73, Cl. D6—20.
Societe des Lunetiers: *See*—
    Tagnon, Luc A. M. 226,282.
Sparacino, Joseph J. Game table. 226,277, 2–6–73, Cl. D34—5.
Spellier, Roland, to Richard Heinz. Structural building block. 226,267, 2–6–73, Cl. D18—2.
Stanley Home Products, Inc.: *See*—
    Anthony, David W., and Urie. 226,253.
    Anthony, David W., and Urie. 226,252.
Tagnon, Luc A. M., to Societe des Lunetiers, Spectacles. 226,282, 2–6–73, Cl. D57—1.
Tancho Co., Ltd.: *See*—
    Hanamura, Kenji. 226,260.
Teabue, Willie J. Fish lure. 226,268, 2–6–73, Cl. D22—27.
Trublood, Arthur J., to Western Road Machinery Co. Mobile drill unit. 226,262, 2–6–73, Cl. D14—3.
Trudeau, Aime. Combined lamp shade and mirror. 226,287, 2–6–73, Cl. D48—16.
Tyson, John F., and J. W. M. Bee, to Northern Electric Co., Ltd. Lighweight headset. 226,273, 2–6–73, Cl. D26—14.
Urie, Richard C.: *See*—
    Anthony, David W., and Urie. 226,252.
    Anthony, David W., and Urie. 226,253.
Welch, Medard W. Combined stimulating and cleaning device. 226,289, 2–6–73, Cl. D83—1.
Western Road Machinery Co.: *See*
    Trublood, Arthur J. 226,262.
Williamson, John K., to National Machine Products Ltd. Leg unit for a worktable. 226,255, 2–6–73, Cl. D6—194.

CLASSIFICATION OF PATENTS

ISSUED FEBRUARY 6, 1973

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2	
3C	3,714,668
46	3,714,669
197	3,714,670
CLASS 3	
1	3,714,671
CLASS 4	
185L	3,714,672
CLASS 8	
111	3,715,184
142	3,715,186
194	3,715,185
CLASS 13	
18	3,715,439
	3,715,440
26	3,715,441
CLASS 15	
104.1R	3,714,673
230.11	3,714,674
244CH	3,714,675
312R	3,714,676
CLASS 16	
62	3,714,677
128R	3,714,678
131	3,714,679
190	3,714,680
CLASS 17	
1R	3,714,681
11	3,714,682
66	3,715,229
CLASS 23	
230B	3,715,188
252R	3,715,190
253TP	3,715,192
259	3,715,189
260	3,715,191
288R	3,715,193
301SP	3,715,194
CLASS 24	
205.1C	3,714,683
230AM	3,714,684
CLASS 28	
1.2	3,714,685
1.4	3,714,686
72.1	3,714,687
CLASS 29	
21.1	3,714,688
25.15	3,714,691
25.2	3,714,689
105A	3,714,690
129	3,714,692
132	3,714,693
148.4R	3,714,694
157C	3,714,695
200P	3,714,696
239	3,714,697
241	3,714,699
408	3,714,698
419	3,714,700
474.1	3,714,701
494	3,714,702
560	3,714,703
569	3,714,704
596	3,714,705
604	3,714,707
624	3,714,706
	3,714,708
626	3,714,709
CLASS 30	
34.1	3,714,710
43.92	3,714,711
95	3,714,712
CLASS 33	
23K	3,714,713
80	3,714,714
174R	3,714,715
CLASS 34	
20	Re.27,573
30	3,714,716
45	3,714,717
74	3,714,719
120	3,714,720
CLASS 35	
8	3,714,722
9A	3,714,723
9R	3,714,721
CLASS 40	
11	3,714,724
84	3,714,725
CLASS 42	
74	3,714,726
79	3,714,727
84	3,714,728
CLASS 43	
4.5	3,714,729
17.2	3,714,730
43.11	3,714,731
53.5	3,714,732
121	3,714,733
CLASS 46	
76R	3,714,734
CLASS 48	
197R	3,715,195
CLASS 49	
220	3,714,735
237	3,714,736
360	3,714,737
404	3,714,738
501	3,714,739
CLASS 51	
33W	3,714,740
165.91	3,714,741
246	3,714,742
392	3,714,743
CLASS 52	
2	3,714,745
28	3,714,744
36	3,714,748
69	3,714,746
70	3,714,749
309	3,714,747
400	3,714,751
484	3,714,753
541	Re.27,574
665	3,714,752
728	3,714,750
CLASS 53	
22B	3,714,754
39	3,714,758
42	3,714,755
48	3,714,756
75	3,714,757
78	3,714,759
112R	3,714,760
118	3,714,761
CLASS 55	
5	3,714,762
163	3,714,763
235	3,714,764
472	3,714,765
CLASS 56	
208	3,714,767
328R	3,714,768
364	3,714,766
CLASS 57	
3	3,714,769
52	3,714,770
77.42	3,714,771
153	3,714,772
CLASS 58	
28B	3,714,773
50R	3,714,867
58	3,714,774
90R	3,714,775
CLASS 59	
23	3,714,776
CLASS 60	
39.31	3,714,779
39.48	3,714,777
39.74R	3,714,778
54.5R	3,714,781
54.6R	3,714,780
203	3,714,782
207	3,714,783
241	3,714,784
258	3,714,785
CLASS 61	
11	3,714,786
46.5	3,714,788
53.5	3,714,789
53.7	3,714,787
CLASS 62	
54	3,714,790
58	3,714,791
	3,714,792
62	3,714,793
137	3,714,794
508	3,714,795
514	3,714,796
CLASS 64	
8	3,714,797
21	3,714,798
CLASS 65	
33	3,715,196
54	3,715,197
152	3,715,198
CLASS 66	
140S	3,714,799
147	3,714,800
170	3,714,801
CLASS 70	
34	3,714,802
58	3,714,803
419	3,714,804
CLASS 71	
101	3,715,199
CLASS 72	
8	3,714,805
19	3,714,806
55	3,714,807
325	3,714,808
326	3,714,809
391	3,714,810
CLASS 73	
19	3,714,811
23.1	3,714,812
	3,714,813
54	3,714,814
64.1	3,714,815
71.5	3,714,816
	3,714,817
73	3,714,818
80	3,714,819
89	3,714,820
90	3,714,821
104	3,714,822
113	3,714,823
117.4	3,714,824
147	3,714,827
178T	3,714,825
194EM	3,714,826
194R	3,714,828
398R	3,714,829
425.4R	3,714,830
431	3,714,831
432SD	3,714,833
432R	3,714,832
CLASS 74	
6	3,714,834
10.33	3,714,835
15.4	3,715,704
125.5	3,714,837
230.24	3,714,838
	3,714,839
421A	3,714,840
492	3,714,841
505	3,714,842
527	3,714,843
552	3,714,844
687	3,714,845
	3,714,846
752C	3,714,836
753	3,714,847
822	3,714,848
869	3,714,849
CLASS 75	
10	3,715,200
	3,715,201
58	3,715,202
76	3,715,203
84.1R	3,715,204
84.5	3,715,205
170	3,715,206
CLASS 76	
104	3,714,850
CLASS 81	
15.7	3,714,851
57.3	3,714,852
CLASS 82	
2.5	3,714,853
101R	3,714,854
CLASS 83	
1	3,714,855
95	Re.27,577
211	3,714,858
453	3,714,856
468	3,714,857
831	3,714,974
CLASS 84	
1.01	3,715,442
	3,715,443
	3,715,444
1.13	3,715,445
1.15	3,715,446
1.24	3,715,447
375	3,715,448
CLASS 85	
1R	3,714,859
CLASS 86	
23	3,714,860
CLASS 87	
8	3,714,862
51	3,714,861
CLASS 89	
1R	3,714,863
14C	3,714,864
CLASS 90	
13C	3,714,865
CLASS 91	
216R	3,714,866
420	3,714,868
434	3,714,869
CLASS 92	
140	3,714,870
CLASS 95	
10CE	3,714,872
10CT	3,714,873
10C	3,714,871
11.5R	3,714,874
12.2	3,714,875
13	3,714,876
31FM	3,714,877
42	3,714,878
	3,714,879
63	3,714,880
89R	3,714,881
	3,714,882
94R	3,714,883
CLASS 96	
1.2	3,715,209
1.5	3,715,207
4	3,715,208
33	3,715,210
35.1	3,715,211
48	3,715,212
49	3,715,213
66HD	3,715,214
CLASS 98	
40D	3,714,884
CLASS 99	
68	3,715,215
78	3,715,216
82	3,714,886
140R	3,715,217
174	3,715,218
239	3,714,887
355	3,714,888
411	3,714,889
425	3,714,885
CLASS 100	
229A	3,714,890
CLASS 101	
93C	3,714,892
228	3,714,893
382MV	3,714,894
451	3,714,891
CLASS 102	
23	3,714,895
41	3,714,896
56	3,714,897
70.2R	3,714,898
90	3,714,899
93	3,714,900
CLASS 104	
12	3,714,901
25	3,714,902
196	3,714,903
202	3,714,904
CLASS 105	
197DB	3,714,905
CLASS 106	
22	3,715,219
39.7	3,715,220
47Q	3,715,221
58	3,715,222
59	3,715,223
74	3,715,224
213	Re.27,581
288B	Re.27,572
CLASS 108	
64	3,714,906
152	3,714,907
157	3,714,908
CLASS 109	
1S	3,714,909
73	3,714,910
CLASS 110	
7R	3,714,911
8A	3,714,912
8R	3,714,914
CLASS 111	
73	3,714,913
CLASS 112	
80	3,714,915
218R	3,714,916
CLASS 114	
20	3,714,917
67A	3,714,918
CLASS 115	
17	3,714,919
18R	3,714,920
28R	3,714,921
CLASS 116	
14	3,714,922
114	3,714,923
115.5	3,714,924
CLASS 117	
21	3,715,225
36.2	3,715,226
37R	3,715,227
46FC	3,715,228
70S	3,715,230
71M	3,715,231
72	3,715,232
126GB	3,715,233
217	3,715,234
CLASS 118	
49	3,714,925
603	3,714,926
612	3,714,927
624	3,714,928
CLASS 119	
80	3,714,929
CLASS 123	
8.27	3,714,930
41.79	3,714,931
75E	3,714,932
122D	3,714,933
139AW	3,714,934
140R	3,714,935
	3,714,936
CLASS 126	
25R	3,714,937
38	3,714,938
CLASS 127	
46A	3,715,235
CLASS 128	
2.05A	3,714,939
77	3,714,940
142	3,714,942
145.8	3,714,941
156	Re.27,571
173H	3,714,943
209	3,714,944
214.4	3,714,945
295	3,714,946
400	3,714,947
418	Re.27,569
CLASS 130	
5R	3,714,948
CLASS 131	
10.5	3,714,949
CLASS 132	
112	3,714,950
CLASS 134	
2	3,715,236
167C	3,714,951
CLASS 136	
89	3,715,237
120FC	3,715,238
133	3,715,239
134P	3,715,240
237	3,715,241
CLASS 137	
1	3,714,952
14	3,714,953
238	3,714,956
244	3,714,957
315	3,714,958
318	3,714,959
340	3,714,960
363	3,714,961
371	3,714,962
487.5	3,714,963
513.3	3,714,964
541	3,714,965
560	3,714,966
588	3,714,967
596.2	3,714,968
630.15	3,714,969
829	3,714,954
839	3,714,955
CLASS 138	
109	3,714,970
143	3,714,971
CLASS 139	
336	3,714,972
CLASS 140	
92.1	3,714,973
CLASS 148	
11.5R	3,715,243
11.5	3,715,242
31.5	3,715,244
171	3,715,245
CLASS 149	
19	3,715,246
21	3,715,247
39	3,715,248
CLASS 152	
228	3,714,976
243	3,714,975
CLASS 156	
17	3,715,249
22	3,715,250
62.8	3,715,251
162	3,715,252
175	3,715,253
180	3,715,254
189	3,715,255
244	3,715,256
299	3,715,257
356	3,715,258
363	3,715,259
477B	3,715,260
541	3,715,262
552	3,715,261
CLASS 161	
33	3,715,263
82	3,715,264
125	3,715,265
140	3,715,266
165	3,715,267
CLASS 162	
72	3,715,268
CLASS 164	
60	3,714,977

CLASS 165	
1	3,714,978
	3,714,979
11	3,714,980
47	3,714,981
55	3,714,982
CLASS 166	
120	3,714,983
134	3,714,984
303	3,714,985
CLASS 169	
1A	3,714,986
2A	3,714,987
13	3,714,988
19	3,714,989
CLASS 172	
58	3,714,990
130	3,714,991
175	3,714,992
CLASS 173	
78	3,714,993
93	3,714,994
CLASS 174	
11BH	3,715,449
15C	3,715,451
	3,715,452
	3,715,453
28	3,715,532
47	3,715,454
48	3,715,455
59	3,715,450
84C	3,715,456
88R	3,715,457
113R	3,715,458
138F	3,715,459
158R	3,715,460
CLASS 175	
5	3,714,995
6	3,714,996
CLASS 176	
36R	3,715,269
38	3,715,270
54	3,715,271
60	3,715,272
67	3,715,273
78	3,715,274
	3,715,275
CLASS 177	
136	3,714,997
189	3,714,998
CLASS 178	
5	3,715,475
5.1	3,715,478
5.2R	3,715,461
5.4CD	3,715,468
	3,715,474
5.4CR	3,715,462
5.4HE	3,715,467
	3,715,471
	3,715,472
	3,715,479
5.4MC	3,715,463
5.4OP	3,715,469
5.4ST	3,715,465
	3,715,466
	3,715,473
5.4R	3,715,464
	3,715,470
	3,715,477
5.8A	3,715,495
6	3,715,476
	3,715,480
6.6FS	3,715,481
6.7R	3,715,482
6.8	3,715,483
	3,715,484
	3,715,497
7.1	3,715,485
	3,715,489
7.2	3,715,486
	3,715,490
7.25	3,715,491
7.3R	3,715,492
	3,715,493
7.3S	3,715,488
7.3	3,715,487
7.5D	3,715,494
58	3,715,496
69.5TV	3,715,499
69.5F	3,715,498
CLASS 179	
1DM	3,715,500
1SA	3,715,512
1D	3,715,501
2C	3,715,502
6AC	3,715,504
6E	3,715,506
15AQ	3,715,505
15BC	3,715,508
15BF	3,715,503
15BM	3,715,510
15BY	3,715,507
15.55T	3,715,509
16E	3,715,511
18AD	3,715,513
18FA	3,715,516
18FF	3,715,515
18HB	3,715,517
81E	3,715,514
84VF	3,715,518
90A	3,715,520
100C	3,715,519
100.2CA	3,715,523
100.2CH	3,715,522
100.2P	3,715,521
100.3V	3,715,524
187	3,715,525
CLASS 180	
6.48	3,714,999
8R	3,715,000
68R	3,715,001
82	3,715,002
103	3,715,003
	3,715,004
	3,715,005
105E	3,715,006
CLASS 181	
.5NC	3,715,007
31B	3,715,008
33HC	3,715,009
50	3,715,010
CLASS 182	
100	3,715,011
107	3,715,012
CLASS 184	
7D	3,715,013
CLASS 187	
9	3,715,014
CLASS 188	
5	3,715,015
184	3,715,016
CLASS 191	
12.2R	3,715,526
CLASS 192	
4A	3,715,017
24	3,715,018
67A	3,715,019
CLASS 195	
31F	3,715,276
63	3,715,277
68	3,715,279
103.5	3,715,280
104	3,715,281
CLASS 197	
1R	3,715,020
82	3,715,021
98	3,715,022
	3,715,023
CLASS 198	
33AA	3,715,024
171	3,715,025
177	3,715,026
184	3,715,027
CLASS 200	
11K	3,715,527
19R	3,715,528
	3,715,531
46	3,715,529
47	3,715,530
61.52	3,715,533
61.53	3,715,535
61.64	3,715,536
61.7	3,715,537
67G	3,715,534
82D	3,715,538
84C	3,715,539
86R	3,715,541
148R	3,715,542
151	3,715,543
157	3,715,544
159A	3,715,545
159R	3,715,540
166BB	3,715,547
166C	3,715,546
167R	3,715,548
172A	3,715,549
CLASS 202	
263	3,715,282
CLASS 203	
6	3,715,283
56	3,715,284
CLASS 204	
12	3,715,285
	3,715,286
38A	3,715,288
52R	3,715,289
96	3,715,290
109	3,715,291
145R	3,715,292
159.14	3,715,293
163R	3,715,294
180G	3,715,295
195B	3,715,298
195M	3,715,297
195R	3,715,296
212	3,715,299
301	3,715,287
312	3,715,300
CLASS 206	
8	3,715,028
65E	3,715,029
CLASS 207	
221R	3,715,030
CLASS 208	
8	3,715,301
14	3,715,302
112	3,715,303
CLASS 209	
75	3,715,031
CLASS 210	
3	3,715,304
19	3,715,305
21	3,715,306
58	3,715,307
60	3,715,308
63	3,715,309
133	3,715,032
193	3,715,033
242	3,715,034
249	3,715,035
321	3,715,036
501	3,715,037
CLASS 211	
128	3,715,038
CLASS 212	
55	3,715,039
CLASS 214	
16B	3,715,048
16.4R	3,715,040
17CA	3,715,041
38B	3,715,043
86A	3,715,042
450	3,715,044
655	3,715,045
674	3,715,046
CLASS 215	
47	3,715,047
CLASS 219	
10.49	3,715,550
10.55	3,715,551
	3,715,552
	3,715,553
	3,715,554
	3,715,555
10.69	3,715,556
62	3,715,557
82	3,715,558
126	3,715,559
131R	3,715,560
145	3,715,561
210	3,715,563
274	3,715,565
322	3,715,566
437	3,715,567
CLASS 220	
39R	3,715,075
44R	3,715,049
54	3,715,050
	3,715,051
	3,715,052
55R	3,715,053
67	3,715,054
CLASS 221	
75	3,715,055
211	3,715,056
	3,715,057
219	Re.27,578
CLASS 222	
148	3,715,058
199	3,715,059
207	3,715,060
241	3,715,119
334	3,715,061
340	3,715,062
545	3,715,063
CLASS 223	
57	3,715,064
111	3,715,065
CLASS 224	
42.24	3,715,066
CLASS 225	
96.5	3,715,067
CLASS 226	
108	3,715,068
CLASS 227	
130	3,715,069
CLASS 228	
44	3,715,070
CLASS 229	
2.5	3,715,071
15	3,715,072
43	3,715,073
57	3,715,074
CLASS 235	
61.11D	3,715,569
61.12M	3,715,570
61.7R	3,715,568
150.2	3,715,571
	3,715,572
150.31	3,715,562
153AC	3,715,573
154	3,715,574
180	3,715,575
CLASS 239	
8	3,715,076
206	3,715,078
265.17	3,715,079
444	3,715,080
573	3,715,081
CLASS 240	
2R	3,715,576
9R	3,715,578
CLASS 241	
1	3,715,082
24	3,715,083
CLASS 242	
54	3,715,084
56R	3,715,085
67.3R	3,715,087
67.3	3,715,086
74	3,715,088
129.5	3,715,089
188	3,715,090
191	3,715,091
CLASS 244	
1SS	3,715,092
76B	3,715,093
83B	3,715,094
CLASS 246	
187A	3,715,579
CLASS 248	
46	3,715,095
223	3,715,096
449	3,715,097
CLASS 250	
41.9ME	3,715,581
49.5TE	3,715,580
49.5A	3,715,582
50	3,715,587
71R	3,715,583
	3,715,585
71.5R	3,715,584
	3,715,586
71.5S	3,715,588
80	3,715,589
83.1	Re.27,579
83.3UV	3,715,594
83.3D	3,715,592
83.3H	3,715,591
83.3R	3,715,590
83.6R	3,715,593
84	3,715,596
84.5	3,715,595
105	3,715,597
106T	3,715,598
212	3,715,600
222R	3,715,601
231R	3,715,599
CLASS 251	
121	3,715,098
149.1	3,715,099
151	Re.27,570
CLASS 252	
8.1	3,715,310
32.7E	Re.27,582
49.5	3,715,312
49.8	3,715,311
52	3,715,313
95	3,715,314
106	3,715,315
188	3,715,316
301.1R	3,715,318
301.1S	3,715,317
319	3,715,319
441	3,715,321
454	3,715,322
529	3,715,324
CLASS 254	
49	3,715,100
87	3,715,101
96	3,715,102
150R	3,715,103
CLASS 259	
1R	3,715,104
2	3,715,105
25	3,715,106
148	3,715,107
CLASS 260	
2.2R	3,715,325
2.5AY	3,715,326
3	3,715,172
17R	3,715,327
22CA	3,715,328
37SB	3,715,329
40R	3,715,330
41B	3,715,331
41.5R	3,715,332
45.75K	3,715,333
46.5UA	3,715,334
47ET	3,715,323
75N	3,715,335
77.5AM	3,715,338
77.5BB	3,715,336
77.5NC	3,715,337
78A	3,715,339
78L	3,715,340
78.4D	3,715,341
80.81	3,715,342
88.1PN	3,715,343
93.7	3,715,344
112.5	3,715,345
157	Re.27,575
	Re.27,576
210R	3,715,346
239E	3,715,348
239.1	3,715,347
239.5	3,715,350
239.57	3,715,349
240.4	3,715,351
243R	3,715,352
	3,715,353
247.2A	3,715,355
247.5B	3,715,354
249.5	3,715,356
256.4N	3,715,357
263	3,715,358
279R	3,715,359
288R	3,715,360
293.53	3,715,361
293.54	3,715,362
306	3,715,363
309	3,715,364
	3,715,365
	3,715,366
309.6	3,715,367
326.5SM	3,715,368
332.3C	3,715,369
335	3,715,370
345.8	3,715,372
349	3,715,371
380	3,715,373
397.2	3,715,374
397.45	3,715,376
397.6	3,715,375
448.2E	3,715,377
453P	3,715,381
453R	3,715,380
463	3,715,378
465D	3,715,382
465G	3,715,379
475PR	3,715,383
479R	3,715,384
482C	3,715,385
486R	3,715,386
488H	3,715,387
497R	3,715,388
	3,715,389
523A	3,715,390
	3,715,391
534E	3,715,393
535R	3,715,394
537R	3,715,392
551S	3,715,395
564R	3,715,396
575	3,715,397
582	3,715,398
583NH	3,715,399
586R	3,715,400
611R	3,715,401
613B	3,715,402
621A	3,715,403
642	3,715,404
666A	3,715,405
668F	3,715,406
668R	3,715,407
669A	3,715,408
674SA	3,715,409
680R	3,715,410
827	3,715,411
835	3,715,412
878R	3,715,413
CLASS 261	
50A	3,715,108
CLASS 264	
3R	3,715,414
25	3,715,415
39	3,715,416
45	3,715,417
82	3,715,418
	3,715,419
130	3,715,421
168	3,715,422
171	3,715,420
250	3,715,423
CLASS 266	
34T	3,715,112
CLASS 267	
115	3,715,113
140	3,715,114
CLASS 271	
26R	3,715,118
44A	3,715,115
	3,715,116
61	3,715,117
CLASS 272	
56.5R	3,715,120
CLASS 273	
35R	3,715,123
93R	3,715,124
101	3,715,121
136Z	3,715,122
CLASS 280	
1.194	3,715,125
11.13B	3,715,126
11.35B	3,715,127
43.22	3,715,128
104.5R	3,715,129
150AB	3,715,130
	3,715,131
405R	3,715,132
479A	3,715,133
CLASS 285	
276	3,715,134
379	3,715,135
CLASS 287	
189.36D	3,715,136
CLASS 289	
200	3,715,077
CLASS 293	
1	3,715,137
	3,715,138
70	3,715,139
CLASS 294	
25	3,715,140
CLASS 296	
23R	3,715,141
CLASS 297	
39	3,715,142
159	3,715,143
386	3,715,144
CLASS 303	
21F	3,715,145
CLASS 305	
35EB	3,715,146
CLASS 307	
9	3,715,602
211	3,715,603
220	3,715,604
246	3,715,605
252Q	3,715,606
287	3,715,607
308	3,715,608
310	3,715,609
CLASS 308	
187.2	3,715,147
CLASS 310	
54	3,715,610
CLASS 312	
209	3,715,148
CLASS 313	
92PH	3,715,611
109	3,715,612
113	3,715,613
183	3,715,614
204	3,715,615
CLASS 315	
3.5	3,715,616
10	3,715,617
	3,715,618
	3,715,619
27TD	3,715,621
27	3,715,620
60	3,715,622
194	3,715,623
209	3,715,624
CLASS 317	
4	3,715,625
68	3,715,626
99	3,715,627
101DH	3,715,628
101R	3,715,629
122	3,715,630
234R	3,715,631
	3,715,632
	3,715,633
	3,715,634
	3,715,635
	3,715,636
235R	3,715,637
247	3,715,638
258	3,715,639
262A	3,715,640
CLASS 318	
7	3,715,641
269	3,715,642
466	3,715,643
573	3,715,644
603	3,715,645

632	3,715,646
CLASS 321	
7	3,715,647
11	3,715,648
45R	3,715,649
CLASS 322	
51	3,715,650
CLASS 323	
4	3,715,651
45	3,715,652
CLASS 324	
.5R	3,715,654
1	3,715,653
6	3,715,655
34D	3,715,659
58.5B	3,715,667
61R	3,715,656
72R	3,715,660
115	3,715,661
140R	3,715,657
154PB	3,715,658
158F	3,715,662
CLASS 325	
4	3,715,663
9	3,715,664
42	3,715,665
	3,715,666
112	3,715,668
320	3,715,669
331	3,715,670
468	3,715,671
CLASS 328	
150	3,715,672
165	3,715,673
CLASS 330	
12	3,715,674
28	3,715,675
31	3,715,677
86	3,715,678
107	3,715,679
	3,715,680
CLASS 331	
11	3,715,681
94.5C	3,715,685
94.5P	3,715,682
94.5	3,715,683
	3,715,684
96	3,715,686
179	3,715,687
CLASS 333	
1	3,715,688
9	3,715,689
17	3,715,690
18	3,715,691
24.1	3,715,692
30R	3,715,676
80T	3,715,693
CLASS 335	
177	3,715,694
229	3,715,695
CLASS 336	
70	3,715,696
CLASS 337	
157	3,715,697
166	3,715,698
348	3,715,699
407	3,715,700
CLASS 338	
20	3,715,701
32S	3,715,703
35	3,715,702
CLASS 339	
98	3,715,705
156R	3,715,706
177E	3,715,708
198R	3,715,707
CLASS 340	
3E	3,715,709
5R	3,715,710
6R	3,715,577
9	3,715,711
10	3,715,713
15	3,715,714
15.5DP	3,715,715
23	3,715,716
27R	3,715,718
27	3,715,717
58	3,715,719
	3,715,720
62	3,715,721
146.1C	3,715,723
146.3AG	3,715,724
146.3H	3,715,722
147	3,715,725
171PF	3,715,726
172.5	Re.27,580
	3,715,727
	3,715,728
	3,715,729
	3,715,730
	3,715,731
173LM	3,715,733
	3,715,734
173R	3,715,732
	3,715,735
174TF	3,715,736
174M	3,715,737
174.1C	3,715,739
174.1H	3,715,738
174.1M	3,715,740
251	3,715,741
253A	3,715,742
276	3,715,712
303	3,715,743
336	3,715,744
347DD	3,715,745
365S	3,715,746
365	3,715,747
560	3,714,718
CLASS 343	
5R	3,715,749
5W	3,715,748
6.8LC	3,715,750
7A	3,715,751
7.3	3,715,752
17.2PC	3,715,753
18B	3,715,754
18E	3,715,755
108R	3,715,757
112R	3,715,758
792.5	3,715,759
873	3,715,756
915	3,715,760
CLASS 346	
33A	3,715,761
74ES	3,715,762
CLASS 350	
58	3,715,149
96B	3,715,150
184	3,715,151
202	3,715,152
273	3,715,153
CLASS 352	
61	3,715,154
CLASS 353	
15	3,715,155
25	3,715,157
CLASS 355	
16	3,715,156
27	3,715,158
110	3,715,159
113	3,715,160
CLASS 356	
3	3,715,161
30	3,715,162
85	3,715,163
109	3,715,164
120	3,715,165
125	3,715,166
CLASS 408	
	3,715,168
149	3,715,167
CLASS 415	
170	3,715,169
CLASS 416	
97	3,715,170
142	3,715,171
198	3,715,176
CLASS 417	
37	3,715,173
311	3,715,174
CLASS 418	
61	3,715,175
83	3,715,178
171	3,715,177
CLASS 423	
21	3,715,424
24	3,715,320
61	3,715,425
234	3,715,426
235	3,715,187
CLASS 424	
3	3,715,427
47	3,715,428
71	3,715,429
127	3,715,430
177	3,715,434
181	3,715,431
199	3,715,432
226	3,715,435
229	3,715,433
304	3,715,436
317	3,715,437
366	3,715,438
CLASS 425	
86	3,715,179
CLASS 431	
25	3,715,180
184	3,715,181
264	3,715,182
328	3,715,183
CLASS 432	
4	3,715,111
29	3,715,110
122	3,715,109

CLASSIFICATION OF DESIGNS

D 2—	232	226,251
D 4—	4	226,252
	31	226,253
D 6—	20	226,254
	194	226,255
D 8—	44	226,256
	52	226,257
	246	226,258
D 9—	175	226,259
	194	226,260
D13—	1	226,261
D14—	3	226,262
		226,263
		226,264
		226,265
D16—	1	226,266
D18—	2	226,267
D22—	27	226,268
D23—	3	226,269
D25—	1	226,270
D26—		226,271
	5	226,272
	14	226,273
		226,274
D34—	3	226,275
	4	226,276
	5	226,277
		226,278
D35—	1	226,279
D44—	10	226,284
		226,285
D45—		226,286
	19	226,280
D48—	16	226,287
D52—	6	226,281
D57—	1	226,282
		226,283
D74—		226,288
	2	226,294
D83—	1	226,289
	12	226,290
D86—	10	226,291
D87—	1	226,292
D89—		226,293

CLASSIFICATION OF PLANTS

P. —	38	3,297
P. —	43	3,298
P. —	70	3,299
P. —		3,301
P. —	81	3,300

GEOGRAPHICAL INDEX OF RESIDENCE OF INVENTORS

(U.S. States, Territories and Armed Forces, the Commonwealth of Puerto Rico, and the Canal Zone)

Alabama	1	Kentucky	21	Oregon	41
Alaska	2	Louisiana	22	Pennsylvania	42
American Samoa	3	Maine	23	Puerto Rico	43
Arizona	4	Maryland	24	Rhode Island	44
Arkansas	5	Massachusetts	25	South Carolina	45
California	6	Michigan	26	South Dakota	46
Canal Zone	7	Minnesota	27	Tennessee	47
Colorado	8	Mississippi	28	Texas	48
Connecticut	9	Missouri	29	Utah	49
Delaware	10	Montana	30	Vermont	50
District of Columbia	11	Nebraska	31	Virginia	51
Florida	12	Nevada	32	Virgin Islands	52
Georgia	13	New Hampshire	33	Washington	53
Guam	14	New Jersey	34	West Virginia	54
Hawaii	15	New Mexico	35	Wisconsin	55
Idaho	16	New York	36	Wyoming	56
Illinois	17	North Carolina	37	U.S. Air Force	57
Indiana	18	North Dakota	38	U.S. Army	58
Iowa	19	Ohio	39	U.S. Navy	59
Kansas	20	Oklahoma	40		

(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

PATENTS

1 : 3,714,821
3,714,833
3,714,889
3,715,246
3,715,399
3,715,414
3,715,693
3,715,723
3 : 3,715,204
4 : 3,714,699
3,715,128
3,715,423
3,715,562
3,715,617
6 : Re.27,574
3,714,672
3,714,695
3,714,697
3,714,704
3,714,707
3,714,723
3,714,748
3,714,749
3,714,765
3,714,766
3,714,777
3,714,785
3,714,786
3,714,790
3,714,792
3,714,809
3,714,816
3,714,817
3,714,829
3,714,830
3,714,852
3,714,866
3,714,886
3,714,887
3,714,895
3,714,897
3,714,899
3,714,900
3,714,907
3,714,915
3,714,942
3,714,965
3,714,974
3,714,981
3,714,995
3,715,008

3,715,009
3,715,015
3,715,024
3,715,026
3,715,030
3,715,035
3,715,043
3,715,071
3,715,078
3,715,079
3,715,084
3,715,087
3,715,089
3,715,091
3,715,093
3,715,107
3,715,110
3,715,113
3,715,122
3,715,125
3,715,134
3,715,148
3,715,152
3,715,156
3,715,158
3,715,164
3,715,195
3,715,222
3,715,225
3,715,227
3,715,268
3,715,274
3,715,287
3,715,297
3,715,299
3,715,301
3,715,335
3,715,355
3,715,363
3,715,368
3,715,398
3,715,442
3,715,472
3,715,474
3,715,480
3,715,481
3,715,509
3,715,549
3,715,555
3,715,572
3,715,574

3,715,593
3,715,595
3,715,600
3,715,613
3,715,615
3,715,625
3,715,627
3,715,641
3,715,652
3,715,662
3,715,674
3,715,712
3,715,731
3,715,735
3,715,736
3,715,738
3,715,749
3,715,753
3,715,754
3,715,756
3,715,758
3,715,760
8 : 3,714,783
3,715,045
3,715,155
3,715,194
3,715,239
3,715,660
9 : 3,714,668
3,714,689
3,714,706
3,714,710
3,714,711
3,714,714
3,714,773
3,714,775
3,714,779
3,714,789
3,714,916
3,714,920
3,714,947
3,714,950
3,714,977
3,715,034
3,715,159
3,715,168
3,715,215
3,715,238
3,715,275
3,715,292
3,715,305

3,715,356
3,715,465
3,715,560
3,715,653
3,715,682
10 : 3,715,018
3,715,371
12 : 3,714,726
3,714,739
3,714,768
3,714,802
3,714,914
3,714,918
3,715,103
3,715,119
3,715,138
3,715,295
3,715,430
3,715,434
3,715,502
3,715,616
3,715,624
3,715,716
13 : 3,714,682
3,714,732
3,714,894
3,714,949
3,714,966
3,715,029
3,715,062
3,715,281
3,715,696
14 : 3,715,379
16 : 3,715,129
3,715,141
3,715,257
3,715,318
17 : Re.27,571
3,714,669
3,714,679
3,714,708
3,714,744
3,714,753
3,714,755
3,714,791
3,714,835
3,714,842
3,714,846
3,714,854
3,714,856
3,714,857

3,714,893
3,714,905
3,714,908
3,714,909
3,714,935
3,714,936
3,714,937
3,714,948
3,714,967
3,714,968
3,714,976
3,714,990
3,714,991
3,715,020
3,715,051
3,715,052
3,715,054
3,715,081
3,715,094
3,715,149
3,715,161
3,715,172
3,715,191
3,715,233
3,715,303
3,715,312
3,715,331
3,715,349
3,715,352
3,715,409
3,715,426
3,715,427
3,715,428
3,715,445
3,715,449
3,715,463
3,715,484
3,715,524
3,715,544
3,715,545
3,715,604
3,715,605
3,715,608
3,715,630
3,715,657
3,715,704
3,715,725
3,715,742
18 : 3,714,709
3,714,734
3,714,794

3,714,845
3,714,849
3,714,925
3,714,956
3,715,032
3,715,142
3,715,143
3,715,188
3,715,345
3,715,347
3,715,362
3,715,367
3,715,458
3,715,464
3,715,492
3,715,493
19 : Re.27,573
Re.27,581
3,714,718
3,714,725
3,714,767
3,714,818
3,714,910
3,714,999
3,715,133
20 : 3,715,000
3,715,720
21 : Re.27,578
3,715,578
22 : 3,714,674
3,714,729
3,714,788
3,714,957
3,715,459
24 : 3,714,824
3,714,896
3,714,917
3,714,955
3,715,011
3,715,038
3,715,092
3,715,123
3,715,189
3,715,231
3,715,241
3,715,254
3,715,280
3,715,298
3,715,508
3,715,565
3,715,654

3,715,663
3,715,689
3,715,692
3,715,708
3,715,748
3,715,750
25 : Re.27,580
3,714,701
3,714,715
3,714,721
3,714,722
3,714,741
3,714,756
3,714,819
3,714,858
3,714,879
3,714,892
3,714,939
3,714,952
3,714,988
3,714,994
3,714,996
3,715,059
3,715,065
3,715,077
3,715,098
3,715,157
3,715,232
3,715,259
3,715,260
3,715,324
3,715,432
3,715,444
3,715,520
3,715,525
3,715,539
3,715,551
3,715,558
3,715,594
3,715,620
3,715,626
3,715,667
3,715,683
3,715,691
3,715,711
3,715,713
3,715,727
3,715,743
3,715,745
3,715,751
26 : 3,714,670
3,714,696
3,714,717
3,714,724
3,714,751
3,714,836
3,714,843
3,714,851
3,714,860
3,714,870
3,714,890
3,714,930
3,714,932
3,714,940
3,714,964
3,715,004
3,715,005
3,715,006
3,715,017
3,715,021
3,715,031
3,715,049
3,715,095
3,715,108
3,715,114
3,715,139
3,715,145
3,715,171
3,715,197
3,715,256
3,715,288
3,715,308
3,715,336
3,715,346
3,715,387
3,715,402

3,715,460
3,715,530
3,715,577
3,715,583
3,715,607
3,715,634
3,715,644
27 : 3,714,688
3,714,693
3,714,913
3,715,162
3,715,307
3,715,337
3,715,343
3,715,359
3,715,540
3,715,702
3,715,722
3,715,737
3,715,740
3,715,747
29 : 3,714,705
3,714,733
3,714,938
3,714,973
3,715,012
3,715,053
3,715,173
3,715,229
3,715,300
3,715,537
3,715,570
3,715,717
31 : 3,714,735
33 : 3,715,726
34 : Re.27,569
Re.27,572
Re.27,582
3,714,678
3,714,684
3,714,731
3,714,757
3,714,795
3,714,823
3,714,837
3,714,868
3,714,881
3,714,912
3,714,922
3,714,927
3,714,954
3,714,972
3,715,016
3,715,033
3,715,036
3,715,037
3,715,050
3,715,124
3,715,131
3,715,160
3,715,177
3,715,178
3,715,212
3,715,230
3,715,248
3,715,249
3,715,286
3,715,333
3,715,340
3,715,348
3,715,353
3,715,358
3,715,361
3,715,364
3,715,366
3,715,372
3,715,373
3,715,375
3,715,380
3,715,382
3,715,385
3,715,386
3,715,395
3,715,397
3,715,400
3,715,413

3,715,433
3,715,450
3,715,461
3,715,477
3,715,483
3,715,485
3,715,486
3,715,489
3,715,498
3,715,499
3,715,500
3,715,505
3,715,512
3,715,518
3,715,521
3,715,546
3,715,586
3,715,603
3,715,638
3,715,642
3,715,664
3,715,665
3,715,666
3,715,670
3,715,676
3,715,678
3,715,679
3,715,680
3,715,685
3,715,686
3,715,688
3,715,690
3,715,705
3,715,709
3,715,732
3,715,733
3,715,734
3,715,755
35 : 3,714,671
3,714,703
3,715,535
36 : 3,714,680
3,714,713
3,714,738
3,714,742
3,714,750
3,714,761
3,714,793
3,714,803
3,714,804
3,714,834
3,714,839
3,714,864
3,714,871
3,714,873
3,714,875
3,714,876
3,714,946
3,714,970
3,715,003
3,715,028
3,715,040
3,715,067
3,715,088
3,715,090
3,715,097
3,715,104
3,715,117
3,715,120
3,715,140
3,715,150
3,715,163
3,715,187
3,715,196
3,715,207
3,715,208
3,715,209
3,715,214
3,715,221
3,715,224
3,715,234
3,715,244
3,715,245
3,715,258
3,715,289
3,715,296
3,715,323

3,715,329
3,715,334
3,715,351
3,715,354
3,715,370
3,715,377
3,715,381
3,715,388
3,715,389
3,715,396
3,715,401
3,715,407
3,715,425
3,715,435
3,715,437
3,715,446
3,715,452
3,715,487
3,715,494
3,715,501
3,715,503
3,715,510
3,715,511
3,715,513
3,715,541
3,715,550
3,715,563
3,715,571
3,715,573
3,715,579
3,715,585
3,715,610
3,715,614
3,715,618
3,715,632
3,715,635
3,715,639
3,715,669
3,715,671
3,715,687
3,715,699
3,715,706
3,715,710
3,715,729
3,715,757
3,715,759
3,715,761
3,715,762
37 : 3,714,676
3,714,685
3,715,418
3,715,419
3,715,496
3,715,619
39 : 3,714,694
3,714,743
3,714,745
3,714,760
3,714,772
3,714,778
3,714,780
3,714,787
3,714,869
3,714,891
3,714,928
3,714,943
3,714,958
3,714,959
3,714,969
3,714,980
3,714,998
3,715,010
3,715,013
3,715,023
3,715,042
3,715,061
3,715,099
3,715,166
3,715,170
3,715,174
3,715,175
3,715,183
3,715,186
3,715,198
3,715,211
3,715,219

3,715,226
3,715,311
3,715,314
3,715,341
3,715,454
3,715,504
3,715,526
3,715,529
3,715,556
3,715,636
3,715,646
3,715,648
3,715,659
3,715,697
3,715,707
3,715,752
40 : Re.27,570
3,714,673
3,714,971
3,715,055
3,715,109
3,715,181
3,715,410
41 : 3,714,736
3,714,859
3,714,885
3,715,118
3,715,137
3,715,182
3,715,596
3,715,609
42 : 3,714,712
3,714,728
3,714,747
3,714,752
3,714,782
3,714,796
3,714,801
3,714,805
3,714,806
3,714,828
3,714,867
3,714,903
3,714,923
3,714,944
3,714,982
3,714,989
3,715,002
3,715,083
3,715,115
3,715,121
3,715,176
3,715,185
3,715,201
3,715,217
3,715,218
3,715,220
3,715,223
3,715,237
3,715,247
3,715,250
3,715,262
3,715,294
3,715,302
3,715,313
3,715,328
3,715,406
3,715,439
3,715,543
3,715,559
3,715,576
3,715,592
3,715,629
3,715,649
3,715,668
3,715,672
3,715,698
3,715,700
3,715,741
44 : 3,715,069
45 : 3,714,754
3,714,901
3,715,416
47 : 3,714,702
3,714,799
3,715,064

3,715,255
3,715,316
3,715,317
48 : Re.27,579
3,714,719
3,714,730
3,714,811
3,714,813
3,714,825
3,714,832
3,714,945
3,714,979
3,714,983
3,714,984
3,714,985
3,714,992
3,714,993
3,715,007
3,715,066
3,715,072
3,715,169
3,715,251
3,715,266
3,715,284
3,715,320
3,715,365
3,715,390
3,715,391
3,715,408
3,715,441
3,715,497
3,715,519
3,715,569
3,715,655
3,715,715
3,715,730
49 : 3,714,740
3,715,100
3,715,470
3,715,533
3,715,628
50 : 3,714,898
3,715,193
3,715,415
51 : 3,714,720
3,714,746
3,714,758
3,714,827
3,715,096
3,715,339
3,715,438
3,715,467
3,715,479
3,715,514
3,715,598
3,715,714
53 : Re.27,577
3,714,716
3,714,820
3,714,953
3,715,265
3,715,306
3,715,568
3,715,718
54 : 3,714,690
3,715,253
3,715,293
3,715,342
3,715,455
55 : 3,714,675
3,714,692
3,714,759
3,714,764
3,714,838
3,714,911
3,714,951
3,715,001
3,715,044
3,715,132
3,715,240
3,715,374
3,715,534
3,715,566
3,715,587
3,715,588
3,715,650

DESIGN PATENTS

5 : 226,264
6 : 226,251
226,256
226,271
226,276
226,278

226,294
8 : 226,279
226,290
12 : 226,268
226,287
226,291

13 : 226,275
17 : 226,254
226,258
226,289
25 : 226,252
226,253

226,263
26 : 226,266
27 : 226,284
226,285
29 : 226,257
34 : 226,274

226,277
226,286
36 : 226,292
37 : 226,259
42 : 226,261

226,265
48 : 226,269
226,280
49 : 226,262
53 : 226,281

PLANT PATENTS

6 :	3,297		3,298	17 :	3,300	25 :	3,301	39 :	3,299	

U. S. GOVERNMENT PRINTING OFFICE : O - 1973

OFFICIAL GAZETTE of the UNITED STATES PATENT OFFICE

February 13, 1973 Volume 907 Number 2

CONTENTS

Page

Patents and Trademark Notices

Meeting of the Public Advisory Committee for Trademark Affairs 294
Patent Suits 294

Patent Notices

Patents Available for Licensing or Sale 296
Certificates of Correction for the Week of February 13, 1973 297
Condition of Patent Applications 298
Plant Patents Granted 299

Patents Granted

General and Mechanical 300
Chemical 449
Electrical 507
Design Patents Granted 568
Index of Patentees . . . . PI 1
Indices of Plants and Designs . . . . PI 35

Classification of

Patents . . . . PI 37
Designs and Plants . . . . PI 39

Geographical Index of Residence of Inventors

Patents . . . . PI 40
Designs and Plants . . . . PI 41

The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

THE OFFICIAL GAZETTE (PATENTS SECTION), issued weekly, subscription $89.00 per annum, foreign mailing $22.25 additional; single copies $2.00 each.

THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly, subscription $17.00 per annum, foreign mailing $4.25 additional; single copies 40 cents each.

CIRCULARS OF GENERAL INFORMATION concerning PATENTS or TRADEMARKS, price 15 cents each.

PRINTED COPIES OF PATENTS are furnished by the Patent Office at 50 cents each; PLANT PATENTS in color, $1.00 each; copies of TRADEMARKS and DESIGN PATENTS at 20 cents each. Address orders to the Commissioner of Patents, Washington, D.C., 20231.

Printing authorized by Section 11(a)3 of Title 35, U.S. Code P.O.

PATENT OFFICE NOTICES

Meeting of the Public Advisory Committee for Trademark Affairs

The Public Advisory Committee for Trademark Affairs was established by the Secretary of Commerce to advise the Patent Office of the Department of Commerce on steps which can be taken in order to increase the efficiency and effectiveness of the administration of the Trademark Act and to provide a continuing source of knowledge from the private sector to the Government in the trademark field.

The next meeting of the committee will be held on February 22nd and 23rd, 1973, at the Cherry Hill Inn, Cherry Hill, New Jersey, beginning at 9 : 00 a.m. each day in the Currier and Ives Room.

The following agenda is to be considered :

1. Review of pending Advisory Committee projects ;
2. Report and discussion of the implementation of previous Advisory Committee recommendations of a recently completed study relating to trademark application processing and record keeping ;
3. Report and discussion of the status of the Trademark Operations ;
4. Discussion of the use of forms in the Trademark Operations ; and
5. Discussion of working hours in the Trademark Operations.

The membership of the Advisory Committee consists of nine members of the Patent Office-Trademark Affairs Committee of the United States Trademark Association.

Meetings of the Advisory Committee are open to the public. Public attendance depending on available space, may be limited to those persons who have notified the Advisory Committee Management Officer in writing, at least five days prior to the meeting, of their intentions to attend the February 22–23 meeting.

Any member of the public may file a written statement with the Committee before, during, or after the meeting, and to the extent that time for the meeting permits the Committee Chairman may allow public presentation of oral statements at the meeting.

All communications regarding this Advisory Committee should be addressed to Mr. Rene D. Tegtmeyer, Advisory Committee Management Officer for Trademark Affairs, Room 3–11D27, U.S. Patent Office, Washington, D.C. 20231.

ROBERT GOTTSCHALK,
Jan. 16, 1973. *Commissioner of Patents.*

Patent Suits

Notices under 35 U.S.C. 290 ; Patent Act of 1952

2,690,610, Begle and Gaudreau, MILLING CUTTER ; **3,273,222**, J. H. Begle, CUTTING TOOL AND METHOD ; **3,487,535**, same, METHOD OF ASSEMBLING AND MAINTAINING CUTTING TOOL, filed Aug. 16, 1972, D.C., E.D. Mich. (Detroit), Doc. 38759, *Kysor Industrial Corp.* v. *Supreme Tri-Bit Co.*

2,880,309, Gallagher and Pelino, HOT-BOX DETECTOR, filed May 7, 1959, D.C., S.D.N.Y., Doc. C–146–39, *Barnes Engineering Company* v. *Servo Corp. of America.* Filed order of discontinuance, Aug. 17, 1972.

2,954,621, Mosher, Goldammer and Long, ADJUSTABLE BRACELET FOR IDENTIFICATION PURPOSES ; **3,059,259**, same, BRACELET FOR IDENTIFICATION PURPOSES, filed Aug. 21, 1972, D.C., M.D. Tenn. (Nashville), Doc. C–6704, *Precision Dynamics Corporation* v. *Robert Englert, individually and doing business as Englert Sales Co.*

3,059,259. (See 2,954,621.)

3,106,112, M. Fisher, TOILET TANK COVER SET, filed Aug. 12, 1968, D.C., S.D.N.Y., Doc. 68–C–3249, *Perfect Mfg., Inc.* v. *Glen Mfg., Inc.* Stipulation and order of discontinuance pursuant to Rule 41a. Aug. 14, 1972.

3,185,207, D. R. Humble, DECORATION STRUCTURE, filed Aug. 16, 1972, D.C., C.D. Calif. (Los Angeles), Doc. 72–1901–AAH, *Soundfold, Inc.* v. *Eastern Carpet Co., Inc.*

3,202,299, M. A. Decuir, MOBILE GUY DERRICK AND COUNTER BALANCING CRANE, filed Aug. 23, 1972, D.C., E.D. Wis. (Milwaukee), Doc. 72–C–474, *American Hoist & Derrick Co.* v. *T. S. DeCuir.*

3,211,335, J. J. Shapiro, LIQUID DISPENSING DEVICE, filed Aug. 15, 1972, D.C., N.D. Calif. (San Francisco), Doc. 72–1482ACW, *Labindustries* v. *L.S.T. Electronics, Inc.*

3,236,390, H. F. J. Sprengel, SHIP'S CARGO BOOM WITH PENDULUM PURCHASE BLOCK FITTING, filed Aug. 16, 1972, D.C., E.D. Pa. (Philadelphia), Doc. 72–1625, *Blohm & Voss AG and MacGregor-Comarain, Inc.* v. *Sun Shipbuilding and Dry Dock Company.*

3,273,222. (See 2,690,610.)

3,296,147, E. M. Gatza, CLEANER FOR FOOD RESIDUES, filed June 19, 1967, D.C., S.D. Ga. (Atlanta), Doc. 11026, *The Dow Chemical Company* v. *Jack Ferrell, individually and doing business as J. & D. Landfill Company, J. P. Bone, individually and doing business as Bone Sales Company, Ed Hill and Gene Forsyth.* Decision that defendant Donald Manning surrender to counsel for plaintiff all "Blue Label" Dow Oven Cleaner now in his possession for destruction by plaintiff enjoined defendant, Aug. 20, 1969.

3,315,320, Bass and Horvat, PNEUMATIC CLEANING MEANS FOR CARDING MACHINES, filed Aug. 15, 1972, D.C., W.D.N.C. (Charlotte), Doc. C–C–72–180, *Jenkins Metal Shops, Inc.* v. *Pneumafil Corporation.*

3,315,339, D. W. Young, TOOL FOR MOUNTING OR DEMOUNTING AUTOMOTIVE VALVE ASSEMBLIES, filed Aug. 18, 1972, D.C., N.D. Ohio (Cleveland), Doc. C72–871, *David M. Young* v. *Joseph J. Sosnoski et al.*

3,319,384, E. T. Berg, CONSTRUCTION FOR EXTRUDED REGLETS, filed Aug. 18, 1972, D.C., N.D. Ohio (Cleveland), Doc. C72–874, *Edward T. Gerg and Superior Concrete Accessories, Inc.* v. *Vari-Seal Corporation.*

3,376,388, M. G. Reiffin, DIRECT-CURRENT-COUPLED TRANSISTOR POWER AMPLIFIERS ; **3,495,181(*a*)**, same, TRANSISTOR POWER AMPLIFIER WITH PROTECTIVE CIRCUITRY, filed July 24, 1972, D.C., N.D. Ill. (Chicago), Doc. 72c1812, *Martin G. Reiffin* v. *Heathkit Electronic Center, Heath Co. & Schlumberger Limited.* Cause dismissed by notice of voluntary dismissal under Rule 41(a) filed by plaintiff, Aug. 2, 1972.

3,400,461, T. L. Faul, CARRIAGE-TYPE DRAWING APPARATUS, filed Aug. 16, 1972, D.C., S.D.N.Y., Doc. 72–C–3494, *Firma Albert Nestler, Ag.* v. *Keuffel & Esser Co.*

3,487,535. (See 2,690,610.)

3,488,868, Gutowski, Kuchta and West, MEASURING TOOL ; **D. 213,643**, same, MEASURING TOOL FOR CARPENTRY AND THE LIKE, filed May 4, 1972, D.C., E.D.N.Y. (Brooklyn), Doc. 72C438, *Stanley Works* v. *Oswall Tool Co., Ltd.* Consent judgment, Aug. 17, 1972.

3,495,181(*a*). (See 3,376,388.)

3,495,181(*b*), M. G. Reiffin, TRANSISTOR POWER AMPLIFIER WITH PROTECTIVE CIRCUITRY, filed July 26, 1972, D.C., N.D. Ill. (Chicago), Doc. 72c1843, *Martin G. Reiffin* v. *Heath Company et al.*

3,496,911, A. Chmelar, ELECTROSTATIC FLOCKING ; **3,551,178**, same, METHOD AND APPARATUS FOR ELECTROSTATIC FLOCKING, filed Feb. 16, 1972, D.C., N.D. Ga. (Atlanta), Doc. 16204, *Velvetex Industrial Corporation* v. *Evershine Products, Inc.* Same, filed Feb. 16, 1972, D.C., N.D. Ga. (Atlanta), Doc. 16205, *Velvetex Industrial Corporation* v. *Universal Textures, Inc.*

3,510,004, J. Hoeltzenbein, ARTIFICIAL KIDNEY, filed Aug. 17, 1972, D.C. Del. (Wilmington), Doc. 4450, *Extracorporeal Medical Specialties, Inc.* v. *Baxter Laboratories Inc.*

3,551,178. (See 3,496,911.)

3,632,879(*a*), R. Freisinger, AUTOMATIC TELEPHONE DIALER FOR EMERGENCY MESSAGES, filed Mar. 3, 1972. D.C., E.D.N.Y. (Brooklyn), Doc. 72C404, *Napco Security Systems, Inc.* v. *Atlantic Metal Products, Inc.* Case transferred to the District Court of the District of New Jersey.

3,632,879(*b*), R. Freisinger, AUTOMATIC TELEPHONE DIALER FOR EMERGENCY MESSAGES, filed Aug. 15, 1972, D.C.N.J. (Newark), Doc. 1399–72, *Napco Security Systems, Inc.* v. *Atlantic Metal Products, Inc.*

D. 213,643. (See 3,488,868.)

Patents Available for Licensing or Sale

3,325,420. TRITIUM - ACTIVATED LUMINOUS PIGMENTS. Karl Schempp, Stuttgart, Germany. Correspondence to: M. S. Striker, 360 Lexington Ave., New York, N.Y., 10017.

3,465,373. HOSPITAL BED. Harriet A. Wilson, 115 Hilltop Road, Waverly, Pa., 18471.

3,526,202. EMERGENCY SIGNAL ASSEMBLY. Hubert & Peter Graulich, 6801 Brighton Place, Coral Gables, Fla., 33133.

3,662,993. PROTECTIVE GUARD FIXTURE. Anthony Lionetto, 19 Hillcrest Ave., Fort Lee, N.J., 07024.

3,670,366. AUTOMATIC STRIPPING MACHINE FOR ABACA AND ALLIED FIBER BEARING PLANTS. Juan T. Villanueva et al., Philippines. Correspondence to: Michael S. Striker, 360 Lexington Ave., New York, N.Y., 10017.

3,692,265. CORNER MOUNTABLE BRACKETS. Forrest C. Barriger, P.O. Box 2626, Fresno, Calif., 93745.

3,697,198. ATTACHMENT FOR CHARCOAL BURNING UNIT. David A. Holder, Jr., 8303 Donoghue Drive, Hyattsville, Md., 20784.

3,698,719. RING PUZZLE WITH QUICK RESTORATION MEANS. Louis M. Winslow, Rural Route 2, Belle Plane, Iowa, 52208.

Hazeltine Research, Inc., offers to grant non-exclusive licenses on reasonable terms and conditions under the following patent.

Inquiries and requests for licenses should be addressed to: Hazeltine Research, Inc., 5445 West Diversey Ave., Chicago, Ill., 60639. Attention: Mr. S. P. Ronzheimer, President.

3,316,349. IMAGE ORTHICON BEAM CONTROL SYSTEM FOR AUTOMATICALLY OPTIMIZING SIGNAL-TO-NOISE RATIO OF THE VIDEO OUTPUT.

General Motors Corporation is prepared to grant non-exclusive license under the following patent upon reasonable terms.

Applications for license may be addressed to the: Director, Patent Section, General Motors Building, 3044 W. Grand Blvd., Detroit, Mich., 48202.

3,535,585. SAFETY LAMP CIRCUIT FOR SERIALLY CONNECTED VEHICLE LAMPS.

The General Tire & Rubber Company is prepared to grant non-exclusive licenses at reasonable royalty rates under the following patent.

Inquiries respecting licenses should be addressed to: General Tire & Rubber Co., 1 General St., Akron, Ohio, 44309.

3,574,149. FLAME RETARDANT FLEXIBLE POLYURETHANE FOAMS.

Eastman Kodak Company announces that, in accordance with its policy, nonexclusive licenses upon reasonable terms are available to responsible applicants under the following U.S. Patent.

This offer is consistent with the present practice of Eastman Kodak Company generally to grant nonexclusive licenses under unexpired U.S. patents on photographic inventions issued to Kodak prior to 1968 and on inventions made in the course of research or development work for the U.S. Government.

Inquiries regarding the availability of such licenses may be addressed to Director, Patent Department, Eastman Kodak Company, 343 State St., Rochester, N.Y., 14650.

3,295,428. PHOTOGRAPHIC APERTURE REGULATING DEVICE.

The RCA Corporation offers to grant non-exclusive licenses on reasonable terms and conditions under the following 29 patents.

Inquiries respecting licenses should be addressed to: RCA Corportion, Staff Vice President, Domestic Licensing, 1133 Avenue of the Americas, New York, N.Y., 10036.

3,702,446. VOLTAGE-CONTROLLED OSCILLATOR USING COMPLEMENTARY SYMMETRY MOSFET DEVICES.

3,702,725. DECODING OF COLOR-ENCODED PHASE GRATING.

3,702,786. MOS TRANSISTOR WITH ALUMINUM OXIDE GATE DIELECTRIC.

3,702,941. ZERO CROSSING POINT SWITCHING CIRCUIT.

3,702,943. FIELD-EFFECT TRANSISTOR CIRCUIT FOR DETECTING CHANGES IN VOLTAGE LEVEL.

3,702,971. BROADBAND MICROWAVE APPARATUS USING MULTIPLE AVALANCHE DIODES OPERATING IN THE ANOMALOUS MODE.

3,702,990. VARIABLE THRESHOLD MEMORY SYSTEM USING MINIMUM AMPLITUDE SIGNALS.

3,703,329. LIQUID CRYSTAL COLOR DISPLAY.

3,703,331. LIQUID CRYSTAL DISPLAY ELEMENT HAVING STORAGE.

3,703,332. LIGHT MODULATOR AND DISPLAY DEVICE.

3,703,401. METHOD FOR PREPARING THE VIEWING-SCREEN STRUCTURE OF A CATHODE-RAY TUBE.

3,703,407. RELIEF PHASE HOLOGRAMS.

3,703,667. SHAPED RISER ON SUBSTRATE STEP FOR PROMOTING METAL FILM CONTINUITY.

3,704,207. PROCESS FOR FORMING AN ISOLATED CIRCUIT PATTERN ON A CONDUCTIVE SUBSTRATE.

3,704,208. PROCESS FOR FORMING A CONDUCTIVE COATING ON A SUBSTRATE.

3,704,936. ACHROMATIC DEPTH-OF-FIELD CORRECTION FOR OFF-AXIS OPTICAL SYSTEM.

3,705,323. CATHODOCHROMIC SODALITE AND CATHODE RAY TUBE EMPLOYING SAME.

3,705,355. WIDE DYNAMIC RANGE PRODUCT DETECTOR.

3,706,014. SEMICONDUCTOR DEVICE.

3,706,016. MOTOR CONTROL CIRCUIT.

3,706,132. MAGNETIC TRANSDUCER FABRICATION TECHNIQUE.

3,706,558. PHOTOGRAPHIC METHOD FOR PRINTING VIEWING SCREEN STRUCTURE INCLUDING TREATMENT OF EXPOSED COATING BEFORE DEVELOPMENT.

3,706,845. METHOD OF IMPROVING THE GAMMA OF A CATHODOCHROMIC DISPLAY DEVICE.

3,706,861. APPARATUS FOR MOUNTING AND SPACING A SIGNAL TRANSDUCER WITH RESPECT TO A RECORDING MEDIUM.

3,706,880. MULTIPLE-PHASE LOGIC CIRCUITS.

3,707,254. AERIAL PHOTOGRAPHY.

3,707,597. VIDEO BLANKING AND AUDIO MUTING CIRCUIT.

3,707,603. FM STEREOPHONIC RECEIVER DETECTION APPARATUS AND DISABLING MEANS.

3,707,723. LIGHT BEAM SCANNING.

General Electric Company is prepared to grant non-exclusive licenses under the following 47 patents upon reasonable terms to domestic manufacturers.

Applications for license under the following 2 patents may be addressed to: General Electric Co., Division Patent Counsel, Housewares Business Div., 1285 Boston Ave., Bridgeport, Conn., 06602.

3,656,018. BRUSH HOLDER ASSEMBLY.

3,673,054. LAMINATED STRUCTURES AND METHOD.

Applications for license under the following 14 patents may be addressed to: Patent Counsel, Lamp Business Division, General Electric Co., Nela Park, Cleveland, Ohio, 44112.

3,191,406. PHOTOFLASH LAMP.

3,384,453. PROCESS FOR PREPARING HIGHLY CRYSTALLINE ALPHA STRONTIUM ACID PHOSPHATE.

3,385,656. METHOD OF PURIFYING ZINC AND CADMIUM CHALCOGENIDES.

3,416,019. ZINC SILICATE PHOSPHOR OF IMPROVED MAINTENANCE.

3,424,605. LAMP PHOSPHOR ADHERENCE.

3,424,606. LAMP PHOSPHOR ADHERENCE.

3,475,072. GETTER FOR INCANDESCENT LAMPS AND SIMILAR DEVICES.

3,475,342. RARE-EARTH OXIDE PHOSPHORS ACTIVATED WITH BISMUTH.

3,484,383. EUROPIUM-ACTIVATED STRONTIUM MAGNESIUM PYROPHOSPHATE PHOSPHORS.

3,506,385. PHOTOFLASH LAMP.

3,532,931. PHOTOFLASH ASSEMBLY FOR SEQUENTIALLY FLASHING LAMPS UTILIZING VOLTAGE AND CURRENT RESPONSIVE DEVICES.

3,535,267. ZINC ORTHOSILICATE PHOSPHOR OF IMPROVED MAINTENANCE AND ITS MANUFACTURE.

3,546,128. LANTHANUM AND GADOLINIUM OXYBROMIDE LUMINESCENT MATERIALS ACTIVATED WITH ERBIUM.

3,658,715. ANTIMONY-ACTIVATED CALCIUM HALOPHOSPHATE CONTAINING BORON.

Applications for license under the following 30 patents may be addressed to: General Electric Co., Building 43, Room 529, 100 Woodlawn Ave., Pittsfield, Mass., 01201.

2,847,541. DOUBLE BREAK LIQUID BLAST CONTACTOR.

2,942,216. ELECTRICAL APPARATUS AND ENCLOSURE THEREFOR.

2,958,016. IMPULSE GENERATING DEVICE FOR A WATTHOUR METER.

3,030,551. ELECTRICAL APPARATUS.

3,039,176. AUTOMATIC WORK PERFORMING METHOD & APPARATUS.

3,073,722. PROCESS FOR COATING FERROUS MATERIAL AND MATERIAL COATED BY SUCH PROCESS.

3,113,375. MECHANISM FOR SPACING SEPARATED LAMINATIONS OF A CUT CORE.

3,118,220. MECHANISM FOR SEPARATING CORE LAMINATIONS.

3,137,190. MAGNETIC PULL UP MACHINE FOR POSITIONING AND LINEAL MEASUREMENT OF MAGNETIC STRIP MATERIAL.

3,154,734. ELECTRICAL MASTER-SLAVE TAP CHANGING SYSTEM.

3,206,569. PROTECTIVE MEANS FOR TRANSFORMER TAP CHANGER.

3,206,580. FLUID IMMERSED TAP CHANGING SWITCHING SYSTEM FOR TRANSFORMERS.

3,211,576. PROCESS FOR COATING FERROUS MATERIAL AND MATERIAL COATED BY SUCH PROCESS.

3,211,577. PROCESS FOR COATING FERROUS MATERIAL WITH MAGNESIUM OXIDE.

3,213,223. INTERLOCKING MEANS FOR SERIES-MULTIPLE SWITCH AND TAP CHANGER IN DUAL RATED TRANSFORMER.

3,302,005. IMPULSE TOTALIZER USING SOLID STATE COMPONENTS.

3,327,373. METHOD OF MAKING PRE-FORMED SINGLE TURN MAGNETIC CORES.

3,344,229. CASING SEAL FOR BUS BARS.

3,348,067. SOLID STATE IMPULSE GENERATOR USING SILICON CONTROLLED RECTIFIERS FOR SWITCHING.

3,427,469. TIME DELAY CIRCUIT FOR REGULATOR CONTROL CIRCUIT.

3,482,198. PHOTOSENSITIVE DEVICE.

3,489,019. HERMETIC SEAL AND SHAFT ASSEMBLY.

3,489,924. PULSE COUNTER DRIVING CIRCUIT.

3,493,952. ELECTRIC CIRCUIT BREAKER W/CONTACT CONDITION INDICATOR.

3,518,544. FAULT DETECTION CIRCUIT FOR SHIELDED CABLE TERMINATION.

3,524,133. STATIC STATE VOLTAGE & CURRENT MONITORING DEVICE FOR ELECTRIC POWER CABLE TERMINATIONS.

3,530,723. METER HAVING METER COVER LINER.

3,532,963. COMPENSATING MEANS FOR UNBALANCE IN CASCADE TYPE INSTRUMENT POTENTIAL TRANSFORMERS.

3,532,964. LOAD COMPENSATED INSTRUMENT POTENTIAL TRANSFORMER OF IMPROVED ACCURACY.

3,699,491. FUSE HAVING VIBRATION DAMPING MEANS FOR PROTECTING THE FUSE LINK THEREOF.

Certificates of Correction for the Week of Feb. 13, 1973

3,503,446
3,566,352
3,578,511
3,586,768
3,608,117
3,609,120
3,624,122
3,624,546
3,629,618
3,639,859
3,647,836
3,649,059
3,655,071
3,658,807
3,663,635
3,666,198
3,673,180
3,674,526
3,678,403
3,678,405
3,678,605
3,679,664
3,680,390
3,681,125
3,682,238
3,682,377
3,682,585
3,682,794
3,683,781
3,683,973
3,684,297
3,684,329
3,684,436
3,684,888
3,685,268
3,685,279
3,685,401
3,685,867
3,686,020
3,686,117
3,687,046
3,687,311
3,687,461
3,687,521
3,687,639
3,687,663
3,687,963
3,688,007
3,688,016
3,688,134
3,688,154
3,688,202
3,688,302
3,688,497
3,688,553
3,688,966
3,689,148
3,689,289
3,689,637
3,689,654
3,689,955
3,690,096
3,690,398
3,690,422
3,690,576
3,690,577
3,690,824
3,690,851
3,690,917
3,690,941
3,691,017
3,691,107
3,691,145
3,691,320
3,691,330
3,691,832
3,692,074
3,692,098
3,692,146
3,692,255
3,692,276
3,692,350
3,692,617
3,692,847
3,692,850
3,692,880
3,693,017
3,693,079
3,693,124
3,693,484
3,693,530
3,693,532
3,693,652
3,693,685
3,693,707
3,693,715
3,693,818
3,693,950
3,693,969
3,693,996
3,694,053
3,694,145
3,694,246
3,694,298
3,694,382
3,694,410
3,694,562
3,694,658
3,694,770
3,694,812
3,694,844
3,694,865
3,694,891
3,694,979
3,695,072
3,695,124
3,695,137
3,695,139
3,695,198
3,695,225
3,695,487
3,695,516
3,695,698
3,695,745
3,696,488
3,696,507
3,696,518
3,696,639
3,697,086
3,697,151
3,697,237
3,697,348
3,697,761
3,697,925
3,698,225
3,698,305

PATENT EXAMINING CORPS

R. A. WAHL, Assistant Commissioner
WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF JANUARY 23, 1973

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—M, STERMAN, Director Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	10-19-71
GENERAL ORGANIC CHEMISTRY, GROUP 120—I. MARCUS, Director Heterocyclic; Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	12-10-71
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—L. J. BERCOVITZ, Director Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	8-12-71
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—A. P. KENT, Director Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	10-01-71
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—R. FRIEDMAN, Director Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	10-01-71
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—N. ANSHER, Director Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	5-31-72
SPECIAL LAWS ADMINISTRATION, GROUP 220—R. L. CAMPBELL, Director Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	1-21-72
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	4-03-72
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—L. FORMAN, Director Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	10-26-71
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—W. L. CARLSON, Director Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	12-27-71
DESIGNS, GROUP 290—R. L. CAMPBELL, Director Industrial Arts; Household, Personal and Fine Arts.	4-29-71
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—A. BERLIN, Director Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	3-01-72
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—D. J. STOCKING, Director Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus: Plastics Working Apparatus: Plastic Block and Earthenware Apparatus: Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	1-03-72
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—A. RUEGG, Director Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	2-01-72
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—M. M. NEWMAN, Director Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	3-06-72
MISCELLANEOUS CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—T. J. HICKEY, Director Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	10-18-71

Expiration of patents: The patents within the range of numbers indicated below expire during February 1973, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents	Numbers 2,733,439 to 2,736,897, inclusive
Plant Patents	Number 1,456

PLANT PATENTS

GRANTED FEBRUARY 13, 1973

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

3,302
ROSE PLANT
David L. Armstrong, Upland, Calif., assignor to Armstrong Nurseries, Inc., Ontario, Calif.
Filed Apr. 15, 1971, Ser. No. 134,514
Int. Cl. A01h *5/00*

U.S. Cl. Plt.—27 **1 Claim**

A floribunda rose of spreading and vigorous bushy growth, abundantly covered with medium-sized somewhat leathery and semi-glossy leaves, having peduncles of short to average length which are smooth except for numerous stipitate glands, the flower of said floribunda rose being characterized in that even from the opening of the bud the petals have pronounced apexes that are from acute to acuminate, seen especially on the outside and intermediate petals. The petalage of the freshly opened flower is double, comprising up to 45 petals and 10 to 14 petaloids in a bloom measuring more than 3 inches but less than 4 inches in diameter. The coloration of the flower is predominantly medium salmon-pink.

3,303
ROSE PLANT
David L. Armstrong, Upland, Calif., assignor to Armstrong Nurseries, Inc., Ontario, Calif.
Filed Apr. 15, 1971, Ser. No. 134,515
Int. Cl. A01h *5/00*

U.S. Cl. Plt.—21 **1 Claim**

A new variety of rose plant of the hybrid tea class, particularly vigorous, tall growing and much branched, with long stems and generally smooth peduncles sometimes offset at an angle at the point of attachment to the stem, each stem generally bearing a single flower, but sometimes carrying an irregular cluster of three to four or more. Foliaceous appendages extend beyond the tip of the bud before the calyx breaks to a distance almost equal to the length of the bud. The flowers are dark red in color, with as many as forty-five petals and sixteen petaloids, the bloom being up to six inches in diameter when fully open. Flower petals are medium thick, moderately leathery, and, on exposure to sun, do not show black spots which sun burn often produces on the outer petals of roses which are deep red in color. Flowers on the bush persist for four to five days in the garden and from five to seven days as cut blooms at living-room temperature, in the month of November, in Ontario, Calif.

3,304
SPUR-TYPE SOUR CHERRY TREE
Francis Warren Carnefix, Fruitland, Idaho 83619
Filed Apr. 19, 1971, Ser. No. 135,323
Int. Cl. A01h *5/03*

U.S. Cl. Plt.—37 **1 Claim**

A spur-type sour cherry tree is disclosed constituting a mutation of the standard Montmorency.

3,305
CARNATION
Vincent P. Quinn, 1235 S. Irving St., Denver, Colo. 80219
Filed June 21, 1971, Ser. No. 155,366
Int. Cl. A01h *5/00*

U.S. Cl. Plt.—70 **1 Claim**

1. The new and distinct variety of carnation plant, substantially as herein described and illustrated.

PATENTS

GRANTED FEBRUARY 13, 1973

GENERAL AND MECHANICAL

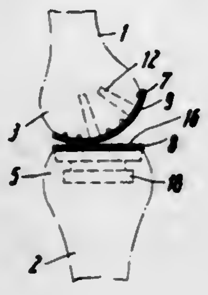
3,715,763
ARTIFICIAL LIMB FOR THE KNEE JOINT

Waldemar Link, 13 Fuhlsbuttler Str. 402-404, Hamburg, Germany

Filed April 21, 1971, Ser. No. 136,082

Int. Cl. A61f *1/24*

U.S. Cl. 3—1 **3 Claims**



An artificial limb particularly suitable for the knee joint of a human being consisting of at least two coacting inserts or implants, which are anchored to the end of the thigh bone and the shin bone. The insert on the thigh bone is a cup-shaped surface and the insert on the shin bone is formed like a block to provide a free supporting face for contact by the surface of the cup-shaped insert.

3,715,764
HIGH POROSITY MANGANESE OXIDE PELLETS

Vincent H. K. Chu, Bethlehem, Pa., assignor to Bethlehem Steel Corporation, Bethlehem, Pa.

Continuation-in-part of Ser. No. 871,599, Nov. 3, 1969, abandoned, which is a continuation of Ser. No. 642,182, May 29, 1967, abandoned. This application May 13, 1971, Ser. No. 143,201

Int. Cl. C01g *45/02*; **B01j** *11/06*

U.S. Cl. 423—49 **4 Claims**

Porous manganese oxide pellets in which a major portion of the manganese oxides is manganous oxide and the porosity of the pellets is not less than about 45%. Preferably, substantially all the manganese oxide in the pellets is manganous oxide and the porosity is about 60 percent. The porous manganese oxide pellets are between about one-fourth inch to about five-eighths inch in diameter. The pellets are useful as sulfur acceptors whereby they can be used to reduce the sulfur content of other materials such as coke pellets, iron ore pellets and the like.

3,715,765
DEODORIZER

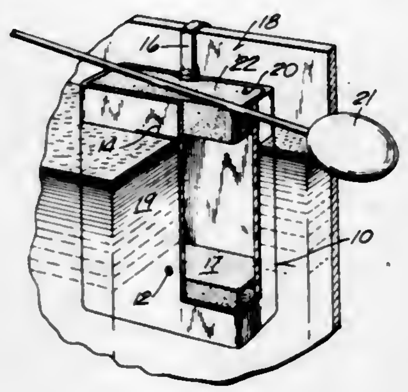
Frank G. Yadro, 7807 North 45th Street, Milwaukee, Wis.

Filed Nov. 4, 1970, Ser. No. 86,884

Int. Cl. E03d *9/02*

U.S. Cl. 4—228 **4 Claims**

Deodorant or perfume is dispensed from an absorbent material whenever a water closet is flushed. The absorbent material is over an air opening in a chamber which is filled with water after the water closet is flushed so that air is expelled through the absorbent material containing deodorant or the like and a small quantity is carried into the room air. The absorbent material may form the top of a chamber normally containing air and water or may be supported on a tray which forms the top. In some embodiments, the absorbent material is initially sealed with or enclosed by water soluble materials.



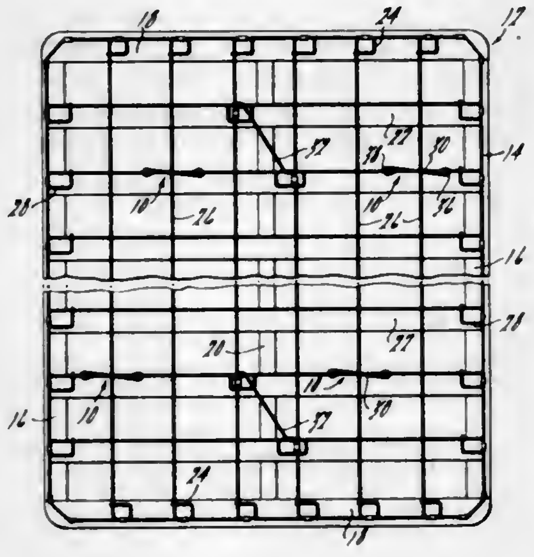
3,715,766
CONNECTOR AND STIFFENER MEMBER FOR INTERSECTING WIRES

Walter V. Slominski, Lexington, Ky., assignor to Hoover Bell and Bearing Company, Saline, Mich.

Filed Sept. 18, 1970, Ser. No. 73,299

Int. Cl. A47c *23/02*

U.S. Cl. 5—247 **9 Claims**



A connector and stiffener member for upper and lower intersecting wires consisting of a length of wire engaged intermediate its ends with the lower one of the intersecting wires substantially at the intersection of the upper and lower wires and having its ends hooked over the upper one of the intersecting wires at positions on opposite sides of the intersection. The connector and stiffener member is stressed so that the hook shape end portions apply downward forces to the upper one of the intersecting wires and an intermediate portion of the connector and stiffener member applies an upward force to the lower one of the intersecting wires at the intersection.

3,715,767
CONTROL MECHANISM FOR SHOE LASTING PINCERS

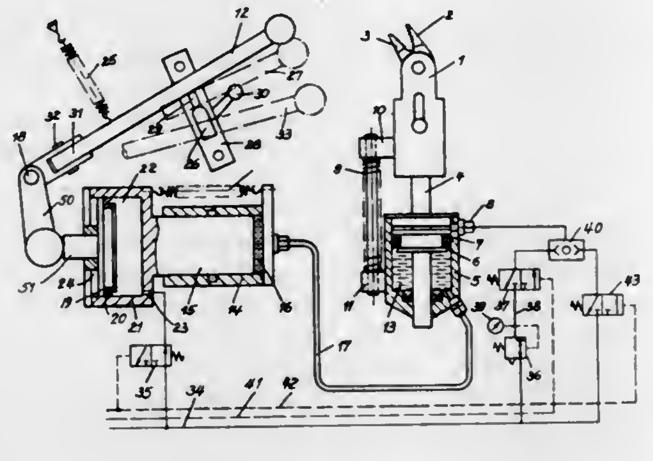
Anton Muhlbach, Frankfurt am Main-Sossenheim, and Rudi Fichtner, Ober Horgern, Germany, assignors to USM Corporation, Flemington, N.J.

Filed Apr. 29, 1971, Ser. No. 138,544

Claims priority, application Germany, Apr. 30, 1970, P 20 21 352.9

Int. Cl. A43d *23/00*

U.S. Cl. 12—14.5 **5 Claims**



A gripper actuating mechanism for shoe lasting machines including grippers movable to tension a shoe upper about a last, an adjusting lever connected through fluid means to follow the movement of the grippers and engageable with a stop to limit the gripper movement, said lever being disengageable from the stop so that movement of the lever causes an adjusting movement of the gripper.

3,715,768
SUPPORT FOR A SHOE LASTING MACHINE

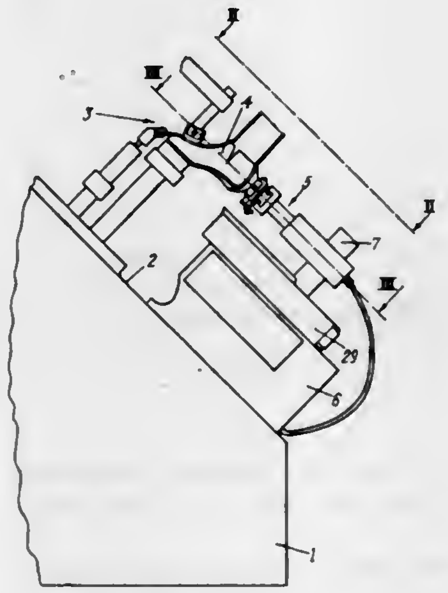
Gerhard Glebel, Neuenhain, Taunus, and Rudi Fichtner, Butzbach, Hessen, Germany, assignors to USM Corporation, Flemington, N.J.

Filed Sept. 8, 1971, Ser. No. 178,766

Claims priority, application Germany, Sept. 8, 1970, P 20 44 385.0

Int. Cl. A44d *3/00*

U.S. Cl. 12—125 **3 Claims**



A support engageable with the heel end of a shoe for support against lasting means, the support, on retraction, being moved bodily widthwise to permit the shoe to drop into a receptacle, and also being swung toward the shoe to deflect the shoe into the receptacle.

3,715,769
SLIDABLE MOBILE BRIDGE

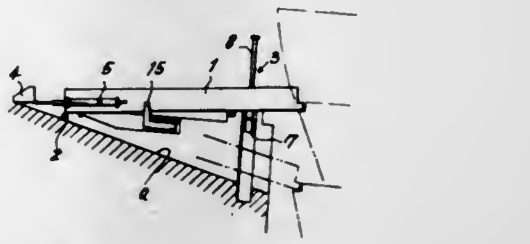
Kunio Mori, Shinagawa-ku, Tokyo, and Yoshio Shirage, Fujisawa-shi, Kanagawa-ken, both of Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed Sept. 21, 1970, Ser. No. 74,070

Claims priority, application Japan, Dec. 28, 1969, 44/105078

Int. Cl. E01d *15/10*

U.S. Cl. 14—71 **8 Claims**



A shiftable mobile bridge for use between a quay and a ship in which a rotatable roller is attached to an end of the main bridge gangway adjacent the quay. The roller can be moved horizontally or vertically by appropriate hydraulic or gravity devices, along an inclined quay face as the main bridge gangway is moved inwardly and outwardly from the quay in a generally horizontal direction. The outboard end of the gangway can also be moved vertically to accommodate differences in level between ship and shore.

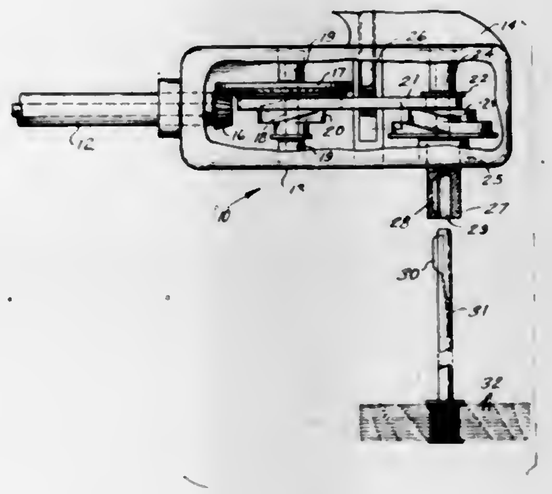
3,715,770
WASHING APPARATUS

Carlos F. Obregon-Gomez, 4231 S.W. 58th Ave., Miami, Fla.

Filed March 22, 1971, Ser. No. 126,655

Int. Cl. A46b *13/02*

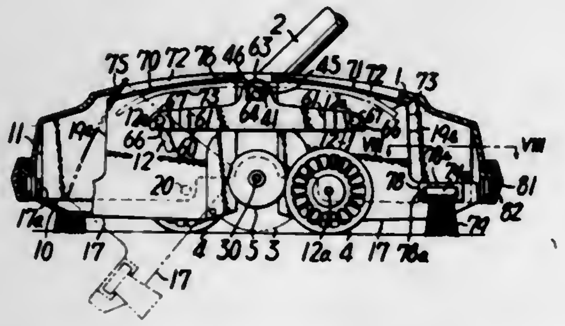
U.S. Cl. 15—23 **2 Claims**



A device for washing pots and pands and the like. The device includes a motor having a flexible cable for powering, mechanically, a handheld unit which receives various rotatable brushes.

3,715,771
CARPET SWEEPER WITH SWING COMB

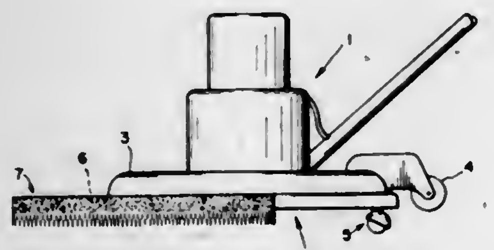
Hiroshi Fukuba, 2-32-82 Matsugaoka, Nagareyama, Japan
Division of Ser. No. 823,570, May 12, 1969. This application March 4, 1971, Ser. No. 121,011
Int. Cl. A47l ***11/33***
U.S. Cl. 15—48 **2 Claims**



A carpet sweeper to be moved back and forth by operating a handle is provided with a rotary cleaning brush adapted to be moved in contact with the floor by means of drive wheels on a sweeper body. The frame cover of the sweeper body is of a double wall structure made of a thin, lightweight synthetic resin plate. The sweeper body further comprises dust receptacles covering the under portion and positioned to the front and rear of the rotary brush, means for elevating the drive wheels and comb members to clean the rotary brush. The operating members for opening or closing the dust receptacles and for elevating means are disposed on the upper surface of the frame cover.

3,715,772
RECIPROCATING CORNER AND BASEBOARD CLEANING AUXILIARY ATTACHMENT FOR ROTARY FLOOR TREATMENT MACHINES

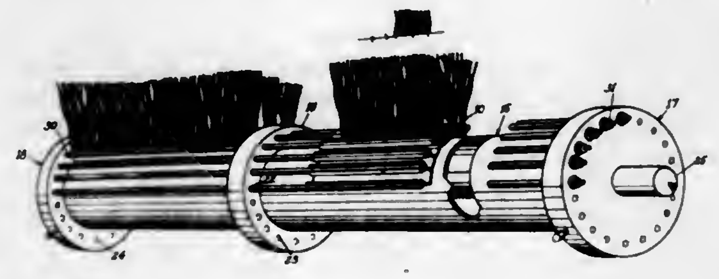
Gertrude E. Downing, 1531 K Street, S.E., Washington, D.C., and William P. Desjardin, 5549 Gary Avenue, Alexandria, Va.
Filed Aug. 31, 1971, Ser. No. 176,663
Int. Cl. A47l ***11/12***
U.S. Cl. 15—49 RB **12 Claims**



An auxiliary attachment is provided for rotary floor treatment machines of the type having a rotary driving element extending downwardly from a generally bell shaped housing for detachable coupling with a rotary type floor treating accessory, such as a rotary brush, rotary buffer, etc. The auxiliary attachment utilizes the rotary drive of the machine to effect a reciprocating action of a floor treating accessory, such as a brush, buffer, etc. The floor treating accessory of the attachment, which may be considered generally as a rubbing element, reciprocates in guides provided in the housing of the attachment. The rubbing element extends beyond the limits of the attachment housing, and preferably includes rubbing surfaces on its upright sides, such that it can also clean baseboards. The drive assembly for the attachment is journaled in the top surface of the attachment housing, and includes at its upper end an appropriate but conventional coupling member which is adapted to detachably couple with the rotary driving element of the machine. When coupled to a machine, the lower edge of the bell shaped housing of the machine abuts against the upper surface of the attachment housing, which preferably is provided with a rubber-like mat. The auxiliary attachment is adaptable for use with different models of rotary machines through the provision of spacer rings or the like for locating the coupling member of the attachment above the top surface of the attachment such that the coupling member will readily mate with and couple to the rotary drive element of the machine, with the lower edge of the bell shaped housing of the machine abutting the upper surface of the attachment housing. By using different spacer rings or different numbers of spacer rings, the attachment is readily adaptable for use with different machines whose rotary driving elements are located differently vertically in their bell shaped housings. The rubbing element of the attachment, viewed in plan, preferably is of wedge shape at its outer end so as to facilitate reciprocation into and out of a corner. The reciprocatory action preferably is effected through a crank and rod mechanism, or an eccentric and rod mechanism, or the like. The particular coupling element used on a particular attachment is selected to be appropriate for the driving element of the machine with which the attachment is to be used. The attachment imparts to a regular rotary machine the capability of a conventional reciprocatory or oscillatory machine, while avoiding the expense of two completely separate machines.

3,715,773
ROTARY SWEEPER BRUSH

Arthur E. Drumm, Route 1, Marysville, Ohio
Filed April 7, 1971, Ser. No. 132,086
Int. Cl. A46b
U.S. Cl. 15—183 **4 Claims**

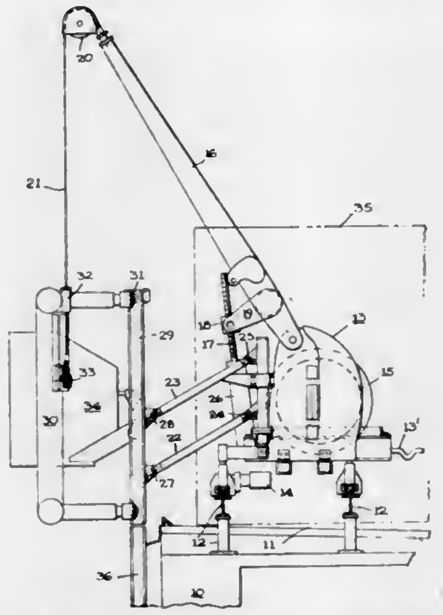


A rotary sweeper brush of the heavy duty type which comprises a central core having longitudinally extending bristle strips mounted thereon at angularly spaced internals therearound. The strips include longitudinal channels from which the bristles extend radially outwardly and which are held against the outer periphery of the core by means of longitudinally extending retaining rods extending between opposed axially spaced collars which may be relatively rotatable on the core. A retaining rod is disposed between each pair of channels of adjacent strips and engages these channels at outer longitudinally extending shoulders to clamp the channels against the periphery of the core.

3,715,774
AUTOMATIC WINDOW WASHER

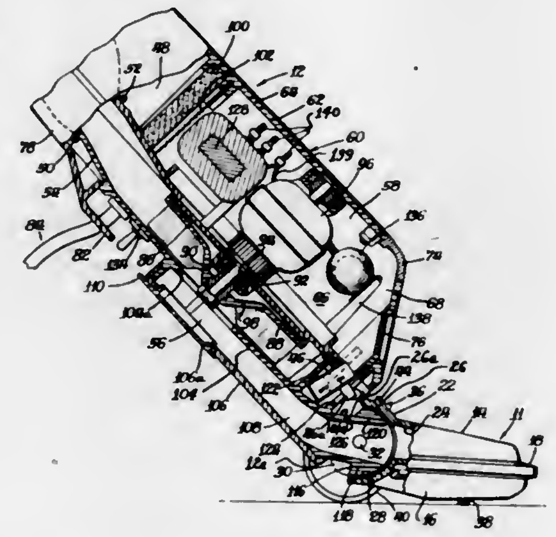
Robert D. Fannon, Jr., 3818 Braidwood Drive, Columbus, Ohio
Filed Jan. 20, 1971, Ser. No. 107,957
Int. Cl. A47l ***5/38***
U.S. Cl. 15—302 **17 Claims**

An automatic window washer has a module riding in tracks on the face of the building and is controlled from a unit mounted on the roof of the building. As the module moves down the face of the building the presence of areas to be washed is automatically sensed and the washing operations then automatically begun and terminated by equipment in the module. The module or modules may be mounted in a span frame for lateral movement therein for washing more than one vertical column of windows when the tracks on the face of the building are spaced apart by a plurality of columns of windows. The washing equipment in the module may take various forms for washing windows of curtain front buildings and for washing recessed windows.



3,715,775
VACUUM CLEANER

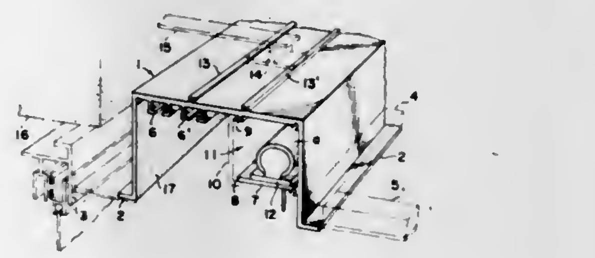
Robert W. Nickelson, Elk Grove Village, Ill., assignor to Sunbeam Corporation, Chicago, Ill.
Filed Nov. 30, 1970, Ser. No. 93,575
Int. Cl. A47l ***9/00, 9/28***
U.S. Cl. 15—410 **7 Claims**



An upright vacuum cleaner comprising floor engaging, suction nozzle means, elongated body means having a handle at the upper end and means pivotally interconnecting the lower end of said body means and said nozzle means. An electric motor driven air impeller and dust collection chamber are provided in the body means, and an electric circuit means, including a switch means, is provided for supplying electrical power to energize the motor. The switch means includes an operator actuated between on and off positions in response to the relative angular positions between the suction nozzle means on the floor and the body means, so that the motor is deenergized whenever the handle is raised to an upright, self-supporting position, and if the handle is pivoted downwardly the switch is closed to energize the motor.

3,715,776
CURTAIN BOX

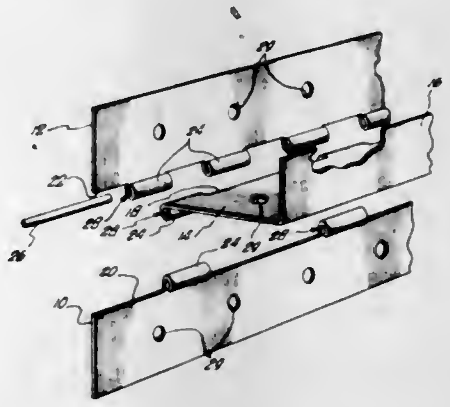
Masatoshi Tanaka, Tokyo, Japan, assignor to Mitsui & Co., Ltd., Tokyo, Japan
Filed Oct. 5, 1970, Ser. No. 77,861
Claims priority, application Japan, Oct. 16, 1969, 44/98,646, 44/98,647, 44/98,648
Int. Cl. A47h ***1/04***
U.S. Cl. 16—94 D **3 Claims**



A curtain box having integrally provided on its surface a curtain rail or rails and means for fitting the curtain box to a desired location, thereby facilitating the fitting of the box itself and also eliminating the necessity of attaching a separate curtain rail or rails to the box.

3,715,777
HEAVY DUTY HINGE

Lloyd G. Hallamore, Long Beach, Calif., assignor to Hallamore Homes, Inc., Fountain Valley, Calif.
Filed Feb. 25, 1971, Ser. No. 118,759
Int. Cl. E05d ***5/06***
U.S. Cl. 16—162 **7 Claims**

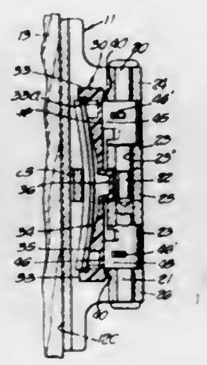


A hinge adapted to connect a pair of massive elements intended to be pivotally secured, one of which is operatively stationary, is disclosed. The hinge includes a pair of flat outer plates and a flanged middle plate sandwiched therebetween. The three plates are pivotally fastened to each other by a pin or shaft extending through interlaced curled sections formed along juxtaposed edges of the respective plates. One of the outer plates is mounted on the operatively stationary element while the other outer plate and the flanged plate are secured to the movable element.

3,715,778
SELF LATCHING HINGE

Harry C. Wilson, 15126 Rayneta Drive, Sherman Oaks, Calif.
Filed Nov. 18, 1970, Ser. No. 90,692
Int. Cl. E05f ***1/12***
U.S. Cl. 16—180 **33 Claims**

A self-latching hinge having leaf spring means mounted in a non-metallic retaining cage supported by a curl portion of a first hinge leaf with the opposite ends of the cage positioned in the path of lobes protruding from curl portions of the second hinge leaf. The cage is resilient and shaped to hold itself and the spring means in assembled position behind the hinge pin. The spring operates to resiliently latch the door or the like supported by the hinge resiliently in closed position. Spring energy released during the opening movement is dissipated gradually as the door opens thereby avoiding abrupt door movement. Tangs integral with one hinge leaf are effective to align the hinge axis accurately parallel to the edge of the door while the hinge is being mounted. The other hinge leaf incorporates self-clamping means for mounting the hinge on the door frame. A pair of hinge pins interfit with one another and with the curls with a press fit.



3,715,779

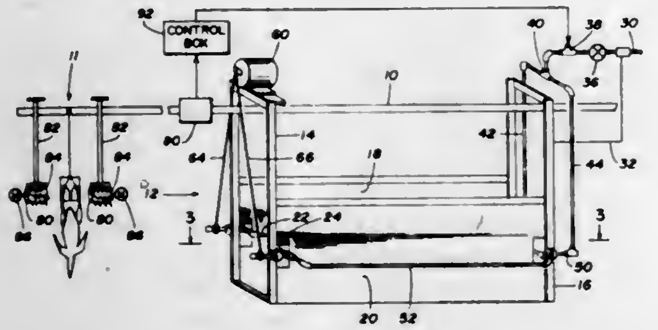
FOWL SINGEING SYSTEM UTILIZING OSCILLATING FLAMES

Bryan T. Snowden, Grapevine, Tex., assignor to Food Equipment Inc., Dallas, Tex.

Filed April 7, 1971, Ser. No. 131,999

Int. Cl. A22c *21/04*

U.S. Cl. 17—11 **7 Claims**



The specification discloses a system for singeing fowl transported by a shackle system. A housing is disposed in the path of travel of the shackle system and elongated pipes are horizontally disposed on opposite sides of the housing and positioned adjacent the middle region of the fowl transported through the housing. The pipes are connectable to a supply of gas and include gas nozzles spaced along the length of the pipes, whereby flames are emitted from the nozzles when the gas emanating therefrom is ignited. A motor rotates an eccentric crank mechanism to oscillate the pipes about predetermined arcs to direct singeing flames over substantially the entire bodies of the fowl being transported therepast. A shaking mechanism is disposed forward of the housing for shaking water from the fowl prior to singeing of the fowl.

3,715,780

APPARATUS FOR THE PROCESSING OF WOOL FIBRES

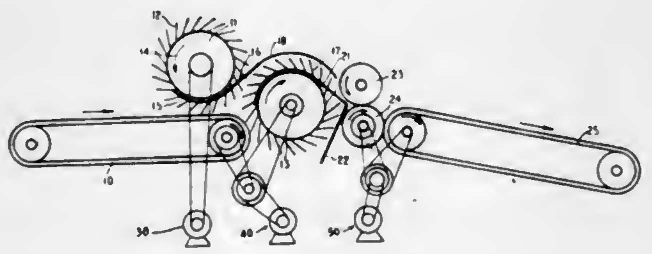
Malcolm Chaikin, 26 Martin Road, Centennial Park, New South Wales; Desmond Rokfalussy, 187 Carrington Road, Coogee, New South Wales, and Alexander Douglas Dircks, 18 Woolwich Street, Hunters Hill, New South Wales, all of Australia

Filed June 22, 1970, Ser. No. 48,420

Claims priority, application Australia, June 23, 1969, 56893/69

Int. Cl. D01g *19/10*

U.S. Cl. 19—128 **2 Claims**



Apparatus for the processing of textile fibers such as wool fibers to form a coherent and even layer of fibers at high velocity for further processing in which fibers are fed on a conveyor belt to a pinned cylinder, the pins of which have a negative inclination and which are forced by rotation of the cylinder into the layer of fibers picking it up from the conveyor and carrying it around. The fibers are then transferred to another pinned cylinder the pins of which also have a negative inclination and which rotates at a faster speed than the first pinned cylinder so that there is a drafting action between them, the fibers being completely stripped from the first pinned cylinder and transferred to the second either by means of a third pinned cylinder the pins of which pass between the pins of the other two or by means of a stripping plate partially encircling the first pinned cylinder to strip the fibers from its pins and lead then under a cover plate which partially surrounds the second pinned cylinder and which serves to hold the fibers while they are penetrated by the pins of the second cylinder. The fibers are finally stripped from the second pinned cylinder and passed to a second conveyor which conveys them for further processing. The negative inclination of the pins assists greatly in overcoming problems of stripping the fibers from the cylinders.

3,715,781

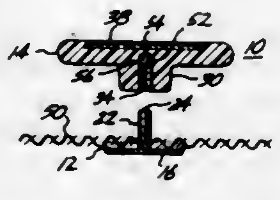
BUTTON ASSEMBLY

Derald M. Salvatori, 12647 Overbrook Road, Leawood, Kans. 66209

Filed Feb. 2, 1971, Ser. No. 111,991

Int. Cl. A44b *1/28, 1/30*

U.S. Cl. 24—90 HA **1 Claim**



A simple button assembly, made up essentially of a button and a button holder, is designed for permanent attachment to garments by the use of a self contained rapidly drying mastic. The button holder is a single unit having a base and a pin, or pointed stem, which extends perpendicularly to the base, and the outer periphery of the base curves in the direction of the stem. This holder is placed on the fabric of a garment by pushing

the sharp point of the stem through the fabric at a desired location and its curved periphery aids in preventing its rotation as the base is pressed against the fabric firmly. The button is also of single unit construction having a bore into which the stem of the button holder is received. This bore contains a rapidly drying mastic which is inserted and sealed off from the exterior during manufacture of the button or at least prior to the installation of the button. The button is fitted onto the holder by inserting the stem of the holder into the bore of the button. During this assembly, the stem of the holder breaks the seal over the mastic. When the seal is broken, the mastic flows and then dries almost instantaneously, permanently sealing the stem of the holder to the bore of the button, thereby permanently positioning the button relative to the fabric of a garment. Mastic is present in a volume which, due to its quick drying nature, will not flow beyond the lower edge of the bore of the button. Therefore, no mastic touches the fabric itself. This button assembly may be attached to fabric with very little effort, in only a few seconds.

3,715,782

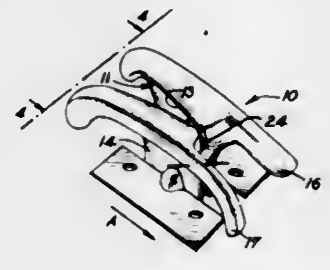
DEVICE FOR SECURING A LINE

E. Strohm Newell, 2350 6th Avenue, Apt. 9-B, San Diego, Calif.

Filed Dec. 9, 1971, Ser. No. 206,427

Int. Cl. F16g *15/04, 11/04*

U.S. Cl. 24—116 **13 Claims**



The device comprises a pair of opposing line engaging surfaces having a structural configuration effective for mutually cooperating with a line placed therebetween. The mutually cooperating surfaces have means that are effective to cause the line to be wedged therebetween when a load is directed along the line. Line guiding means are incorporated on the surfaces causing the line to move therebetween when the line is draped or dragged longitudinally along the device. At least one pair of arcuate hook portions extend in the direction toward the line load. The hook portions are laterally displaced with respect to each other and are turned downwardly and away from the direction of the load. The hook portions include an outboard surface and an inboard surface. The device of this invention may be used for securing lines composed of various constructions such as twisted cords, chain links and the end of a bolt on a turnbuckle.

3,715,783

FASTENER ATTACHMENT DEVICE FOR FLEXIBLE SHEET

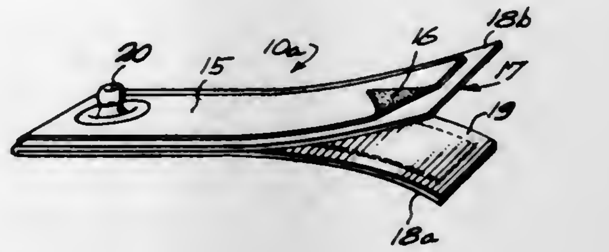
Kenneth J. Parks, 4 Joseph Lane, Ringwood, N.J., and Constantine F. Economy, 3441 Congress Street, Allentown, Pa.

Filed Feb. 10, 1971, Ser. No. 114,296

Int. Cl. A44b *21/00*

U.S. Cl. 24—265 R **3 Claims**

A fastener attachment device for application to marginal edge portions of flexible sheet materials to facilitate the fastening of such sheet material is described. The device comprises a length of tape coated on one side with a pressure-sensitive adhesive and folded against itself midway along its length to provide an inner adhered-together portion and non-adhered, opposed, outwardly-extending portions retained in separated relation before use of the device by an interposed cover or tear strip member. Fastening means in the form of a snap fastener, eyelet, ring or the like is affixed to the adhered-together portion of the tape. In use, the outwardly-extending portions of the tape will be separated from the cover or tear strip member and applied flat against opposite marginal side portions of the sheet material to which the device is to be applied.



3,715,784

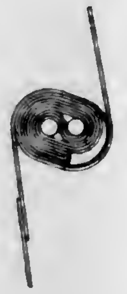
METHOD OF MAKING A MINIATURE METALIZED CAPACITOR

Charles C. Rayburn, 8501 West Higgins Rd., Glenview, Ill.

Filed Jan. 8, 1971, Ser. No. 104,887

Int. Cl. H01g *13/00*

U.S. Cl. 29—25.42 **5 Claims**



Miniature capacitor is formed from a single strip of dielectric material metalized on each of its sides. The strip is wound generally from the middle of the completed capacitor using its lead wires as mandrels. The winding time is considerably shortened and a plurality of insulating thicknesses of strip material are quickly placed between the two lead wires by initially locating a central portion of the strip between the first lead wire and a retractable winding pin which orbits so as to carry the strip around the first lead wire in the form of a loop which is wound into the capacitor after the second lead wire has been inserted. The winding pin is mounted adjacent an elongated slot. The first lead wire may be loaded in an axial direction at one end of the slot and carried to the other end of the slot by the looped strip as the strip is carried around the lead wire by the orbiting of the winding pin and slot. The second lead wire may then be fed into the slot along the same axis as the first lead wire was fed, and the winding pin retracted, without any interruption in the winding. The leads are retained in the capacitor by heat shrinking the dielectric strip.

3,715,785

TECHNIQUE FOR FABRICATING INTEGRATED INCANDESCENT DISPLAYS

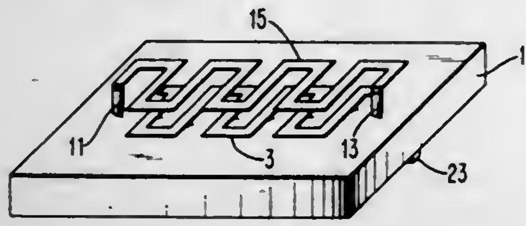
Alan V. Brown, and Frederick Hochberg, both of Yorktown Heights, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed April 29, 1971, Ser. No. 138,409

Int. Cl. H01j *9/00*

U.S. Cl. 29—25.11 **24 Claims**

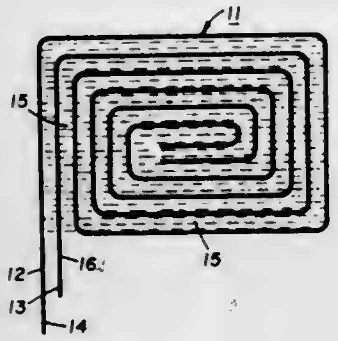
Incandescent "microfilaments" for integrated display devices, and the like, are batch fabricated using planar technologies. The planar incandescent filaments are made of thin films, suspended to minimize heat conduction losses. Heat losses are additionally minimized by appropriately shaping the ends of the filaments. By utilizing planar technologies all filaments of a display device may be fabricated en masse in a single plane and, individual filaments may be etched to various shapes and curves thereby obviating the problems encountered where elements must be strung between support posts, in a straight line. Typically, a ceramic substrate is first coated with a layer of reflecting material and etched, if desired, to the pattern selected for the reflecting surface. Thereafter, a support material, such as glass, is deposited over the substrate and reflecting material. Holes are then drilled into the glass and substrate and filled with conductive material, to thereby form support posts. A filament material, such as tungsten, is then deposited over the support layer so as to make conductive contact with the underlying support posts. By using conventional etching techniques a filament of desired pattern is then formed between the posts. Thereafter the support layer may be etched away leaving the filament suspended between the posts.



3,715,786

METHODS AND APPARATUS FOR INCREASING THE CAPACITANCE VALUE OF A CAPACITOR

Donald R. Brown, Downers Grove, and Otto T. Masopust, Jr., Clarendon Hills, Ill., assignors to Western Electric Company, Incorporated, New York, N.Y.
Filed May 12, 1971, Ser. No. 142,466
Int. Cl. H01g *13/00*
U.S. Cl. 29—25.42 **26 Claims**

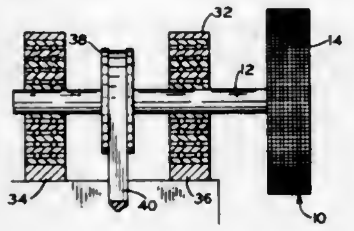


The capacitance value of a metallized film capacitor is increased by applying a voltage across the plates of the capacitor to generate an electrostatic attraction force therebetween to draw the metallized films closer together into a higher capacitance configuration. Heated wax is then impregnated into the space between the plates of the capacitor and allowed to cool to fix the plates in the higher capacitance configuration. The capacitance value of a metallized film, wax impregnated capacitor is increased by heating the capacitor to lower the viscosity of the wax therein, by applying a voltage across the plates of the capacitor to generate an electrostatic attraction force therebetween to draw the metallized films closer together through the heated wax into a higher capacitance configuration, and by cooling the capacitor to increase the viscosity of the wax therein to fix the plates in the higher capacitance configuration.

3,715,787

KINETIC ENERGY DEVICE FOR FORMING WORK PIECES

Arthur Franklin Hudson, P.O. Box 1025, Huntington, Ind.
Filed Nov. 25, 1970, Ser. No. 92,669
Int. Cl. B23d *67/00, 69/00, 71/00*
U.S. Cl. 29—76 R **7 Claims**

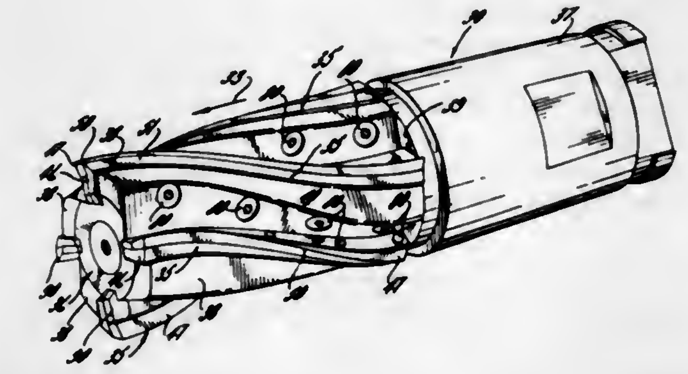


A kinetic energy device at substantial rates of speed develops an apparent hardness which is considerably in excess of its inherent hardness. A rotatable member having a plurality of protuberances and consisting of metal or other suitable composition, will develop properties at high rate of speed which is a function of the speed itself, thus the material comprising the protuberances takes on apparent hardness many times that of the same material in a static condition. The present invention utilizes this property of high speed in the order of 10,000 – 100,000 surface feet per minute rotational speed, to develop apparent hardness in the projectiles on the periphery of the machining wheel so that the designer has not only available to him a wide range of materials which were heretofore impractical to use in machining operation, but also has the ability to use a kinetic energy device in such applications as stock removal, wherein the working piece, i.e., the kinetic energy possessing piece can perform its intended function at lower wear rate, at lower temperatures, the product removed is in a more desirable size or form, and the work piece is formed without causing mechanical rupturing of the total work piece or other objectionable damage thereto.

3,715,788

ROTARY CUTTER WITH HELICAL BLADES

James C. Ayer, Rockford, Ill., assignor to The Ingersoll Milling Machine Company, Rockford, Ill.
Filed March 1, 1971, Ser. No. 119,575
Int. Cl. B26d *1/12*
U.S. Cl. 29—103 A **22 Claims**

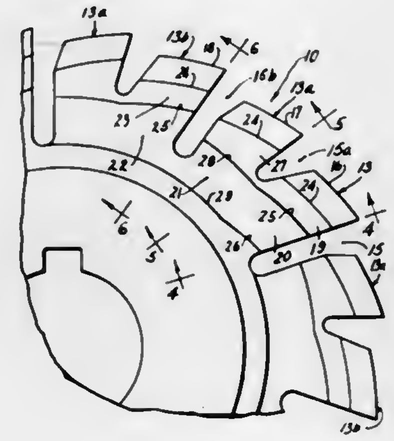


The cutter includes serrated helical blades detachably fastened by screws to a rotatable body with serrated, blade-receiving slots whose centerlines are offset from and preferably inclined relative to the rotational axis of the body to enable the blades to be located in the slots with the centerlines of the blades spaced from the axis while always keeping the serrations on the blades in precise mating engagement with the serrations in the slots.

3,715,789

HOB

Stuart J. Johnson, Rockford, Ill., assignor to Barber-Colman Company, Rockford, Ill.
Filed July 19, 1971, Ser. No. 163,800
Int. Cl. B26d *1/12*
U.S. Cl. 29—103 B **12 Claims**

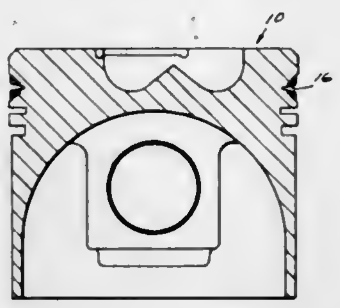


A hob for cutting gears and the like in which the teeth are formed in repeating sets of at least two teeth and the teeth of each set have different radial lengths whereby all of the teeth cut to generate the final form of the root portion of the gear teeth and only some of the hob teeth generate the final form of the tip portions of the gear teeth. While the hob may be a finishing tool, more usually it is a rough-cutting tool and, in this context, the final form is the form of the gear teeth before finishing where that is required. The teeth of the hob, when used as a rough-cutting tool, are given a profile wich permits the metal that must be removed by the finishing tool to be distributed on the gear teeth in a preselected manner so as to make more effective use of the finishing tool.

3,715,790

METHOD OF REINFORCING PISTON RING GROOVES

William C. Reinberger, Independence, Ohio, assignor to TRW Inc., Cleveland, Ohio
Continuation-in-part of Ser. No. 762,720, Sept. 26, 1968, abandoned. This application Jan. 13, 1971, Ser. No. 106,279
Int. Cl. B23p *15/10*
U.S. Cl. 29—156.5 R **6 Claims**



Method of making an aluminum alloy piston with a ring groove reinforcement wherein a grooved piston blank is cleaned to remove any oxide films, and a bonding metal is sprayed over the surface of the groove while the blank is at a temperature of from about 330° to 390° F., and thereafter a wear resistant metal is sprayed into the groove while the blank is still at a temperature within the aforementioned range to thereby fill the groove.

3,715,791

NICKEL-ALUMINUM COMPOSITE MATERIAL

Aurel I. Berghezan, Rhode-St-Genese, Belgium, assignor to Cabot Corporation, Boston, Mass.
Continuation of Ser. No. 688,945, Dec. 6, 1967. This application March 10, 1970, Ser. No. 18,334
Int. Cl. B22f *1/00*
U.S. Cl. 29—182.5 **4 Claims**

A nickel-aluminum composite metallic material produced from nickel and aluminum powders characterized by high strength throughout a wide range of temperatures and having excellent resistance to oxidation at elevated temperatures.

3,715,792

POWDER METALLURGY SINTERED CORROSION AND WEAR RESISTANT HIGH CHROMIUM REFRACTORY CARBIDE ALLOY

Arnold L. Prill, Edmond, Okla., and Stuart E. Tarkan, Monsey, N.Y., assignors to Chromalloy American Corporation, West Nyack, N.Y.
Filed Oct. 21, 1970, Ser. No. 82,787
Int. Cl. C22c *29/00*
U.S. Cl. 29—182.7 **4 Claims**

A corrosion and wear resistant high chromium refractory carbide alloy is provided by powder metallurgy suitable for use as a seaming tool in the food canning industry comprising primary carbide grains of at least one refractory carbide selected from the group consisting of TiC, CbC, VC and TaC dispersed through a high chromium alloy matrix consisting essentially by weight of about 14 to 24 percent chromium, about 0.4 to 1.2 percent carbon, up to about 3 percent nickel, up to about 5 percent molybdenum, and the balance essentially iron.

3,715,793

PLATED SUPER-COAT AND ELECTROLYTE

John H. Kefalas, Billerica, and Joseph A. Loycano, Bellingham, both of Mass., assignors to Honeywell Inc., Minneapolis, Minn.
Division of Ser. No. 605,374, Dec. 28, 1966, Pat. No. 3,531,322. This application May 4, 1970, Ser. No. 46,582
Int. Cl. B32b *15/04*
U.S. Cl. 29—194 **12 Claims**

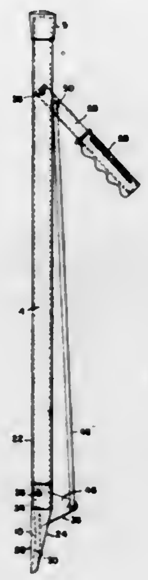
Multi-layered magnetic record surfaces having a non-magnetic nickel super-coat, electroless plated on the magnetic layer for protection against wear and corrosion, especially with non-metal substrates; also allowing superposition of identical magnetic layers with proper magnetic separation and for providing an etchable substrate strike for safer plating of discrete patterns of magnetic films. Also, methods and solutions for electroless plating such non-magnetic films by simple, convenient modifications of a reliable magnetic electroless plating method.

3,715,794

REMOVAL TOOL FOR AUTOMOTIVE RADIATOR HOSE

Robert L. McCollum, and Robert Holcombe, Royston, Ga., assignors to Thomas M. Strickland, Royston, Ga.
Filed Feb. 10, 1971, Ser. No. 114,152
Int. Cl. B23p *19/00*
U.S. Cl. 29—235 **7 Claims**

Nesting, pivoted bifurcated elements are mounted at one end of a elongated handle, and a remote-control linkage is provided whereby the elements can be forcibly spread apart to remove a radiator hose from the radiator neck. The opening of the inner element is tapered to accommodate various sizes of necks and hoses.



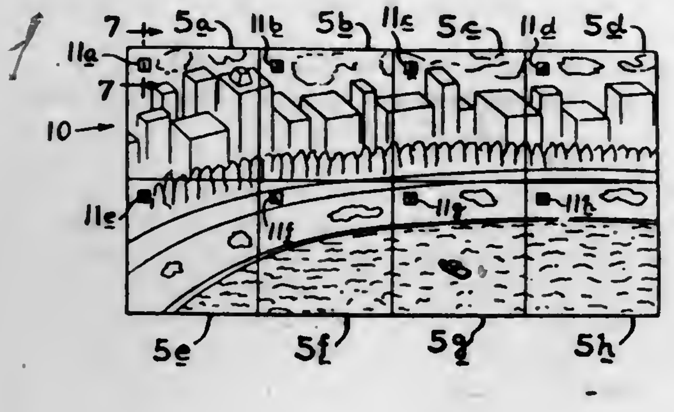
3,715,795
PROCESS OF MAKING A MIRROR BACKED PICTURE UNIT

Hoyne E. Greenberg, Beverly Hills, Calif., and Max L. Wexler, Chicago, Ill., assignors to Hayne Industries Inc., Los Angeles, Calif.

Division of Ser. No. 864,732, Oct. 8, 1969, Pat. No. 3,589,507. This application June 4, 1971, Ser. No. 149,997

Int. Cl. B23p *17/Q0*

U.S. Cl. 29—412 **6 Claims**



A method of making mural forming plates which form a much larger mural when placed in juxtaposed relation comprising projecting a picture to be displayed on a photo-sensitized silk screen of at least the size of the desired mural, processing the light-exposed silk screen to provide a pattern of open screen areas corresponding to the picture involved, applying a pigment-forming material through said processed silk screen to one surface of a transparent plate at least as large as the mural, applying a mirror-forming surface over the silk screened pigment-forming material on the plate involved, and cutting the plate into relatively small, easy-to-handle pieces.

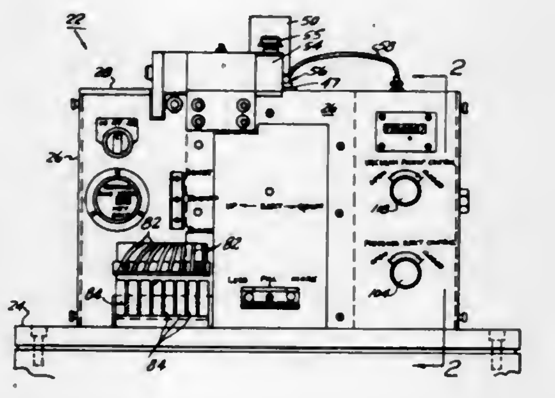
3,715,796
FLUID POWER EJECT MECHANISM FOR A POWDER COMPACTING PRESS AND METHOD OF COMPACTING

Georges D. DeTroyer, Detroit, Mich., assignor to Wolverine-Pentronix, Inc., Lincoln Park, Mich.

Division of Ser. No. 861,611, Sept. 29, 1969, Pat. No. 3,645,658. This application Nov. 3, 1971, Ser. No. 195,515

Int. Cl. B22f *3/02*; **B23p** *19/04*

U.S. Cl. 29—420 **6 Claims**



A fluid power system for a pick-up and discharge mechanism for small manufactured articles or parts, such as made by a powder compacting press or the like. After compacting in a die cavity, the finished parts upon ejection from the die cavity or cavities are picked up by a pick-up head operatively connected to a suction source for displacement of the finished parts over a discharge port or ports through which the finished parts are individually discharged by means of a gentle blast of pressurized air. The suction forces to pick up the finished parts is obtained from a flow of air through an appropriate venturi-like aspirator assembly.

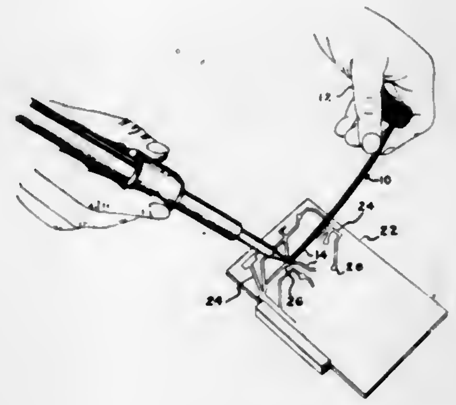
3,715,797
METHOD FOR SOLDER REMOVAL

Thomas J. Jackson, Fremont; Dan A. Weltsch, Sunnyvale, and Stephen J. Beattie, Redwood City, all of Calif., assignors to Wik-It Electronics Corporation

Division of Ser. No. 667,406, Sept. 13, 1967, abandoned. This application Oct. 23, 1970, Ser. No. 83,597

Int. Cl. B23p *19/00*

U.S. Cl. 29—426 **4 Claims**



A rope-like member of braided heat conducting metallic wires coated with a second metal and a flux is applied to a solid solder joint. Heat applied to the rope-like member liquifies the solder which in turn is absorbed into the member thereby removing solder from the joint.

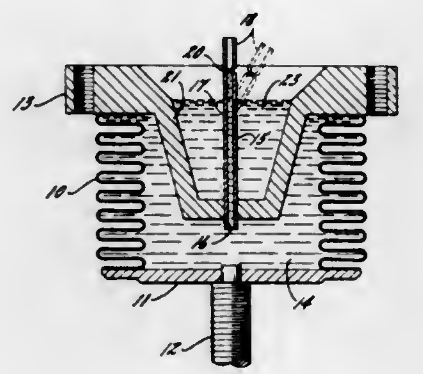
3,715,798
ASSEMBLING BELLOWS DAMPER UNIT

Gerald F. Ostroot, St. Cloud, and Robert H. Torborg, Cold Spring, both of Minn., assignors to DeZurik Corporation, Sartell, Minn.

Division of Ser. No. 726,089, May 2, 1968, Pat. No. 3,608,436. This application June 12, 1970, Ser. No. 57,861

Int. Cl. B23p *19/04*

U.S. Cl. 29—454 **5 Claims**



A liquid-filled force damper unit is described in which a spring metal bellows unit is vacuum-filled with damping fluid to eliminate all air bubbles, and provided with a frangible seal. The unit is assembled to a reservoir which is filled with damping fluid above the level of the seal, which is then broken off, and a relatively flexible reservoir diaphragm is added to allow the unit to be used in any position.

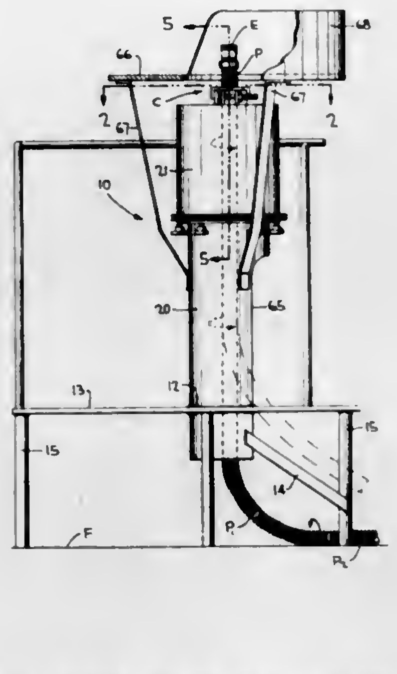
3,715,799
METHOD FOR FLEXIBLE PIPE WELDING

Edgar M. Flood, Paducah, and William H. Green, Hickory, both of Ky., assignors to Weld-Eze, Inc., Paducah, Ky.

Filed Nov. 17, 1970, Ser. No. 90,403

Int. Cl. B23k *31/02*

U.S. Cl. 29—475 **5 Claims**



Method and apparatus are disclosed for welding a pipe extension to a flexible, elongated pipe or hose wherein one end of the pipe is held upright for welding and the other end of the pipe is supported at an angle, such as on a horizontal surface of a cooperating support. The complete pipe including both ends and the intermediate angular section are rotated at substantially constant speed while a bead of weld material is applied in the weld area to give a uniform, leakproof weld. Since the one end of the pipe is upright, the extension may be rested on the end face without clamping and the welding rod is held stationary during welding. The clamp means for holding the welded end of the pipe is carried by a concentric support tube and rotatable cap assembly through which the pipe passes; the cap being stabilized by top and bottom bearings. The clamp includes opposed pivotal jaws on the annular top wall of the rotating cap; the jaws being tightened by screw means at the opposite end. Two-piece split collars are selected to roughly correspond to the outer dimension of the pipe. A fixed chain on the cap is used to drive the same from a motor driven sprocket, which combination retains the cap captive in the axial direction. A pedestal mount adaptor may be used for large diameter pipe.

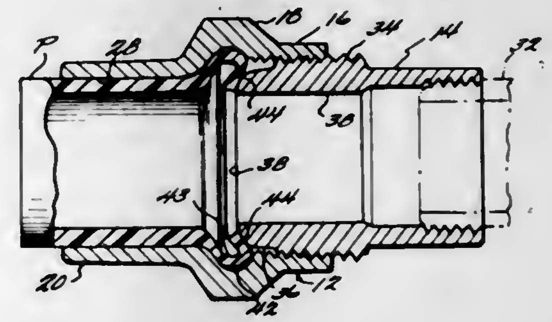
3,715,800
METHOD OF MAKING A COUPLING JOINT

Wilbur R. Leopold; Frank C. Hackman; Carl E. Floren, and Wallace E. Gould, all of Decatur, Ill., assignors to Mueller Co., Decatur, Ill.

Division of Ser. No. 885,462, Dec. 16, 1969, Pat. No. 3,687,492. This application Oct. 29, 1971, Ser. No. 194,067

Int. Cl. B29c *27/30*

U.S. Cl. 29—506 **4 Claims**



A method of making a service pipe coupling or joint for use in fluid distribution systems, the coupling or joint utilizing a plastic pipe, a flare-type coupling nut for coupling the plastic pipe into a distribution system, the coupling nut cooperating with a tubular body member which may be another pipe, a valve, or other fitting. The method includes cold flaring the end portion of the plastic pipe while within the coupling nut beyond its elastic limit or memory into an annular upset bead-like portion terminating in an inwardly turned lip, the annular upset bead-like portion trapping the plastic pipe axially with respect to the coupling nut. Then the method further involves the application of the tubular body to form the coupling or joint by further forming the bead-like flare to provide a seal and packing and to increase the resistance of pipe pullout from the joint.

3,715,801
TOOL CHANGER FOR MACHINE TOOL

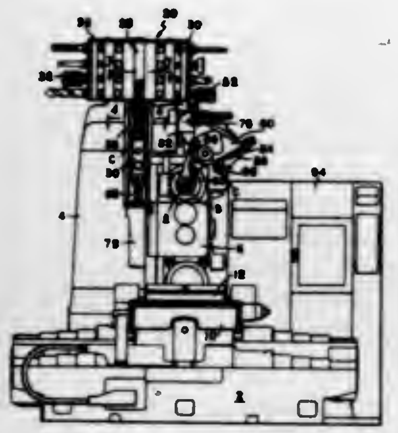
Yoshikazu Sato, No. 1,026, 4-chome, Shimotakaido, Suginami-ku, Tokyo, and Makoto Sato, No. 1-10, 1-chome, Nakano, Nakano-ku, Tokyo, Japan

Filed March 4, 1969, Ser. No. 804,220

Int. Cl. B23q *3/157*

U.S. Cl. 29—568 **6 Claims**

A tool changing mechanism for a machine tool having a horizontal spindle. A rotatable magazine is provided with a plurality of guides for supporting and guiding a plurality of tool cartridges. Each cartridge is provided with a plurality of vertically aligned tools. The magazine is indexed to align a selected cartridge with a transfer station. The cartridge is shifted into the transfer station and is positioned to present a selected tool to a transfer mechanism for removal of the tool and insertion into the spindle. The tool is returned to the cartridge by the transfer mechanism after use. A tape controlled motor means coordinates the operation of magazine, cartridges, and transfer mechanism to provide for returning one tool while another tool is operating on the work.



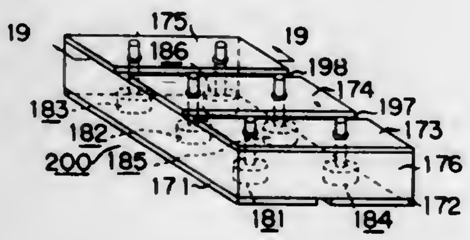
3,715,802
SEMICONDUCTOR APPARATUS AND METHOD FOR MANUFACTURING THE SAME

Masanobu Suenaga, Minami-ku, Yokohama-shi; Tetsuo Machii, Isogo-ku, Yokohama-shi; Takahiro Sawano, Setagaya-ku, Tokyo; Takehiko Kobayashi, Kawasaki-shi; Tadao Dengo, Kohoku-ku, Yokohama-shi, and Tetsuzo Nakai, Kawaguchi-shi, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan

Filed June 25, 1970, Ser. No. 59,853

Int. Cl. B01j *17/00*

U.S. Cl. 29—588 **8 Claims**



A semiconductor apparatus comprising a first and a second electrode substrate arranged substantially in parallel to each other, a semiconductor element containing a plurality of electrode members located between and opposite to the first and second electrode substrates, a layer of organic adhesive material inserted between the first and second electrode substrates for their integral bonding, and a means for connecting the first and second electrode substrates with the aforesaid plurality of electrode members mechanically as well as electrically.

3,715,803
ROTARY DRY SHAVER WITH TILTABLE SHEAR PLATES

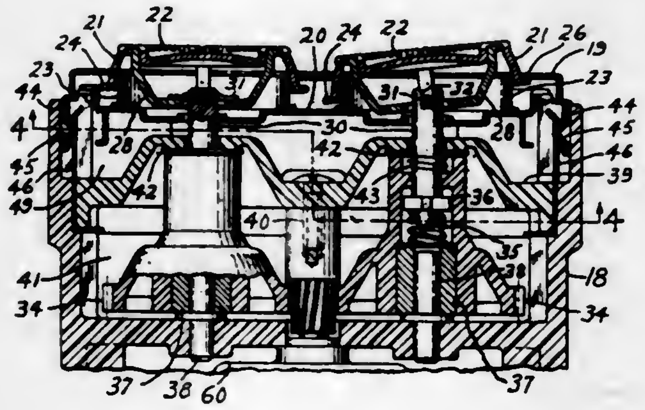
Tracy B. Tyler, 7936 Byron Ave., Miami Beach, Fla.

Filed Feb. 16, 1971, Ser. No. 115,546

Int. Cl. B26b *19/16*

U.S. Cl. 30—43.5 **6 Claims**

A rotary dry shaver comprising a component housing, a pair of tiltable cutting elements with exposed apertured shear plates, a bladed rotary cutting member cooperative with the inner surface of the shear plates and coactively tiltable therewith, a driving shaft for the cutting members, the shear plates and cutting members normally disposed at a right angle to the shaft axes, the cutting elements independently supported axially on a spherically radiused surface whereon they are freely tiltable at diverse angles relative to the shaft axes, a removable cutting element retaining frame with apertures through which a portion of each of the cutting elements projects, the outer surface of the projecting portion correspondingly spherically radiused and fittingly and tiltably retained by and in the frame apertures, a chamber in the housing beneath said frame to receive hair clippings, apertures through the housing sidewalls communicating with the chamber, hinged side plates to open and close the wall apertures, the side plates and said frame comprising cooperative engaging portions by which the frame is positively secured in place when the side plates are closed, the shear plate apertures and the blades of the cutting member opposedly two-edged for cutting in either rotational direction, a driving motor, means for reversing the rotation of the cutting member at desired intervals, a toothed edge reciprocal hair trimming clipper embodied in the housing, the toothed edge of which may be projected from or retracted into the housing, the clipper being operably connected to a driving element when it is projected and disconnected when it is retracted.



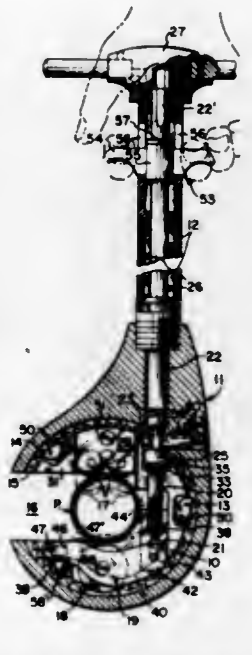
3,715,804
FREE FULCRUMED LEVER ACTION FOR THE CUTTING WHEEL PIPE CUTTER

Elmer G. Kelley, 14300 Clayton Road, San Jose, Calif.

Filed Feb. 19, 1971, Ser. No. 116,911

Int. Cl. B23d *21/08*

U.S. Cl. 30—102 **8 Claims**



A free fulcrumed yoke supporting the cutting wheel of a ratchet type pipe cutter within a C-shaped cutting head, the yoke embracing a rider guided for lineal movement relative to and on an adjusting screw having a thrust bearing in its head portion fixed to pull the rider upon turning of the screw when the latter has keyed connection with a spring loaded manipulatable adjusting rod provided with finger engageable triggers, and keeper means for holding the triggered rod in retracted position until the keeper is engaged by the head portion of the adjusting screw as it approaches axial alignment with the adjusting rod.

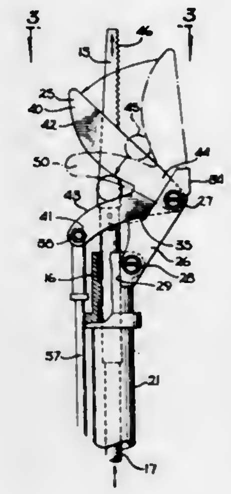
3,715,805
IMPROVEMENT IN A TREE PRUNING SAW

Donald M. Fraser, Los Angeles, Calif. (4416 Lennox Ave., Sherman Oaks, Calif. 91403)

Filed June 1, 1970, Ser. No. 41,970

Int. Cl. B27b *11/10*

U.S. Cl. 30—166 **8 Claims**



An improvement in a tree or shrub branch pruning saw apparatus having a motor providing motive power for a reciprocating saw blade, and comprising a saw blade reciprocably carried on the end of a tubular pole opposite its other end at where the power source is carried, and a V-notched member pivotally mounted on a link which in turn is pivotally mounted to the end of the pole. Means such as an axially slidable handle, is provided along the pole's length and is pivotally connected to the V-notched member. Manual to-and-from (axial) motion provided the sliding handle pivots a selected branch held in the V-notched member through or across the path of the reciprocating saw blade. Stop means are provided for limiting the arc of movement of the V-notched member.

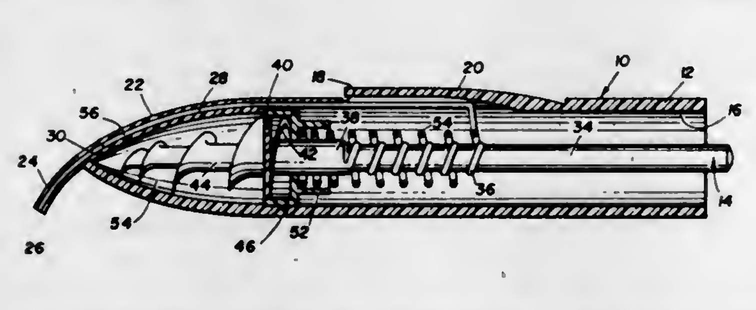
3,715,806
DISPOSABLE DENTAL APPLIANCE AND METHOD FOR PREPARING AND PLACING SILVER AMALGAM FILLINGS

Fuller Warden; Eugene W. Lewis; Bernard F. McNickle, and Jack H. Mills, all of Tulsa, Okla.

Filed March 11, 1970, Ser. No. 18,452

Int. Cl. A61c *5/04*

U.S. Cl. 32—60 **5 Claims**



A dental hand piece for mixing silver alloy and mercury to provide an amalgam for tooth fillings, extruding and carrying the amalgam into the tooth cavity and packing the amalgam in the cavity through the use of a single tool. The hand piece is disposable and is preloaded with measured proportions of the silver alloy and mercury which are stored in separate compartments until mixing thereof is desired to provide the amalgam. The tool is adapted for operation by the dentist's Doriot type straight hand piece, or the like, and automatically mixes the amalgam, extrudes the amalgam from the carrier portion thereof for deposit directly into the tooth cavity, and selectively packs the amalgam in the cavity upon response to actuation of the tamper mechanism by the dentist.

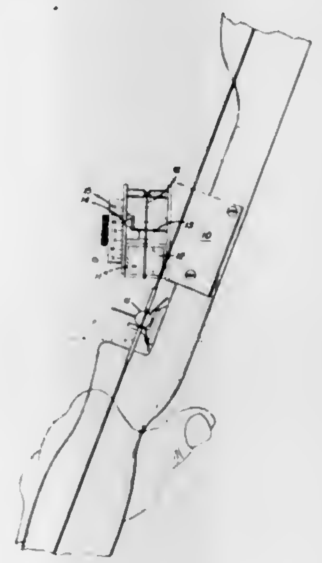
3,715,807
ARCHERY BOW SIGHT

Frederick R. Heffer, 574 Meadowbriar Rd., Rochester, N.Y.

Filed Nov. 24, 1970, Ser. No. 92,477

Int. Cl. F41g *1/00;* **F41b** *5/00*

U.S. Cl. 33—265 **3 Claims**



An archery bow sight comprises a mounting means such as a bracket having attached a thereto mirror in a vertical plane adapted to reflect a horizontally located arrow and having attached sighting means such as a cross hair sight with a movable blade shaped horizontal member adapted to be adjusted to predetermined angles or distances.

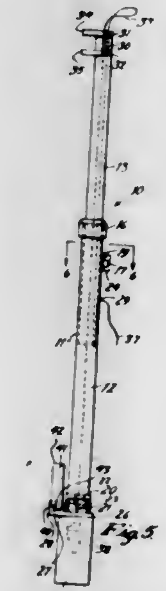
3,715,808
VERTICAL ALIGNMENT GAUGE

Albert V. Petrik, 2866 Joyce Road, Roslyn, Pa.

Division of Ser. No. 866,995, Oct. 16, 1969, Pat. No. 3,638,325. This application Aug. 13, 1971, Ser. No. 171,479

Int. Cl. G01c *15/10*

U.S. Cl. 33—347 **2 Claims**



A telescopically adjustable tubular construction for upright arrangement having a central opening in its upper end and permanent magnet means extending laterally from an upper region of the tubular construction for holding engagement with a door jamb or the like, a standoff member adjacent to a lower region of the tubular construction, a window provided in a lower region of the tubular construction, and plumb bob means suspended interiorly of the tubular construction visually accessible through the window.

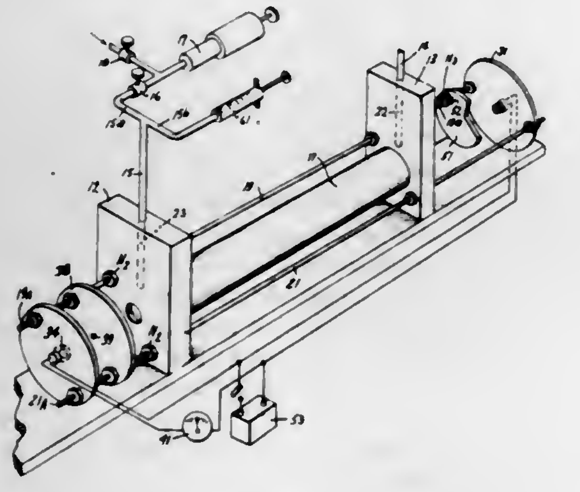
3,715,809
EDUCATIONAL ATMOSPHERIC PARTICLE DETECTOR

Theodore A. Rich, Schenectady, N.Y., assignor to Environment/One Corporation, Schenectady, N.Y.

Filed Nov. 5, 1971, Ser. No. 196,012

Int. Cl. G09b *23/12;* **G01n** *21/00*

U.S. Cl. 35—19 B **10 Claims**



An educational atmospheric particle detector of low cost construction that can be assembled, disassembled and operated by students and apprentice technicians for classroom and laboratory study purposes. The particle detector is of the condensation nuclei meter type comprising a hollow tubular member that serves as an expansion cloud chamber and is mounted between two end blocks supported on a plurality of threaded rods. The end blocks have inlet and outlet passageways which communicate with the interior of the tubular expansion cloud chamber, and have aligned openings through which a transmission light beam passes. Suitable collimating lens are supported within the aligned openings in the end block members for focusing the light from a light source positioned at one end of the cloud chamber, onto a photo cell or other light sensitive device positioned at the opposite end of the expansion cloud chamber. A novel rotatable disc or diaphram which serves as a light shutter is supported on one of the plurality of supporting rods and can be rotated into or out of the light path in order to modulate the amount of light which is allowed to impinge on the photo cell or other light sensitive detector. With this arrangement zero adjustment calibration of the instrument can be performed. Additionally, a pin hole aperture formed in a small disc supported on the supporting rod is located in the light path between photo cell and adjacent lens. The pin hole aperture serves to restrict the measured light to those light rays parallel to the cloud chamber axis and are normally transmitted without interruption. Upon expansion of the space within the cloud chamber so as to condense water droplets about the particles entrained in a sample gaseous atmosphere being monitored, the cloud of water droplets scatters the light beam and results in a change in the electric output signal from the light sensitive detector device which is a measure of the number of particles entrained in the sample gaseous atmosphere. Additionally, a two-stage expansion is provided for which allows the detector to be used for particle size measurement purposes.

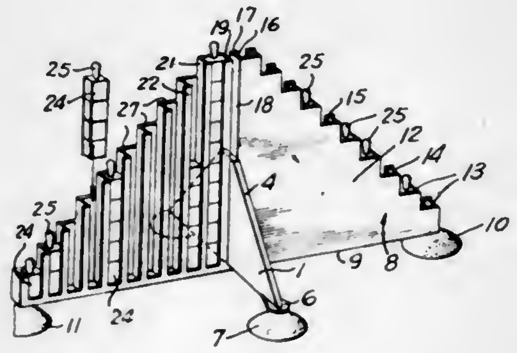
3,715,810
EDUCATIONAL GAME

Harry D. Coates, Apt. 417, 5021 Seminary Rd., Alexandria, Va.

Filed June 4, 1971, Ser. No. 149,918

Int. Cl. G09b *1/16*

U.S. Cl. 35—35 R **4 Claims**



An educational game including an upright game board having pluralities of vertical parallel slots of varying lengths on opposite sides thereof and playing pieces each capable of being inserted in one of said slots with a side of the playing piece visible and players apply lettering representing words to said playing piece sides and insert each playing piece in an appropriate one of said slots in an effort to fill a given number of said slots before an opponent.

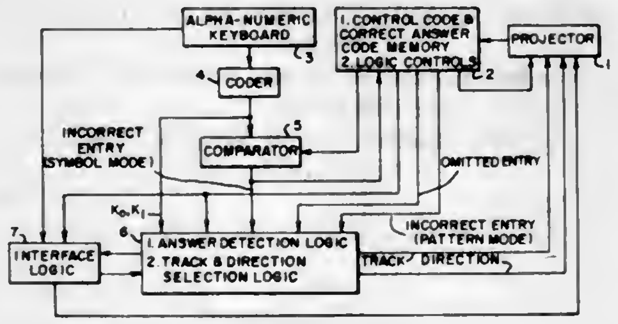
3,715,811
REMEDIAL BRANCHING TEACHING SYSTEM

Francis T. Thompson, Murrysville, and Shan C. Sun, Pittsburgh, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Oct. 13, 1970, Ser. No. 80,359

Int. Cl. G09b *7/04*

U.S. Cl. 35—48 **15 Claims**


ALPHA-NUMERIC KEYBOARD
3
1. CONTROL CODE & CORRECT ANSWER CODE MEMORY
2. LOGIC CONTROLS
2
PROJECTOR
1
4
CODER
5
COMPARATOR
INCORRECT ENTRY (SYMBOL MODE)
OMITTED ENTRY
K_0, K_1
7
6
INTERFACE LOGIC
1. ANSWER DETECTION LOGIC
2. TRACK & DIRECTION SELECTION LOGIC
INCORRECT ENTRY (PATTERN MODE)
TRACK
DIRECTION

A system for interpreting input responses, such as student answers, and effecting appropriate output responses wherein the system is operative in a plurality of modes for interpreting input responses, for example, as correct, incorrect, or nearly correct, with the appropriate output response being effected so that a student progresses through programmed instructional material according to answers given at various points in the instructional material either in a primary or remedial manner.

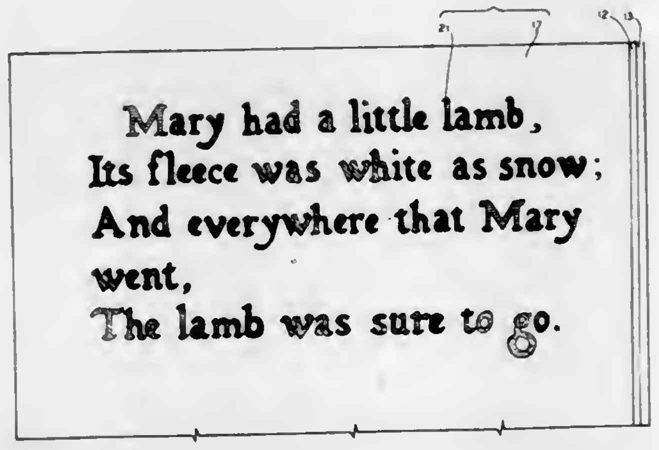
3,715,812
COLOR CODED PRONUNCIATION SYMBOL SYSTEM

Lorna Beth Novak, 2023 Street, Amarillo, Tex.

Filed Dec. 7, 1970, Ser. No. 95,433

Int. Cl. G09b *17/00*

U.S. Cl. 35—35 J **9 Claims**



A color coded symbol system is applied to the letters of the English alphabet for such different language sounds as such letters have in different words to facilitate the pronunciation and reading and learning of such words.

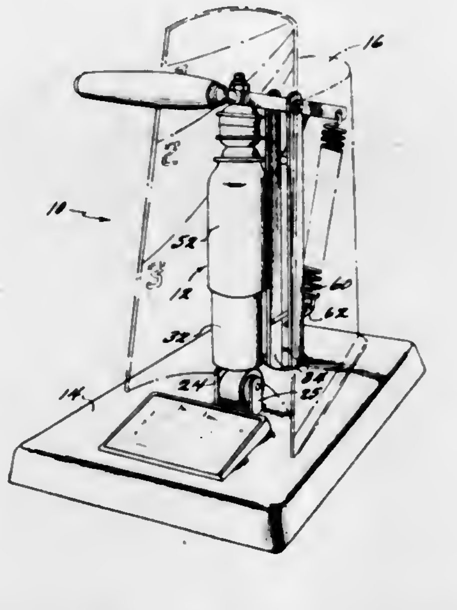
3,715,813
SHOCK ABSORBER DEMONSTRATION STAND

John A. Wiegand, Northbrook, Ill., assignor to Maremont Corporation, Chicago, Ill.

Filed Oct. 4, 1971, Ser. No. 186,200

Int. Cl. G09b *25/00*

U.S. Cl. 35—49 **4 Claims**



The disclosure embraces a shock absorber demonstration stand having a base and a post extending generally perpendicularly from the base; a lever arm is pivotally attached intermediate its ends to the post adjacent its upper end and a shock absorber has one end mounted on the base and its other end connected to the lever arm on one side of the post; a tension spring is connected at one end to the lever arm on the side of the post opposite the shock absorber and the other end of the tension spring is connected to the post.

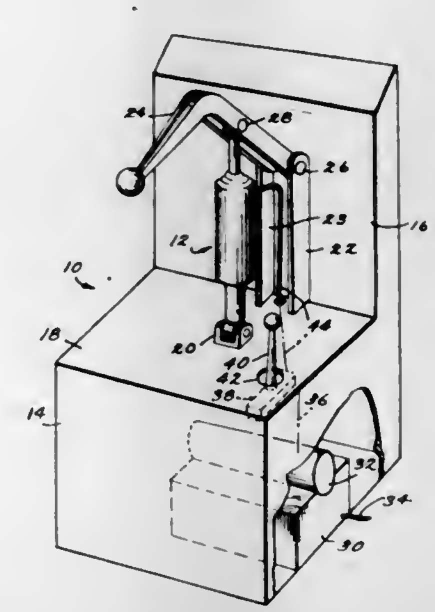
3,715,814
SHOCK ABSORBER DEMONSTRATION STAND

John A. Wiegand, Northbrook, Ill., assignor to Maremont Corporation, Chicago, Ill.

Filed Sept. 28, 1971, Ser. No. 184,639

Int. Cl. G09b *25/00*

U.S. Cl. 35—49 **5 Claims**



The disclosure relates to a shock absorber demonstration stand for a load supporting damper unit of the type having a variable volume load supporting air chamber therein, which is utilized in load levelling suspension systems. The demonstration stand includes a support frame having a movable lever arm mounted thereon with the damper unit having one end fixedly attached to the frame and its other end attached to the movable lever arm so that upon actuation of the lever arm, the damper unit can be extended or contracted along its longitudinal axis. The demonstration stand further includes an air compressor unit which is housed in the frame and is of the type which substantially continuously supplies fluid at a predetermined pressure to a constant volume chamber. Fluid pressure is supplied to the air chamber of the damper unit through a conduit and a control valve, the conduit being connected to the chamber in the compressor unit. The control valve is manually operable so that an individual can control the amount of fluid pressure delivered to the air chamber of the damper unit.

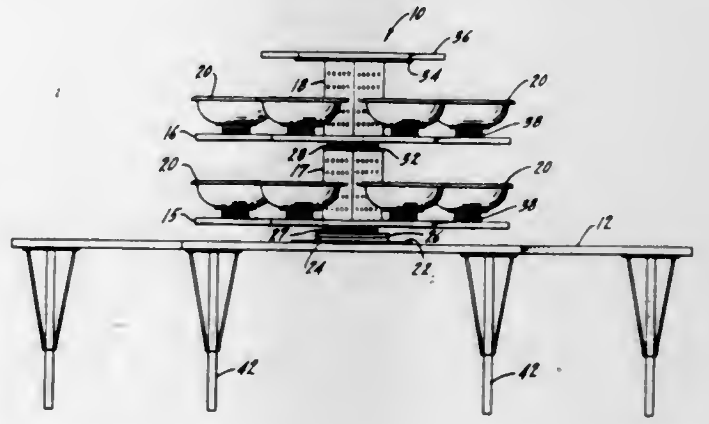
3,715,815
LEARNING CENTER

Robert B. Lewis, P. O. Box 2190, Aspen, Colo.

Filed July 31, 1970, Ser. No. 60,027

Int. Cl. A47b *41/04*

U.S. Cl. 35—60 **1 Claim**



A learning center for pre-school children comprising a worktable having attached perpendicularly to one face a supporting rod having arranged thereon a plurality of turntables and a plurality of display boards. The turntables, aligned parallel to the worktable, are free to revolve independently of one another in a clockwise or counter-clockwise direction about the supporting rod. The display boards can be constructed to revolve in conjunction with the turntables or to remain stationary. Attached at the outer periphery of each turntable are a plurality of containers spaced equidistant from each other and free to rotate about their axis. The containers are divided into multiple compartments so that a variety of materials can be contained therein. A display table is attached at the top of the learning center above the turntables and display boards.

3,715,816

AMUSEMENT BOOK FOR CHILDREN

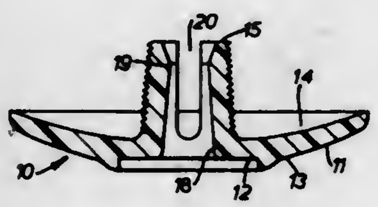
Earle A. White, 1626 Sunnyside Avenue, Salt Lake City, Utah
Filed Jan. 13, 1971, Ser. No. 106,229
Int. Cl. G09b *1/06*
U.S. Cl. 35—73 **11 Claims**

An amusement book for children including on pages thereof animal representation provided with releasable retaining means for releasably receiving the animal's natural food and, in combination therewith and on the same or an opposite page, the said food in its store or natural habitat for selective movement and releasable attachment to the animal representation proximate its mouth area.

3,715,817

SHOE STUDS

David John White, Crowborough, and Benjamin Henry Knight, Groombridge, England, assignors to White Knight Products Limited, Crowborough, England
Filed Jan. 17, 1972, Ser. No. 218,210
Claims priority, application Great Britain, Mar. 9, 1971, 6,333/71
Int. Cl. A43c *15/00*
U.S. Cl. 36—67 D **10 Claims**

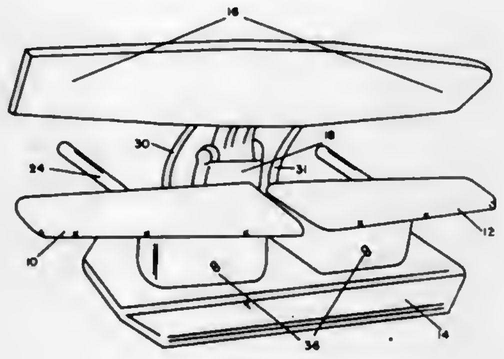


A stud assembly for shoes, for example, golf shoes comprises a flange member for engagement in a conventional socket in the sole of a shoe, the flange spreading the load over a suitable area of the sole of the shoe and a stud member removably press fitted into a central bore in the flange member.

3,715,818

METHOD AND APPARATUS FOR PRESSING FABRICS

James E. Sassman, 34 Stoniker Drive, Trenton, N.J.
Continuation of Ser. No. 758,735, Sept. 10, 1968, abandoned.
This application July 20, 1970, Ser. No. 64,027
Int. Cl. D06f *71/34*
U.S. Cl. 38—15 **3 Claims**

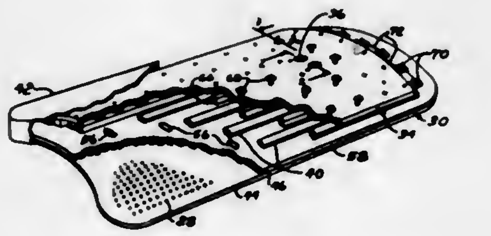


A pressing machine for drycleanable fabric or material includes a stationary buck and a movable head. The buck is operated such as to be at substantially room temperature, and has a plurality of apertures in its pressing surface communicating with a chamber which is maintained under continuous vacuum. The head has a plurality of apertures in its pressing surface which communicate with a steam chamber. When the head is caused to move into engagement with the buck, steam is forced through the apertures in the press head to press the fabric or material held in the machine.

3,715,819

PRESS HEAD CONSTRUCTION

Richard M. Hanson, Salt Lake City, Utah, assignor to McGraw-Edison Company, Elgin, Ill.
Filed Sept. 7, 1971, Ser. No. 178,284
Int. Cl. D06f *71/34*
U.S. Cl. 38—16 **10 Claims**

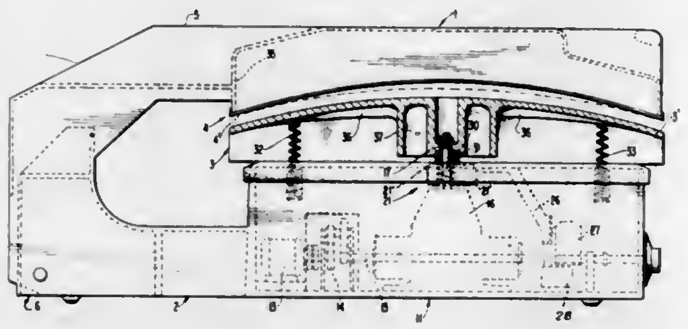


For use in an industrial scissor-type garment press, an electrically heated head having a fluid tight chamber and openings therefrom for discharging live steam and/or for drawing vacuum, the head having a press face element formed from a pair of adjacent plates of highly conductive material, such as aluminum, the entire peripheral edge of the plates being welded together, the adjacent faces of the plates being flush except for channels in one plate that define with the opposite plate the chamber where the openings are provided through the press face plate from the channels, a fitting connection through the backup plate to the steam channels, spacers secured to the backup plate and a mounting plate secured to the spacers, elongated electric strip heating elements fitted between the backup and mounting plates and the spacers, bolts threaded in the mounting plate urging the heating elements against the backup plate, and taps in the mounting plate for securing the head relative to the press.

3,715,820

IRONING PRESS

Wolfgang Hentschel, 8000 Munich 49, Germany, assignor to Dornier A.G., Friedrichshafen/Bodensee, Germany
Continuation of Ser. No. 867,318, Oct. 17, 1969, abandoned.
This application Nov. 4, 1970, Ser. No. 86,936
Claims priority, application Germany, Nov. 2, 1968, P 18 06 776.0
Int. Cl. D06f *71/00*
U.S. Cl. 38—17 **4 Claims**

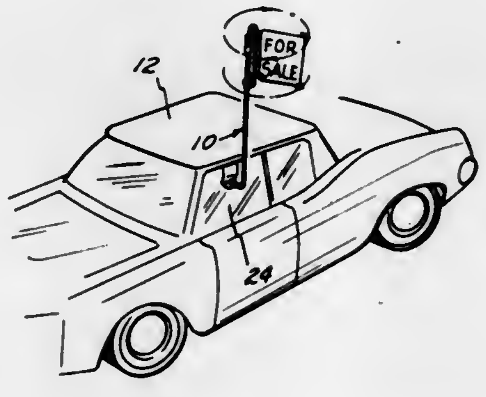


This invention relates to an ironing press comprising buck means having a convex curvature and head means having a concave curvature, and a pressure mechanism for pressing said means together, one of said means being bendable and of a flatter curvature than the other, and the other of said means being rigid.

3,715,821

VEHICLE SIGN

Edward L. Hawes, 405 East Goulson, Hazel Park, Mich.
Filed Oct. 12, 1970, Ser. No. 79,727
Int. Cl. G09f *7/00*
U.S. Cl. 40—129 C **10 Claims**

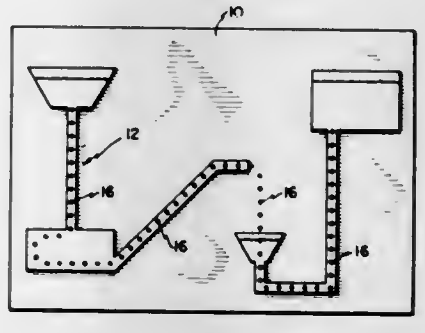


A sign assembly for use on a vehicle having at least one generally vertically adjustable window for mounting a clamp portion of the sign thereto. The clamp portion supports a standard and frame section of the sign assembly generally upwards and above the roof of the vehicle in order for the sign to be visible from all directions. Adjustment and locking means are provided on the standard to provide substantially vertical positioning of the sign regardless of the configuration of the window edge. In a first embodiment the sign has a flag portion mounted to the frame section which is rotatable in order to attract attention. The sign frame section is adapted to easily mount and dismount different flag portions to the assembly and at the same time to hold the flag portions taut and securely mounted. In a second embodiment, the sign is securely fastened to the standard and adjustment means are provided not only to vertically position the sign but also to adjust and lock the sign in any axial rotational position.

3,715,822

DISPLAY SYSTEM

Lindsey B. Hansen, Jr., Ogden, and Val D. Hyer, Sunset, both of Utah, assignors to Control Graphics Company, Ogden, Utah
Filed Nov. 16, 1970, Ser. No. 89,748
Int. Cl. G09f *13/18*
U.S. Cl. 40—130 K **10 Claims**

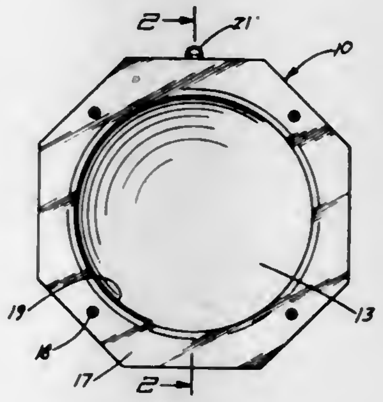


A display system which includes a plurality of separately activated light sources, a plurality of light guides coacting with each light source such that one end of each light guide is juxtaposed with a light source and the opposite end of each light guide is positioned in a display face such that the opposite ends of the guides are lighted according to a predetermined program when the light sources are activated. The light sources are programmed and the light guides are arranged in the display face to simulate light movement over the display face when the display system is operated.

3,715,823

DECORATIVE ARTICLE HOLDER

Cleo A. Brossard, Buffalo, Minn.
(4400 Brunswick Ave. N., Minneapolis, Minn. 55422)
Filed Feb. 26, 1971, Ser. No. 119,195
Int. Cl. G09f *1/12*
U.S. Cl. 40—152 **10 Claims**

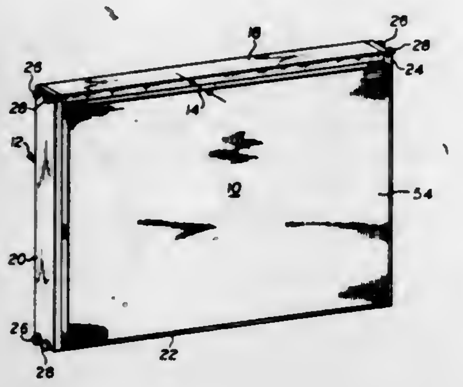


A holder for mounting and displaying decorative articles such as plates, medallions and the like. The holder includes a base with a recess for receiving the article, cushioning fabric or similar material for resiliently supporting the article and retaining means for holding the article in the recess. The retaining means may preferably be transparent so as not to obscure any of the article.

When the article to be mounted is transparent, the cushioning material, being visible through the article, is selected to enhance the appearance of the article.

3,715,824
FRONT LOADING VARIABLE DEPTH PICTURE FRAME

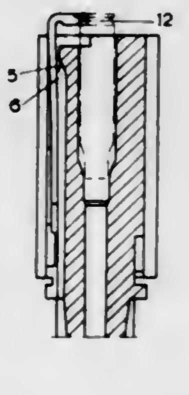
Arnold Rochman, 3636 16th Street N.W., Washington, D.C.
Filed Dec. 14, 1970, Ser. No. 97,578
Int. Cl. G09f *1/12*
U.S. Cl. 40—152 **6 Claims**



A framework structure is provided whereby pictures may be mounted through the frontal plane of a quadrilateral frame, with bracket means being provided upon the frame for attachment to the rear side of the picture. The bracket means are adjustably spaced relative to the frontal plane of the frame to enable adjustability of the picture relative to the frontal plane of the frame.

3,715,825
CARTRIDGE CASE EJECTOR IN A FIREARM TO BE OPENED BY BREAKING

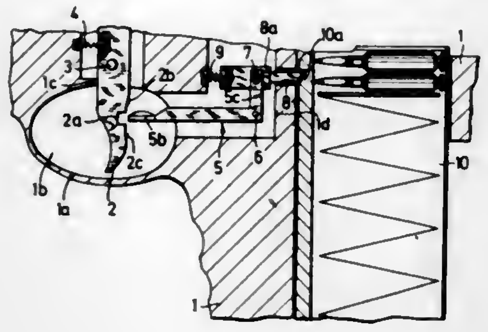
Leo Ilmonen, Jyvaskyla, Finland, assignor to Valmet Oy, Helsinki, Finland
Filed Oct. 22, 1970, Ser. No. 82,991
Claims priority, application Finland, Oct. 24, 1969, 3072/69
Int. Cl. F41c *15/00*
U.S. Cl. 42—47 **3 Claims**



For a firearm which is opened by breaking it and in which a cartridge with grooved base is used, an ejector is disclosed which moves backwardly when the firearm is opened. The invention is particularly characterized in that the ejector, which moves in a guiding groove in the firearm, and said groove are so shaped that when the ejector moves backward on opening the firearm, the ejector bends to the side, whereby a prong on the ejector moves in outwardly direction from the groove in the base of the cartridge case.

3,715,826
FIREARM MAGAZINE RELEASING LEVER AND TRIGGER SAFETY

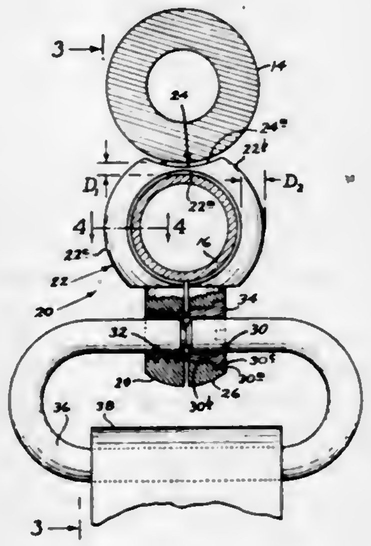
Paul Seifried, Badenweiler, Germany, assignor to Rheinmetall GmbH, Dusseldorf, Germany
Filed March 11, 1971, Ser. No. 123,184
Claims priority, application Germany, March 24, 1970, P 20 14 328.6
Int. Cl. F41c *17/02, 17/00, 17/08*
U.S. Cl. 42—70 E **3 Claims**



A firearm in particular an automatic rifle, which comprises a housing, and a trigger guard received by the housing. A trigger lever extends into the trigger guard and a magazine releasing lever is provided. A magazine is operatively connected with the magazine releasing lever and an operative connection is arranged between the trigger lever and the magazine releasing lever, in order to lock one of the levers upon operation of the other of the levers.

3,715,827
MAGAZINE TUBE MOUNTING FOR SLING SWIVEL

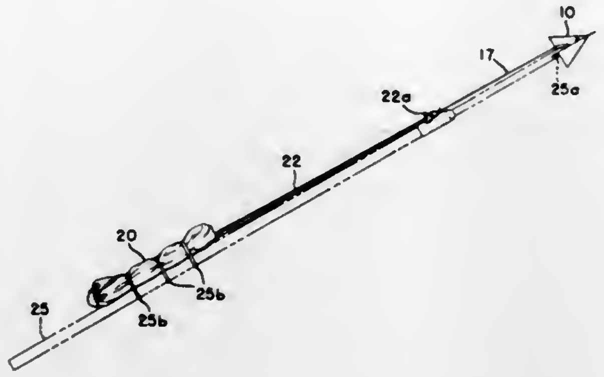
Preston V. McKinzie, Auburn, Calif., assignor to Michaels of Oregon Co., Portland, Oreg.
Filed May 20, 1971, Ser. No. 145,222
Int. Cl. F41c *23/02*
U.S. Cl. 42—85 **8 Claims**



A device for mounting a sling swivel on the magazine tube of a firearm. The device includes a band notched on its outer surface to afford clearance for the adjacent barrel.

3,715,828
ANTI-SHARK DROGUE DART

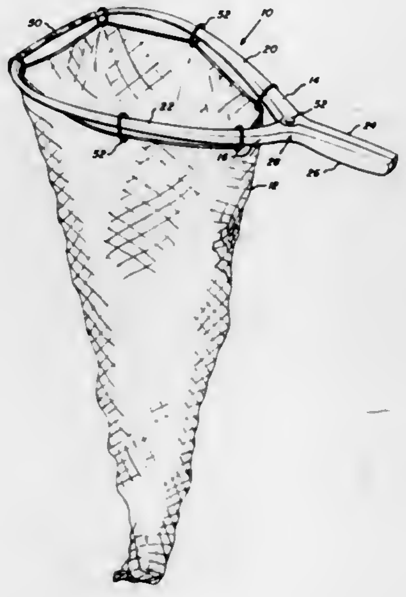
Clarence S. Johnson and Arthur F. Langguth, San Diego, Calif., assignors to the United States of America as represented by the Secretary of the Navy
Filed Mar. 24, 1971, Ser. No. 127,694
Int. Cl. A01k *81/00*
U.S. Cl. 43—6 **4 Claims**



A sharpened, metallic dart secured to the riser lines of a small drogue chute is releasably mounted on the tip of a spear gunshaft with the drogue chute folded and elastically carried on the shaft. Upon embedding the dart in the shark's body via the launched spear shaft, and retracting the shaft, the drogue chute is pulled free and fills with water as the creature moves through the water. The entrained mass, captured by the chute, provides an asymmetrical drag to upset the hydrodynamic equilibrium of the shark and render him incapable of swimming in a coordinated manner and to, thusly, remove him as a danger to divers.

3,715,829
COLLAPSIBLE FISHING NET

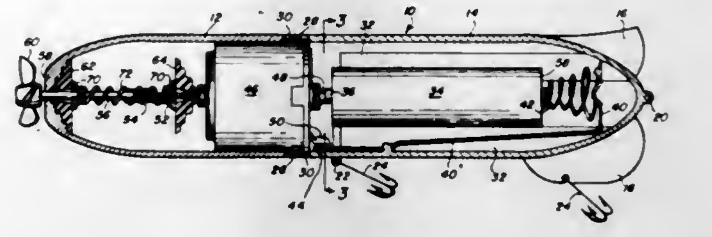
Charles L. Hamilton, 1315 Maryland Avenue, Golden Valley, Minn.
Filed Dec. 10, 1970, Ser. No. 96,947
Int. Cl. A01k *77/00*
U.S. Cl. 43—12 **4 Claims**



A collapsible fishing net formed of a pair of frame parts having handle and bowed frame portions which are pivotally connected to one another to permit separating and bringing together of the bowed portions with separation and bringing together of the handle portions for the purpose of opening and closing the net frame. A flexible interconnecting member attaches to the free extremities of the curved, bowed portion to complete the net frame and a net is suspended therefrom.

3,715,830
SELF-PROPELLED FISHING LURE

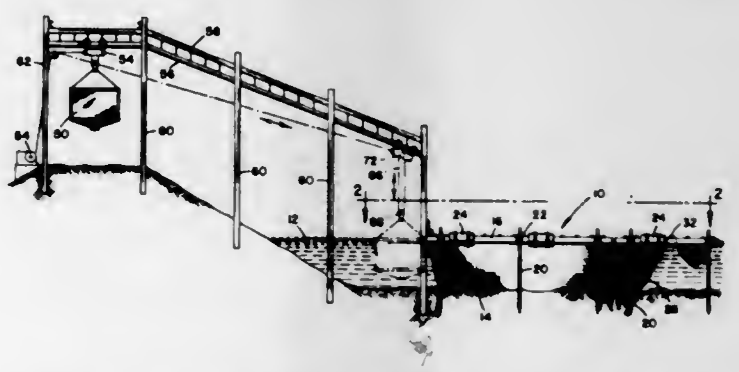
Benjamin W. Price, Nebo Route 1, Box 222, Marion, N.C.
Filed Feb. 25, 1971, Ser. No. 118,847
Int. Cl. A01k *85/06*
U.S. Cl. 43—26.2 **4 Claims**



An artificial self-propelled fishing lure including a generally cylindrical body portion in which are carried an electric motor and a battery, the electric motor being connected to a shaft which extends through an end wall of the body portion to a connection with a driving propeller. The body portion is made of two parts which are rotatable with respect to one another about the longitudinal axis of the body portion, and the battery and electrical motor contacts are arranged to be engaged at a selected rotational positional of said body parts whereby the motor will operate the driving propeller. To prevent water from entering the body portion at the propeller shaft and reaching the motor, annular sealing members are fitted to the propeller shaft for engagement, respectively, with the interior wall surface at the end wall of the body portion and with the motor, and a biasing spring is arranged to urge these sealing members into engagement with the motor and the wall surface respectively. The shaft receiving openings in the sealing members are conical to provide a cavity between the shaft and the sealing members, and these cavities are filled with grease or the like which prevents water from flowing along the shaft. The cavities may be closed by cap members to retain the grease in the spaces, and the biasing spring may abut the cap members to hold them in place.

3,715,831
METHOD AND APPARATUS FOR HARVESTING FISH

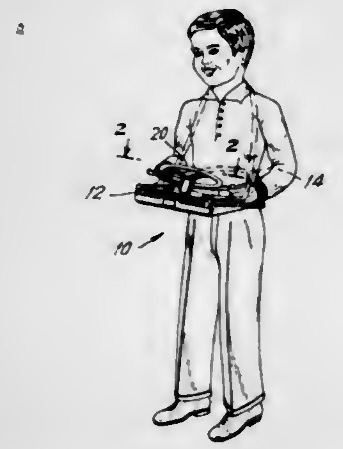
Glenn E. Mason, 1134 Martingale Road, Jackson, Miss. 39206
Filed Aug. 30, 1971, Ser. No. 175,835
Int. Cl. A01k *75/00*
U.S. Cl. 43—4.5 **11 Claims**



Fish are harvested from shallow ponds, etc. having a regulatable water level by providing a net which is initially open at one end in a region which is several feet lower than the lowest portion of the remainder of the bed of the pond or lake so that the fish congregate in this region. Alternatively, the fish may also be lured into a net area by trailing fish food from the rear of a boat. Three sides of the net may be secured to a framework approximately at the water level, and a roller is disposed under the net at the other side of the structure at the water level. Movement of the roller within a rail assembly towards the opposite side of the framework against the underside of the net progressively decreases the volume enclosed by the net and moves the fish towards the side of the apparatus nearest the shore line. The fish are herded into a conveying mechanism which conveys the fish to shore and deposits them in a suitable vehicle. The invention is applicable to the commercial production, processing and sale of fish.

3,715,832
BODY CARRIED SIMULATED AUTO TOY

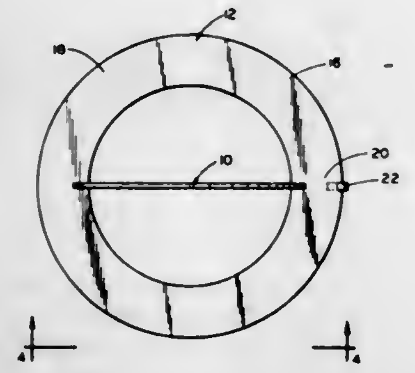
Orazio Giovacchino Giacomo Torres, Palmas y Ombues 5354, Montevideo, Uruguay
Filed Dec. 6, 1971, Ser. No. 205,013
Int. Cl. A63h *33/26*
U.S. Cl. 46—1 B **5 Claims**



A child's toy simulating an automobile and comprising a horizontally oriented platform and front and side wall members is shown. The platform has a steering column and steering wheel projecting from it and dashboard instrumentation represented upon it. Likewise, the front and sidewalls have detail simulating the front and side walls of an automobile. In the preferred embodiment an enclosure is formed with a bottom wall and electrical circuitry is provided to operate directional signals and headlamps controlled by switches mounted on the platform.

3,715,833
GLIDER TOY

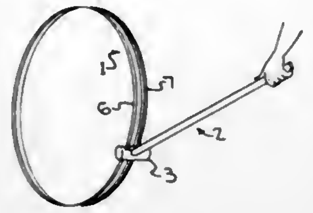
Robert J. Nickerson, Forest Park, and James N. Economos, Evergreen Park, both of Ill., assignors to Nickerson, Economos and Noonan, Evergreen Park, Ill.
Filed Sept. 13, 1971, Ser. No. 179,939
Int. Cl. A63h *27/00*
U.S. Cl. 46—79 **10 Claims**



A glider toy is provided having at least one longitudinally extending planar fin and a planar annulus perpendicular to the fin. The annulus is bilaterally symmetrical with respect to its median longitudinal plane.

3,715,834
HOOP-AND-STICK TOY

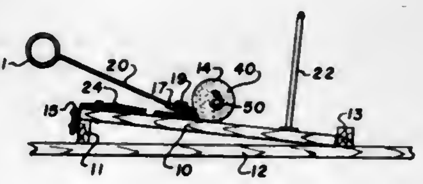
Avion Paul Lewis Gelis, 638 Hailey Avenue, Slidell, La.
Filed April 17, 1972, Ser. No. 244,640
Int. Cl. A63h *33/02*
U.S. Cl. 46—220 **5 Claims**



A hoop-and-stick toy wherein the hoop has two peripheral, upstanding rims at both edges and the stick has a cylindrical head with two relatively wide grooves for mating with the rims, giving maximum guidance and control of the hoop and yet allowing maximum flexibility in the use of the toy.

3,715,835
ENCAPSULATING TREE SEEDLING ROOT SYSTEMS

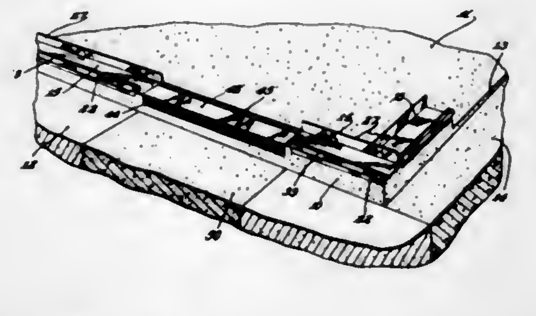
Norman R. Pelton, 12127 York Ave., Haney, B.C., Canada
Filed Oct. 2, 1970, Ser. No. 77,553
Int. Cl. A01g *9/10*
U.S. Cl. 47—58 **5 Claims**



A device for encapsulating the roots of a tree seedling in a clay-like mud which comprises a flexible sheet secured at one edge to a base and having a blade extending along an opposite edge. A quantity of mud is placed on the sheet, the root system of the seedling is placed on the mud and then the sheet folded to bring the blade edge close to the opposite edge to fold the mud around the seedling. The blade is then slid along the sheet, away from the edge secured to the base, to form the mud into a generally cylindrical shape around the roots.

3,715,836
METHOD OF BUILDING CONSTRUCTION

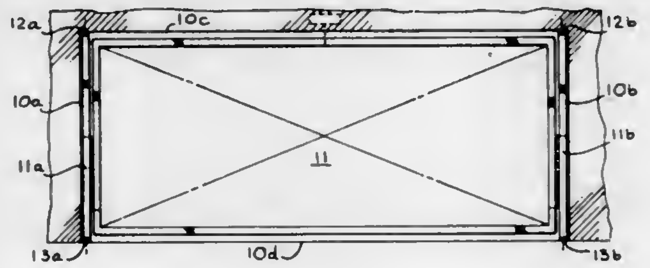
Donald G. Monroe, Prospect Heights, Ill., assignor to Active Garage Builders Inc., Chicago, Ill.
Original application Jan. 9, 1970, Ser. No. 1,721. Divided and this application Aug. 19, 1971, Ser. No. 173,082
Int. Cl. E04b *1/40*
U.S. Cl. 52—741 **14 Claims**



A wall-carrying base plate is mounted on a poured, still plastic cementitious foundation by resting gauging means integral with one edge of the base plate on a form member to determine the elevation of the base plate. A depending flange on the base plate is engaged against an inner side of the form to determine the longitudinal placement of the base plate. The base plate is then supported by the form until the foundation material has set. Flange means on the base plate are embedded in the foundation material while still plastic to anchor the plate to the foundation. After the foundation material has set studs may be anchored on the base plate and siding connected to the gauging means as a starter and secured to the studs. Door framing is adapted to be associated with the base plate, as well as threshold structure.

3,715,837
SECURITY GATE APPARATUS

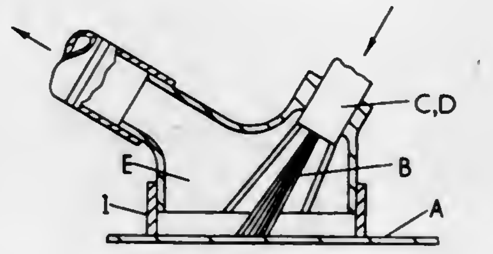
Michael T. Hamel, 1032 Werbel Place, San Pedro, Calif.
Filed June 8, 1971, Ser. No. 150,964
Int. Cl. E06b *3/32*
U.S. Cl. 49—380 **1 Claim**



The present invention provides apparatus by means of which the various sections of a security gate can be easily and expeditiously raised and installed.

3,715,838
APPARATUS FOR CORRECTING MISPRINTED MATTER ON SHEET MATERIAL

Gideon Maurice Young, London; Harold Silman, Esher, and Eric John Hill, Slough, all of England, assignors to Vacu-Blast Limited, Slough, England
Filed March 2, 1971, Ser. No. 120,248
Claims priority, application Great Britain, March 6, 1970, 10,837/70; March 26, 1970, 14,684/70
Int. Cl. B24c *1/00*
U.S. Cl. 51—12 **5 Claims**

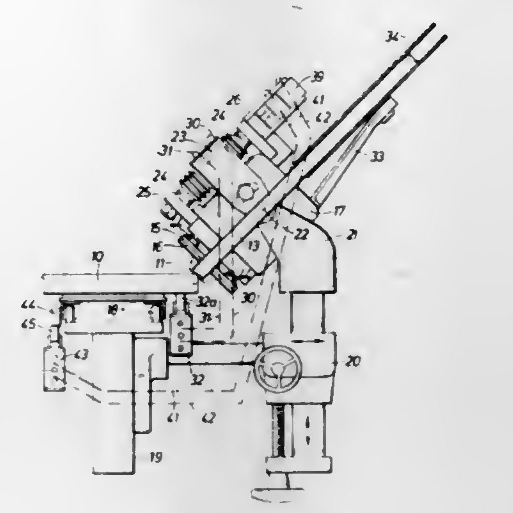


Apparatus for correcting misprinted matter on sheet material, the means for directing a stream of finely divided particulate abrasive or granular material on the sheet material and means for collecting the spent material immediately after use, in which the projection may take place within an enclosure which is positioned over the sheet material and to which a suction air flow is connected to remove the abrasive material after use.

3,715,839
GRINDING DEVICE FOR THE RADIUSED CHAMFERING OF AN EDGE OF A WORKPIECE

Karl Heesemann, Friedenstrasse 54, 4970 Bad Oeyenhausen-Rehme, Germany
Filed Sept. 14, 1971, Ser. No. 180,356
Claims priority, application Austria, Sept. 15, 1970, 8361
Int. Cl. B24b *21/16*
U.S. Cl. 51—58 **7 Claims**

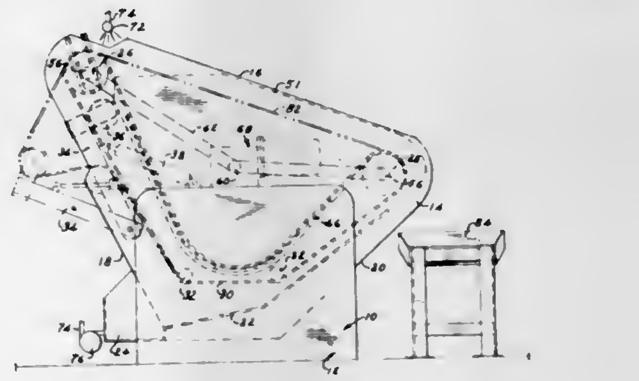
A grinding device for the radiused chamfering of an edge of a workpiece. The grinding device is characterized by a grinding belt progressively drawn from a spool and passed around a pressing surface on a pressing shoe which has a trapezoidal



channel profile. A motor, with apparatus which produces an orbital movement for the pressing shoe, is included.

3,715,840
APPARATUS AND METHOD FOR FINISHING WORKPIECES

Richard L. Davidson, Sturgis, Mich., assignor to The Grav-I-Flo Corporation, St. Joseph County, Mich.
Filed Dec. 31, 1970, Ser. No. 103,266
Int. Cl. B24b *31/10*
U.S. Cl. 51—163 **17 Claims**

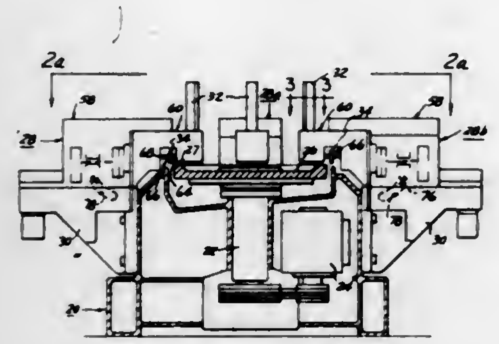


A tumbling machine having an endless belt arranged so that the top run of the belt defines with a pair of side walls a V-shaped tumbling chamber in which the mixture of abrasive media and the workpieces are loaded so that at one side of the chamber the workpieces are caused to travel upwardly to a high point, then flow down towards the opposite side of the chamber where they are again conveyed by the belt around the apex of the V.

3,715,841
AUTOMATIC PROFILE GRINDING MACHINE WITH AN INDEXING MECHANISM

Oscar Schnellman, 8030 Zurich, Switzerland, and Henry Willy Stier, Dearborn Heights, Mich., assignors to Carmet Company, Pittsburgh, Pa.
Division of Ser. No. 751,879, Aug. 12, 1968, Pat. No. 3,587,192. This application April 28, 1971, Ser. No. 138,214
Int. Cl. B24b *49/04*
U.S. Cl. 51—165.88 **5 Claims**

An automatic profile grinding machine with indexing mechanism especially for contour grinding of relatively small parts such as tool inserts, comprised of a grinding wheel, work stations arranged around said grinding wheel, universal work feeding mechanism associated with each work station, individual cam mechanisms for each work station to index the grinding steps, electric and fluid pressure control mechanisms to control operation of the machine, work measuring mechanism and adjusting mechanism associated with the measuring mechanism to compensate for wear or out of balance condition of the grinding wheel.



3,715,842
SILICA POLISHING COMPOSITIONS HAVING A REDUCED TENDENCY TO SCRATCH SILICON AND GERMANIUM SURFACES

Bruce Charles Tredinnick, Flemington, N.J.; James Richard Gambale, Media, Pa., and Paul Montgomery Dupree, Delaware Township, Hunterdon County, N.J., assignors to Tizon Chemical Corporation, Flemington, N.J.

Filed July 2, 1970, Ser. No. 52,094
Int. Cl. B24b *1/00*; **C08h** *17/12*

U.S. Cl. 51—281 **11 Claims**

Alkaline aqueous silica polishing compositions are provided, having a reduced tendency to scratch silicon and germanium surfaces, such as single crystal wafers polished for use in semiconductors. The polishing compositions comprise silica as the polishing agent, and a water-soluble cellulose ether, and are used with water.

ERRATUM

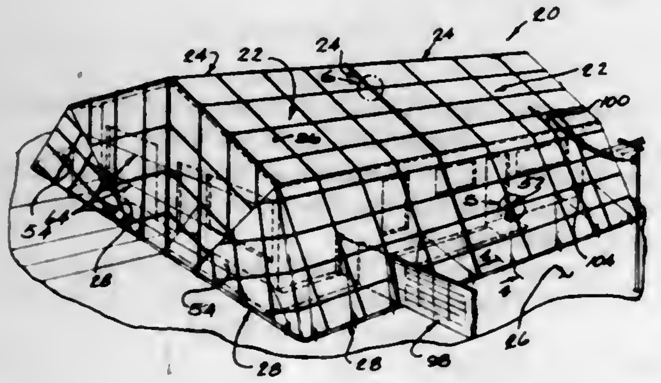
For Class 52—21 see:
Patent No. 3,715,958

3,715,843
FIRE PROTECTION APPARATUS FOR A BUILDING

Virgil R. Ballinger, P.O. Box 18948 Cimmaron Station, Los Angeles, Calif.

Filed Aug. 23, 1971, Ser. No. 174,026
Int. Cl. E04b *1/34*

U.S. Cl. 52—3 **16 Claims**



Fire-resistant apparatus for covering and enclosing a building for protecting it from airborne firebrands, or the like, produced by a high-velocity fire storm. The enclosing apparatus includes flexible, thin-sheet cover means of fire-resistant or fire-retardant material which is usually in the form of several panel portions adapted to be edge-joined by junction means to provide a composite cover of a desired size and shape for protecting a particular building and which is then pulled into place covering the building with edges of the cover means being firmly fastened together and effectively sealed substantially completely around the building to adjacent ground surface portions by edge-fastening means so that the high-velocity winds produced by a fire storm will be substantially excluded and so that the fire-retardant character of the cover means will prevent the building from catching fire as a result of burning embers or firebrands being blown by the approaching fire storm onto the building (of course, with the protective fire-retardant cover interposed therebetween). The multi-panel cover means and the edge-fastening means and auxiliary fastening strap means provided for attachment thereof are so constructed as to be capable of being very quickly and relatively easily assembled and mounted in protective relationship over a building by a small crew of men when the building is threatened by an approaching fire storm.

ERRATUM

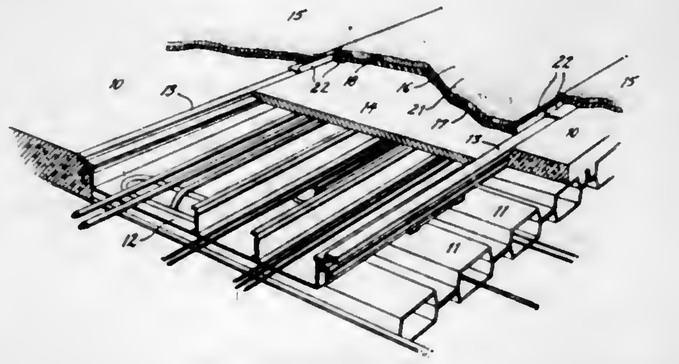
For Class 52—3 see:
Patent No. 3,715,843

3,715,844
FLOOR CONSTRUCTION INCLUDING CARPETED TRENCH HEADERS

Robert P. Breading, 714 Pine Street, Philadelphia, Pa.

Filed Feb. 24, 1971, Ser. No. 118,415
Int. Cl. E04b *5/48*

U.S. Cl. 52—221 **2 Claims**



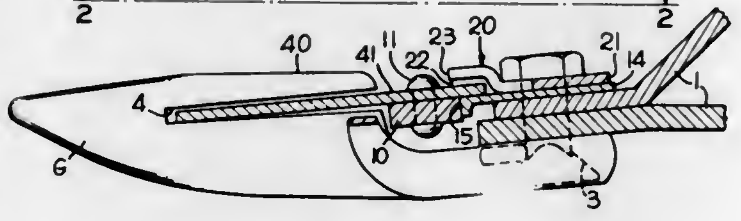
In a floor construction especially of the type which includes a floor slab and a trench header embedded in the floor slab and covered by a trench header cover, carpet on the floor slab and on the trench header cover has abutting edges where it meets. A carpet strip is secured to the abutting edges, having an elongated base underlying the carpet backing, and having an upstanding edge portion secured to the base and running along the edge of the carpet. The edge portion with the base makes an angle between 80° and 84°, preferably 83°. The edge portion at its top is below the top of the pile, and it extends above the carpet backing, locking the carpet at the edge. The carpet strip is secured to the carpet and to the floor slab or the trench header cover as the case may be. The back of the carpet strip preferably is of diminishing thickness at the edge remote from the upstanding edge portion.

3,715,845
MOWER SICKLE HOLD-DOWN MEANS

Benjamin A. Braunberger, West Bend, Wis., assignor to Gehl Company, West Bend, Wis.

Filed May 12, 1972, Ser. No. 252,865
Int. Cl. A01d *55/06*

U.S. Cl. 56—305 **5 Claims**



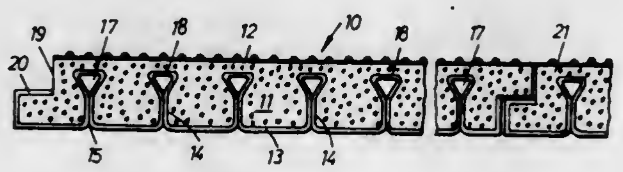
A hold-down clip is provided for a mower sickle for harvesting crops or the like in which reciprocating sickle sections cooperate with forged guards to provide a cutting action of the crop through which the mower moves. The clip extends over the rear portion only of the sickle sections and holds the sickle assembly down in position. The hold-down clip is out of the way and insures smooth flow of the crop over the sickle.

3,715,846
SELF-SUPPORTING INSULATING ELEMENT

Heinz Sullhofer, Niederrheinstrasse 158, 4000 Dusseldorf, Germany

Filed Sept. 8, 1970, Ser. No. 70,206
Int. Cl. E04c *1/30, 2/22*

U.S. Cl. 52—309 **1 Claim**



A self-supporting insulating element for roofs and walls with an insulating core of hard foam material, especially polyurethane hard foam material, and with two cover layers one of which is formed by a reinforced metal sheet or reinforced web of synthetic material.

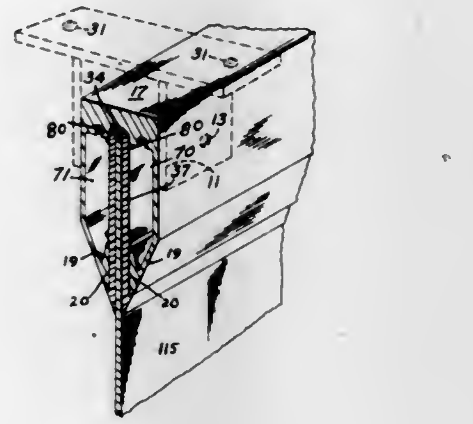
3,715,847
PANEL AND EXTRUSION COMBINATION

Albert E. Straus, Erie, Pa., assignor to General Partition Manufacturing, Erie, Pa.

Filed June 10, 1970, Ser. No. 45,179
Int. Cl. E04b *2/74*

U.S. Cl. 52—400 **1 Claim**

A wall including an extrusion supported in a bracket member for attaching the extrusion to a wall. The extrusion having generally U shaped legs receiving a leg of the panel between them, the legs converging toward each other and terminating in spaced relation adapted to receive the edge of a relatively thin panel. A U shaped spacer member adapted to be supported over the edge of a thinner panel and inserted in the space, and screws extending through the bracket legs and into the legs of the extrusion. The extrusion forms a relatively rigid frame for a thin panel.

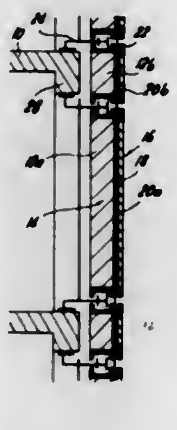


3,715,848
MULTIPLE LAYER OUTSIDE WALL OF A BUILDING OR THE LIKE

Paul Jordan, Zahringerplatz 2, Constance, Germany

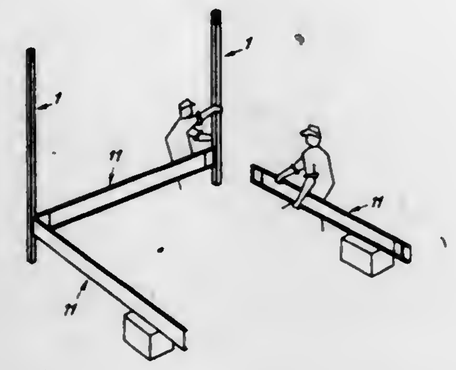
Filed Apr. 15, 1970, Ser. No. 28,614
Claims priority, application Switzerland, Apr. 18, 1969, 5,857/69
Int. Cl. E04b *1/62, 2/88*

U.S. Cl. 52—235 **23 Claims**



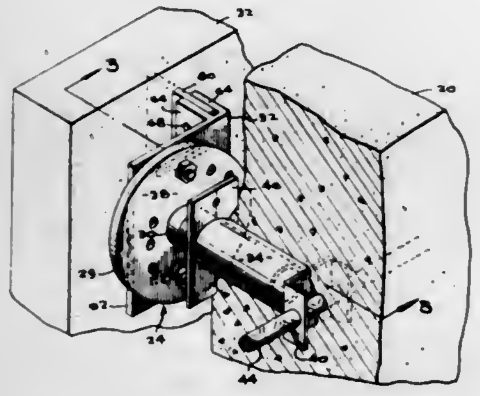
A multiple layer outer wall for a building or the like which embodies an outer wall layer portion and an inner wall layer portion as well as an insulation skin arranged between both of the aforementioned wall portions. This insulation skin is constructed as a membrane consisting of an elastic elongatable, tear resistant and thermally insulating material which at least is primarily covered both towards the outside of the building as well as toward the inside of the building by the respective outer and inner wall layer portions. Furthermore, the insulation membrane or skin is free of interruptions defining parting lines or separation joints or at least possesses less separation joints or parting lines than one of both wall layer portions, and additionally, the inner wall layer portion is assembled from a plurality of substantially rectangular wall elements which are laterally arranged adjacent one another with horizontal spacing and/or vertical spacing.

3,715,849
BUILDING CONSTUCTION
Marcel Rudolf Strassle, 9533 Kirchberg, Switzerland
Filed Oct. 1, 1970, Ser. No. 77,251
Claims priority, application Switzerland, Aug. 19, 1970, 12428/70
Int. Cl. E04h *12/00*
U.S. Cl. 52—646 **7 Claims**



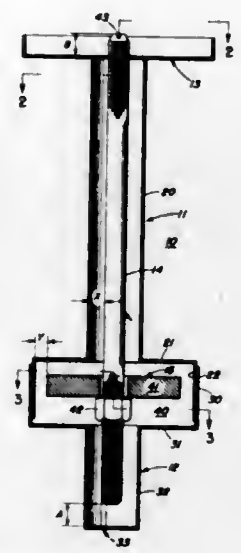
A building construction with hollow vertical pillars to which the required girders are directly connected. The pillars have a many-cornered, particularly a four-cornered, profile, and the side walls of the pillars are of corrugated shape, each side wall having alternating inner and outer peaks of trapezoidal shape. The outer peaks in the side walls are disposed on opposite sides of an inner peak, there being provided flanges which partially cover the space within the peaks. At each of the corners of the pillar there is provided an outwardly extending rib; at least on two side surfaces the pillar is provided with apertures on which to hang girders.

3,715,850
ADJUSTABLE MOUNTING DEVICE
James L. Chambers, 3615 Coker Street, Irving, Tex.
Filed Aug. 25, 1971, Ser. No. 174,631
Int. Cl. E04b *1/41*
U.S. Cl. 52—701 **17 Claims**



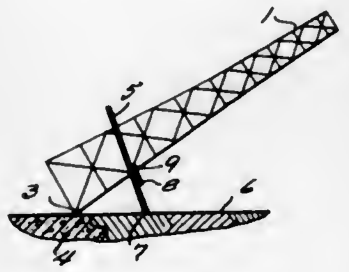
An adjustable mounting device is provided for supporting a decorative slab or the like from a building frame by means of an internal sleeve connected to the building frame with a table plate having a cantilever stem threadably received on the interior of the sleeve for inward and outward movement of the slab with respect to the frame. The table plate includes a plurality of aperture pairs to which an angle bracket is adjustably connected with the angle bracket being of L-shaped configuration and having a base plate and two parallel plates forming a slot in which a fixture plate on the slab is received; the pair of spaced plates defining the slot have a plurality of apertures through which a supporting bolt means extends into the fixture plate so that horizontal and vertical adjustment in any direction is provided for enabling connection of the fixture plate to the supporting building framework.

3,715,851
ANCHOR BOLT ASSEMBLY
Charles F. Bennett, 1325 Locust Ave., Bohemia, N.Y. 11716
Continuation of abandoned application Ser. No. 807,770, Mar. 13, 1969. This application May 7, 1971, Ser. No. 141,345
Int. Cl. E02d *5/74;* **E04b** *1/38*
U.S. Cl. 52—707 **7 Claims**



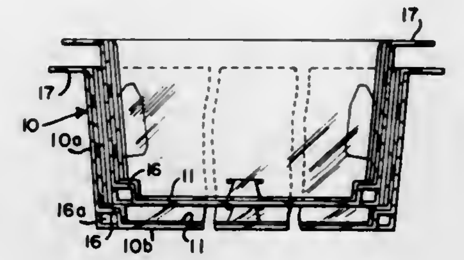
An anchor bolt assembly which is particularly useful for anchoring heavy machinery to bases or floors, such as a concrete floor, and which includes a sleeve member adapted to be embedded in the floor, and an anchor bolt or stud means positioned between restraining shoulders of the sleeve member.

3,715,852
METHOD OF ERECTING TOWER-LIKE STRUCTURE
Taro Koga; Taku Egusa, both of Hiroshima, and Yoshihiko Miyatani, Kamo-gun, all of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan
Filed Dec. 8, 1970, Ser. No. 96,290
Int. Cl. E04b *1/00;* **E04g** *1/00, 23/00*
U.S. Cl. 52—745 **10 Claims**



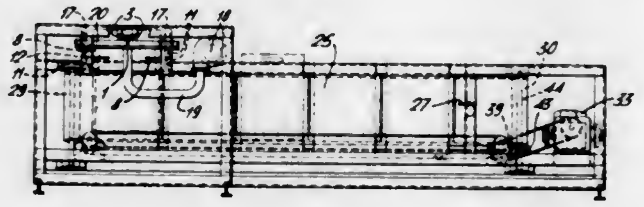
A method of works for erecting tower-like structures, characterized by the steps of assembling a tower-like structure as laid on the ground, coupling the lower end thereof onto the foundation with a horizontal pivotal shaft, pivotably mounting one ends of movable beams at an interval along an axis which is parallel to said pivotal shaft onto the ground, or onto a support structure or a side of said tower-like structure apart from said pivotal shaft, providing jack means on said movable beams so that said jack means may operate in their lengthwise direction and may move along said movable beams in their lengthwise direction while alternately engaging either end thereof fixedly with the movable beam, coupling one operating end of said jack means respectively onto a side of said tower-like structure or onto the ground or a support structure with a pivotal shaft which is parallel to said first pivotal shaft, and driving said jack means to erect said tower-like structure about said first pivotal shaft while either pushing or drawing.

3,715,853
BOILABLE BAKEABLE PACKAGE AND METHOD
Robert P. Bemiss, Hillsborough, Calif., assignor to Robalex Inc., San Francisco, Calif.
Filed Oct. 26, 1970, Ser. No. 83,704
Int. Cl. B65b *31/00*
U.S. Cl. 53—22 A **14 Claims**



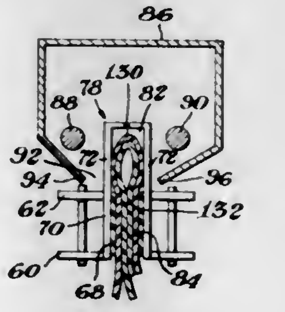
A laminated or multi-layer wall tray is provided which has a self-supporting outer layer or wall portion of paperboard which can be formed and handled as an independent self-supporting unit during manufacture of the laminated tray. A plastic liner is heat-vacuum formed into the paperboard tray or carton to provide a boilable, bakeable, liquid-tight, leak-proof lining for the tray which in its entirety is of a boilable or bakeable character, and to provide a strengthened structure of the composite tray of the outer paperboard supporting structure and inner plastic film liner in supporting structure. Both the liner and the paperboard are preferably made of a thinness or caliper of a dimension less than cqn be normally employed in such structures when used alone. At the bottom of the paperboard outer structure has certain formed indents around its bottom corner edge which provide resting portions or stops for nesting of the tapered trays to be handled as a stack, and also provide exit openings or vents for air from within the carton or tray at required positions to the outside during the thermo-vacuum forming of the liner. The method of fabricating or combining the components of such a tray comprises the steps of forming the outer paperboard structure or layer with the corners locked or secured together in self-supporting fashion to receive the plastic liner by thermo-vacuum forming process drawn inside of the self-supported paperboard outer structure to correspond identically to the inner profile of the paperboard container thereby locking and if desired, adhering the molten plastic material to the inside paperboard structure. A laterally horizontally extending flange may be provided around the upper edge of either the paperboard or the plastic, or both.

3,715,854
BAGS AND BAG-SUPPLYING APPARATUS
Alexander Steel Smith, 16, William Allen Lane, Lindfield, and Ernest Arthur Bailey, Magnolia, Station Road, Eynsford, both of England
Filed June 2, 1970, Ser. No. 42,666
Int. Cl. B65b *43/36, 67/12*
U.S. Cl. 53—29 **7 Claims**



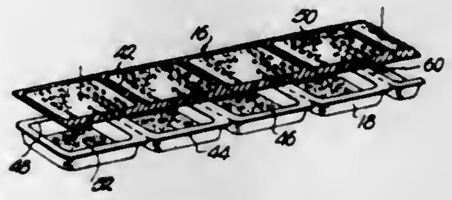
A bagging apparatus having means for advancing a bag in a flat or collapsed condition to a station where it can be opened for charging, means for retaining the bag in open position, mouth uppermost, and means for advancing the bag, when charged, and while retaining the charged bag in upright condition. Preferably air jet means are provided at the opening station for opening the leading bag of a spring-urged closely packed set of flat or collapsed bags on a holder means being provided for securing the front panel of that bag while the rear panel of said bag is retained on the holder. Conveyor means which can be stopped as required, e.g., at the opening and charging station, are provided for conveying the charged bag from that station.

3,715,855
METHOD AND APPARATUS FOR AUTOMATICALLY VENTING PLASTIC BAGS
William A. Armstrong, Brookpark, Ohio, assignor to Basic Packaging Systems, Inc., Avon Lake, Ohio
Filed Dec. 21, 1970, Ser. No. 99,780
Int. Cl. B65b *7/08*
U.S. Cl. 53—37 **2 Claims**



Method and apparatus for automatically closing plastic film bags while simultaneously venting the bag in a manner so that the bag is essentially "leak proof," but yet is able to breathe to avoid expansion of "pillowing" when stored at high temperature. The invention contemplates folding over the top portion of the bag, applying heating along the fold line sufficient to heat plastify the film and while cooperatively shielding short increments of the film; and thereafter squeezing and cooling the film to pressure set the seal. Each shielded increment forms an air vent to the above-noted quality.

3,715,856
PACKAGING METHOD
Mark Borel, Prairie Village, Kans., assignor to Jules Borel & Co., Kansas City, Mo.
Filed Aug. 19, 1971, Ser. No. 173,102
Int. Cl. B65b *7/28*
U.S. Cl. 53—41 **5 Claims**



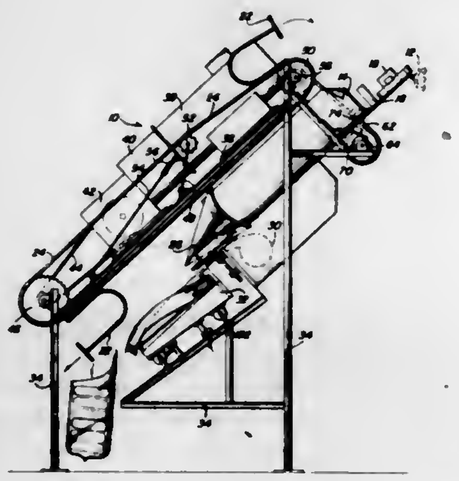
A sealed container has a closure which includes a label attached to an outturned flange of the container by a peripheral band of pressure sensitive adhesive on the label such that the label is adapted to be peeled back at one of its corners to dispense articles one at a time from the container and to be then pressed back into place until another article is to be dispensed, the closure being produced by a method which uses a backing sheet to present a path attached to the label by such adhesive and disposed within the confines of the band for protecting the articles against contact with the adhesive.

A single coating of the pressure sensitive adhesive is initially used to laminate the backing sheet with a label sheet and the patches are then preformed by die cutting the backing sheet. The labels may also be preformed by die cutting and/or by die perforating of the label sheet. The waste materials of the sheets are then removed, presenting the closures, each consisting of a patch still glued to the label and exposing only the pressure sensitive adhesive band on the label around the patch.

3,715,857
BAGEL BAGGING MACHINE

Daniel H. Fronczak, Buffalo, N.Y., assignor to Abels Bagels, Inc.

Filed Sept. 8, 1971, Ser. No. 178,619
Int. Cl. B65b *57/20, 43/36*
U.S. Cl. 53—62 **23 Claims**



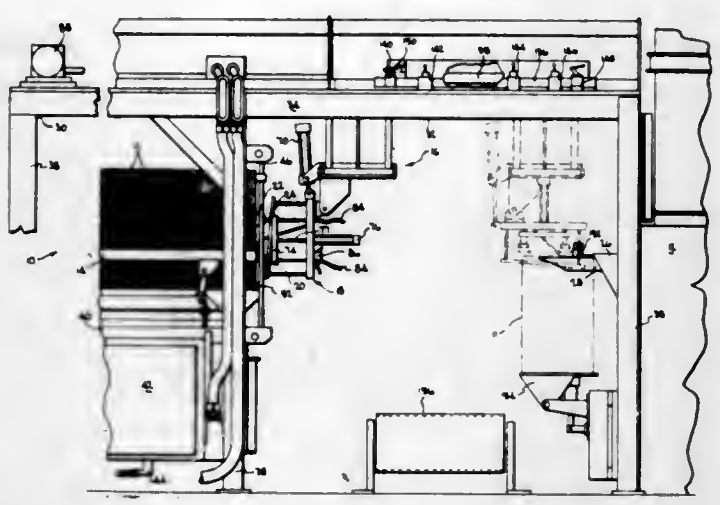
An apparatus for packaging bagels and other articles, said apparatus comprising a solenoid operated gate and counter for permitting the passage of predetermined number of bagels into a sloped chute, a drive mechanism for advancing and pushing the bagels in a stacked manner beyond the chute and into an inflated bag for sealing and shipping. The bags are stacked upon a pair of tiers, one of which is automatically shifted into alignment with an inflation blower when the other bag supply becomes exhausted.

3,715,858
VALVE BAG PLACER

Will G. Durant, and David C. Ball, both of Ontario, Calif., assignors to Cherry-Burrell Corporation, Chicago, Ill.

Filed Sept. 1, 1971, Ser. No. 176,867
Int. Cl. B65b *43/26*
U.S. Cl. 53—190 **10 Claims**

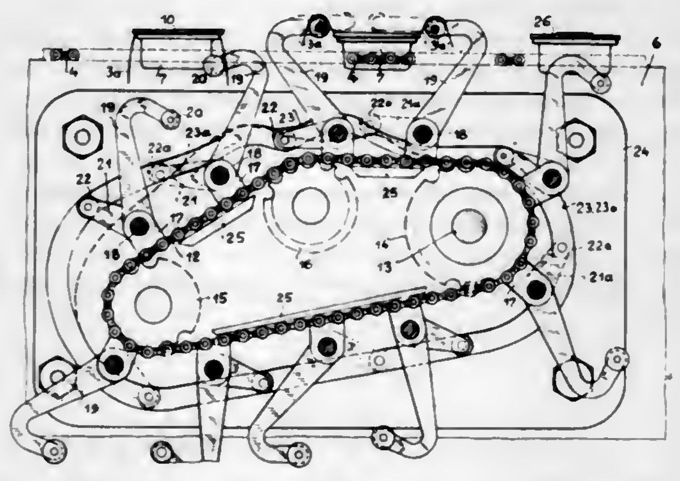
Apparatus for removing valve bags from a magazine and placing the bags onto a horizontal filler spout for filling with flowable material. Handling means having a pair of grippers picks the forwardmost bag from the magazine and then pulls the bag valve open using an associated opening element. The bag valve is positively held open while the handling unit travels to the filler where the valve is inserted over the aligned spout. The apparatus is adapted to serve a pair of side-by-side fillers from a single magazine because lateral shifting of the handling means can be effected during its travel to align it with either filler spout. The operation is fully automatic and embodies a pneumatic control system which regulates each step of the bag-placing operation.



3,715,859
APPARATUS FOR WRAPPING UP OF DISC-SHAPED FOOD AND TABLE LUXURIES, AS CHEESE DISCS, CHOCOLATE BARS OR THE LIKE

Gunter Reinecke, Wuppertal-Elberfeld, Germany, assignor to Benz & Hilgers GmbH, Dusseldorf, Germany

Filed Dec. 22, 1970, Ser. No. 100,688
Claims priority, application Germany, Jan. 2, 1970, P 20 00 023.1
Int. Cl. B65b *11/10, 49/10*
U.S. Cl. 53—209 **4 Claims**

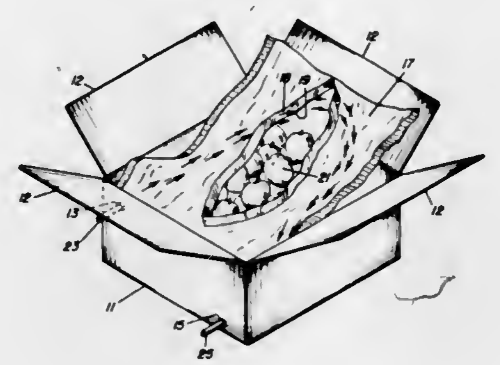


An apparatus for wrapping of disc-shaped food-and table-luxuries, as cheese discs, chocolate bars and the like, in foils of paper and/or metal and synthetic material, respectively, including a continuously rotating transportation band, which comprises means for feeding a wrapping material web and a plurality of discs to the transportation band, folding members fold over closing flaps projecting on opposite sides of the discs. A pair of feeding chains turn continuously, and include an upper and a lower path. A plurality of carrying strips receive in series the discs underlayed by wrapping material and bridging over the pair of feeding chains. The carrying strips are spaced apart from each other at a distance, that by cross-cutting of the wrapping material web between adjacent carrying strips two closing flaps are produced, and the passing of the folding members disposed below the pair of feeding chains and causing of the folding over of the closing flaps is made possible.

3,715,860
METHOD OF PRESERVING PERISHABLE PRODUCTS

Joseph J. Esty, 2033 Catalina Blvd.,
San Diego, Calif. 92107

Continuation of abandoned application Ser. No. 58,266, July 27, 1970, which is a division of application Ser. No. 645,968, June 14, 1967. This application July 23, 1971, Ser. No. 165,398
Int. Cl. B65b *31/04*
U.S. Cl. 53—22 B **2 Claims**

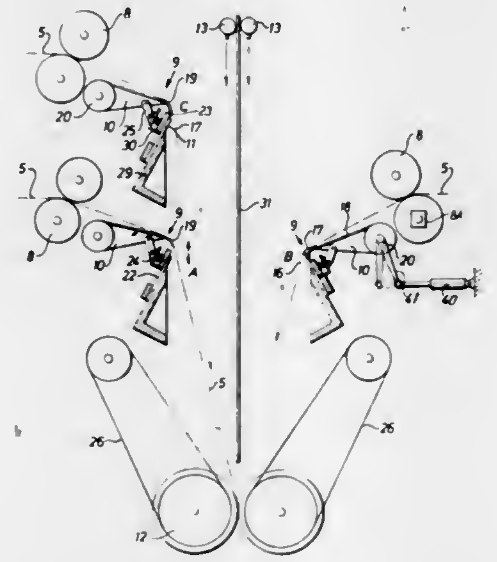


The method of packaging perishable products in a container and insuring preservation of the products while in the container, which method consists in permanently sealing the opening of the container after the product is packaged thereafter forcing an inert fluid to expel the air from the container through a port entry and exhaust, then sealing the port entry and exhaust while in the process of purging, thus trapping the inert fluid in the container.

3,715,861
IMPROVEMENTS IN A WRAPPING MACHINE FOR WRAPPING CYLINDRICAL OBJECTS

Stig Axel Odelberg, P. O. Box 259, 43080 Hovas, Sweden

Filed Sept. 11, 1970, Ser. No. 71,591
Int. Cl. B65b *11/04, 61/06;* **B26f** *3/02*
U.S. Cl. 53—211 **15 Claims**



A machine is disclosed for wrapping a web around a rotating cylindrical object. The web is fed from a supply roll through feed rolls and over a cutting means where the feed direction is changed. From this point the web with the assistance of further guiding means is passed onto the periphery of the rotating object. The cutting means comprise a web guide for bringing the web in contact with the cutting edge of a knife. In the cutting operation the supply and feed rolls are braked and the web is brought in contact with the knife edge, the portions of the web on each side of the severing line being free to move, in the feed direction, thereby assuring a clean cut without folding the upstream portion of the web and allowing the severed web portion free continuous passage to the periphery of the rotating object.

ERRATUM

For Class 52—319 see:
Patent No. 3,715,865

3,715,862
AUTOMATIC BAGGER OF GROCERIES SUNDRIES

Paul G. Schohl, 15 Einig St., Titusville, Fla. 32780

Filed Aug. 9, 1971, Ser. No. 95,897
Int. Cl. B65b *67/12*
U.S. Cl. 53—390 **2 Claims**

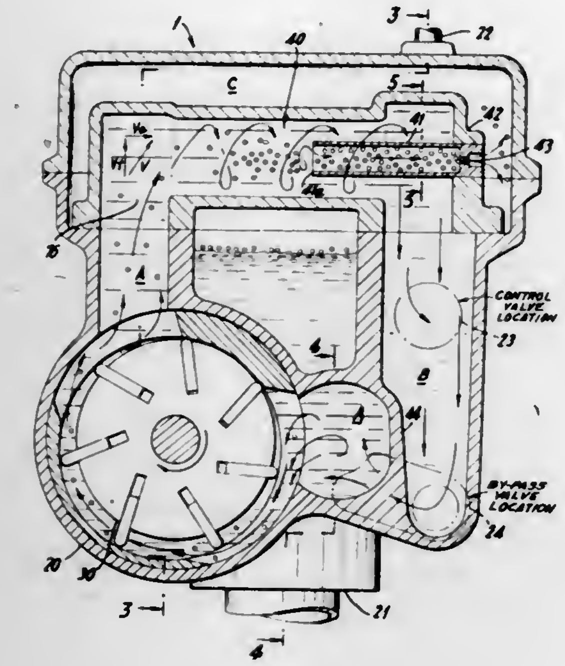
This invention is a novel way to improve and eliminate extra motion and lost time in the packaging of groceries and most of the items found in supermarkets and stores. After observing for many years the old manner of packaging the customers' items, it was noted that the cashier must pick up each item to price, and she either sets it back down or gives it a toss to the far end of the checkout counter. Why not be able to bag at the same time, as you check out? This invention operates on a small rugged 110 electrical system. Simply plug in anywhere. The machine will fit under any conventional grocery counter and be out of the way. It can be used at all times or it can be by-passed.

3,715,863
COMPACT PUMP/AIR SEPARATOR APPARATUS

Paul Zanoni, Muskegon, Mich., assignor to Bennett Pump Inc., Muskegon, Mich.

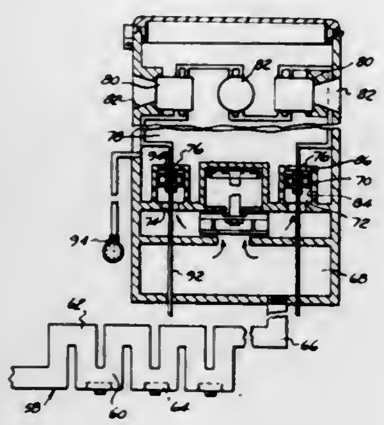
Filed March 26, 1971, Ser. No. 128,291
Int. Cl. B01d *19/00*
U.S. Cl. 55—204 **9 Claims**

A pump/air separator apparatus for use in dispensing gasoline includes an air separator of the cyclone type in which air and a low percentage of gasoline are removed from the pressurized gasoline by the air separator, with the air being vented to the atmosphere and the gasoline being returned to the suction side of the pump. Simultaneously pure gasoline is delivered from the air separator through an outlet valve to a meter and then to the nozzle dispenser, and any excess of such pure gasoline is by-passed back to the suction side of the pump.



3,715,864
SMOG PULVERIZING MACHINE

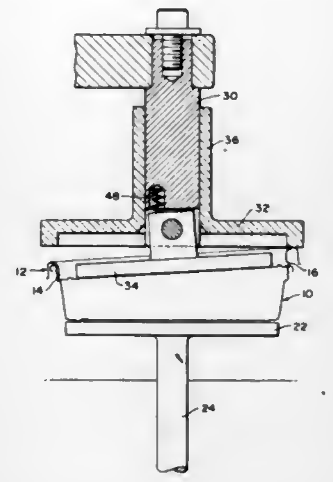
Eugene Rushin, 3988 Sheridan St., Detroit, Mich.
Filed May 13, 1971, Ser. No. 143,000
Int. Cl. B01d *50/00*
U.S. Cl. 55—213 **6 Claims**



This invention relates to apparatus for diluting and dispersing smoke from a furnace. It comprises the drawing of smoke from a furnace or other smoke producing apparatus by pumps into mixture with a flow of warm air. The resulting mixture is serially pumped into a first chamber. Float valves relieve this first chamber into a second or high pressure chamber. When these valves are sufficiently pressed downwardly by pressure in the second chamber, solenoid actuated valves in the second chamber are opened to relieve the mixture at relatively high pressure and velocity into the outside atmosphere. The solenoid actuated exit valves are provided with apparatus to remain in a locked open position until the float chambers rise sufficiently to deactuate this locking apparatus.

3,715,865
CAPPING DEVICE FOR CONTAINERS

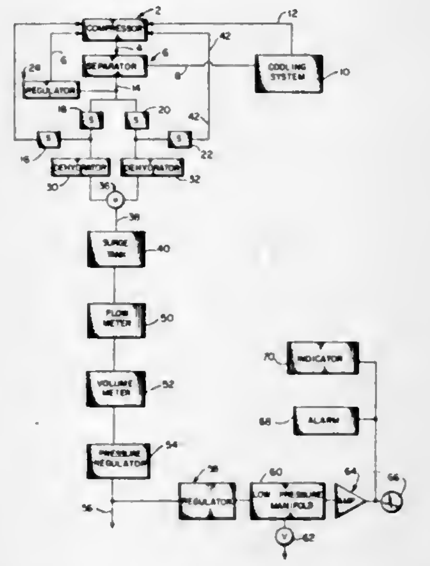
Paul Davis, Swampscott, Mass., assignor to Sweetheart Plastics, Inc., Wilmington, Mass.
Filed Nov. 5, 1970, Ser. No. 87,179
Int. Cl. B65b *7/28*
U.S. Cl. 53—319 **12 Claims**



A mechanism for seating lids on containers including as one embodiment a vertically movable container support and a capping head having a plate and an inner disc pivotally carried on a post above the support. As the container with a lid resting on its rim moves upwardly, the plate is carried upwardly on the lid and the disc seats one side of the lid and then seats the other side on the container, thereby minimizing distortion of the lid and container, and allowing air to escape from the container. In another embodiment the container remains stationary, and the pivotally mounted disc without the plate is vertically movable toward and away from the container and the lid.

3,715,866
DRY AIR SYSTEM

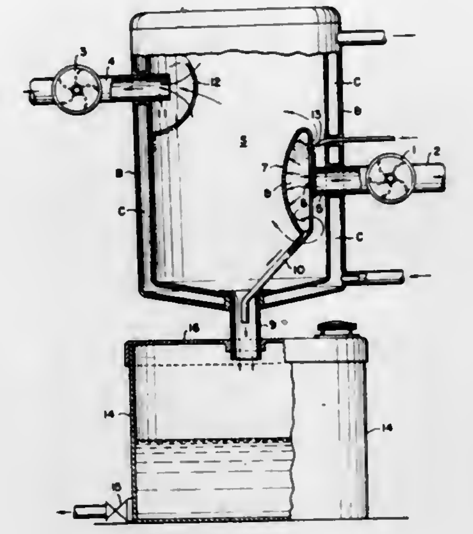
Edward S. Chatlos, Morristown, Paul G. K. Schroeder, Sparta, and Clarence O. Prinkey, Caldwell, N.J., assignors to Chatlos Systems, Inc., Hanover, N.J.
Filed Apr. 30, 1970, Ser. No. 33,288
Int. Cl. B01d *53/04*
U.S. Cl. 55—179 **2 Claims**



An improvement in dry air systems is provided by utilizing flow rate and volume indicators on the output side of a surge tank so as to minimize pulsating action during transition from one de-hydration tower to the other in the drying portion of the system. Moreover, humidity indication means are incorporated to signal the differential trend in condition as well as an alarm condition.

3,715,867
APPARATUS FOR PURIFYING GASES

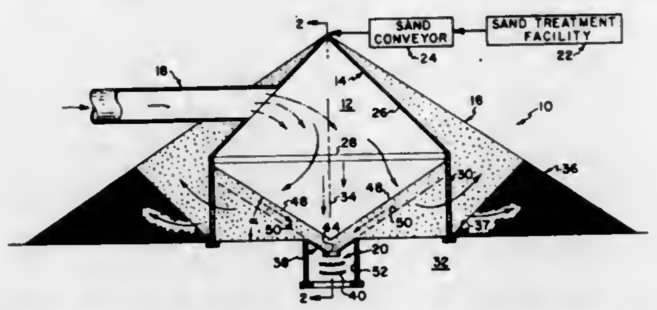
Katashi Aoi, 840 Juniso, Kamakura, Japan
Filed Nov. 30, 1970, Ser. No. 93,639
Int. Cl. B01f *3/04*
U.S. Cl. 55—222 **4 Claims**



A gas separating chamber is defined in a box or vessel which has a gas inlet, a gas outlet and an exhaust tube. An adiabatic expansion chamber for separation and removal of toxic components in gases is positioned within the gas separating chamber and a cooling means for reducing the temperature of gases is disposed inside or outside of the vessel.

3,715,868
APPARATUS FOR POLLUTION CONTORL OF FURNACE GASES

Charles P. Biasi, 74 Braman Road, Waterford, Conn.
Filed Nov. 23, 1970, Ser. No. 91,763
Int. Cl. B01d *23/16*
U.S. Cl. 55—315 **10 Claims**

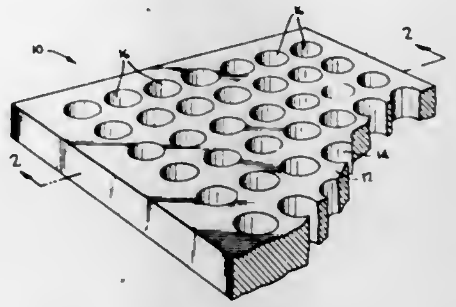


A filter device is disclosed for removing of particulate material and reactive vapors from the exhaust gases from a furnace or the like. The device comprises a flow velocity reduction chamber for separating particles above a predetermined size. Particulate filter material is used to remove smaller particles from the exhaust stream. Chemicals may be added to the filter device, either into the chamber or into the particulate filter material. Means are provided for removing fouled particulate filter material.

3,715,869
FILTER

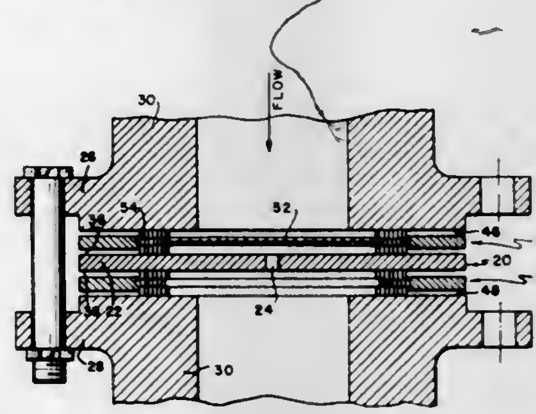
Herbert K. Holden, Bon Air, Va., assignor to American Filtrona Corporation, Richmond, Va.
Continuation-in-part of application Ser. No. 764,788, Oct. 3, 1968, now Patent No. 3,611,678. This application Mar. 8, 1971, Ser. No. 121,989
Int. Cl. B01d *53/04*
U.S. Cl. 55—387 **15 Claims**

A bonded activated carbon filter and a method for making the same are disclosed. The filter contains activated carbon and a thermosetting or thermoplastic resin binder, and is a self-contained disposable filter having voids in sufficient amount to provide a pressure drop of about 0 to 0.5 inch of water at a face velocity of up to approximately 450 feet per minute. The method includes mixing the dry ingredients and sufficient water, charging to a mold, applying sufficient pressure, discharging the green mold piece and curing the resulting filter. By the use of granular activated carbon a larger filled face area/void ratio may be provided for certain applications since the granular material provides some permeability through the filled face area while the voids permit control of the pressure drop characteristic of the filter.



3,715,870
ORIFICE AND FILTER ASSEMBLY

Lawrence L. Guzick, 10322 Royal Road, Silver Spring, Md. 20903
Filed June 29, 1970, Ser. No. 50,501
Int. Cl. B01d *35/02*
U.S. Cl. 55—466 **2 Claims**

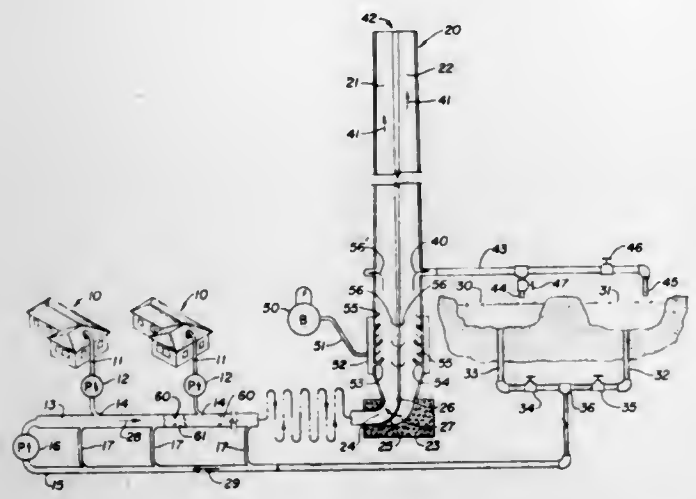


A plate member containing an orifice for use in a pipeline of steam powered equipment to control the drainage of steam condensate with a minimum loss of steam. A filtering element is located adjacent the plate member in the pipeline to prevent deleterious material from clogging the orifice.

3,715,871
SMOG ELIMINATOR

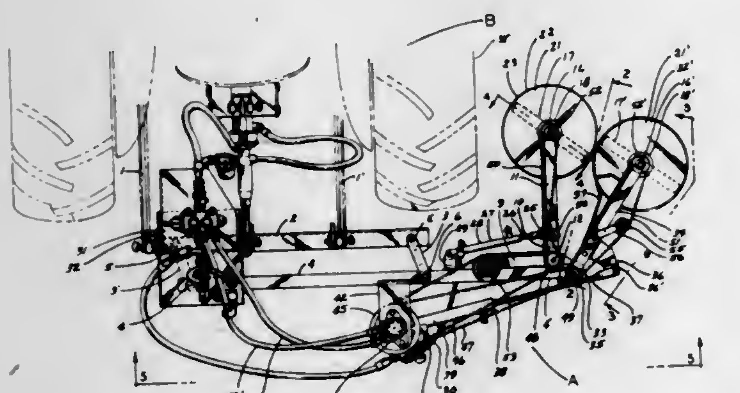
Benjamin Jones, and Rosetta M. Jones, both of 711 N. Columbia St., Brazil, Ind.
Filed May 26, 1971, Ser. No. 147,039
Int. Cl. B01d *47/02*
U.S. Cl. 55—227 **10 Claims**

A smog eliminator for removing smoke and gas from the byproducts of combustible materials. An underground pipe system has pressurized water flowing therethrough mixing with the smoke and gas produced by dwelling house heaters or factories or anything creating gas or smoke. The smoke and gas is thoroughly mixed with the water in the underground pipe system and is then routed to a vertical chimney having nozzles emitting upwardly directed steam. The pressurized water flows from the chimney carrying therewith dissolved gases and particulate matter. The undissolved gas passes out of the chimney into the atmosphere. Two bodies of water are utilized for receiving the unclean water from the chimney and for circulating fresh water back to the underground pipe system.



3,715,872
MOWING APPARATUS

Philip Thompson, Jr., 16 Sunset Trail, Austin, Tex.
Filed July 19, 1971, Ser. No. 163,598
Int. Cl. A01d *35/26*
U.S. Cl. 56—10.4 **8 Claims**

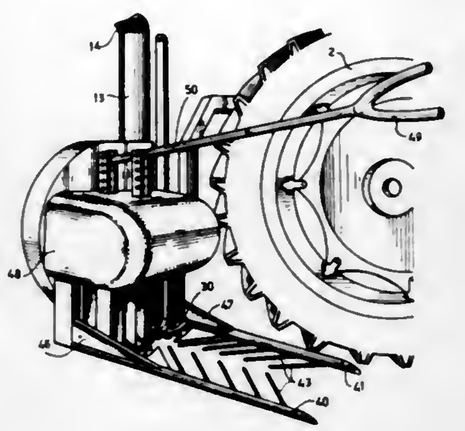


A mowing apparatus adapted for mounted disposition upon a vehicle comprising a mounting arm, and first and second cutter blade-carrying arms presented in generally side-by-side relationship with resilient means for urging said arms toward each other; there being blade guards carried on said first and second arms. Said resilient means are yieldable upon impact of said guards with an upright so as to maintain said guards in contact with the upright while moving relatively therepast to present said blades for trimming grass and the like adjacent to said upright.

3,715,873
HARVESTING AND ENSILAGE CUTTING APPARATUS

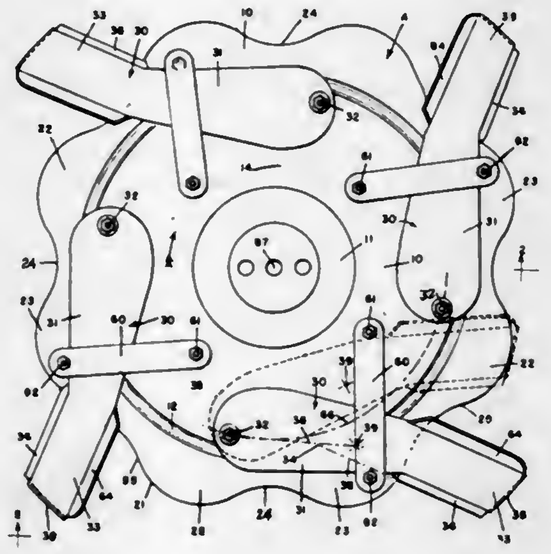
Petrus Wilhelmus Zweegers, Geldrop, Nieuwendijk, 46, Netherlands
Filed Nov. 23, 1971, Ser. No. 201,296
Claims priority, application Netherlands, Nov. 23, 1970, 7017081; March 3, 1971, 7102855; Sept. 7, 1971, 7112316
Int. Cl. A01d *55/26, 49/00*
U.S. Cl. 56—13.4 **26 Claims**

Harvesting and ensilage cutting apparatus, comprising a chopper rotor in a housing with a front inlet opening, a pair of cooperating feed rolls mounted for counterrotation about substantially vertical axes closely in advance of said front inlet opening, stalk cutting means below said pair of feed rolls and a pair of forwardly extending guide means for guiding row crop toward said pair of feed rolls.



3,715,874
LAWN MOWER CUTTERS

Chester O. Goserud, 3205 Woodbridge Street, St. Paul, Minn.
Filed Oct. 1, 1971, Ser. No. 185,541
Int. Cl. A01d *55/18*
U.S. Cl. 56—295 **3 Claims**

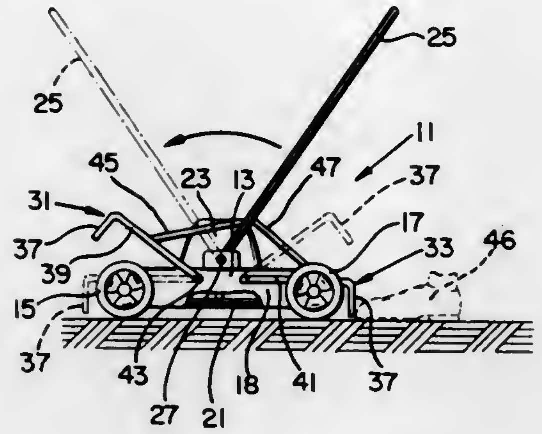


A lawn mower cutter having a rotatable body and a plurality of cutting units with sharpened edges and object striking ends pivoted thereto and adapted to swing outwardly by centrifugal force, said units being adapted to swing inwardly of the peripheral edge of said body to protective areas of the body where the cutting edges of said units are within the protective areas of the body, said body having marginal undulating edges defining the protective areas and forming projections serving to engage objects and shift the same outwardly.

3,715,875
LAWN MOWER SAFETY GUARD

William S. Brucker, Towson, Md., assignor to The Black and Decker Manufacturing Company, Towson, Md.
Filed Feb. 9, 1972, Ser. No. 225,209
Int. Cl. A01d *67/00, 55/18*
U.S. Cl. 56—320.1 **2 Claims**

A rotary lawn mower comprising a deck housing supported by wheels for movement along the ground. A motor is supported upon the deck housing and drives rotary blade means disposed therebeneath. An upstanding handle is connected to the deck housing for control and manipulation of the mower. The handle is pivotally mounted upon the deck of flipover movement to facilitate opposite directional, longitudinal movement of the mower without having to turn it around.



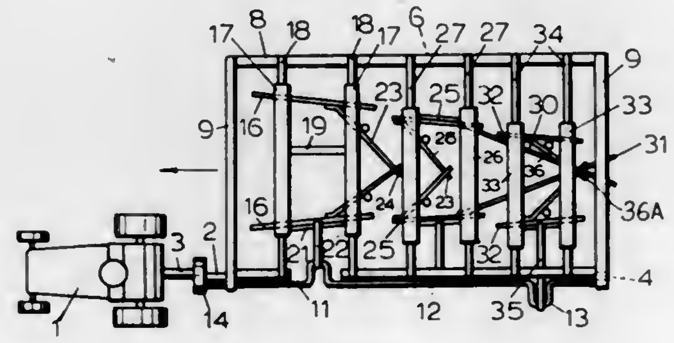
Novel guard means is provided on the mower to prevent an operator's foot from accidentally coming into contact with the rotary blade means. The guard means is constructed to so protect the operator's feet in both longitudinal directions of movement of the mower, and to minimize interference with efficient grass cutting.

ERRATUM

For Class 56—305 see:
Patent No. 3,715,845

3,715,876
GRAPE HARVESTER AND FLEXIBLE BAR

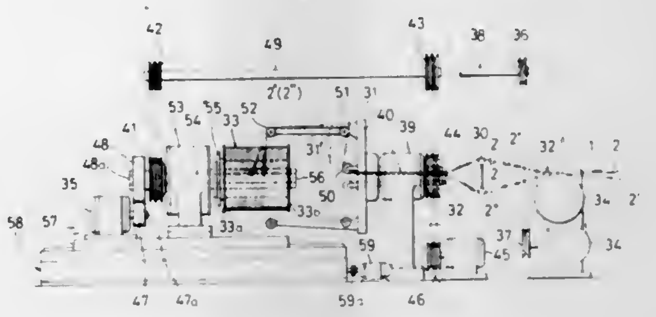
Philip B. McCord, 9845 East Lake Road, R.D. 1, North East, Pa.
Filed June 18, 1971, Ser. No. 154,445
Int. Cl. A01g *19/00*
U.S. Cl. 56—330 **4 Claims**



The invention disclosed herein is an improved combination grape harvester and flexible bar. The frame of the mobile harvester travels along opposite sides of a row of grape vines which are supported on a trellis wire. The machine has groups of generally horizontal flexible bars extending lengthwise of the rows and moves horizontally back and forth crosswise of the row, vertically positioned to engage and shake the top, bottom and intermediate parts of the fruit bearing vines. Each of the flexible bars has a loop formed at an intermediate point of them so that the bar has additional flexibility and is prevented from breaking and is given an exceeding amount of flexibility.

3,715,877
COMMUNICATION CABLE

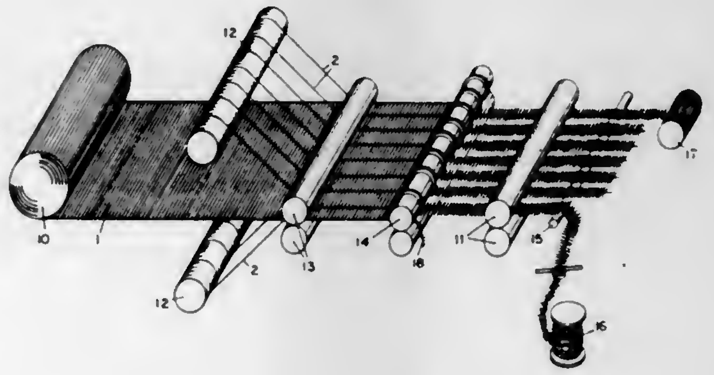
Hisateru Akachi, Tokyo, Japan, assignor to Oki Densen Kabushiki Kaisha, Kanagawa-ken, Japan
Filed Oct. 7, 1970, Ser. No. 78,870
Claims priority, application Japan, Oct. 27, 1969, 44/85933; Oct. 27, 1969, 44/85934
Int. Cl. H01b *13/04, 11/04*
U.S. Cl. 57—156 **36 Claims**



A communication cable, and the method and apparatus therefore, made up of twisted strands of laid component conductors, wherein the component conductors are laid at pitches varying stepwise throughout their lengths and/or the strands are twisted at pitches varying stepwise throughout their lengths, whereby the production speed and efficiency are drastically increased as compared to conventional communication cable production techniques.

3,715,878
PROCESS FOR MAKING CHENILLE-TYPE YARN

Charles W. Kim, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.
Continuation-in-part of Ser. No. 821,414, May 2, 1969. This application March 12, 1971, Ser. No. 123,503
Int. Cl. D02g *3/42*
U.S. Cl. 57—156 **5 Claims**



Novel decorative yarns are prepared by laying up a nonwoven web comprising a series of parallel warp yarns bonded to filling yarns and thereafter separating the web into strips along lines substantially parallel to the warp yarns and twisting the resultant product to form chenille-type yarns. The filling yarns can be either continuous filament or random laid staple fibers. Separation of the web into strips is accomplished by slitting in the case of continuous filament filling yarns or by simple mechanical pulling apart in the case where staple fibers are used in the filling.

3,715,879

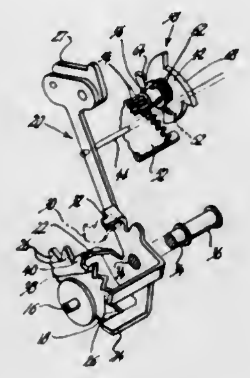
INTERMITTENTLY REPEATING ALARM MECHANISM

Edward F. Cielaszyk, Oglesby, Ill., assignor to General Time Corporation, Mesa, Ariz.

Filed April 5, 1972, Ser. No. 241,285

Int. Cl. G04b *23/10*

U.S. Cl. 58—18 **4 Claims**



A spring wound alarm clock, an alarm mechanism which permits an intermittent sounding of the alarm. Such mechanism comprises a star wheel which causes the alarm clapper to repeatedly oscillate and strike the bell surface to sound the alarm. In keeping with the present invention, at least one tooth of the star wheel is deformed from the others and serves to arrest the clapper and thereby silence the alarm after a very brief alarm-sounding period; not more than a single revolution of the star wheel. Following about two minutes of silence, a continuously rotating cam wheel which is in engagement with a projection on the clapper member effectively removes the clapper from the star wheel arresting position and thereby frees the mechanism for a second brief alarm-sounding period. The above intermittent alarm sequence of very brief alarm-sounding will continue up to approximately 50 minutes, or until the alarm mechanism is manually disabled.

3,715,880

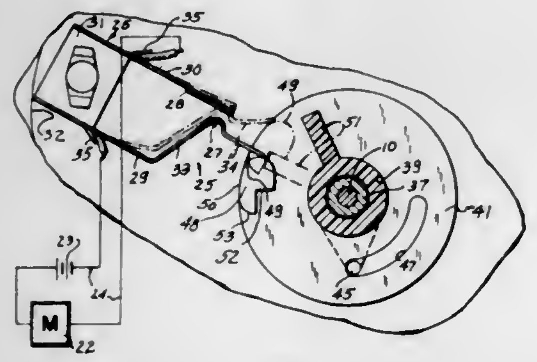
BATTERY CLOCK WIND DEVICE

John Roger Simons, Delavan, Wis., assignor to Bunker Ramo Corporation, Oak Brook, Ill.

Filed June 7, 1971, Ser. No. 150,520

Int. Cl. G04c *1/00*

U.S. Cl. 58—41 **11 Claims**



An electromechanical rewind device for clock mechanism, in which a rewind motor switch is closed by operating means driven by the spring-powered drive shaft, and means on the rewind gear driven by the motor operates after a predetermined interval of motor operation to drive the switch-operating means in overrun relation to the shaft to release the switch which thus opens and stops the motor.

3,715,881

DISPLAY CONTROL DEVICE FOR TIMEPIECES

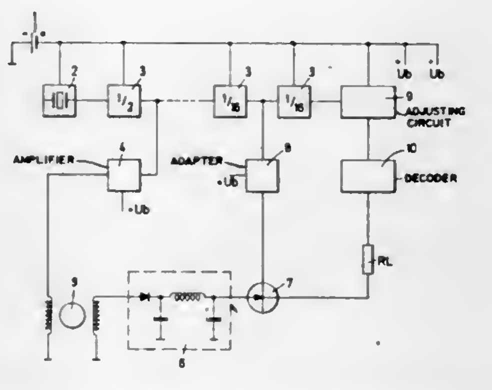
Pierre Girard, Bienne, Switzerland, assignor to Manufacture des Montres Rolex S. A. Bienne, Bienne, Switzerland

Filed May 11, 1971, Ser. No. 142,309

Claims priority, application Switzerland, May 11, 1970, 6974/70

Int. Cl. G04b *19/30*

U.S. Cl. 58—50 R **8 Claims**



The display is controlled by a device supplied by the same battery as the timing base of the timepiece. The signals produced by the timing base are then sent to a voltage elevating device through an amplifier. Afterwards they are rectified, hacked and pulsed to a liquid crystal cell having an electrooptic effect and displaying the time indications.

3,715,882

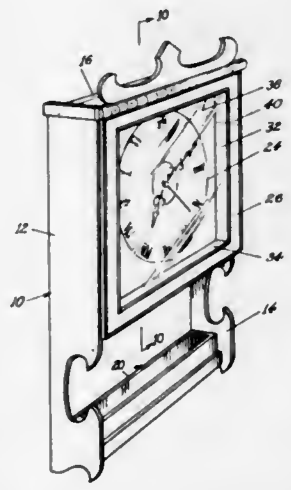
CLOCK CABINET

Harold Herman Ohde, 522 Southwood Ave., Columbus, Ohio

Filed July 16, 1971, Ser. No. 163,295

Int. Cl. G04b *37/00*

U.S. Cl. 58—53 **7 Claims**



A clock having an easily and quickly removable front panel to which the clock face and clock drive mechanism are mounted. Attractive crown, collar and side ornamentation on the cabinet is removably mounted and conveniently interchangeable with different ornamentation.

3,715,883

SYNCHRONOUS ALARM CLOCK

Walter Trimpler, Nurnberg, Germany, assignor to DIEHL, Nurnberg, Germany

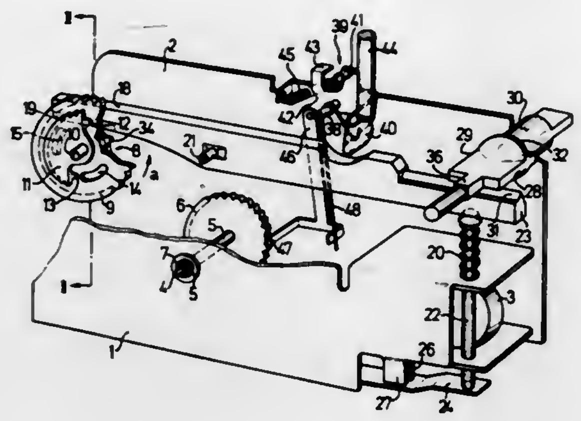
Filed Dec. 16, 1970, Ser. No. 98,638

Claims priority, application Germany, Dec. 27, 1969, G 69 50 134.4

Int. Cl. G04b *13/00*

U.S. Cl. 58—21.15 **12 Claims**

A alarm clock which is driven by an alternating current synchronous motor and has an alarm device in the form of an oscillator which is adapted to be released to the influence of an alternating magnetic field derived from the field structure of the motor. The alarm device includes manual turn off and also includes a manual arrangement for interrupting the alarm device for a certain period of time while sounding. The alarm device, unless permanently shut off will become effective at the same time each day and will sound for a predetermined interval unless turned off.



3,715,884

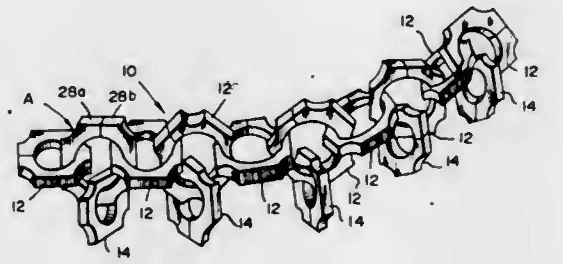
DRUM SCRAPING CHAIN

Murray A. Sanders, Woodside, N.Y., assignor to Allen-Stevens Drums Accessories Corp., South Plainfield, N.J.

Filed Aug. 31, 1970, Ser. No. 68,404

Int. Cl. F16g *13/18*

U.S. Cl. 59—78 **9 Claims**



A chain for scouring the inside surfaces of a drum. The chain has a plurality of running links, these being links which are secured to each other in seriation. Cross-links are attached to mutually spaced (not directly interconnected) running links to increase chain flexibility. All the links have the same configuration. Indentations are provided at each corner between adjacent sides of the link. All the links have hard surfaces, for example being case hardened or nitrided.

3,715,885

HEAT VAPOR DIFFERENTIAL ENGINE

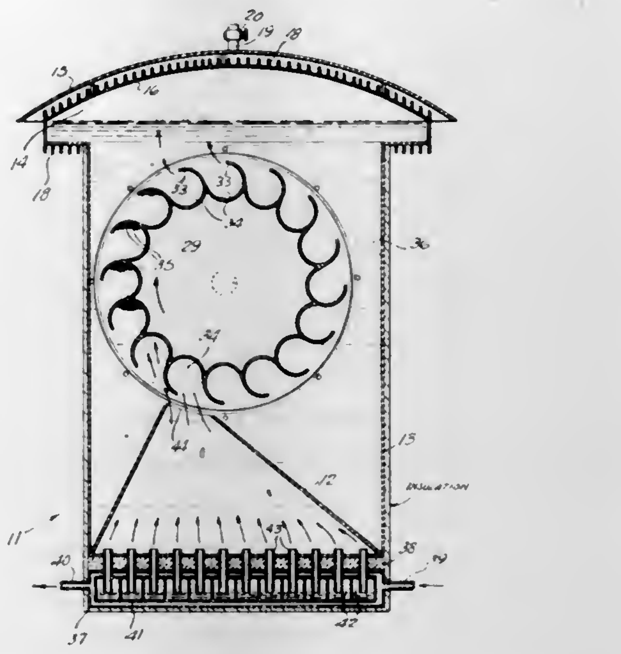
George O. Schur, 3775 S.W. 108th Avenue, Miama, Fla.

Filed Nov. 12, 1971, Ser. No. 198,161

Int. Cl. F01k *25/10;* **F03g** *7/02, 7/00*

U.S. Cl. 60—25 **12 Claims**

A heat engine consisting of a hermetically vapor vacuum sealed container and a heat-transfer fluid circuit, the fluid circuit including a heat source such as a solar heat collector. The engine employs as a working fluid a liquid with a low boiling point in the container, the heat transfer circuit passing through the lower portion of the container so that heat is conducted therefrom to the working fluid, causing bubbles to be generated therein. The bubbles flow upwardly and drive a turbine assembly mounted in the upper portion of the container. The turbine assembly is magnetically coupled to an external load device. The top of the container consists of a condenser exposed to ambient temperature wherein the bubbles are condensed and returned to a liquid state.



3,715,886

GAS TURBINE INSTALLATION WITH A CENTRIFUGAL FLUID VANES COMPRESSOR

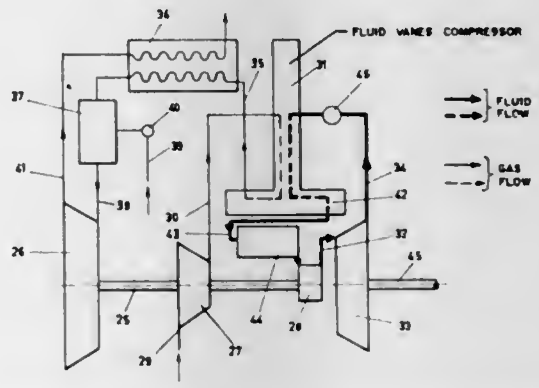
Pieter Van Staveren, 19, Wilhelminasingle, Pijnacker, Netherlands

Filed April 7, 1971, Ser. No. 132,106

Claims priority, application Netherlands, April 7, 1970. 70/04991

Int. Cl. F02c *3/02*

U.S. Cl. 60—39.18 R **1 Claim**



A gas turbine installation comprising a gas turbine the shaft of which is coupled with a compressor and a fluid pump, which drives a fluid turbine.

The improvement consists in that in the gas turbine cycle a centrifugal fluid vanes compressor is incorporated, which on the one hand is connected to the compressor for the supply of gas and on the other hand is connected to the exhaust of the hydraulic turbine for the supply of the fluid forming the fluid vanes, which fluid also drives the rotor.

The efficiency of the installation and its velocity in response to changes in load are considerably improved.

3,715,887

MULTIPLE STAGE GAS COMPRESSION APPARATUS AND METHOD

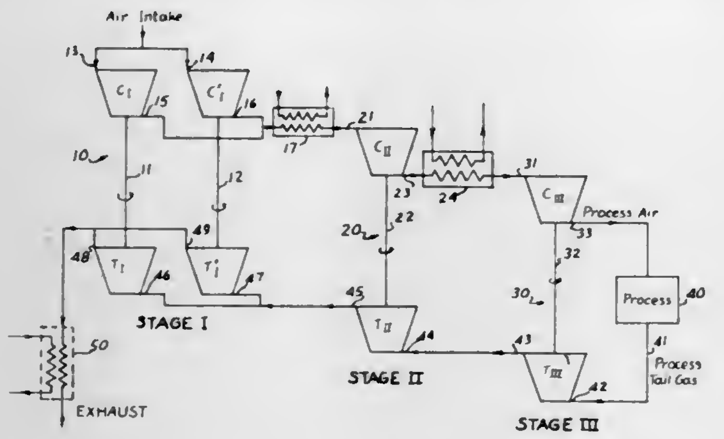
David M. Weatherly and Desmond J. Byrne, Atlanta, Ga., assignors to The D. M. Weatherly Company, Atlanta, Ga.

Filed Sept. 10, 1971, Ser. No. 179,436

Int. Cl. F01k *3/18*

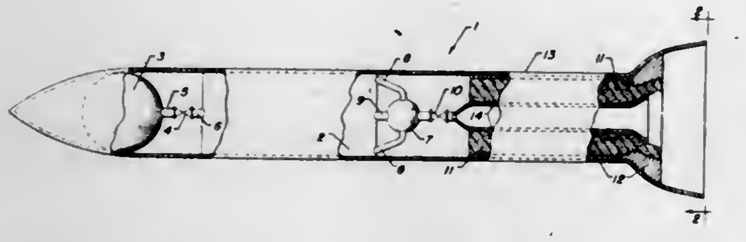
U.S. Cl. 60—59 T **10 Claims**

Gas compression apparatus and method in which gas compression occurs in a series circuit including two or more gas compression stages in which each of the compression stages is independently driven by a corresponding number of separate gas expansion stages which are connected in series to a source of heated gas. Each of the individual compression-expansion stages may comprise a separate turbocharger. The gas expanders obtain power from a source of hot gas applied in series circuit commencing with the expander driving the compression stage having the greatest discharge pressure and ending with the expander driving the compression stage having the lowest discharge pressure.



3,715,888
HYBRID ROCKET

Stephen N. Massie, Palatine, Ill., assignor to Universal Oil Products Co., Des Plaines, Ill.
Filed Nov. 26, 1969, Ser. No. 880,286
Int. Cl. F02k *9/06*
U.S. Cl. 60—251 **5 Claims**

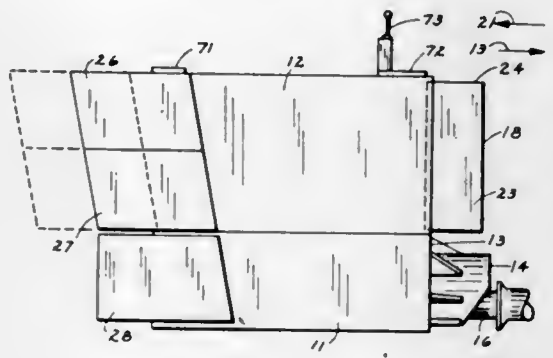


An improved hybrid rocket, wherein a tube for conducting liquid oxidizer to a solid fuel charge passes through the solid fuel charge and is constructed so as to structurally disintegrate when subjected to the heat produced by the reaction of the solid fuel and liquid oxidizer. Disintegration of the tube proceeds at approximately the same axial rate as does consumption of the solid fuel during operation of the rocket. As a result, the liquid oxidizer is continually supplied to the appropriate location in the solid fuel charge so as to increase the uniformity and thoroughness of burning. The burn time of the rocket may thereby be extended and the thrust may be varied by utilizing a tube of varied cross section and varied wall thickness.

3,715,889
TRENCH SHORING MACHINE

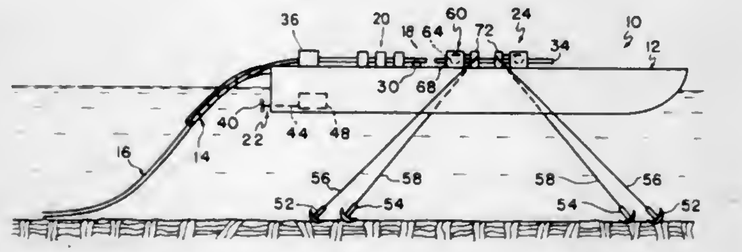
Donald Bixler, 9520 Copley Dr., Indianapolis, Ind., and Robert H. Corey, 6938 Tousley Dr., Indianapolis, Ind.
Filed Dec. 3, 1971, Ser. No. 204,437
Int. Cl. E21d *5/12*
U.S. Cl. 61—41 A **21 Claims**

Upper and lower generally rectangular boxes, affixed together, are disposed in a trench to provide a safe working space for workmen installing underground pipe. Probing side plates at the front of the boxes are movable forward and backwards hydraulically to control collapse of the trench wall ahead of the box assembly. An upstanding pusher wall at the rear end of the upper box is hydraulically drivable rearwardly to push against fill in the trench behind the box assembly whereby, upon compaction, the box assembly is pushed forward in the trench. A shroud affixed to the rear of the lower box below the pusher wall assembly covers and protects the pipe from separation as the box assembly is moved forward. The box side walls are tapered inwardly toward the rear to minimize soil adhesion resistance to forward movement of the box assembly. Hydraulic lifting pads under the assembly assist in steering and maintenance of proper leveling and grade of the box assembly. Balancing and phasing means are provided in the hydraulic system. A built-in greasing system is employed.



3,715,890
MOORING SYSTEM FOR PIPELAYING BARGES

Carl G. Langner, Houston, Tex., assignor to Shell Oil Co., New York, N.Y.
Filed Jan. 15, 1971, Ser. No. 106,820
Int. Cl. B63b *35/04, 21/16*
U.S. Cl. 61—72.3 **8 Claims**



A pipelaying barge particularly adapted for use in intermediate water depths is disclosed. The barge has propellers which apply forward thrust to the barge, and a tension brake which grips the pipe and provides controlled relative motion between the pipe and the barge. Forward movement of the barge and tension in the pipe are controlled by the combined action of these propellers and the tension brake. Lateral movement of the barge is controlled by anchor systems operating off each side of the barge.

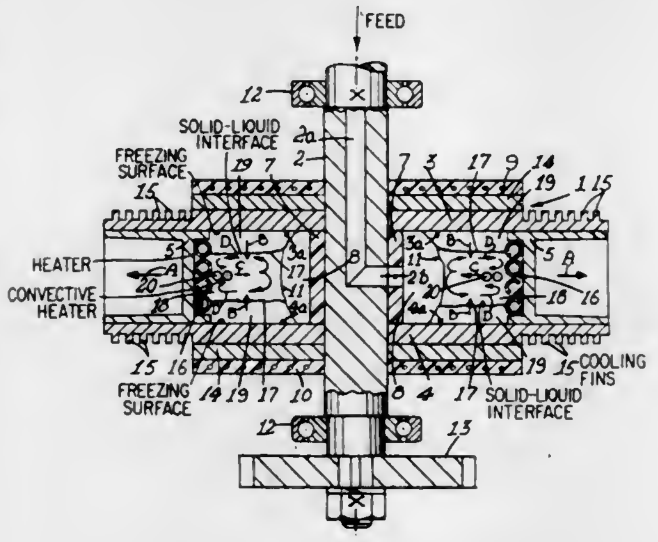
3,715,891
POULTRY FREEZING PROCESS

Walter Harper Martin, San Antonio, Tex., assignor to Refrigeration Engineering Corporation, San Antonio, Tex.
Filed Dec. 11, 1970, Ser. No. 97,298
Int. Cl. F25d *13/06*
U.S. Cl. 62—63 **4 Claims**

A poultry freezing process by means of which the natural moisture within poultry products is crystallized for preservation, the process being carried out by moving the products through a moisture-laden chamber maintained at a temperature of approximately 15° to 25°F. and thereafter passing air over the poultry products in the chamber at a low velocity for a period of from about 30 to 90 minutes thereby reducing the temperature of the poultry products to approximately 18° to 28°F. throughout.

3,715,892
PURIFICATION OF CRYSTALLIZABLE MATERIAL BY DIRECTIONAL FREEZING

Ernest Leslie Anderson, Johannesburg, Republic of South Africa, assignor to South African Inventions Development Corporation, Pretoria, Republic of South Africa
Filed Feb. 22, 1971, Ser. No. 117,622
Claims priority, application South Africa, March 5, 1970, 70/1496
Int. Cl. B01d *9/04*
U.S. Cl. 62—58 **9 Claims**

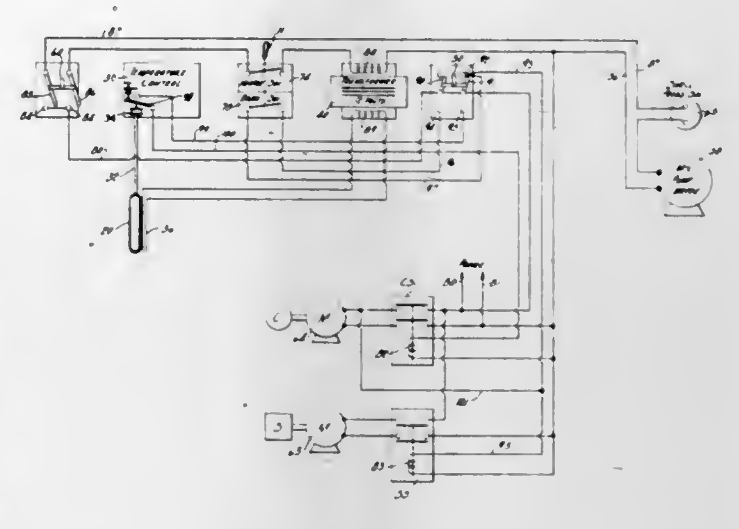


Purification of crystallizable material by directional freezing wherein a molten mass of the material is progressively solidified from a first region in the mass to a second region in the mass; the material is rotated during solidification to subject the material to centrifugal force which is at least equal to the force of gravity, preferably at least ten times the force of gravity, and which acts in a direction transversely to the direction of solidification; and heat is introduced into the molten material to induce convective flow of molten material past the advancing solid-liquid interface in a direction transversely to the direction of solidification, preferably in the same direction as that in which the centrifugal force acts.

3,715,893
TEMPERATURE CONTROL SYSTEM FOR FREEZERS

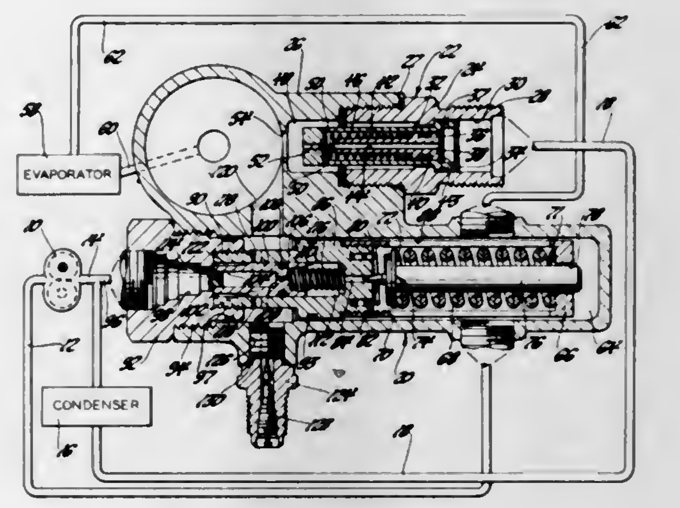
Bernfried M. Werner, Pompano Beach, Fla., assignor to Louis A. M. Phelan, Pompano Beach, Fla.
Filed March 25, 1971, Ser. No. 127,886
Int. Cl. F25c *7/10*
U.S. Cl. 62—135 **2 Claims**

A temperature control system for freezer mechanism of the continuous freezing type and in which various combinations of ingredients are fed into a freezing chamber and frozen. A scraper slowly rotates over the inner surface of the chamber to remove the frozen mix from the surface of the cylinder. The freezing chamber is pressurized and the product forced out of a serving valve at one end of the freezer and the temperature of the product is sensed and is used to control the refrigeration means. A heat anticipator is also energized during the draw and heats the sensing means so that the need for refrigeration is anticipated prior to the time it is actually required, thereby eliminating any time lag in supplying refrigeration.



3,715,894
AIR CONDITIONING BYPASS CONTROL

Richard E. Widdowson, Dayton, Ohio, assignor to General Motors Corp., Detroit, Mich.
Filed Sept. 16, 1971, Ser. No. 181,070
Int. Cl. F25b *41/00*
U.S. Cl. 62—196 **3 Claims**



A vapor compression air conditioning system including defrost control valve means between the compressor outlet and the evaporator in bypass relationship to the condenser and expansion valve for supplying hot refrigerant directly to the evaporator for defrosting in response to a predetermined low temperature of refrigerant in the evaporator which corresponds to frost accumulation. The control valve includes a piston reciprocal in a housing and having one end of the piston exposed to the compressor outlet pressure and the second end exposed to a refrigerant pressure within a variable volume control chamber between the piston and the housing. A small diameter bleed port extending through the piston equalizes the pressure forces acting on the ends of the piston to normally maintain the piston in a closed position. When a bimetal spring in an adjacent enclosure senses a low refrigerant temperature which corresponds to frost accumulation on the evaporator, a passage between the control chamber and the enclosure is opened for rapidly reducing pressure in the control chamber and causing the piston to move to its open position in which hot refrigerant is directed to the evaporator.

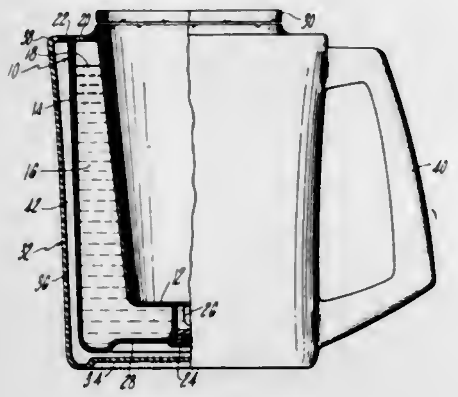
3,715,895
DRINKING CUP FOR FREEZING A BEVERAGE TO A SLUSH-LIKE CONDITION

Edward J. Devlin, Madison, Conn., assignor to Glacier Ware, Inc., Clinton, Conn.

Filed July 8, 1970, Ser. No. 53,231

Int. Cl. F25d *3/00*

U.S. Cl. 62—457 **11 Claims**



A portable liquid cooling container having a receptacle of a predetermined capacity and a surrounding receptacle defining a compartment for a refrigerant having a sufficient heat absorption capability to convert the liquid contents of the receptacle from a liquid to a semi-congealed condition under ordinary room temperature conditions.

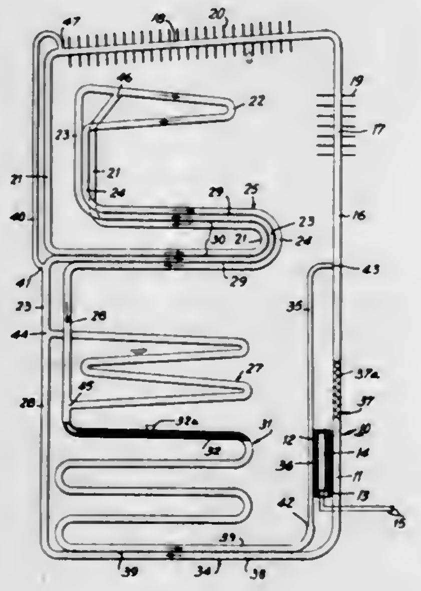
3,715,896
ABSORPTION REFRIGERATION APPARATUS OF THE INERT GAS TYPE

Nicolas Eber, Zurich, Switzerland, assignor to Aktiebolaget Electrolux, Stockholm, Sweden

Filed May 7, 1971, Ser. No. 141,294

Int. Cl. F25b *15/10*

U.S. Cl. 62—490 **7 Claims**



In absorption refrigeration apparatus of the inert gas type all of the parts are formed of piping and are of the same diameter except the pump pipe and vent pipe connecting the outlet end of the condenser to the inert gas circuit. These particular pipes also can be formed of the same size piping employed to form all of the other parts of the apparatus by deforming them so that they are non-circular in cross-section and will carry out their intended function during operation of the apparatus.

3,715,897
FLAT BED KNITTING MACHINE

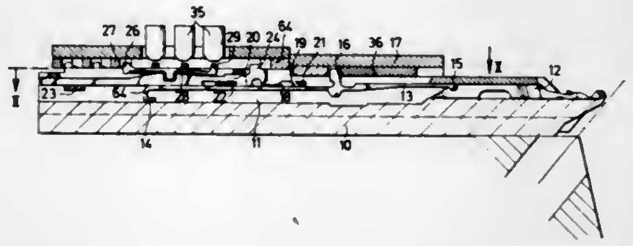
Wilhelm Hadam, Reutlingen, Germany, assignor to H. Stoll and Company, Stollweg, Germany

Filed March 4, 1971, Ser. No. 120,836

Claims priority, application Germany, March 9, 1970, P 20 10 973.3

Int. Cl. D04b *7/00, 15/66*

U.S. Cl. 66—75 R **14 Claims**



A flat bed knitting machine of the type in which needles are movable in tricks under the action of selector jacks, wherein the selector jacks have butts which operatively engage knitting, transfer and re-setting locks and wherein movement of the selector jacks is controlled by a patterning lock. The patterning butt of the selector jack is adjustable relative to the body of the selector jack. This adjustable patterning butt is in the form of a bridge element pivotably connected to the selector jack and movable between two end positions by a spring and an electrically operated device. Elements fixed to the patterning lock advance and return the selector jacks.

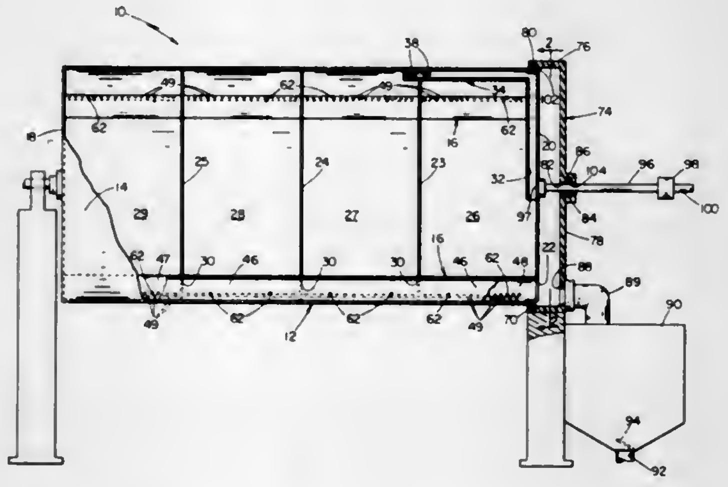
3,715,898
WASHING MACHINE

James R. Olliges, Sr., River Grove, Ill., assignor to A-TO, Inc., Willoughby, Ohio

Filed April 13, 1971, Ser. No. 133,546

Int. Cl. D06f *37/06, 37/08*

U.S. Cl. 68—145 **13 Claims**



A washing machine of the type including a cylindrical drum rotatable in at least one direction about a horizontal axis and including at least one hollow in transverse-cross section rib projecting radially inwardly from the cylindrical wall of the drum and extending longitudinally of the drum, the rib defining in cooperation with a portion of the drum wall a longitudinally-extending passage and the portions of the rib defining the passage, other than a longitudinally-extending rib portion adjacent the drum wall, being imperforate.

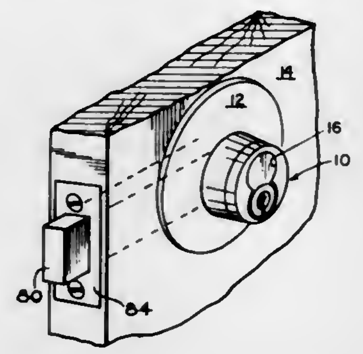
3,715,899
RIM CYLINDER LOCK MECHANISM

Rolland Gene McCullum, Indianapolis, Ind., assignor to Best Lock Corporation, Indianapolis, Ind.

Filed Aug. 9, 1971, Ser. No. 169,989

Int. Cl. E05b *27/00*

U.S. Cl. 70—369 **15 Claims**



A lock cylinder for mounting on the face of a door with mounting screws which are concealed by a face plate which is breech locked to the cylinder body and held in locked position by reception of a lock core in non-concentric aligned openings in the face plate and body. The core and non-concentric openings are desirably figure-8 shaped, and the mounting screws located beside the narrow waist portion of the figure-8 shape, within a cylindrical envelope. A bolt is actuated by a bell crank which swings in an arc between the two screws.

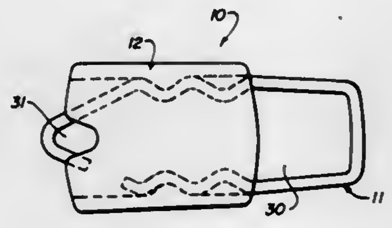
3,715,900
KEY RETAINER

Alan E. Sherman, Maryland Heights, Mo., assignor to Aranar Marketing Services, Inc., Chicago, Ill.

Filed Nov. 9, 1970, Ser. No. 87,789

Int. Cl. A47g *29/10*

U.S. Cl. 70—456 R **4 Claims**



A key retainer comprising generally a loop of resilient material having only one discontinuity provided by substantially facing adjacent ends thereof. This loop normally is slidably disposed within a sleeve, in a fashion such that one end thereof forms a relatively large ring for holding several keys whose ready removal normally is not required, and the opposite end thereof forms a smaller ring for holding a key or keys whose ready removal is desired.

3,715,901
APPARATUS FOR TAPERING FLEXIBLE TUBES

Roger Couland, 51, rue Maurice Philippot, 92 Fontenay-aux-Roses, France

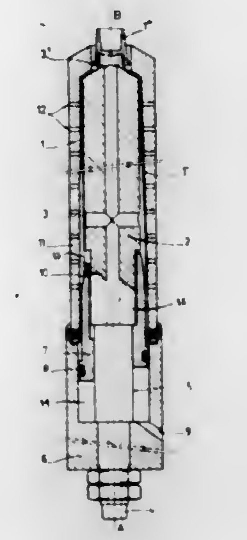
Filed March 2, 1970, Ser. No. 15,735

Claims priority, application France, March 18, 1969, 6907626

Int. Cl. B21d *26/04*

U.S. Cl. 72—58 **11 Claims**

Apparatus for tapering cylindrical tubes formed of a flexible material comprising a supporting member having a generally cylindrical cross section adapted to be inserted into a cylindrical flexible tube to thereby support the tube and having passage means defined in the support member to transmit a fluid pressure to the periphery of the support member, a matrix having a substantially conical cross section into which the support member, upon which is mounted a tube, is inserted and a moveable sleeve member adapted to be engaged in a sealing relationship with the base of the flexible tube which is moveable in response to fluid pressure to continuously maintain the sleeve member in a sealing engagement with the base of the tube while a fluid pressure is supplied to the passage means in the support member to expand the wall of the flexible tube so that it corresponds to the configuration of the matrix.



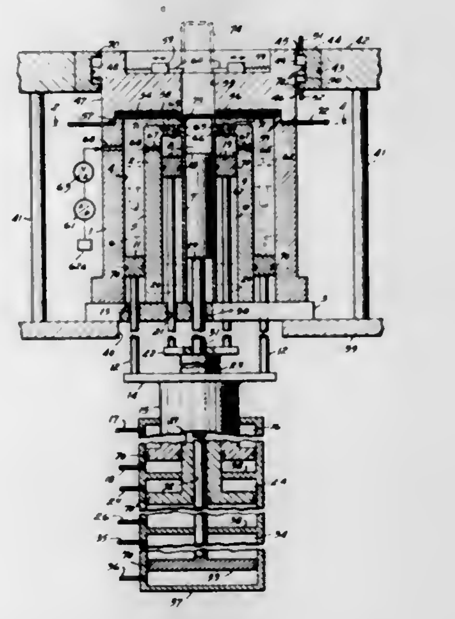
3,715,902
METHOD AND APPARATUS FOR OPERATING ON A BLANK OF MATERIAL, E.G., DEEP DRAWING

Francis Joseph Fuchs, Jr., Princeton Junction, N.J., assignor to Western Electric Co. Inc., New York, N.Y.

Filed Feb. 10, 1971, Ser. No. 114,198

Int. Cl. B21d *22/20*

U.S. Cl. 72—60 **192 Claims**

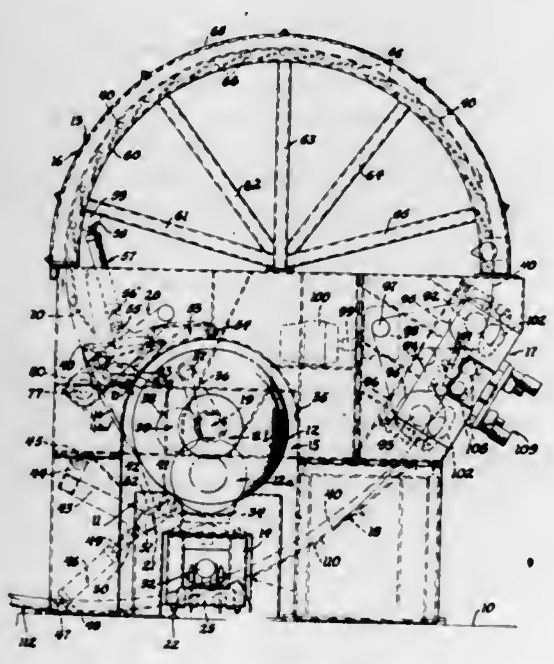


Pressurized viscous fluid, pumped by annular pistons, flows in contact with one surface of a blank inwardly from the periphery thereof, thereby to force the opposite surface of the blank against a low friction surface, thereby to pressurize the blank and exert viscous drag force on the surface of the blank to extrude the peripheral portion of the blank inwardly, in cooperation with a ram perpendicularly engaging the central portion of the blank, to deep draw the blank through a die opening. In a modification, a heating element is provided in contact with the flow of viscous fluid opposite the surface of the blank contacted by the viscous fluid to raise the efficiency of the operation. In another modification, by proper staging, the average pressure in the viscous fluid can be made to increase in the overall direction of flow of the viscous fluid. The viscous fluid can be applied to inwardly extrude the blank uniformly or non-uniformly. In yet another modification, pressurized viscous fluid, pumped by annular pistons, flows in contact with both faces of a blank inwardly from the periphery thereof, thereby to pressurize the blank and exert viscous drag force on both surfaces of the blank to extrude the peripheral portion of the blank inwardly.

3,715,903
STRIP STOCK UNCOILER AND STRAIGHTENING DEVICE

John A. Huber, Birmingham; Berlyn E. Baringer, Southfield; Ellert F. Bruns, Birmingham, and Michael R. Ulewicz, Warren, all of Mich., assignors to P.A.S.-Artco, Inc., Detroit, Mich.

Filed Jan. 13, 1971, Ser. No. 106,126
Int. Cl. B21d *1/02*
U.S. Cl. 72—183 **16 Claims**

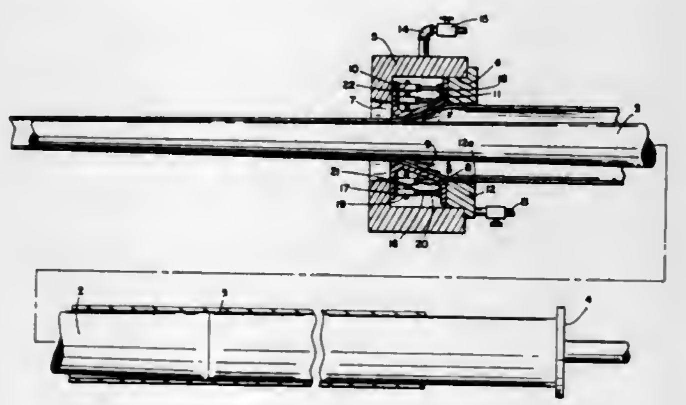


A machine for uncoiling and straightening strip stock having a strip stock uncoiler means and an adjustable strip stock peeler means positioned adjacent the uncoiler means for stripping the leading edge of a coil of strip stock away from the body of the coil when the strip stock uncoiler means is actuated. A strip stock threading means is positioned adjacent the uncoiler means for receiving the leading edge of the strip stock coil from the peeler means and imparting to the strip stock a partial removal of the set that has been placed in the strip stock due to its winding into a coil. The threading means feeds the strip stock upwardly through an upper arcuate threading chute which then feeds the strip stock downwardly into a straightening means. A lower arcuate threading chute feeds the strip stock from the straightening means down and under the strip stock uncoiler means and thence to a strip stock processing machine without developing a set in the straightened strip stock.

3,715,904
DIE ASSEMBLY

Frank J. Lesko, Phoenix, Ariz., assignor to Reynolds Metals Company, Richmond, Va.

Filed Jan. 14, 1971, Ser. No. 106,344
Int. Cl. B21c *3/06*
U.S. Cl. 72—276 **13 Claims**



A die assembly for forming a tubular metal blank on a tapered mandrel into a tapered tube conforming to the taper of the mandrel comprising a die composed of non-metallic plastic material capable of being repeatedly stretched outwardly and contracted back to its original form, the die having a passage therethrough tapering from minimum cross section near one end of the die to maximum cross section near the opposite end of the die and desirably having outwardly projecting flanges at its respective ends, a housing in which the die is mounted and means for applying fluid pressure in the housing against the outside of the die to collapse the tubular metal blank about the mandrel as the tubular metal blank and mandrel pass through the die. The flange at the larger end of the die preferably has a greater transverse dimension than the flange at the smaller end of the die. The outside dimensions of the flanges are preferably smaller than the inside dimensions of the housing opposite the flanges by at least about 6% of the maximum outside dimension of the flanges. The die may comprise a plurality of die elements arranged side by side in contact each having a passage therethrough, the passages through the die elements being coaxial but of different cross-sectional dimensions to provide in effect a passage through the die tapering from minimum cross section near one end of the die to maximum cross section near the opposite end of the die. Means may be provided for applying and controlling fluid pressure separately to the respective die elements whereby optimum control of the collapsing of the tubular metal blank about the mandrel is attained. Means are preferably provided pressing the flanges of the die generally axially of the die assembly against the housing to prevent leakage of pressure fluid between the flanges and the housing. Spaced apart struts are preferably provided which extend generally axially of the die assembly between the flanges to press the flanges against the housing. The struts are desirably longitudinally extensible to enable them to exert a controlled degree of pressure against the flanges; they may be provided with threaded extension devices. Desirably hollow pressure transmitting members lie against the flanges and the struts apply pressure against such members.

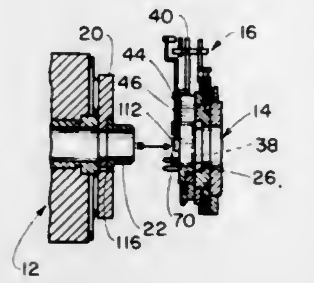
3,715,905
PART FEED FOR APPARATUS SUCH AS METALLIC CAN BODY FORMERS

Elpidifor Paramonoff, Los Angeles, Calif., assignor to Standun Inc., Compton, Calif.

Filed April 1, 1971, Ser. No. 130,195
Int. Cl. B21d *24/16*
U.S. Cl. 72—349 **3 Claims**

Cup-shaped metallic can bodies are fed downwardly, one at a time, into a part holder between a withdrawn horizontally reciprocal ram and a redraw and ironing die pack of a can body former, a redraw die pad first advancing a redraw die

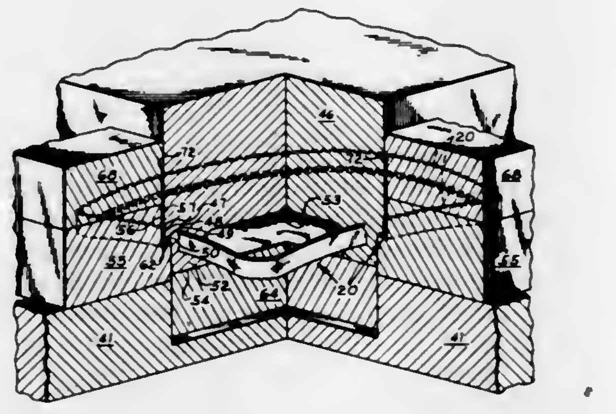
horizontally into the can body open end, followed by the ram moving into the can body within the redraw die and carrying the can body progressively through a redraw die ring and a series of ironing die rings. The part holder has a U-shaped yoke receiving the can bodies downwardly therein and positioning the can bodies in exact longitudinal alignment with the redraw die and ram movements by individually selectively adjustable, transversely spaced side and underlying bottom alignment members. Each of the alignment members has a main portion movable in a yoke vertical slot and a pin projecting from the main portion and yoke toward the redraw die pad, the alignment member main portion and pin having longitudinally aligned surfaces exposed inwardly of the part holder yoke forming spaced holding surfaces extending a major portion of the cup longitudinal length to exactly position the cup. The part holder alignment members each have adjustment means for moving the alignment member main portions within the yoke slots to obtain the exact cup positioning.



3,715,906
METHOD AND APPARATUS FOR FORMING A SHADOW MASK FRAME

Ralph E. Roper, Indianapolis, Ind., assignor to Wallace Expanding Machines, Inc., Indianapolis, Ind.

Filed Mar. 30, 1971, Ser. No. 129,483
Int. Cl. B21d *19/08*
U.S. Cl. 72—354 **11 Claims**

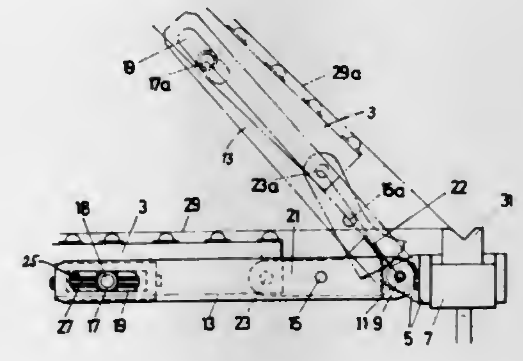


A method and apparatus for forming a shadow mask frame having a dish-shaped wall positioned obliquely with respect to the longitudinal axis of the frame. The shadow mask frame is formed by applying columnar force to a wall of a workpiece in a direction parallel to the longitudinal axis causing complete plastic deformation of the frame. Simultaneous to the step of applying force, a second wall of the workpiece is contained within a pair of concave convex complementary sized dies so as to form a dish-shaped configuration. The apparatus has a top die with stuffing ledge movable toward a bottom die with a convex portion. The stuffing ledge forces the workpiece between the complementary sized dies thereby forming the dish shape. Simultaneously, a punch passes through the workpiece and is held therein during the plastic deformation to accurately size the opening of the shadow mask frame.

3,715,907
APPARATUS FOR SUPPORTING SHEET MATERIALS IN BENDING PRESSES

Teruma Hamada, Tokyo, Japan, assignor to Amada Co., Limited, Kanagawa-prefecture, Japan

Filed Oct. 26, 1970, Ser. No. 83,966
Claims priority, application Japan, Oct. 29, 1969, 44/86,049
Int. Cl. B21d *43/00;* **B23g** *3/18*
U.S. Cl. 72—419 **7 Claims**



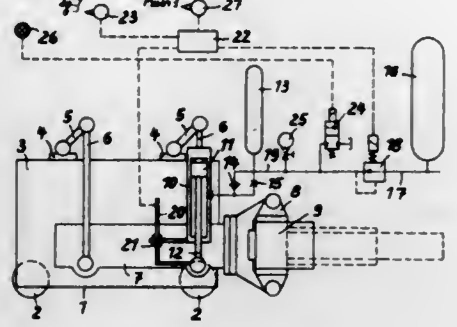
For use with press-brakes or sheet-metal bending presses, an apparatus comprising at least one mechanism including a member for supporting sheet materials to be bent, which member is rotatably and slidably supported by a first link member pivotally mounted on a table of the press-brake, and further pivotally supported by a second link member which is also rotatably supported by the first link member, the rotational movement of the second link member relative to the first link member being regulated by a geared engagement between the second link member and the press-brake table in such a way that the supporting member is at all times in contiguous contact with the sheet materials being bent. The described mechanism is usually provided on both sides of the supporting member in a substantially symmetrical arrangement.

3,715,908
FORGING MANIPULATORS

Ludwig Schussler, Willich, Germany, assignor to Schloeman Aktiengesellschaft, Dusseldorf, Germany

Filed May 21, 1970, Ser. No. 39,219
Claims priority, application Germany, May 24, 1969, P 19 26 638.7
Int. Cl. B21j *13/10;* **B23q** *3/00*
U.S. Cl. 72—420 **3 Claims**

In a forging manipulator, apparatus is provided for controlling the position of workpiece holding jaws with respect to the body of the forging manipulator. The jaws are mounted on the body by a suspension system including a pressure fluid operated cylinder and piston unit, a first accummulator in fluid connection with the cylinder, a second accummulator for higher pressure fluid connected through a pressure regulating valve to the first accummulator, and sensing means, such as a potentiometer, for providing a control signal in accordance with the relative positions of the cylinder and piston to control the pressure regulating valve to admit fluid as necessary into the first accummulator so as to bias the suspension system to a predetermined position.



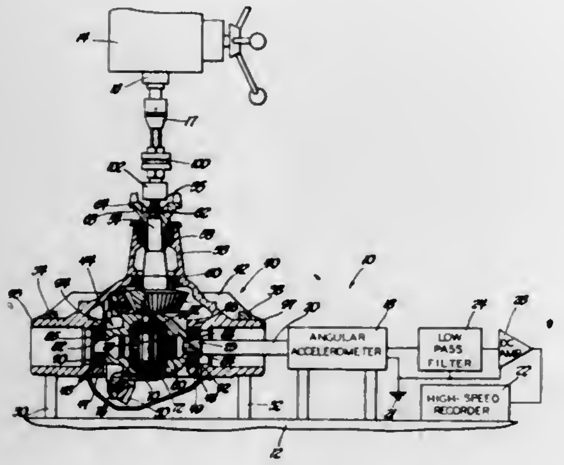
3,715,909
METHOD AND APPARATUS FOR DETERMINING BEARING PRELOAD IN A GEAR TRAIN

Michael J. Wolanin, Sterling Heights, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Dec. 6, 1971, Ser. No. 205,179

Int. Cl. G01m *13/02*

U.S. Cl. 73—9 **7 Claims**



An angular accelerometer is connected to a gear train so as to measure the deceleration of one of two meshed gears having backlash as the gears move independently of each other during the period after rotational power input to the gear train is disconnected when the backlash is taken up. The only resisting torque exerted on the one gear during the backlash takeup period is the drag torque of the preloaded bearings rotatably supporting it which varies directly with the bearing preload. The drag torque is determined from the measured deceleration and from this drag torque the bearing preload is determined.

3,715,910
DETERMINATION OF RESIDUAL SOLVENT IN OILSEED MEALS AND FLOURS BY A VOLATILIZATION PROCEDURE

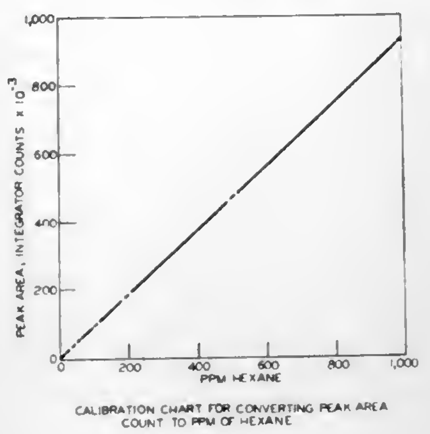
Sara P. Fore; Eric T. Rayner, and Harold P. Dupuy, all of New Orleans, La., assignors to The United States of America as represented by the Secretary of Agriculture

Filed Jan. 26, 1971, Ser. No. 109,883

Int. Cl. G01n *31/08, 25/14*

U.S. Cl. 73—23.1 **3 Claims**

This invention relates to a simple volatilization procedure for the determination of residual solvents in oilseed meals and flours. A sample of meal or flour and water are weighed into a serum bottle. The bottle is sealed and heated in an oven to volatilize the residual solvent. An aliquot of the headspace gas is then analyzed by gas chromatography.



CALIBRATION CHART FOR CONVERTING PEAK AREA COUNT TO PPM OF HEXANE

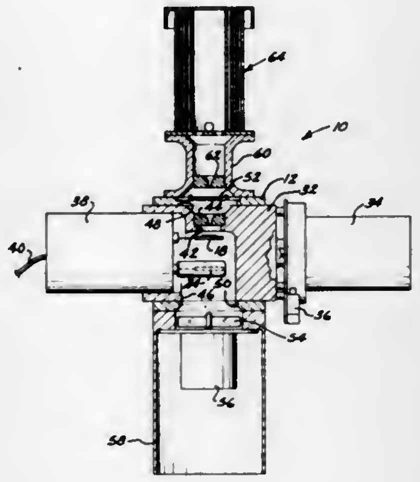
3,715,911
APPARATUS FOR SENSING AIR-BORNE PARTICULATE MATTER

Raymond L. Chuan, Altadena, Calif., assignor to The Susquehanna Corporation

Filed May 11, 1970, Ser. No. 36,222

Int. Cl. G01n *15/02;* **G08b** *21/00*

U.S. Cl. 73—28 **12 Claims**



The sensing apparatus of the present invention combines the impaction action of a decelerated small air jet with a quartz crystal microbalance to detect, by mass sensing, the presence of micron size air-borne particulate matter. A quartz crystal, coated with a tacky material and oscillating in a shear mode as part of a resonant circuit, responds to very small changes of mass on its surface by changes in the resonant frequency. This frequency is mixed with that of a reference oscillator and the differential frequency, which is proportional to collected mass, may be counted or converted to an analog signal suitable for direct recording or display, or for the performing of control functions.

3,715,912
DENSITOMETER

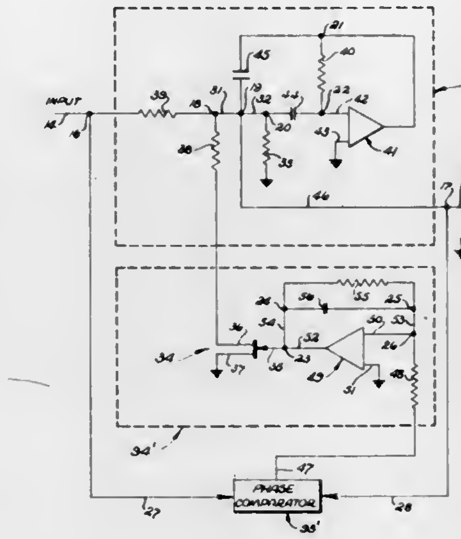
Gerald Lance Schlatter, Boulder, Colo., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed April 8, 1971, Ser. No. 132,493

Int. Cl. G01n *9/00*

U.S. Cl. 73—32 **13 Claims**

A vibration densitometer having a resonant structure and a tracking filter with a limited tracking band, and an oscillator to add an alternating signal to the filter input of an amplitude less than that supplied thereto at the resonant frequency of the structure when the structure is vibrating. The oscillator output signal has a frequency which is located midway between the upper and lower limits of the tracking band. Without the oscillator the densitometer will not resonate under moderate conditions of pipeline noise. The oscillator provides reliable self-starting. It gives both an amplitude and a frequency boost. The densitometer switches immediately to the resonant frequency after first homing in on the oscillator output signal.



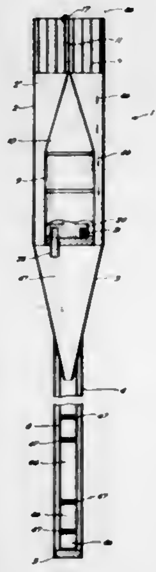
3,715,913
AQUATIC SEDIMENT AND POLLUTION MONITOR

Roger Y. Anderson, 5014 Guadalupe Tr., N.W., Albuquerque, N. Mex.

Filed March 25, 1971, Ser. No. 127,891

Int. Cl. G01n *1/20*

U.S. Cl. 73—61 R **15 Claims**



An aquatic sediment and pollution monitor adapted to be positioned in a body of water comprising an elongated, vertically alignable, collecting tube having an open upper end and a closed lower end for collecting, over a long period of time, the natural materials and polluting substances that accumulate in the body of water. A generally funnel-shaped magnifying cone is positioned with the small diameter end thereof extending into the open end of the collecting tube to magnify the amount of sediment and pollution collected. A baffle is positioned in the magnifying cone adjacent the large diameter end thereof for minimizing turbulence in the collecting tube and for preventing entrance thereinto of large organisms. Means are also provided for automatically marking, at regular intervals, the quantity of sediment and pollution accumulated in the collecting tube during such intervals.

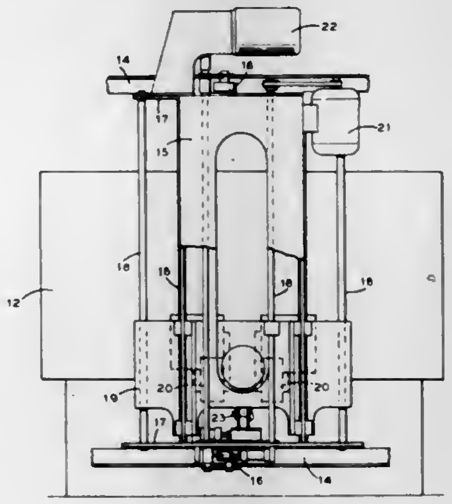
3,715,914
ON SITE PRESSURE VESSEL INSPECTION DEVICE

Leonard B. Gross; Charles R. Johnson, both of Lynchburg, and Stephen C. Nattsas, Bedford, all of Va., assignors to The Babcock & Wilcox Company, New York, N.Y.

Filed Oct. 12, 1970, Ser. No. 79,831

Int. Cl. G01n *9/24*

U.S. Cl. 73—67.7 **10 Claims**



A remotely controlled method for the non-destructive inspection of the primary pressure containment means of a nuclear reactor, on the site of use, for the detection of degradation resulting from sustained exposure to radiation. This method utilizes dual probes operating on a send-and-receive basis, wherein an ultrasonic beam is sent into a thick vessel wall describing a V-like path in the same. The transducers are fixed with respect to each other, and are transported about a programmed course in fixed relation to the vessel, so as to allow the beam to inspect 100 percent of the steel in such wall. If a defect was present in the steel, it would interfere with the path of the ultrasonic beam and a corresponding loss of energy would be detected and recorded. A comparison of the record of signals resulting from this inspection, with an established pattern of signals having its inception prior to service would indicate the initiation and propagation of a defect so that, if necessary, remedial procedures could be undertaken.

3,715,915
LIGHT INTENSITY STRAIN ANALYSIS

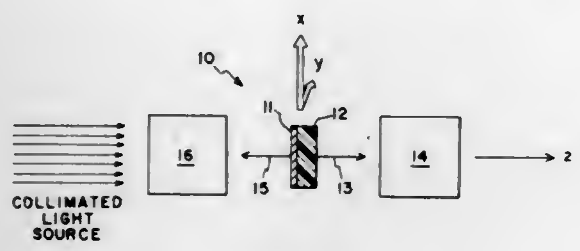
Jerry G. Williams, Hampton, Va., assignor to The United States of America as represented by the Administrator of National Aeronautics and Space Administration

Filed April 28, 1971, Ser. No. 138,230

Int. Cl. G01b *11/18*

U.S. Cl. 73—88 A **13 Claims**

A process for the analysis of the strain field of structures subjected to large deformations involving a low modulus substrate having a high modulus, relatively thin coating thereon. The optical properties of transmittance and reflectance are



measured for the coated substrate while stressed and unstressed to thereby indicate the strain field for the coated substrate.

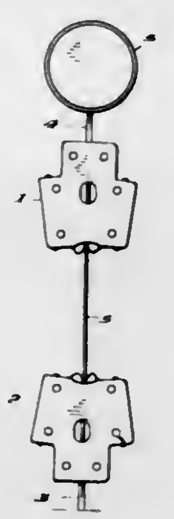
3,715,916
GRIPS FOR HOLDING SPECIMENS

Fernald S. Stickney, West Caldwell, N.J., assignor to Instrument Specialties Company, Inc., West Paterson, N.J.

Filed Jan. 26, 1971, Ser. No. 109,860

Int. Cl. G01n *3/04*

U.S. Cl. 73—103 **10 Claims**



Grips for tensile testing of a specimen, such as a strip of metal, arranged in pairs in longitudinal aligned relation to grip opposite end portions of a specimen strip, the tensile strength of which is to be determined in a suitable testing machine such, for example, as one attached to a dynamometer. Each of the grips comprises a frame including a pair of side plates in clamping relation with compression blocks therebetween, forming an elongated throat. A pair of gripping members, such as wedges, are slidably mounted in the throat and have bearing relation against the compression blocks. The inner opposed faces of the wedges are adapted to receive an end of the specimen therebetween. The throat is open at opposite ends for access to the wedges to move these bodily with respect to the compression blocks or relative to the bearing means thereof to cause frictional engagement between the wedges and the specimen or to release the wedges therefrom.

3,715,917
NON-ROUND FLUID DYNAMOMETER

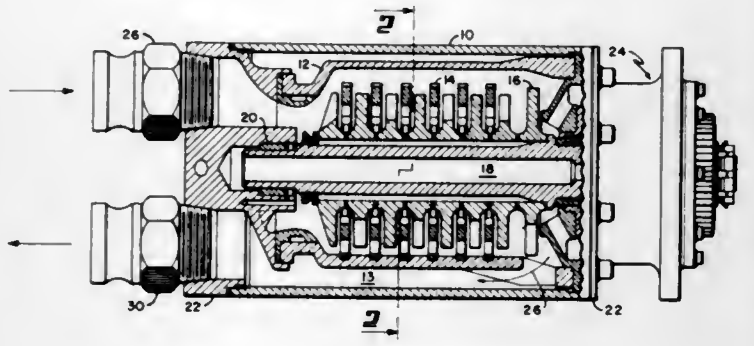
Joachim C. Bronder, Trumbull, Conn., assignor to Avco Corporation, Stratford, Conn.

Filed Sept. 17, 1971, Ser. No. 181,358

Int. Cl. G01l *3/20*

U.S. Cl. 73—134 **5 Claims**

The operating characteristics of an otherwise conventional fluid dynamometer are improved by supporting the rotor and stator disks within a housing having a cross section which is non-round. The use of the non-round housing causes a change



in direction of motion of the fluids within the dynamometer, thereby preventing the formation of a solid rotating core of fluid.

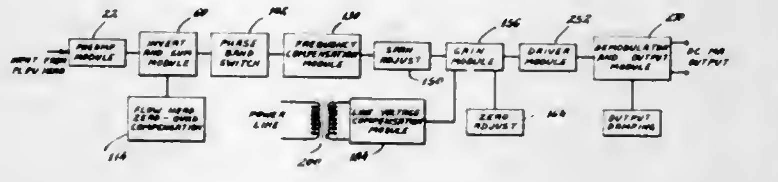
3,715,918
MAGNETIC FLOWMETER APPARATUS

John E. Bailey, Needham, Mass., assignor to The Foxboro Company, Foxboro, Mass.

Filed April 29, 1970, Ser. No. 32,804

Int. Cl. G01f *1/00*; G01p *5/08*

U.S. Cl. 73—194 EM **30 Claims**



Magnetic flowmeter apparatus comprising a flow head producing an alternating flow potential which is directed to an electronic transmitter apparatus arranged to produce a d-c flow signal corresponding to flow rate. The transmitter includes a number of physically separate modules each including a solid-state amplifier, and having circuit elements arranged to provide specific functions such as zeroizing the common mode signals, injecting quadrature and in phase signal components, compensating for line voltage and frequency variations, and the like. The overall transmitter system is arranged in an open-loop, non-feedback configuration.

3,715,919
METHOD AND APPARATUS FOR MEASURING THE FLOW RATE OF ELECTRICALLY CONDUCTIVE FLUIDS

Hiroshi Kishimoto; Kenzo Kobayashi; Yoshiharu Hamazaki, and Mituaki Danno, all of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Chiyoda-ku, Tokyo, Japan

Filed April 6, 1970, Ser. No. 25,668

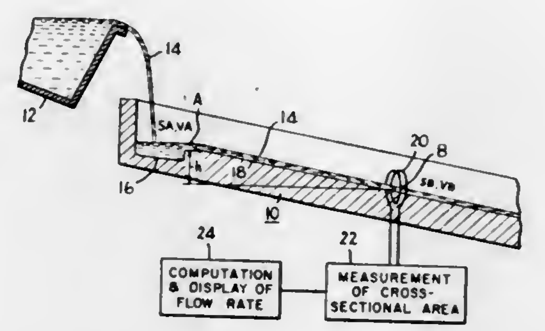
Claims priority, application Japan, April 7, 1969, 44/26734; April 7, 1969, 44/26735

Int. Cl. G01f *13/00*

U.S. Cl. 73—194 E **16 Claims**

A process and apparatus for measuring the flow rate of electrically conductive fluids comprises flowing an electrically conductive fluid down an inclined passageway and through electromagnetic coils disposed respectively around upstream

and downstream portions of the passageway. A change in inductance of each coil due to the electrically conductive fluid is


14
12
A
SA VA
14
18
16
10
20
8
SB VB
24
22
COMPUTATION & DISPLAY OF FLOW RATE
MEASUREMENT OF CROSS-SECTIONAL AREA

measured to determine the corresponding cross sectional area SA or SB of the fluid at the upstream or downstream locations. Then the flow rate Q is computed from the expression

$$Q=\frac{SA\cdot SB}{\sqrt{SA^2-SB^2}}\sqrt{2gh}$$

where g is the acceleration due to gravity and h is a vertical difference in level between both coils. When the downstream portion has a much higher in flow speed than the upstream portion, $Q=SB\ \sqrt{2gh}$ is used.

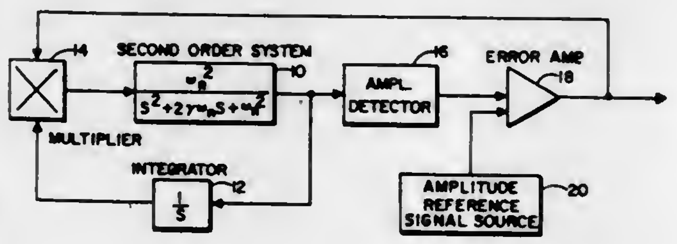
3,715,920
APPARATUS FOR DETERMINING THE DAMPING RATIO OF A SECOND ORDER VIBRATION SYSTEM

Leslie J. Groberman, Minneapolis, and Edward R. Wuori, St. Paul, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed April 20, 1971, Ser. No. 135,785

Int. Cl. G01f *1/00*

U.S. Cl. 73—194 B **7 Claims**



Apparatus for measuring the damping ratio of a second order system. The apparatus takes the form of a mass rate flow meter comprising an impact plate adapted to be inserted in a fluid flow. The plate and its mounting means forms a second order system which has a damping ratio proportional to the rate of mass flow. The plate is connected in a loop with an integrator, or a differentiator, and a multiplier. The integrator of differentiator provides, among other things, phase shifting. The loop gain is increased until the loop oscillates. Automatic gain control stabilizes the oscillations and the amplitude of the loop oscillations is compared with a reference quantity. The signal resulting from this comparison is used to adjust the gain of the multiplier such that the amplitude of the loop oscillations is kept constant. The signal used to adjust the gain of the multiplier is proportional to the damping ratio of the second order system and therefore is also proportional to the mass flow rate.

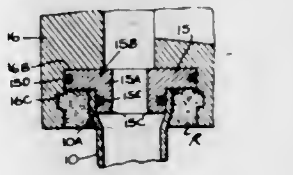
3,715,921
END-SEALED VARIABLE-AREA FLOWMETER

Oscar H. Grauer, Jenkintown; Omund A. Seglem, Doylestown, and Erwin K. Kaucher, Souderton, all of Pa., assignors to Fisher & Porter Company, Warminister, Pa.

Filed Oct. 6, 1971, Ser. No. 187,014

Int. Cl. G01f *1/00*

U.S. Cl. 73—209 **14 Claims**



A flowmeter of the rotometer type, wherein a variable-area meter tube is supported at its ends between inlet and outlet fittings. Each end fitting is permanently secured to the meter tube. This is accomplished by means of a hollow socket of corrosion-resistant material which is received within a well formed in the end fitting, the socket having a neck section of reduced diameter which engages the end of the tube. The annular region in the well surrounding the neck section and the tube end is filled with a compound serving to seal-in the socket and bond the tube end to the fitting.

3,715,922
COLOR PYROMETER

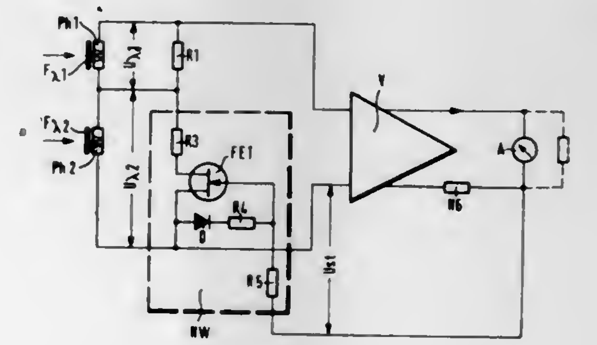
Kurt Menge, Karlsruhe, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Sept. 21, 1970, Ser. No. 74,098

Claims priority, application Germany, Sept. 20, 1969, P 19 47 791.9

Int. Cl. G01j *5/60*; G05f *1/60*

U.S. Cl. 73—355 EM **3 Claims**



A color pyrometer with two photo devices responding to different wavelengths and having output resistors connected in opposition. One resistor is controlled by a feedback voltage obtained from a differential amplifier responding to the voltage differential across the resistors to maintain the differential at 0. The controlled resistance or the feedback voltage is a measure of the ratio of received radiation intensities at the two wavelengths.

3,715,923
TEMPERATURE MEASURING METHOD AND APPARATUS

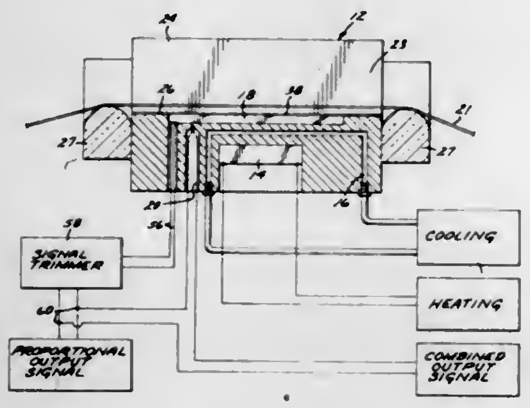
David R. Hornbaker, 1520 Cole Way, La Habra, and Dieter L. Rall, 11818 E. North Circle Dr., Whittier, both of Calif.

Filed July 23, 1970, Ser. No. 57,629

Int. Cl. G01k *1/16*, *7/12*

U.S. Cl. 73—361 **14 Claims**

A temperature measuring method and apparatus, the apparatus including a thermal sink or reference body signal a heat flow sensor, and operative to determine the temperature of an external medium or body by utilizing the principle that convective and conductive heat exchange between the reference body and the external body will be zero when the bodies are at the same temperature, the apparatus in one embodiment having the heat flow sensor mounted in a reference body whose temperature is known. The method of the invention yields the absolute temperature of the external body by using the heat flow sensor to sense the rate of convective heat flow between the bodies, and then calibrating the resulting signal or output in terms of the temperature difference between the bodies. In one embodiment of the apparatus the external body is carried through or across the reference body a predetermined distance from the heat sensor to facilitate calibration of the heat flow sensor output signal.



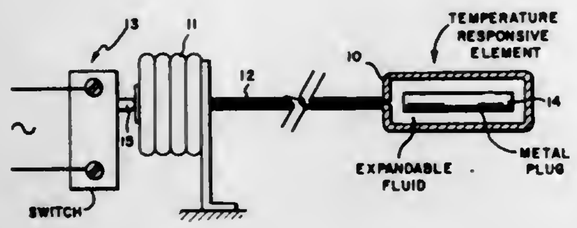
3,715,924
FLUID EXPANDABLE TEMPERATURE APPARATUS HAVING EXCESSIVE TEMPERATURE RELIEF APPARATUS

Lorne W. Nelson, Bloomington, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Sept. 4, 1970, Ser. No. 69,864

Int. Cl. G01k *5/02*; **H01h** *37/36*

U.S. Cl. 73—368 **6 Claims**



A temperature responsive control apparatus having a fluid filled system wherein upon a change in temperature of a fluid filled responsive element an increase in volume of the fluid produces an output. A metal plug which is contained in the fluid of the responsive element has a substantially constant volume throughout the normal temperature working range, but decreases in volume above a predetermined maximum temperature to limit the volume change to protect the control apparatus when being exposed to excessive destructive temperatures above the predetermined temperature.

3,715,925
MINIATURE RECORDING ALTIMETER

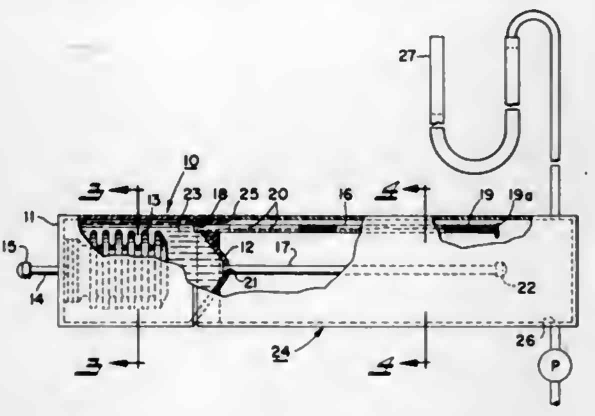
Ernest W. Miller, 20946 Northwood, Fairview Park, Ohio

Filed Oct. 26, 1971, Ser. No. 192,168

Int. Cl. G01l *7/18*

U.S. Cl. 73—384 **12 Claims**

A recording altimeter is provided and particularly a miniaturized, compact altimeter adapted for use in flying amusement devices. The altimeter includes a pressure-sensitive system having gauge means, the entire system and gauge means normally being filled with an incompressible fluid such as an alcohol-water mixture. As the pressure outside of the altimeter decreases, part of the incompressible fluid is expelled from the gauge means. After the altimeter returns to original pressure conditions, the partial loss of water from the gauge means reflects a minimum pressure or pressure difference to which the altimeter has been subjected.



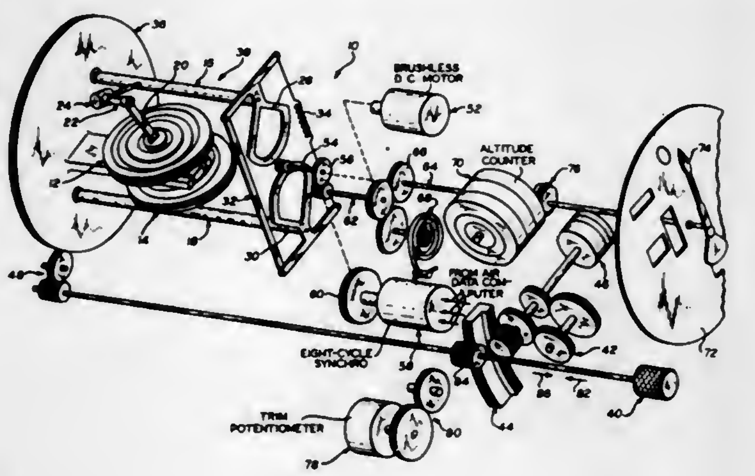
3,715,926
DUAL MODE ALTIMETER

Geoffrey S. Hedrick, Malvern, Pa., assignor to Lear Siegler, Inc., Grand Rapids, Mich.

Filed June 28, 1971, Ser. No. 157,582

Int. Cl. G01l *7/14*

U.S. Cl. 73—387 **20 Claims**



In a dual mode altimeter having an altitude display means, pressure responsive drive means, including diaphragm capsules adapted to expand and contract in response to changes in altitude, mechanical means connecting the pressure responsive drive means to the display means for driving the display means in response to expansion and contraction of the capsules, a remote altitude signal source and a servo means including a follow-up synchro connected in driving relationship to the altitude display, the servo being responsive to a signal received from the remote source for effecting overriding of the pressure responsive drive means for driving the mechanical means and, thus, the display means in response to the received signal, the improvement comprises a brushless D.C. motor operatively connected to the synchro in a closed servo loop and to the mechanical means. The motor is directly connected to a central pinion which is in meshing relationship with a gear sector operatively connected through a rocking shaft to the diaphragm capsules. In the servoed mode of the altimeter, the brushless D.C. motor drives the altitude display. In the pneumatic mode, the servo loop is electrically opened and the excitation windings of the motor are grounded, the motor providing magnetic damping in the pneumatic mode. Zero correction of the servo loop is provided by scaling and summing one of the pair of sinusoidal outputs of the synchro with the other sinusoidal output, the output providing an error correction signal for the servo loop. The brushless D.C. motor includes an independent feedback path including a second stator winding for providing direct rate feedback control.

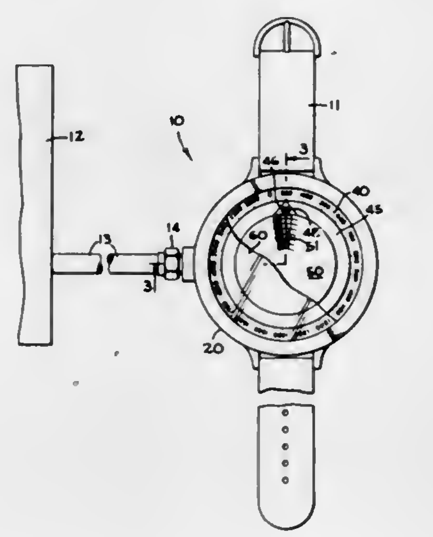
3,715,927
GAUGE FOR INDICATING EXHAUST TIME OF AIR SUPPLY FOR SCUBA DIVERS

Roger L. Grant, 1243 Monte Vista St.,
San Luis Obispo, Calif. 93401

Filed Mar. 5, 1971, Ser. No. 121,255

Int. Cl. G01l *19/00, 7/04*

U.S. Cl. 73—389 **8 Claims**



A wrist-type gauge for a scuba diver to enable the scuba diver to take a direct reading as to the time remaining before the exhaustion of the air supply. Toward this end, the gauge comprises relatively rotatable discs. One disc is connected to the air tank and is displaced angularly in response to variations in air pressure in the tank. Time remaining indicia are disposed in columns radially on the one disc under associated air pressure magnitudes. Another disc has a radially disposed opening to expose a column of radially aligned time remaining indicia on the one disc. On the other disc is disposed radially aligned depth indices adjacent an opening. An operator is informed of the depth of his location and reads through the opening the exposed time remaining for the exhaustion of air in the tank by aligning through radial distance the time remaining value with the selected depth of location.

3,715,928
VARIABLE SPEED POWER TRANSMISSION

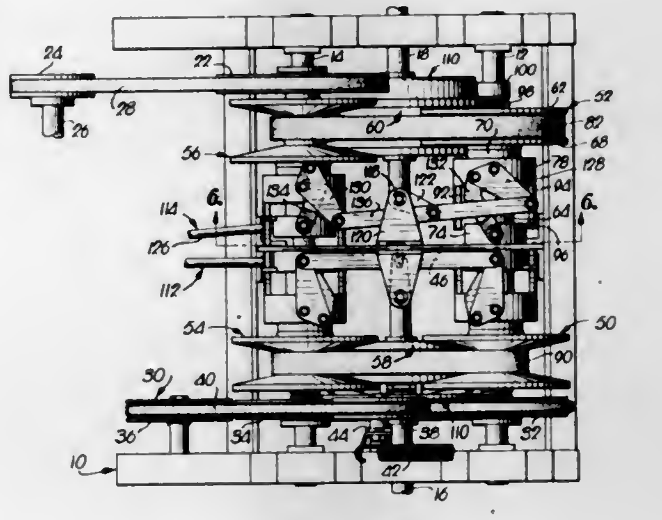
Cecil L. Case, and Harold Keith Garrison, both of Newton, Kans., assignors to Hesston Corporation, Hesston, Kans.

Filed Oct. 7, 1971, Ser. No. 187,323

Int. Cl. F16h *9/00, 11/00*

U.S. Cl. 74—218 **21 Claims**

A belt transmission having forward and reverse shafts, power driven continuously in opposite directions, utilizes operator-controlled, dual section sheaves for driving one or a pair of output shafts at infinitely variable speeds in either of two directions. Both sections of the operator-actuated sheaves are shiftable axially of their shafts, permitting use of symmetrical belting. Either or both of the output shafts may be driven forwardly or in reverse at selected speeds without interrupting the power to either of the two counter-rotating shafts. When the sections of the continuously rotating sheaves are open, their belts rest upon idler bearings between the sections.



3,715,929
CAM BARREL FOR HOLDING AT LEAST ONE DISPLACEABLE LENS ELEMENT

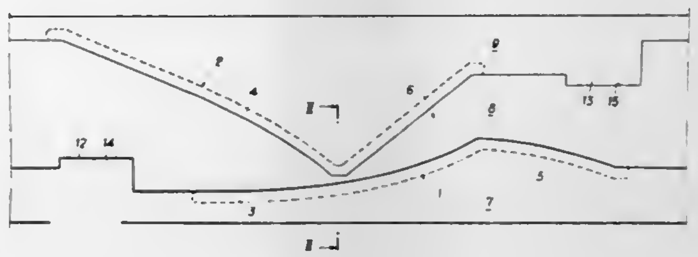
Franz Konigslehne, Ste. Croix, Switzerland, and Hanns Plihal, Vienna, Austria, assignors to Karl Vockenhuber and Raimund Hauser, Vienna, Austria

Filed Oct. 26, 1970, Ser. No. 83,990

Claims priority, application Austria, Oct. 31, 1969, A 10289/69

Int. Cl. F16h *53/00*

U.S. Cl. 74—567 **6 Claims**



A cylindrical barrel body comprises at least two axially aligned annular members, one of which is formed with a cam face which is inclined to the generatrices of said barrel body. Said two annular members have mutually confronting end faces extending along said cam face.

3,715,930
VARIABLE DIAMETER CENTRIFUGALLY-OPERATED DRIVE PULLEY

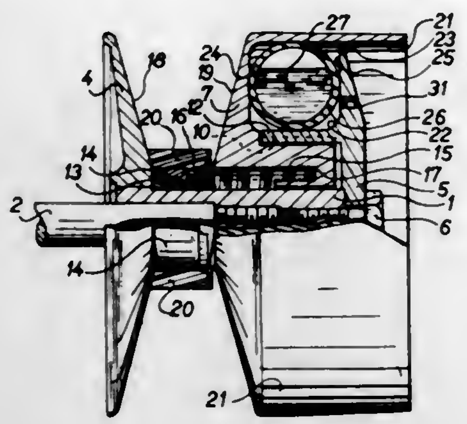
Gilles Beliveau, 1225 Fremont St.; Jean-Marc Beliveau, 426 St. Joseph Blvd. West, and Victor Beliveau, 8352 Place Mont Richard, Ville d'Anjou 434, all of St. Bruno de Montarville, Quebec, Canada

Filed May 27, 1971, Ser. No. 147,337

Int. Cl. F16h *11/06*

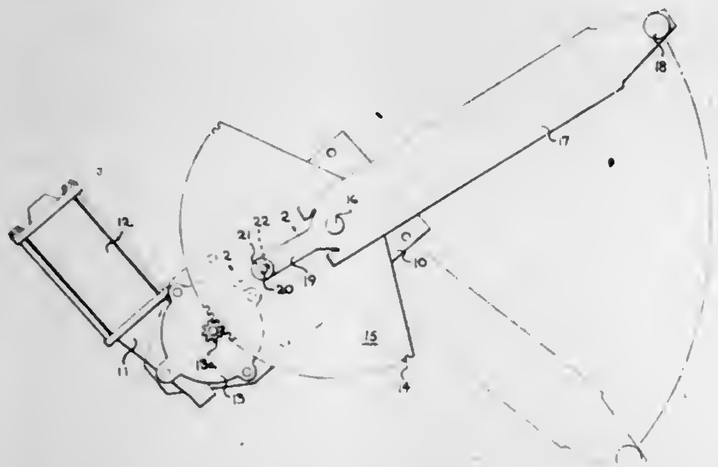
U.S. Cl. 74—230.17 E **1 Claim**

A variable diameter pulley for use as a drive pulley in a V-belt drive assembly in which the axially movable pulley half is moved towards the fixed pulley half under action of centrifugal forces, said centrifugal forces being produced by a liquid filled annular flexible liquid-tight tube disposed in a chamber defined by the axially movable pulley half, a cylindrical wall depending from the periphery thereof and a disc secured to the drive shaft. Rotation of the liquid causes flattening of the tube with increase of rotational speed, thereby displacing the movable pulley half towards the fixed pulley half.



3,715,931
GEAR MOUNTED DRIVE ARM ADAPTED TO FLEX AS CANTILEVER BEAM

Joseph C. Littmann, Temperance, Mich., assignor to Dura Corporation, Toledo, Ohio
Filed April 19, 1971, Ser. No. 135,047
Int. Cl. F16h *57/00;* **E05f** *11/24*
U.S. Cl. 74—411 **6 Claims**

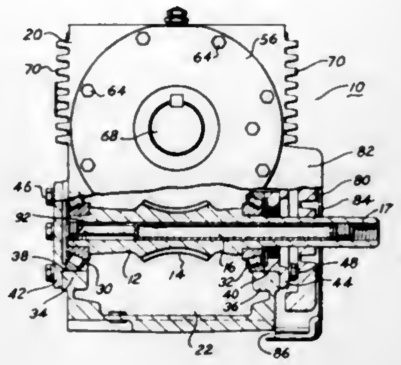


A vehicle window regulator drive arm, or the like is, mounted on the pivot pin of a power driven gear sector. An integral extension is on the inner end of the drive arm, the end of which has a pin and slot connection with the gear sector. The arm extension is shaped to provide flexure without stress risers and flex like a cantilever beam about the pivot pin. The pin and slot connection affords the movement necessary as the drive arm foreshortens while flexing.

3,715,932
SPEED REDUCER

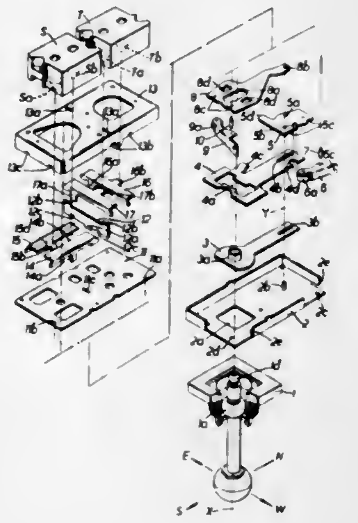
Theo F. Sharp, South Bend, Ind., assignor to Reliance Electric Company, Mishawaka, Ind.
Filed Nov. 9, 1970, Ser. No. 87,703
Int. Cl. F16h *1/16;* **F24h** *3/00;* **F28d** *15/00*
U.S. Cl. 74—425 **15 Claims**

A mechanical power transmission means in which there is a driving element, a driven element, and a shaft on which one of the elements is mounted. The shaft contains a chamber with a heat pipe system therein for transmitting heat generated in or transferred to the element on said shaft, to a point remote from the element for regulating the temperature in the power transmission means. The present concept is particularly adapted to speed reducers of the worm and gear type.



3,715,933
JOYSTICK OPERATOR FOR PUSHBUTTON SWITCH

Douglas Burton Robinson, Sharnbrook, England, assignor to Cutler-Hammer, Inc., Milwaukee, Wis.
Filed April 5, 1971, Ser. No. 130,954
Claims priority, application Great Britain, May 4, 1970, 21,239/70
Int. Cl. G05g *9/04*
U.S. Cl. 74—471 XY **8 Claims**

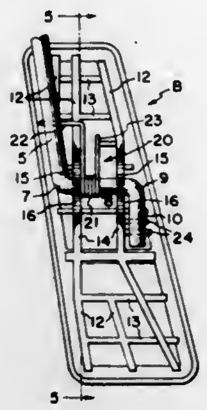


A mechanism for actuating selected ones of a plurality of plungers comprising a plurality of levers each of which is rotatable in engagement with at least one corresponding plunger to actuate the plunger and a common operating member to selectively rotate said levers.

3,715,934
ACCELERATOR PEDAL

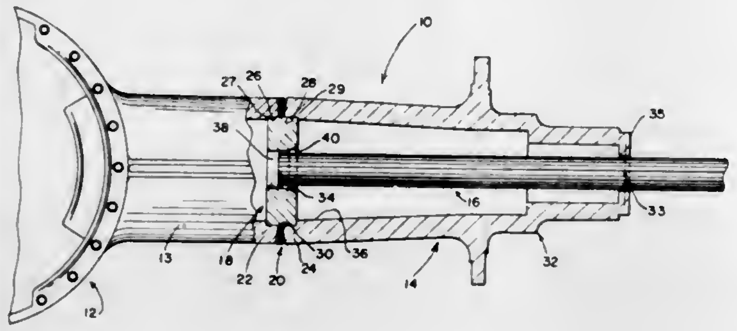
Lawrence N. Reed, Warren, Mich., assignor to Essex International, Inc., Fort Wayne, Ind.
Filed Dec. 3, 1971, Ser. No. 204,588
Int. Cl. G05g *1/14*
U.S. Cl. 74—560 **15 Claims**

An accelerator pedal adapted for mounting on a throttle linkage including an elongated lever having a laterally extending arm adjacent one end thereof comprises a pedal body having spaced apart pairs of mounting projections extending from one side thereof and between which the arm of the throttle lever is rotatably accommodated. The projections include flexible retaining fingers which extend toward the pedal body along converging lines. Each retaining finger has a free end which bears against the lever arm so as rotatably to retain the pedal body on the arm. A spring biases the pedal body to rotate in one direction and the lever arm includes an extension which is engageable with the pedal body to limit its rotation.



3,715,935
WELD FIXTURE AND AXLE SHAFT INSTALLATION GUIDE

Edward W. Ebey, Roundlake, Ill., assignor to International Harvester Company, Chicago, Ill.
Filed Oct. 12, 1971, Ser. No. 188,043
Int. Cl. F16h *57/02*
U.S. Cl. 74—607 **5 Claims**

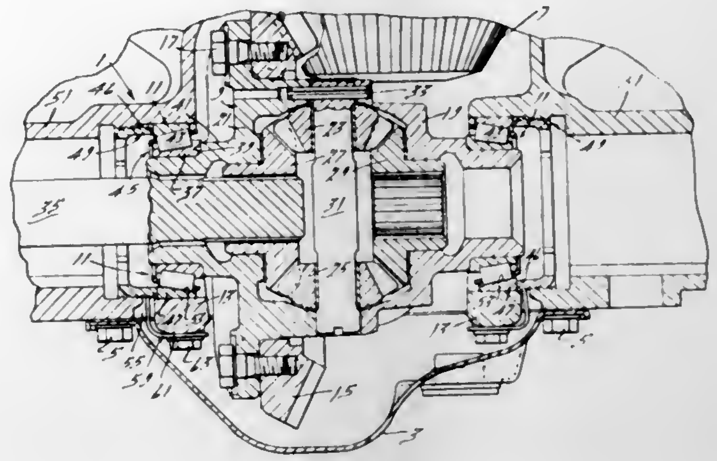


A cylindrical member which pilots a differential housing to an end spindle during the welding thereof. The member is positioned such that as the center of gravity of an axle shaft passes into the spindle end during installation thereof, the leading end of the shaft is supported by the member.

3,715,936
DIFFERENTIAL BEARING PRELOAD LOCK

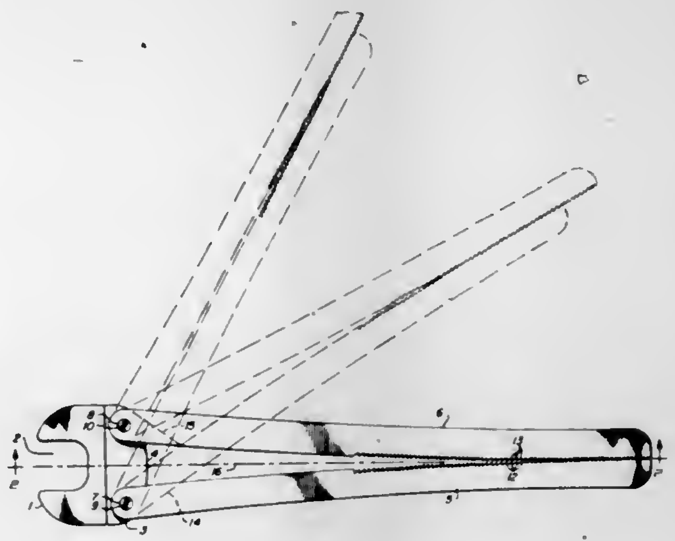
Evan L. Jones, Detroit, Mich., assignor to Chrysler Corporation, Highland Park, Mich.
Filed April 5, 1971, Ser. No. 131,386
Int. Cl. F16h *1/40, 1/44*
U.S. Cl. 74—713 **10 Claims**

Automotive differential mechanism including rotatable bearing adjusters for applying a predetermined load o bearings mounting a two-piece differential case Locking members are provided for engaging the threads of the adjusters to inhibit rotation thereof.



3,715,937
ANGULARLY ADJUSTABLE END WRENCH

James E. Cade, Phoenix, and Frank Mossuto, Scottsdale, both of Ariz., assignors to said Mossuto, by said Cade
Filed July 8, 1971, Ser. No. 160,848
Int. Cl. B25g *1/06*
U.S. Cl. 81—177.8 **1 Claim**



An end wrench is provided in which the angle between the nut receiving opening and the handle structure may be readily adjusted across a broad angle range. The handle comprises two separate pieces, each of which is individually, pivotally fixed to the head section symmetrically about a line bisecting the nut receiving opening. The inner edge of each handle portion is provided with serrations which are complementarily configured to interlock when the handle portions are clasped together. By manually separating the handle portions and moving them longitudinally with respect to one another, the angle of the head portion with respect to the handle may be adjusted to the angle desired whereupon the handle portions may be brought together to lock the head portion at the desired angle.

3,715,938
METHOD OF CONTROLLING A CYCLE OF OPERATIONS FOR MACHINING A ROTARY WORKPIECE

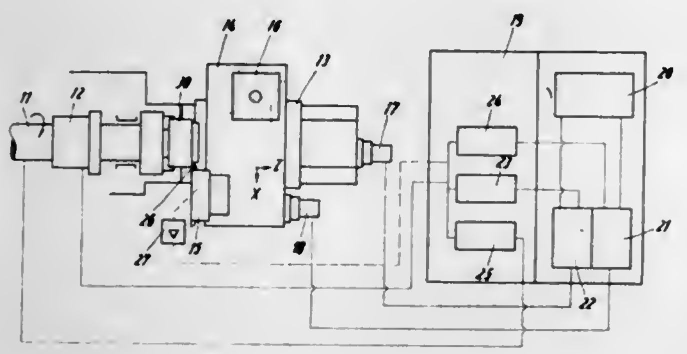
Alfred Ledergerber, Bielefeld, and Walter Plassmeier, Hiddesen near Detmold, both of Germany, assignors to Werkzeugmaschinenfabrik Gildemeister & Comp Aktiengesellschaft, Bielefeld, Germany

Filed Oct. 28, 1970, Ser. No. 84,856

Claims priority, application Germany, Oct. 31, 1969, P 19 54 845.9

Int. Cl. B23b *1/00*

U.S. Cl. 82—1 C **22 Claims**



A method for machining a rotary workpiece in radial and axial directions under the control of electronic program control means in which the maximum and minimum permissible reference values are stored, and which responds to signals of measuring devices representing the torque applied by the main spindle and workpiece to the cutting tool, advance rates of the tool, the cutting force, and other operational data. When the tool cuts into the workpiece, the increased torque is measured and the rate of rapid feed of the tool reduces, or the tool is stopped, so that the tool is freed of the workpiece, whereupon the tool is advanced so that the measured torque increases to a maximum, whereupon the direction of movement is changed and the work piece is machined until the cutter no longer engages the work piece.

3,715,939
AUTOMATIC LATHE

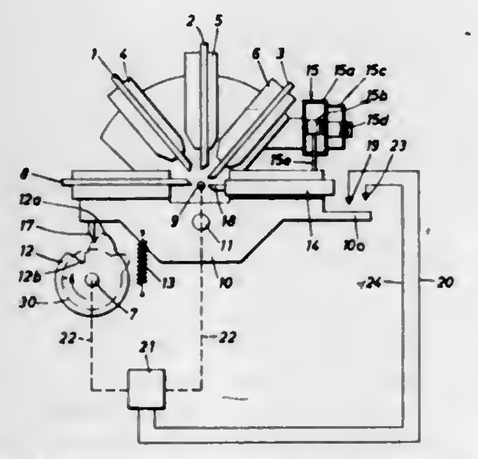
Henri Leschenne, Moutier, Switzerland, assignor to Fabrique de Machines Andre Bechler S.A., Moutier (Canton of Berne), Switzerland

Filed Aug. 30, 1971, Ser. No. 176,074

Claims priority, application Switzerland, Sept. 4, 1970, 13241/70

Int. Cl. B23b

U.S. Cl. 82—21 B **4 Claims**



An automatic lathe equipped with a mechanism rendering possible interruption of the rotation of a control shaft during a machining cycle, this control shaft being equipped with at least one cam disc fixedly seated thereon controlling the movement of given tools. There is provided at least one device for carrying out at least one working or machining operation by means of at least one predetermined tool during standstill of the control shaft. This device embodies at least one element for bringing about the feed of such predetermined tool and there is also provided a mechanism which controls the speed of feed movement of this tool or the duration of the machining operation carried out by such tool. There is additionally provided a response or feeler means, for instance a microswitch, and associated operable connection means in order to place again the control shaft into rotation as soon as the machining operation carried out by the aforementioned predetermined tool has been completed.

3,715,940
MACHINE FOR CUTTING ROD-LIKE ARTICLES INTO REQUIRED LENGTHS

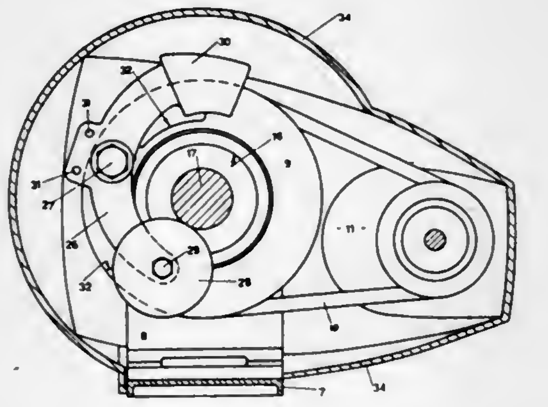
Lessel George Davis, Lurline Bay, New South Wales, Australia, assignor to Twentieth Century Blinds Pty. Limited, Undercliffe, New South Wales, Australia

Filed Dec. 7, 1970, Ser. No. 95,861

Claims priority, application Australia, Dec. 23, 1969, 65681/69

Int. Cl. B23b *5/14*

U.S. Cl. 82—63 **5 Claims**



A machine for cutting of the end of rod-like articles such as a rolled-up window shade. The article is held stationary and protrudes through a hole in the center of a flywheel, and a knife suspended from a lever pivoted on the flywheel cuts around the periphery of the article. A weight on the opposite end of the lever forces the knife against the flywheel by centrifugal action as the flywheel rotates.

3,715,941
SLITTING MACHINE

Theodore E. Andrews, Kutztown, and John J. Weller, Emmaus, both of Pa., assignors to Armstrong Cork Company, Lancaster, Pa.

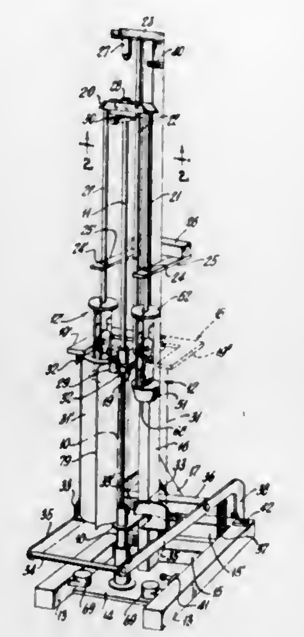
Filed Feb. 8, 1971, Ser. No. 113,342

Int. Cl. B26d *3/08*

U.S. Cl. 83—7 **33 Claims**

The invention contemplates a tool and method for slitting a tubular work piece having a bore of substantially constant cross-section. To this end, a slitting-tool holder is provided with work-piloting body or positioning elements so sized and configurated as to stabilize the holder in the bore of the work piece during a working traverse. One or more slitting-tool elements is positioned on the holder so as to project, in a work-slitting position, radially outwardly of the body element at one angular location (or at plural angularly spaced locations) with respect to the longitudinal axis of the work piece. The working traverse is accomplished with the slitting tool in cutting position, with assurance of perfect alignment through piloting derived from the bore of the work piece.

In a specifically described employment, two slitting-tool elements are arrayed to project outward of diametrically opposed locations, one element being adjusted to cut to less than work-piece thickness, the other being set to cut for greater than work-piece thickness. The work piece may thus become two hingedly related, substantially alike, elongated halves of the original tubing.



3,715,942
LIQUID SHAVING COMPOSITION AND METHOD OF SHAVING

Donald L. Courtney, Wilmington, Del., assignor to ICI America Inc., Wilmington, Del.

No Drawing. Filed May 31, 1968, Ser. No. 733,327

Int. Cl. A61k *7/14*

U.S. Cl. 83—22 **11 Claims**

Liquid shaving compositions comprising liquid, nonionic surfactant and having an HLB from 1 to 9 and a viscosity from 0.1 to 50 stokes at 25° C. Method of shaving which comprises wetting the portion of the skin to be shaved, applying a liquid shaving composition of this invention onto the cutting edge of a razor to provide a thin layer thereon, and advancing the cutting edge of the razor over the dampened surface of the skin to sever the hair fibers.

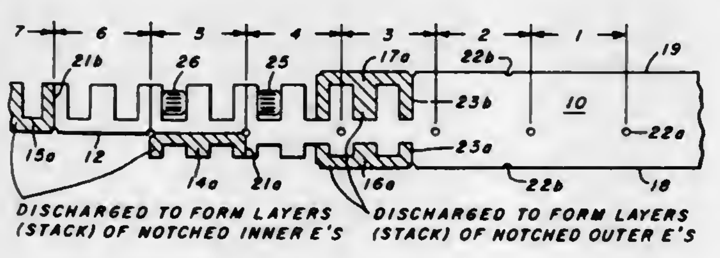
3,715,943
METHOD OF STAMPING LAMINATIONS

Robert K. Hirai, LaMiranda; John H. Boomer, and Edward R. Small, both of Fullerton, all of Calif., assignors to The Arnold Engineering Company, Marengo, Ill.

Filed June 2, 1971, Ser. No. 149,268

Int. Cl. B26d *1/00*

U.S. Cl. 83—50 **1 Claim**


DISCHARGED TO FORM LAYERS (STACK) OF NOTCHED INNER E'S
DISCHARGED TO FORM LAYERS (STACK) OF NOTCHED OUTER E'S

The present invention is an improvement upon an earlier invention relating to a scrapless method of stamping E laminations from an endless strip of metal. The pattern in this particular method involves stamping small circular and semicircular apertures in the metal strip, respectively, at the regions where right angle die punches cluster and terminate at the edge of the metal strip so that there is no metal in the strip from which spurs may develop.

Also, this differs from the previous inventions whereby the inner E's were stamped out first, leaving the outer edges of the strip to be cut off as small and large E laminations. In this invention the patent changes as follows: Two E's are removed from the outer edges of the strip, one small and one large, leaving the center of the strip as a skeleton to subsequently to chopped off as small and large E's.

3,715,944
PHOTOCOPYING APPARATUS

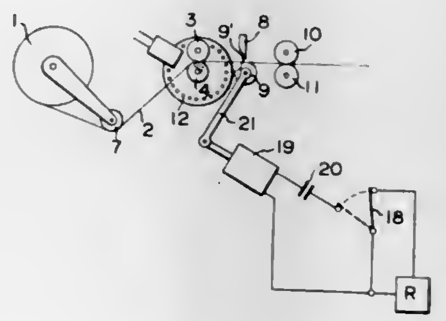
Wilhelm Josef Knechtel, Rodheim, and Detlef Schaffer, Wetzlar, Germany, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed July 13, 1970, Ser. No. 54,512

Claims priority, application Germany, July 14, 1969, P 19 35 616.2

Int. Cl. B26d *5/00, 7/24*

U.S. Cl. 83—58 **4 Claims**



A photocopying apparatus in which the optical image of an original is formed with different dimensions on electrostatically charged paper, foil or like material. A means for measuring the length of photosensitive paper supplied from a supply roll of paper is provided, and this measuring means on the one hand controls cutter means through comparator means for comparing actual measurements with standard formats and on the other hand controls a drive mechanism for drawing paper from said roll of paper, whereby copies of different standard formats can be obtained without changing sheets of copying paper.

3,715,945
AUTOMATIC CUTTING MACHINE

Takashi Mochizuki; Yoshinori Komasuzaki; Satoshi Hara; Hideo Nojima; Tamio Shimizu, and Shigeo Suzuki, all of Tokyo, Japan, assignors to Muto Industrial Co., Ltd., Tokyo, Japan

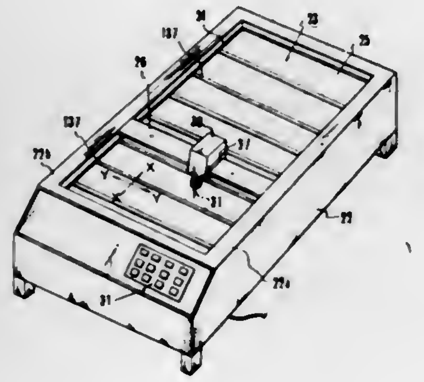
Filed Sept. 17, 1970, Ser. No. 73,016

Claims priority, application Japan, Sept. 22, 1969, 44/90672; Oct. 31, 1969, 44/103457; Nov. 23, 1969, 44/110919; Jan. 16, 1970, 45/4979; Jan. 24, 1970, 45/7702; March 19, 1970, 45/26353; March 19, 1970, 45/26354; March 25, 1970, 45/28039; April 14, 1970, 45/35921; April 14, 1970, 45/35920; Dec. 16, 1969, 44/101139; Jan. 24, 1970, 45/6447; Jan. 26, 1970, 45/6880; Feb. 12, 1970, 45/12186; Feb. 12, 1970, 45/12187; March 25, 1970, 45/24642; April 15, 1970, 45/31597; April 28, 1970, 45/36521; April 28, 1970, 45/36522; June 27, 1970, 45/56169The portion of the term of this patent subsequent to 15, 1970, 45/31597; April 28, 1970, 45/36521; April 28, 1970, 45/36522; June 27, 1970, 45/56169, has been disclaimed.

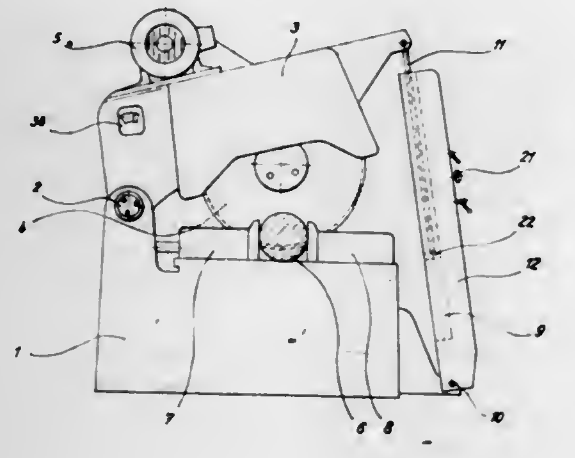
Int. Cl. B26d *1/04;* **B23d** *27/00*

U.S. Cl. 83—71 **4 Claims**

An automatic cutting machine comprising a cutting table made of a spray material or brush-like fine hair, and a carriage mounting a cutting device comprising a cutter and adapted to move parallel to the upper surface of the cutting table. The carriage is operatively associated with a numerical control system and moves in a predetermined directions while the cutter moves up and down in reciprocating motion to cut into the cutting table, so that a cloth or other material placed on the cutting table can be automatically cut into any shape as desired while the cloth is held in place by a suction force produced in a section of the cutting table where cutting of the material is effected.

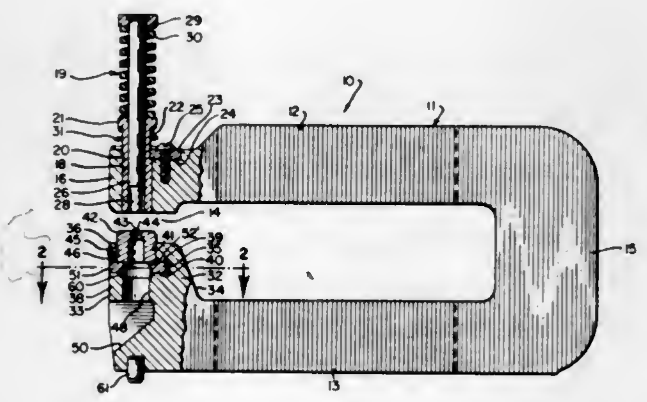


3,715,946
FEED CONTROL APPARATUS FOR A ROTARY TOOL
Dieter Kaltenbach, Rebweg 33, 7850 Lorrach, Germany
Filed Sept. 15, 1971, Ser. No. 180,654
Claims priority, application Germany, Sept. 17, 1970, P 20 45 930.7
Int. Cl. B26d *5/12*
U.S. Cl. 83—72 **10 Claims**



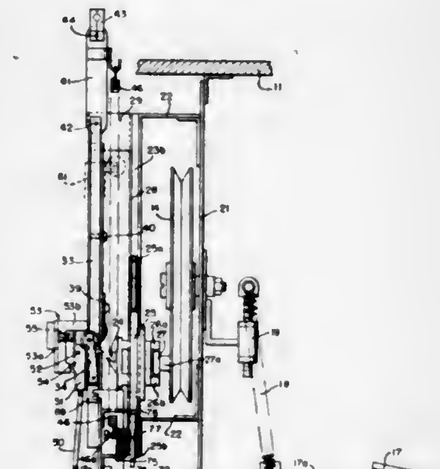
A saw blade is rotated by an electric motor while fed by a hydraulic feeding motor into a workpiece. A regulating throttle controls the hydraulic motor to vary the feeding speed, and is operated by a control means to either slowly increase the feeding speed or to rapidly reduce speed in accordance with the indications of a torque responsive amperemeter in the circuit of the electric motor. Two manually settable stops limit the movement of the regulating throttle independently of the control means and of the indication of the amperemeter in two end positions in which the hydraulic feeding motor is set to a maximum and a minimum feeding speed, respectively, selected for a specific workpiece.

3,715,947
PERFORATING DEVICE
Ralph L. Weisbeck, Buffalo, and Dennis Daniels, Williamsville, both of N.Y., assignors to Unipunch Products, Inc., Buffalo, N.Y.
Filed Dec. 28, 1970, Ser. No. 101,583
Int. Cl. B26f *1/14*
U.S. Cl. 83—140 **4 Claims**



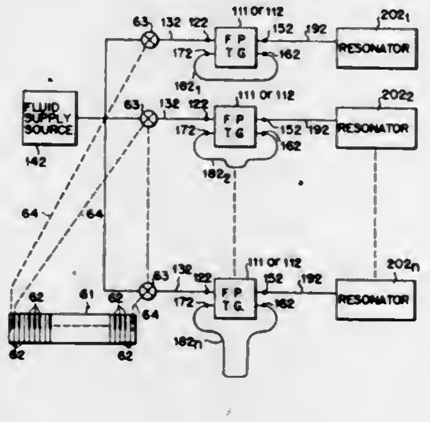
A perforating device of improved construction is disclosed comprising a C-shaped holder having an upper arm carrying the usual punching and stripping assembly and a lower arm which is provided with a horizontal slot to leave a portion of this lower arm above the slot to embrace the usual die button about its full circumference, an apertured plate-like member composed of a harder material than the holder being removably arranged in said slot to provide an upwardly facing annular seat for the die button, this member backing up the die button and being in turn supported over a larger area on the lower portion of said lower arm which thereby acts as a base for said member.

3,715,948
MECHANICAL POWER ASSIST APPARATUS
Janis Liepings, 427 North Huron, Pierre, S. Dak.
Filed June 30, 1971, Ser. No. 158,190
Int. Cl. B26d *5/10*
U.S. Cl. 83—573 **10 Claims**



A power assist for a hand-operated punching machine comprises an output bar mounted for reciprocating movement, and normally spring-biased to a predetermined quiescent position. A motor-driven pulley continuously operates to reciprocate a catch mechanism along a straight line path parallel to the normal direction of extension of the output bar; and the output bar is in turn provided with a pivotally mounted catch which is normally spring biased to a position spaced from the path of movement of the power driven catch. A treadle mechanism is provided for selectively repositioning the pivotally-mounted catch so that it engages the power-driven catch when said power-driven catch next passes the location of said pivotally-mounted catch; and this engagement between catches causes the output bar assembly to be driven upwardly in a power stroke. Upon completion of a single power stroke, the catch automatically disengages, and the output bar returns to its quiescent position where it remains until the treadle is again depressed. Locking means are provided for assuring that the treadle cannot be reactuated during occurrence of the power stroke.

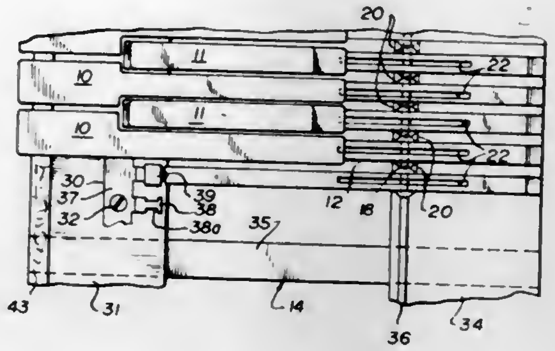
3,715,949
MUSICAL INSTRUMENT USING A FLUID POWERED TONE GENERATOR FOR GENERATING SONIC ENERGY
Akihiko Takeuchi, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu-shi, Japan
Filed Feb. 16, 1972, Ser. No. 226,875
Claims priority, application Japan, Feb. 18, 1971, 46/7,167, 46/7,168
Int. Cl. G10d *7/00*
U.S. Cl. 84—330 **18 Claims**



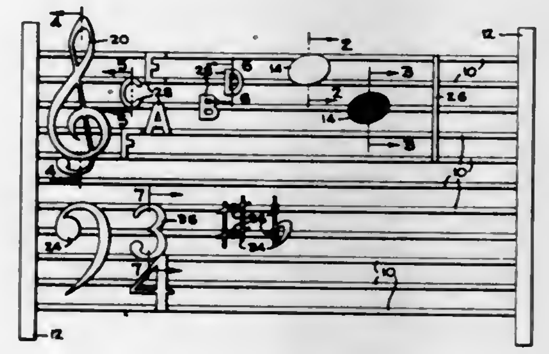
A musical instrument using a fluid powered tone generator wherein the oscillating frequency is determined by the length and inner diameter of a looped frequency-determining fluid-passing tube connected to the main fluid passageway of the oscillator of the tone generator to control the main flow of the fluid. Variation of oscillating frequencies can be obtained by slidingly varying the length of the frequency-determining tube; by arranging a plurality of fluid oscillators having, respectively, varied lengths of frequency-determining tubes, in an order corresponding to a predetermined order of musical notes, so that they are selectively controlled, for example, by a keyboard; or by coupling a plurality of parallel connected frequency determining tubes to a fluid oscillator and selectively controlling insertion of one of the tubes in the oscillator circuit.

3,715,950
KEY CONSTRUCTION FOR KEYBOARD INSTRUMENTS
Albert W. Nordquist, Ivoryton, Conn., assignor to Pratt-Read Corporation, Ivoryton, Conn.
Filed Sept. 22, 1971, Ser. No. 182,693
Int. Cl. G10c *3/12*
U.S. Cl. 84—433 **8 Claims**

A key for keyboard instruments includes a key cap member mounted on an elongated key stick made of uniform material, such as wood. A transverse notch is formed in the key stick to receive a pivotal portion of a pivot-spacer member which has upstanding spacer portions on either side of the key stick in the region of the notch. A slot is also formed in the key stick in the region of the notch so as to make the same more flexible in a transverse direction thus allowing the key to engage the spacers and sufficient resiliency of the key stick will prevent sticking of the key to the pivot-spacer member.



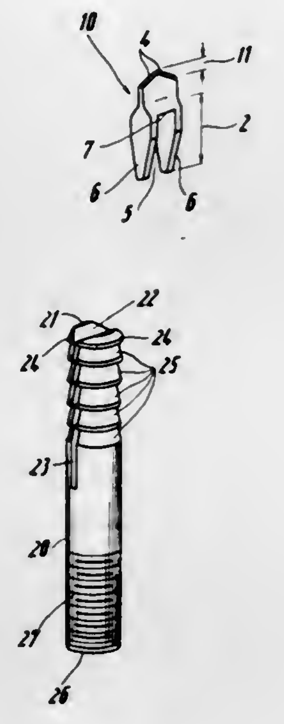
3,715,951
MUSIC TEACHING AID
Clara M. Lanaro, 1002 Pepper Ave., Sunnyvale, Calif. 94087
Filed June 30, 1971, Ser. No. 158,392
Int. Cl. G09b *15/00*
U.S. Cl. 84—470 **2 Claims**



A music teaching aid including a plurality of wires supported by a frame in spaced parallelism to simulate the appearance of a musical staff together with note members, clef-identifying members, note-identifying members, measure-indicating members, sharp and flat-indicating members and musical time-indicating members arranged for removable connection to the wire staff members, thus to simulate a musical score.

3,715,952
EXPANSION ANCHOR UNIT
Artur Fischer, Altheimer Str. 219, Tumlingen, Germany
Filed March 27, 1970, Ser. No. 23,339
Claims priority, application Germany, Sept. 19, 1969, P 19 47 369.9
Int. Cl. F16b *13/06*
U.S. Cl. 85—68 **9 Claims**

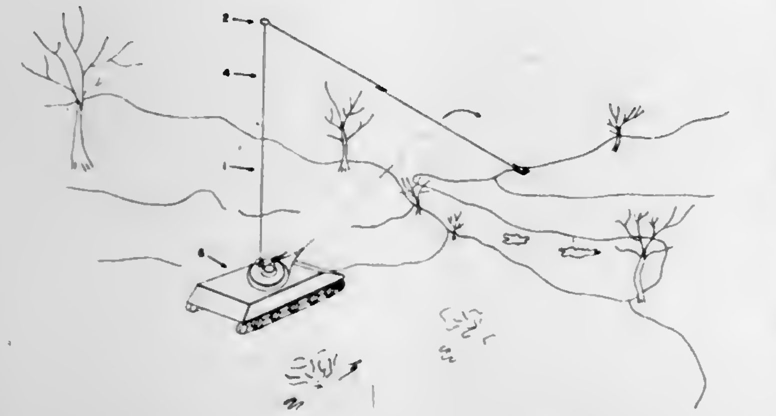
An expansion anchor unit has a first member a leading portion of which is provided with cutter edges for drilling a hole in a support structure, and a trailing portion of which converges in direction away from the leading portion. A second member is provided with a forward end portion matingly engageable with the trailing portion of the first member, and with a rearward end portion engageable by a tool which is operative for jointly rotating both of the members in a sense effecting drilling of a hole in a support structure by the cutter edges. The second member may itself be configurated as an expansion member to be expanded by the first member after the latter has drilled the hole in the support structure, or an additional expansion member may be provided which, after the second member is disengaged from the first member and removed from the hole, is inserted into the hole and forcibly wedged into contact with the first member to be expanded by the same.



3,715,953
AERIAL SURVEILLANCE AND FIRE-CONTROL SYSTEM

William L. Allan, West Lafayette, Ind., assignor to The United States of America as represented by the Secretary of the Army

Filed Feb. 4, 1966, Ser. No. 525,802
Int. Cl. F41g *1/40, 3/06, 7/14*
U.S. Cl. 89—36 L **6 Claims**

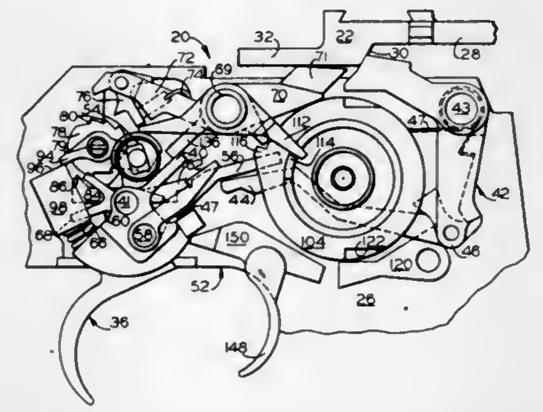


An aerial surveillance and fire-control system including an elevatable fire-control and scanning section and a control console mounted in a combat vehicle. The scanning section is defined by a TV camera, a pulsed laser rangefinder/illuminator, and an azimuth readout device, all mounted on a three-axis, rate-stabilized platform. A protective, but transparent, housing is provided for the scanning section, and this housing, when retracted, is seated in a mating compartment in the roof of the vehicle. A coilable, extendible type mast is provided for raising and lowering the scanning section. A cable-reel assembly disposed adjacent the coiled mast within the vehicle supplies the electrical cable within the mast.

3,715,954
FIRING MECHANISM FOR A MULTI PURPOSE FIREARM

Edward T. Rude, Jr., Columbia, Md., assignor to The United States of America as represented by the Secretary of the Army

Filed Aug. 31, 1971, Ser. No. 176,417
Int. Cl. F41d *11/02*
U.S. Cl. 89—127 **14 Claims**

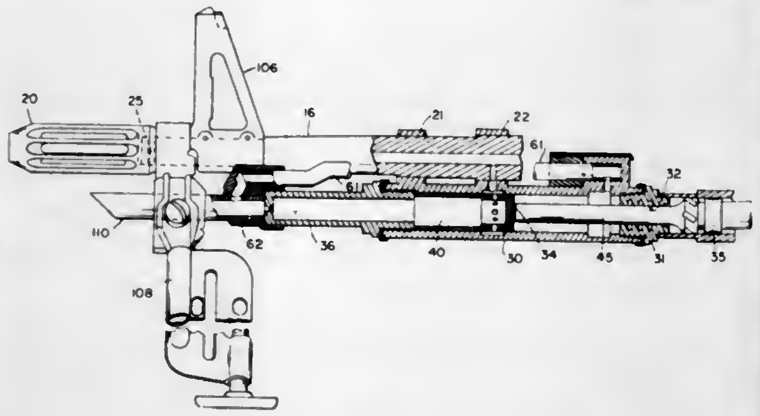


A firearm having both point and area fire power comprises a rifle and grenade launcher mounted thereon. A firing mechanism in the rifle selectively adapts the firearm for semiautomatic fire, automatic fire at a reduced rate, three round bursts and grenade fire from a single trigger and comprises the trigger, a sear and a fire control mechanism operationally disposed therebetween in cooperation with a reciprocal firing pin to achieve the desired mode of fire as selected by a rotary selector. A counter is rotated by the firing pin to count the rounds in the three round burst and then disconnects the trigger from the sear for release thereof to hold the firing pin. In semiautomatic fire the selector rotates the counter to the position it is in after the second round of the three round burst and for automatic fire the automatic volley commences as with the semiautomatic fire and then continues until the trigger is released with an inertia wheel momentarily stopping the operation of the rifle after each round and then actuating the sear for release of the firing pin. For launcher fire, the selector disconnects the trigger from the sear and connects it to an arm linking the trigger to the launcher.

3,715,955
MACHINE GUN GAS ACTUATING AND EVACUATION SYSTEM

Cranston Wesley Folley, Kennebunk, Maine, and John Gonsalves Rocha, Westfield, Mass., assignors to Maremont Corporation, Chicago, Ill.

Filed Feb. 12, 1970, Ser. No. 10,927
Int. Cl. F41d *5/10;* **F41h** *7/12*
U.S. Cl. 89—193 **5 Claims**

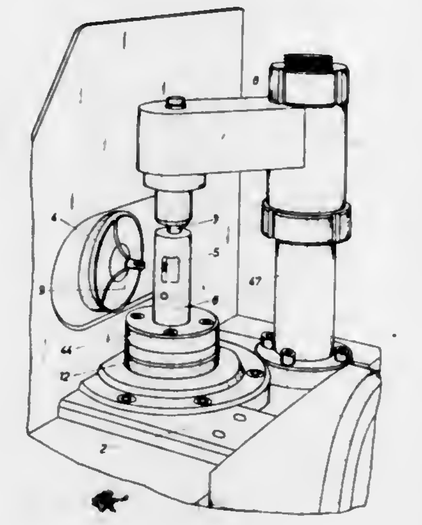


In a machine gun having a gas-actuating system including a gas cylinder responsive to gas pressure generated by the discharge of a round and including a receiver and a barrel mounted therein having a predetermined bore and a muzzle, a novel gas evacuation means, a novel barrel extension means and a novel gas seal means all for removing exhausted gas from the area surrounding the machine gun receiver, gas cylinder and receiver. The novel gas evacuation means, mounted on the gas cylinder and along the barrel, is in communication with the gas-actuating system for removing exhausted gas therefrom and conveying said exhausted gas for discharge at a location remote from the muzzle; the novel barrel extension is attached to the muzzle of the barrel, has a bore greater than the barrel bore for removing exhausted gas from the muzzle and conveying said exhausted gas for discharge at a location remote therefrom free from interference with the operation of the gun mechanism; and the novel gas seal means includes an obturating nut and sealing collar provided in the gas-actuating system for preventing exhausted gas from passing rearwardly therethrough and escaping from the receiver.

3,715,956
MACHINE TOOL FOR CUTTING LONGITUDINAL GROOVE IN CYLINDRICAL WORK PIECE

Karl Lieser, Wuppertal-Elberfeld, Germany, assignor to Firma Hermann Werner, Wuppertal-Hahnerberg, Germany

Filed April 24, 1970, Ser. No. 31,616
Claims priority, application Germany, April 26, 1969, P 19 21 514.6
Int. Cl. B23c *3/28*
U.S. Cl. 90—20 **8 Claims**



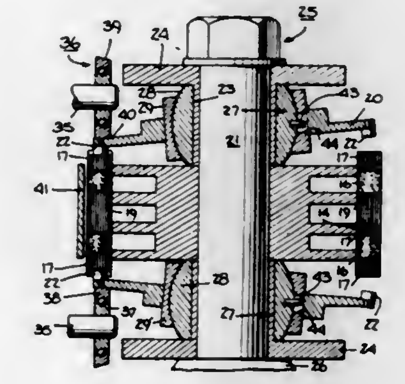
A machine tool for forming longitudinal grooves in a cone apex of cross slot-engine lathes or similarly designed work pieces, and retaining a work piece in a clamping chuck, and a rotating cutter tool. The latter cuts into the work piece in longitudinal direction of the latter. The cutter tool comprises a fly cutter. Means are provided for continuous rotation of the work piece. The cutter tool cuts into the work piece.

3,715,957
APPARATUS FOR COMPACTING FILTER TIP ASSEMBLIES

Floyd V. Hall, Durham, N.C., assignor to Liggett & Myers Incorporated, New York, N.Y.

Filed Dec. 28, 1970, Ser. No. 101,802
Int. Cl. B31d *3/00;* **A24c** *5/48*
U.S. Cl. 93—1 C **21 Claims**

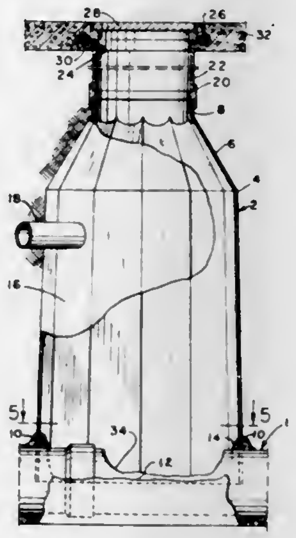
The plates contain pressure pads about the peripheries and each is mounted in angular relationship to the cigarette transfer drum and is rotatable along with the transfer drum. The pressure pads are arranged in opposed pairs to converge towards each other as the plates rotate so as to compact charges of granular material within a multi-section filter tip assembly located at the point of conveyance.



3,715,958
PREFORMED MANHOLE BODY

David D. Crawford, 1601 North Oak Street, Mineral Wells, Tex., and John W. Elvington, 4105 Kingsbury, Wichita Falls, Tex.

Filed Jan. 19, 1971, Ser. No. 107,776
Int. Cl. E02d *29/14*
U.S. Cl. 52—21 **6 Claims**



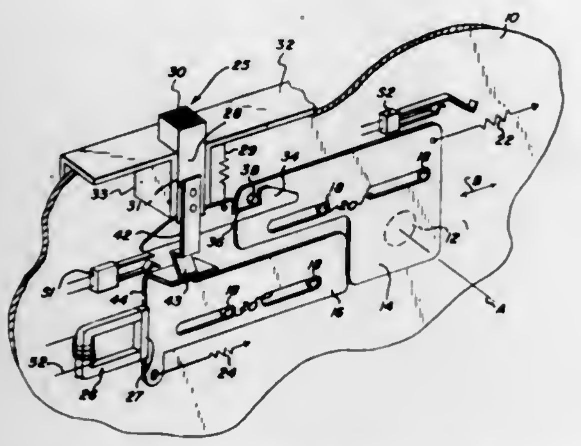
A manhole body which is preformed of plastic or concrete and reinforced to withstand the weight exerted by the ground and outside sources of water, which manhole body may be of a size and shape to fit on a sewer line of any size and depth, with the sleeve extending to the surface so as to give access into the manhole body which has a suitable cover therefor. The manhole bodies are of unitary, tapered construction and are so designed as to fit in telescoped relation to conserve room during shipping or storage. Transverse semi-circular notches are formed in the lower side of each manhole body so as to fit the upper contour of a sewer line, so when a cementitious material, such as concrete, is poured to seal the bottom and sides of the manhole, the top portion of the sewer line, above the concrete, may be broken away to provide a sewage outlet from the manhole body and access to the sewer line admit cleaning tools.

3,715,959

APPARATUS FOR PROVIDING SHUTTER RELEASE AND FOR INDICATING END OF A CONTROLLED TIME EXPOSURE

Donald M. Harvey, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 19, 1971, Ser. No. 173,196
Int. Cl. G03b *7/08, 9/16, 17/18*
U.S. Cl. 95—10 CT **5 Claims**



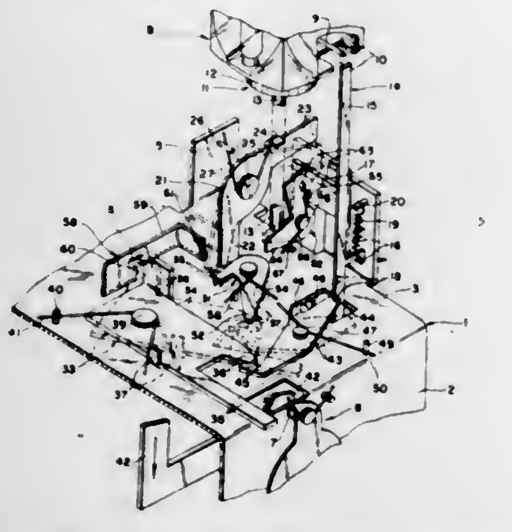
Apparatus for actuating a camera shutter to uncover an exposure aperture, for actuating switch means, and for indicating the end of a controlled time exposure, including a shutter actuating member movable from a first position to a second position for actuating the shutter to uncover the exposure aperture. The shutter actuating member is retained in the second position during a controlled time exposure, and is released for return movement to the position in response to the actuation of the shutter to cover the exposure at the end of the controlled time exposure. The returning of the shutter actuating member to the first position indicates the end of the controlled time exposure.

3,715,960

CAMERA MECHANISM ADAPTED TO FIRE MECHANICALLY-ACTUABLE FLASH UNITS

Horst Simon, Stuttgart, and Heinrich Killgus, Kornwestheim, both of Germany, assignors to Eastman Kodak Company

Filed Nov. 27, 1970, Ser. No. 93,325
Claims priority, application Germany, Dec. 4, 1969, P 19 60 843.6
Int. Cl. G03b *15/04*
U.S. Cl. 95—11.5 R **1 Claim**



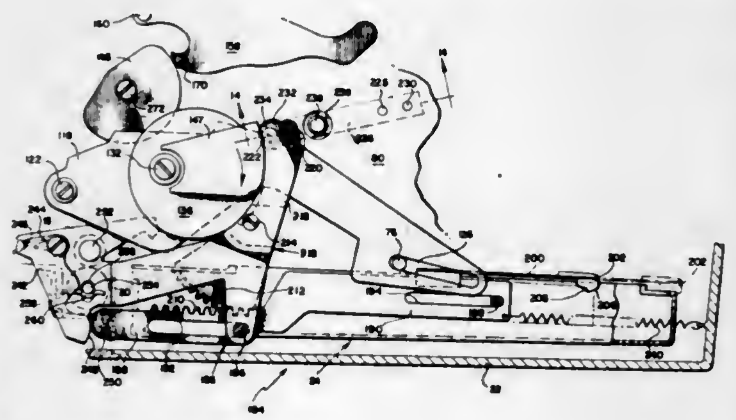
A camera mechanism adapted to receive mechanically-actuable multilamp flash units has a pre-energized flash actuator bar which is released by operative movement of the shutter actuator and is propelled to extend partially from the camera body to operate a mounted flash unit. A pre-energized retracting member is subsequently released by the shutter actuator to return the flash actuator bar to its pre-energized position within the camera body. Rotation of the flash unit, to position a fresh lamp, is thus facilitated and the possibility of damaging the actuator bar is reduced.

3,715,961

REFLEX MEMBER POSITIONING MECHANISM

Irving Erlichman, Wayland, Mass., assignor to Polaroid Corp., Cambridge, Mass.

Continuation-in-part of Ser. No. 67,051, Aug. 26, 1970. This application Dec. 20, 1971, Ser. No. 209,711
Int. Cl. G03b *19/12*
U.S. Cl. 95—42 **20 Claims**



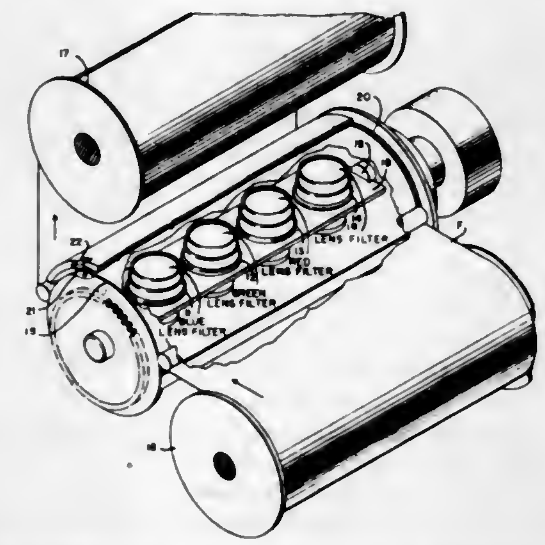
A reflex camera in which the mirror is driven by a spring gear wound by a motor. The spring gear transmits power by shaft **132** to the cam **136**. Arm **118** is connected by a pin to a grove inside the cam so that when the cam is rotated, the arm will rotate counterclockwise. The arm is connected to the reflex member **70** and the rotation of the arm raises the reflex member to the exposure position. Upon completion of a photographic exposure, the motor will rotate the profile cam **168** a sufficient amount to release the cam **136** from its exposure position. Thereafter, further rotation of the cam **136** is effected by the spring gear to return the reflex member to the normal viewing position.

3,715,962

SPECTRAL-ZONAL COLOR RECONNAISSANCE SYSTEM

Edward F. Yost, Jr., Northport, N.Y., assignor to Spectral Data Corporation, Hicksville, N.Y.

Continuation of Ser. No. 519,854, Jan. 11, 1966, abandoned. This application April 20, 1970, Ser. No. 30,199
Int. Cl. G03b *7/00*
U.S. Cl. 95—12.5 **7 Claims**



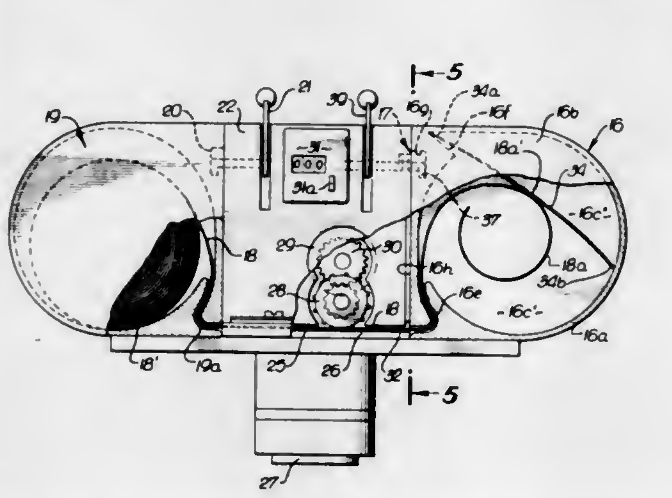
Multiple images of a common scene are formed by exposure of photographic film primarily to separated zones of the actinic electromagnetic spectrum. The several film images are il- minated individually with lights of selected chromaticities. The chromaticity of the light illuminating at least one of the images is widely separated from the chromaticity associated with the corresponding exposing spectral zone for that image. The illuminated images are displayed in registration for evaluation.

3,715,963

FILM TAKE-UP MAGAZINE AND ATTACHMENT ASSEMBLY THEREFOR

Maurice LeCover, 145 South Arden Boulevard, Los Angeles, Calif.

Filed Sept. 3, 1971, Ser. No. 177,682
Int. Cl. G03b *17/22*
U.S. Cl. 95—31 C **8 Claims**



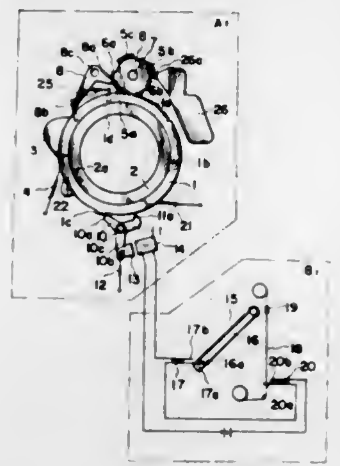
A film take-up magazine includes a flat spring extending across the magazine interior. As additional convolutions of exposed film accumulate in the magazine, tangential film-spring contact displaces the spring to increase the effective size of the film receiving chamber. The magazine is attached to a camera by an assembly including a lever operated latch. The same lever moves a knife edge plate to sever the exposed film and to cover the film exit aperture when the magazine is detached from the camera.

3,715,964

LENS SHUTTER CONTROL MECHANISM FOR A SINGLE LENS REFLEX CAMERA

Shohei Tenkumo, Saka-shi, Osaka-fu, and Takeshi Egawa, Kainan-shi, Wakayama-ken, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Miname-ku, Osaka, Japan

Filed Sept. 17, 1970, Ser. No. 73,134
Claims priority, application Japan, Sept. 17, 1969, 44/73230
Int. Cl. G03b *19/12*
U.S. Cl. 95—42 **3 Claims**



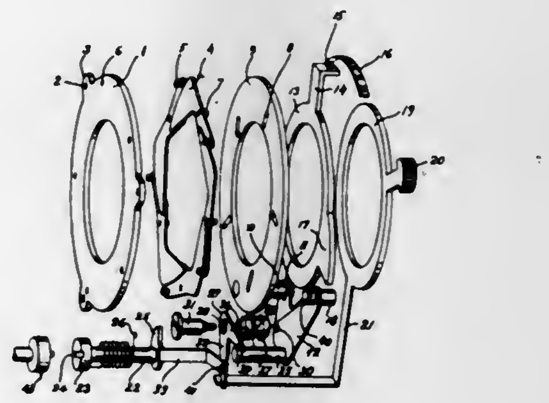
A lens shutter control mechanism includes an operating member movable between a first and second cocked position in accordance with the actuation of an electromagnetic means whereby a shutter blade member is respectively opened and closed with said operating member respectively in said first and second cocked position. A latch member actuated by the electromagnetic means retains the operating member in the second cocked position. The actuation of the electromagnetic means is determined by the operation of two switches which are operated in accordance with the movement of a mirror between a viewing position and a picture taking position.

3,715,965

PRESET DIAPHRAGM FOR INTERCHANGEABLE LENSES OF SINGLE-LENS MIRROR REFLEX CAMERAS

Alf Ingvar Alfredsson, Savedalen, Sweden, assignor to Fritz Victor Hasselblad

Filed Dec. 9, 1970, Ser. No. 96,560
Claims priority, application Sweden, May 6, 1970, 6,236/70
Int. Cl. G03b *9/07*
U.S. Cl. 95—64 B **8 Claims**



A preset diaphragm for an interchangeable lens of a single-lens mirror reflex camera in which the diaphragm is controlled by a mechanism in the camera body having a shaft detachably coupled in the edge of the lens mount which rotates in one direction during release of the camera and in the opposite direction during film transport and this rotational movement is transferred to a shaft in the lens which opens and closes the preset diaphragm by turning the diaphragm cover. Specifically, the shaft in the lens carries a cam disc which is spring-loaded and pivotally mounted on one leg of an angle lever. The other leg of the angle lever is resiliently connected with a guide plate for the diaphragm cover. In operation, the angle lever and guide plate are turned relative to one another when the guide plate movement is stopped at the preset aperture value thus allowing the cam disc to complete its rotation by the mechanism in the camera body.

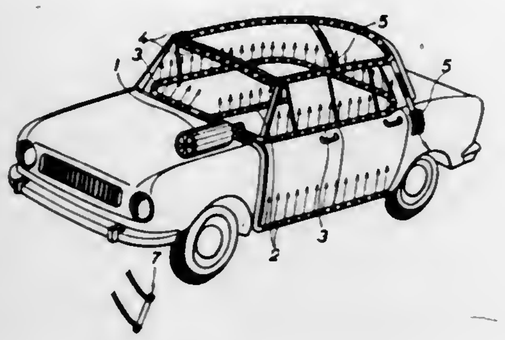
3,715,966

LAPPING ANTICONDENSATION VENTILATION FOR WINDOWS OF VEHICLES

Tuure Tapio Miettinen, Oulu, Finland

Filed Apr. 30, 1971, Ser. No. 138,970
Int. Cl. B60h *1/24*
U.S. Cl. 98—2.18 **6 Claims**

A lapping anticondensation ventilation system to prevent the condensation of moisture on the windows of vehicles, thus improving the traffic safety and the convenience of motoring. The lapping system uses for ventilation of windows fresh, normally heated air, the relative humidity of which will not increase upon its admixture with exhaled air. The flow will take place along the windows by the shortest path under a pressure gradient

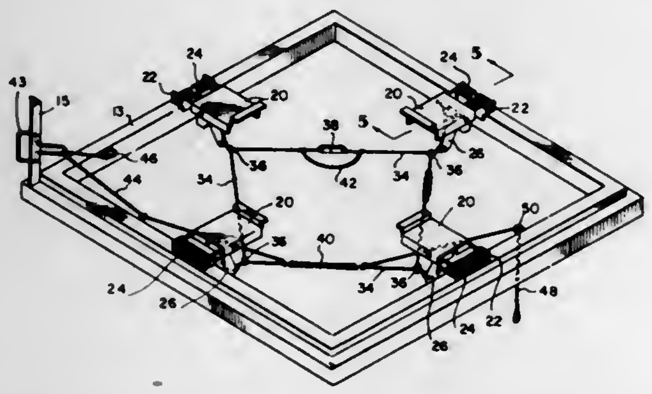


produced by an air distribution channel running around the lower edges of the windows and by a suction channel.

3,715,967
POWER ROOF EXHAUSTER OR HEAT RELIEF VENT

Thomas R. Field, Indianapolis, Ind., assignor to Jenn-Air Corporation, Indianapolis, Ind.

Filed March 22, 1971, Ser. No. 126,672
Int. Cl. F23l *17/02*
U.S. Cl. 98—42 **4 Claims**

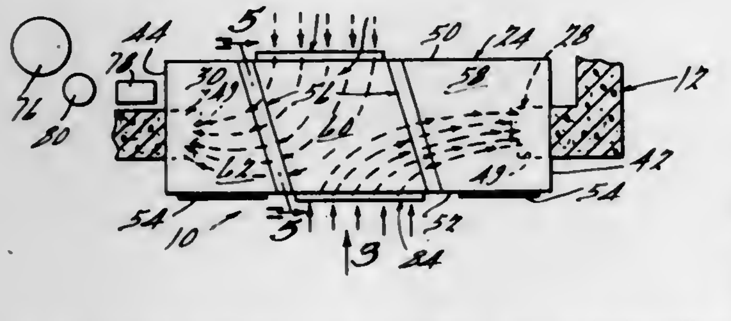


This invention relates to a power roof exhauster or a heat relief vent having spring loaded release mechanism which, in response to high temperatures such as caused by fire, is caused to release for opening side louvers on the exhauster or vent. The release mechanism is triggered by the melting of a heat fusible link or by manual release.

3,715,968
AIR CURTAIN STRUCTURE

Artel R. Henson, Pontiac, Mich., assignor to Disco Engineering, Inc., Detroit, Mich.

Filed Feb. 12, 1970, Ser. No. 10,812
Int. Cl. F24f *9/00*
U.S. Cl. 98—36 **17 Claims**

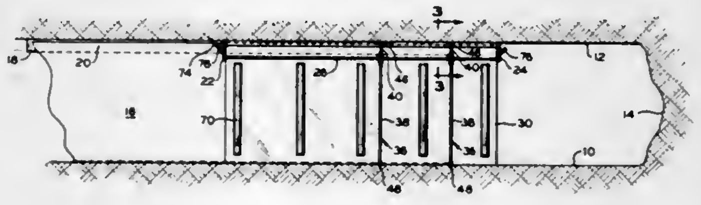


An air curtain structure for providing a flow of air across an access opening to a building or the like and comprising an enclosure adjacent the upper end of the opening and a pair of downwardly extending support columns arranged adjacent the sides of the opening and defining a pair of opposed air discharge slots; the enclosure being provided with a pair of heat exchanger coil assemblies adapted to condition air preparatory to the same being communicated to the support columns; at least one air blower mechanism for forcing air in heat transfer relation with the coil assemblies, and a pair of air inlet assemblies, one of which is adapted to induct air from the interior of the building into the enclosure and the other of which is adapted to induct fresh outside air from the exterior of the building into the enclosure, with the air intake assemblies being provided with closure means for selectively opening and closing the same, whereby to permit either the induction of fresh outside air and/or the recirculation of air inside the building through the heat exchanger coil assemblies.

3,715,969
MINE VENTILATION CONTROL SYSTEM

James V. Burgess, Jr., P. O. Box 385, Madison, W. Va.

Filed Feb. 26, 1971, Ser. No. 119,270
Int. Cl. E21f *1/00, 3/00*
U.S. Cl. 98—50 **10 Claims**

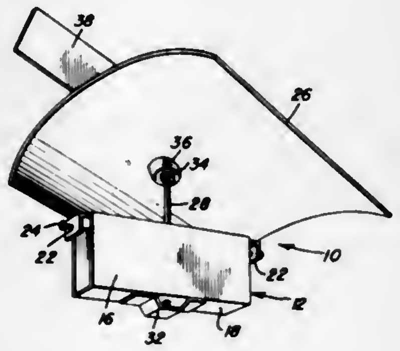


A mine ventilation control system for directing air flow in the immediate region of the working face of a mine, including an extensible curtain assembly which can be readily mounted adjacent the end of a line curtain and advanced toward the working face of the mine at a rate commensurate with the removal of the material being mined.

3,715,970
DEVICE FOR ENHANCING GAS DISCHARGE

Fernando Cano, 1300 Libertad, Chihuahua, Mexico

Filed March 25, 1971, Ser. No. 128,050
Int. Cl. F23l *17/02*
U.S. Cl. 98—70 **2 Claims**

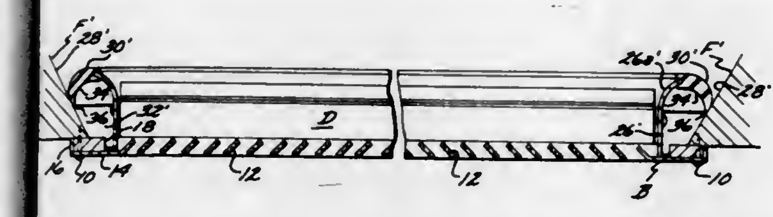


A vertically orientated body adapted to be clamp-mounted to the upper discharge end of a smoke or gas stack. The body rotatably mounts a vertically elongated shaft which incorporates an inclined arcuate hood thereover adapted to cover the stack and preclude the entry of water and down drafts. The hood is wind orientated through a vertical wind vane affixed thereto whereby the upper discharging portion thereof is always located downwind.

3,715,971
HOT AIR REGISTER

Lillian R. Moyer, 9925 Domering Road, Downey, Calif.

Filed Jan. 19, 1970, Ser. No. 3,633
Int. Cl. F24f *13/00*
U.S. Cl. 98—110 **3 Claims**

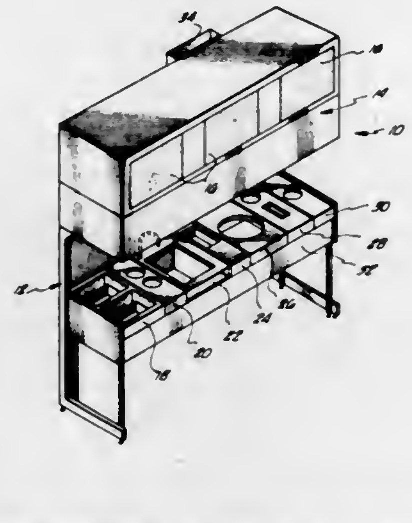


A hot air register of the type that includes a vertically baffled front piece that is secured to a wall in communication with the outlet of a hot air duct therein. The front piece has a resilient sealing strap disposed between the rearward peripheral surface thereof and the wall. A plurality of horizontally disposed louvers that are pivotally adjustable in unison are supported in a rigid sheet frame that extends rearwardly from the front piece into said duct. The rearward portions of said frame are formed to flare outwardly towards the interior surface of said duct but do not contact the same. A slotted resilient member engages the rearward extremities of said frame and is also in sealing contact with the interior surface of said duct. The resilient strip, frame, resilient member and a portion of the interior surface of said duct cooperate to define a dead space into which soot and dust are discharged by the hot air, and which soot or dust would otherwise be discharged laterally relative to said front piece to discolor the wall adjacent to said register.

3,715,972
CLEAN WORK STATION

Francis Kelso, Los Angeles, and Arnold J. Gustin, Glendale, both of Calif., assignors to Integrated Air Systems, Inc., Burbank, Calif.

Filed May 28, 1971, Ser. No. 147,774
Int. Cl. F23j *11/00*
U.S. Cl. 98—115 LH **9 Claims**

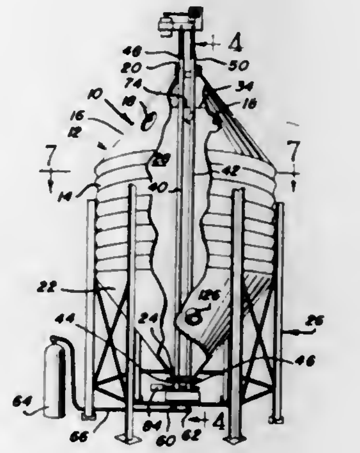


A laminar flow clean work station adapted for rapid change n work setup by utilizing a common exhaust plenum and drain and interchangeable work modules. Each module empties separately into the common exhaust plenum and drain. Each module has a separate exhaust damper which is adjustable to suit the particular exhaust requirement of the work to be undertaken at the module. Air is exhausted through the series of apertures formed in each module below a work receiving opening the station work surface. The opening forms a lip overhanging the module work receiving space and has a depending flange to further baffle the apertures from the station work surface.

3,715,973
APPARATUS FOR HEATING GRAIN OR THE LIKE

Eugene G. Sukup, Dougherty, Iowa

Filed July 13, 1970, Ser. No. 54,374
Int. Cl. B01d *7/16*
U.S. Cl. 99—235 R **25 Claims**

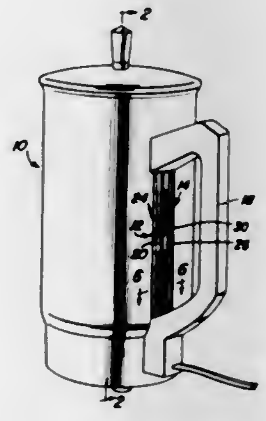


A pair of vertical auger conveyors are provided in one compartment of a dual compartment storage bin, and a return guide tube in the opposite compartment. A burner at the lower end of each conveyor effects combustion upward along the conveyor walls for heating grain as it moves up each auger conveyor. Raw grain from one compartment enters the lower end of one auger conveyor and is partially heated as it ascends this conveyor, then free-falls through the guide tube to the lower end of the second auger conveyor, and is heated further as it is moved upward in the second conveyor from whence it is discharged to the second compartment. The burners are controlled in response to the temperature of the grain to obtain the desired heating.

3,715,974
ABBREVIATED CYCLE COFFEEMAKER

James H. Beverett, 410 Nottingham Road, Montgomery, Ala.

Filed June 1, 1971, Ser. No. 148,709
Int. Cl. A47j *31/00*
U.S. Cl. 99—285 **8 Claims**



A percolator type coffeemaker incorporating combined water and temperature level indicators correlated so as to provide an automatic indication of the initial water temperature required to brew a predetermined amount of coffee within a specific time. A basket insert is utilized to insure a proper and rapid flow through the ground coffee to insure a complete extraction therefrom within the abbreviated cycle achieved by utilizing specifically preheated water.

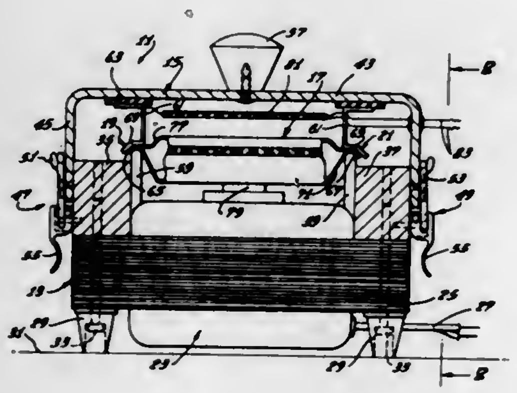
3,715,975
FOOD HEATING DEVICE

Leonard Tony King, Long Beach, Calif., assignor to Speedline Partnership, San Francisco, Calif.

Continuation-in-part of Ser. No. 48,209, June 22, 1970, which is a continuation-in-part of Ser. No. 629,315, April 7, 1967, abandoned. This application May 11, 1971, Ser. No. 142,243

Int. Cl. A47j *27/62*

U.S. Cl. 99—331 **17 Claims**



A food heating device for heating and cooking food items such as TV-dinners that are prepackaged in standard electrically conductive containers. A rigid secondary winding from a step-down transformer supports the opposed ends of the conductive food package for passing a high current directly through the food package and at least some of the food contained therein for rapidly and efficiently heating the food. Resistance and reactance losses are minimized by holding the container close to the transformer and by assuring a low resistance connection to the container. Means are provided for assuring uniform heating of the container contents and for sensing the average temperature of the container.

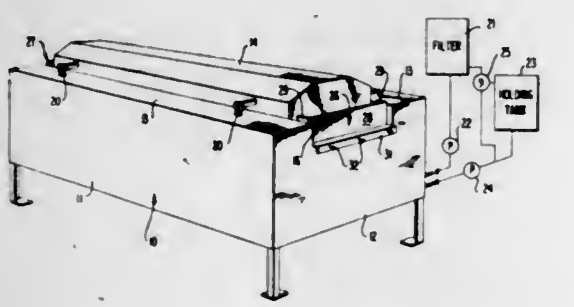
3,715,976
COMMERCIAL FOOD FRYER AND METHOD OF CLEANING

John F. Krakowski, Rehoboth Beach, Del., assignor to Mark 7 Seafood and Industries, Inc., Houston, Del.

Filed Oct. 18, 1971, Ser. No. 190,116

Int. Cl. A47j *37/12*

U.S. Cl. 99—404 **9 Claims**



Readily detachable gasketed extension panels are secured to the infeed and discharge ends of a continuous-type fryer for fish or like food products. The extension panels permit flooding of the fryer with cleaning liquid to a level above the food conveyor so that the latter is totally immersed during cleaning and laborious scrubbing and scouring is eliminated.

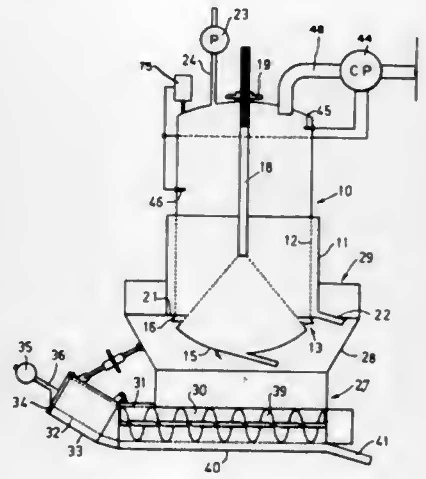
3,715,977
JUICE EXTRACTING DEVICE

John Mackenzie, Adelaide, Australia, assignor to Jack Sinclair, Adelaide, South Australia, Australia, part interest

Filed Dec. 1, 1970, Ser. No. 94,001

Int. Cl. B30b *9/14*

U.S. Cl. 100—117 **5 Claims**



A device for extracting fruit juice from crushed fruit wherein the epidermal cells of the crushed fruit are driven through a perforate conduit and have pressure applied to them to express juice from them, the device comprising a primary extraction container, a secondary extraction container having an auger with drive means coupled thereto, a perforate member beneath the auger, a perforate conduit constituting an extension of the perforate member, imperforate juice collecting means beneath both the perforate member and perforate conduit, and a discharge opening in the perforate conduit, the discharge opening containing restriction means so that pressure is built up on the epidermal cells by driving of the auger, the perforate conduit varying in direction so that the epidermal cells when being driven there-through have pressure reduced on them and then reapplied.

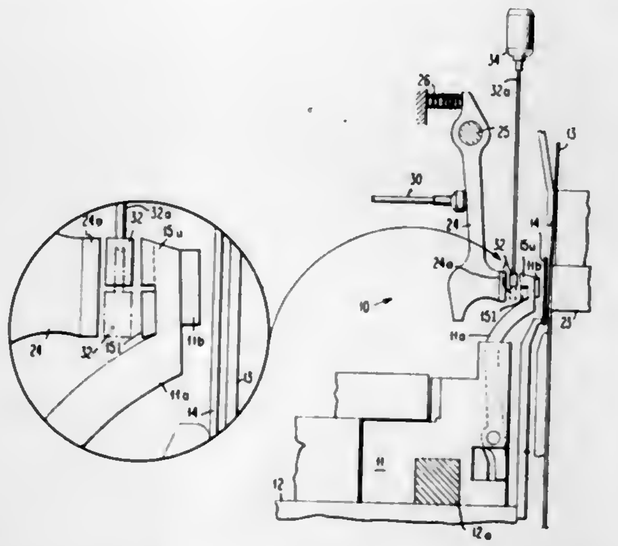
3,715,978
PRINTER HAMMER MECHANISM

Jerry W. Raider, Endicott, N.Y., assignor to International Business Machines Corp., Armonk, N.Y.

Filed Sept. 3, 1970, Ser. No. 69,317

Int. Cl. B41j *1/20, 9/14*

U.S. Cl. 101—93 C **2 Claims**



A printer has a type cartridge with a plurality of character-bearing type levers, alternate levers having faces on the back at different levels. Print hammers for each print position have striking faces covering both levels, and selection of the type levers is made by operating an interposer between the printer hammers and type levers to the desired level.

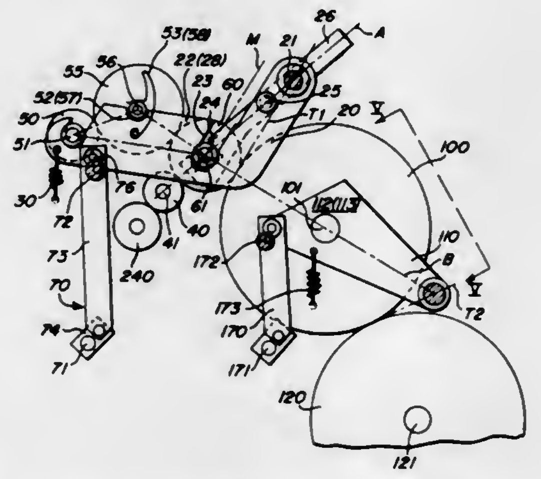
3,715,979
OFFSET PRINTING MACHINE

Edgar Erb, Leitershofen; Walter Habiger, Mohringen; Willi Kramer, Zuffenhausen; Wolfgang Pfeil, Kornwestheim, and Reinhold Weigele, Muenchingen, all of Germany, assignors to Fortuna-Werke Maschinenfabrik Aktien gesellschaft, Stuttgart-Bad Cannstatt, Pragstrasse, Germany

Filed July 9, 1970, Ser. No. 53,547

Int. Cl. B41f *31/34;* **B41l** *27/36*

U.S. Cl. 101—144 **10 Claims**



A printing machine of the offset type in which a foil covered roller is engageable with a rubber cloth covered roller to supply printing material thereto, while an application roller engages the foil covered roller to apply printing material thereto. Both the foil covered roller and the application roller are supported for tilting movement so the foil covered roller can be moved toward and away from the rubber cloth covered roller, while the application roller can be moved toward and away from the foil covered roller. Frames supporting the foil covered and application rollers are tiltable about respective axes lying substantially in the common tangential plane of the line of contact of the respective roller and the roller relative to which it is tiltable. The machine includes a supply of printing material contained in a reservoir formed by a ductor roller and a counter roller adjustably pressed together. The ductor roller is unidirectionally driven in adjustable steps to draw printing material from the reservoir.

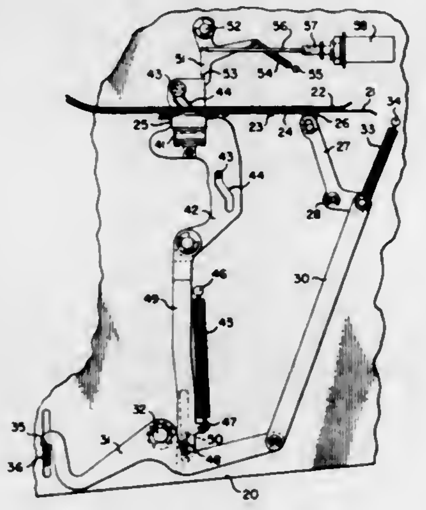
3,715,980
REINKING MECHANISM

Louis E. Zurbuchen, Dayton, and William R. Bradam, New Carlisle, both of Ohio, assignors to The National Cash Register Co., Dayton, Ohio

Filed Dec. 28, 1970, Ser. No. 102,007

Int. Cl. B41k *1/42*

U.S. Cl. 101—333 **6 Claims**



A printing and reinking mechanism which includes a member supporting a printing element and adapted for movement in a printing direction, means for selectively controlling the movement of the support member in a printing direction, a reinking member adapted for movement to a position engaging the printing element and actuating means for moving said printing element and the reinking member to provide a reinking operation and a printing operation.

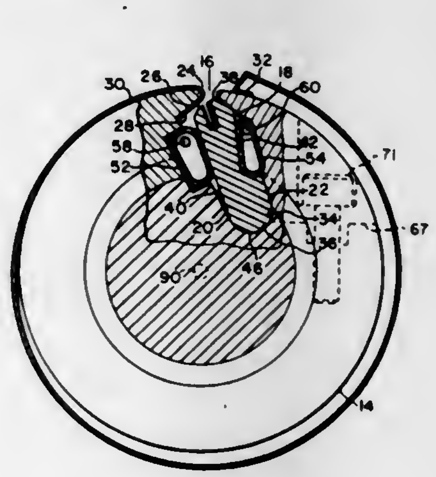
3,715,981
FLUID ACTUATOR AND LOCK FOR PRINTING PLATE CYLINDERS

Harold W. Huffman, Hamilton, Ohio, assignor to The Hamilton Tool Company, Hamilton, Ohio

Filed June 29, 1970, Ser. No. 50,642

Int. Cl. B41f *27/12*

U.S. Cl. 101—415.1 **15 Claims**



The printing cylinder is provided with an internal inflexible clamp bar rockingly mounted, for movement selectively either to an operative plate-clamping position or to an inoperative plate-releasing position, by means of a foot-controlled valve for enabling the pressman to utilize both of his hands exclusively for accurate positioning of the printing plate upon the cylinder.

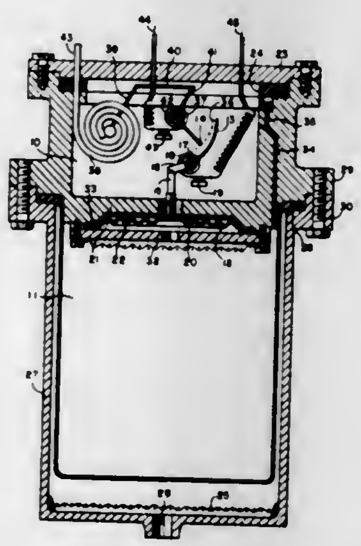
3,715,982
PRESSURE ARMING DEVICE

Harvey C. Hayes, Washington, D.C., and Horace M. Trent, Alexandria, Va. (both % Naval Research Laboratory, Washington, D.C. 20020)

Filed Dec. 3, 1946, Ser. No. 713,730

Int. Cl. F42b *21/38;* **F42c** *13/00*

U.S. Cl. 102—18 **6 Claims**



5. An arming device for underwater mines comprising a source of electrical power, a mine power supply circuit, a normally open control circuit, relay means responsive

to closure of said control circuit to connect said power circuit to said source, means responsive to a drop in pressure to close said control circuit, a first timing means operable to open said power circuit after a given time and a second timing means operable upon opening of the power circuit to block operation of the control circuit for a given time.

3,715,983
EXPLOSIVE FRAGMENTATION OF POROUS SOLIDS

Edward J. Rosinski, Deptford, N.J., assignor to Mobil Oil Corporation

Division of Ser. No. 828,723, May 28, 1969, Pat. No. 3,620,965. This application Nov. 3, 1970, Ser. No. 86,608

Int. Cl. F42d *1/00*

U.S. Cl. 241—1 **4 Claims**

Porous solids having surface area of at least five square meters per gram are reduced to smaller particle size by explosive fragmentation. Exemplary disclosure concerns aluminosilicate zeolites in extremely finely divided form prepared by detonation of crystalline zeolites having adsorbed therein explosive compounds and compositions. In one particular embodiment, finely divided zeolite catalyst is supplied to the reactants and energy is furnished to the system by detonation of explosive-loaded crystalline zeolites within the reaction mixture. In addition, the products of detonation may afford reactants.

3,715,984
PYROTECHNIC DEVICES

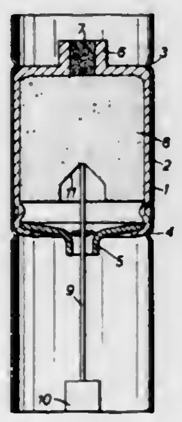
Dudley Charles Murray, Homington, England, assignor to Pains-Wessex Limited, Salisbury, Wiltshire, England

Filed June 9, 1970, Ser. No. 44,725

Claims priority, application Great Britain, June 9, 1969, 28,974/69

Int. Cl. C06d *1/04*; **C06b** *19/02*

U.S. Cl. 102—34.2 **13 Claims**



In a rocket with plastic propellant, which includes a solid oxidizing agent, a fuse means is used to directly ignite the propellant, and copper chromate is associated with the propellant by either being distributed within the propellant and/or on the surface of the propellant to be ignited.

3,715,985
IMPACT SWITCH

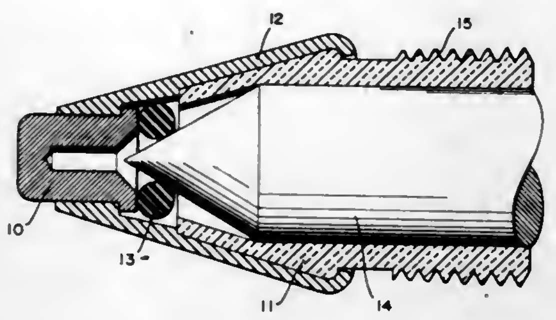
Mark A. Fugelso, 521 12th Ave. S.E., Minneapolis, Minn.

Filed June 9, 1970, Ser. No. 44,830

Int. Cl. H01h *35/14*; **F42c** *19/06, 15/40*

U.S. Cl. 102—70.2 R **2 Claims**

A nose impact switch for a projectile comprising a plunger, an insulator, a cover and a O-ring assembled such that when a projectile impacts, the plunger is moved back against a slender rod, constituting a switch function and thereby conducting electrical energy through the plunger to the rod and to a receptor.



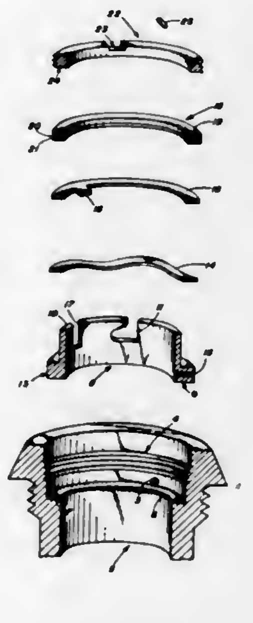
3,715,986
TORQUE CLUTCH FOR MILITARY FUZES

Scott B. Dunlap, Peter R. Osterling, and Charles W. Tepper, Rochester, N.Y., assignors to the United States of America as represented by the Secretary of the Navy

Filed Jan. 27, 1970, Ser. No. 10,109

Int. Cl. F42c *9/00*

U.S. Cl. 102—71 **10 Claims**



A torque clutch for time settable fuzes in which assembly friction is generated at two interfaces between asbestos fiber pads and a smooth metal surface. Axial pressure at these interfaces is provided by a spring washer and is adjusted by a threaded ring. The threaded adjusting ring is pinned to the nonrotating fuze member and the lower asbestos friction pad is bonded to the nonrotating fuze member to assure that these three parts do not move with respect to each other.

3,715,987
FUZE FOR A NONGYRATORY PROJECTILE

René Morel and Robert Simmen, Geneva, Switzerland, assignors to Mefina S.A., Fribourg, Switzerland

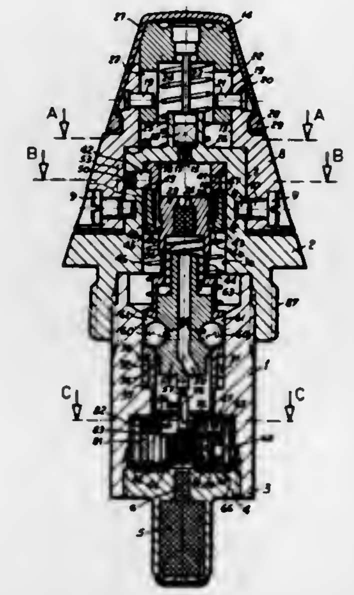
Filed Apr. 21, 1971, Ser. No. 136,065

Claims priority, application Switzerland, May 14, 1970, 7,240/70

Int. Cl. F42c *1/08*

U.S. Cl. 102—74 **10 Claims**

The fuze, e.g. for a mortar, can be detonated instantaneously on impact or, by previous adjustment, with a time delay. The fuze has a primary fuse for detonation on impact by a firing pin but is held spaced from the latter by a locking device which can be unlocked by the axial acceleration due to departure of the shot. The fuze also has a detonator safety device comprising a secondary fuse and a holder movable transversally to the axis of the fuze to bring the secondary fuse opposite the detonator. Time delay of the secondary fuse is provided by a clockwork movement rotating a toothed sector. A second firing pin for the secondary fuse acts as a stop blocking the toothed sector in inactive position. The second firing pin is borne by a plunger slidable axially in the fuze. A ball blocking mechanism fixes the primary fuse holder and the plunger rigidly to one another as long as the projectile has not undergone impact after the departure of the shot. Impact releases the blocking balls enabling the plunger and thus the second firing pin to be driven back by a spring, with the time delay, against the secondary fuse.



3,715,988
MISSILE FUSES

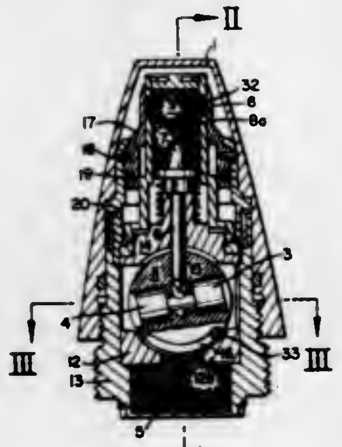
Roger Bares, Roques S/ Garonne, France, assignor to Societe E. Lacroix

Filed July 29, 1970, Ser. No. 59,126

Claims priority, application France, Aug. 26, 1969, 6929160

Int. Cl. F42c *15/26*

U.S. Cl. 102—80 **5 Claims**



A fuse for a ballistic missile comprising a hammer and a firing chain so arranged that when the missile strikes its objective the hammer penetrates the firing chain and causes the missile to explode. The firing chain includes two detonators carried in a rotor which has a safety position in which the detonators are out of alignment with the firing hammer, the detonators being brought into active position with a delay period after firing of the missile due to an imbalance in the rotor so that rotation of the missile after firing causes the detonators to be aligned with the hammer. In consequence when the missile strikes an objective after a predetermined time from the initiation of its flight the hammer penetrates the detonators and causes the missile to explode.

3,715,989
IMPACT FUZE FOR PROJECTILES

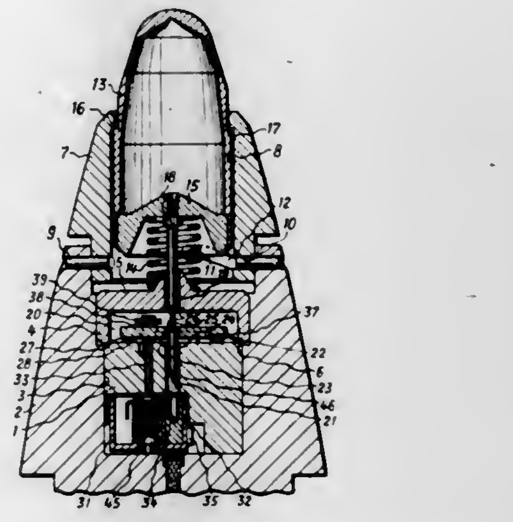
Robert Apotheloz, Wallisellen, Switzerland, assignor to Werkzeugmaschinenfabrik Oerlikon Buhrle AG, Zurich, Switzerland

Filed April 26, 1971, Ser. No. 137,213

Claims priority, application Switzerland, May 1, 1970, 6593/70

Int. Cl. F42c *9/04*

U.S. Cl. 102—84 **2 Claims**



An impact fuze for projectiles of the type containing a controllably adjustable escapement regulator for determining the post-bore safety period, i.e. the safe period of the fuze after leaving the barrel. Means are provided for adjusting the running time of the escapement by altering the depth of engagement between the escapement wheel and the escapement lever. These means may comprise a bearing pin having portions of different diameters which is displaceable so that the different diameters can be selectively engaged by the bearing bore of the escape lever to vary the depth of the engagement. The bearing pin may form the striker pin of the fuze. Thus it is possible for the post-bore safety period of the projectile to be adjusted by a gun crew before the firing of the gun to defend gun positions against a surprise attack launched from nearby.

3,715,990
LIQUID OR POWDER DISPENSING DART

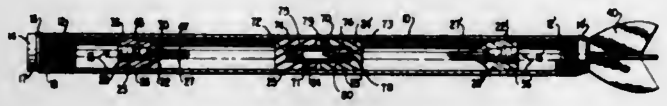
Harold C. Palmer, Douglasville, Ga., assignor to Palmer Chemical and Equipment Company, Inc., Douglasville, Ga.

Filed May 21, 1971, Ser. No. 145,612

Int. Cl. F42b *5/12*

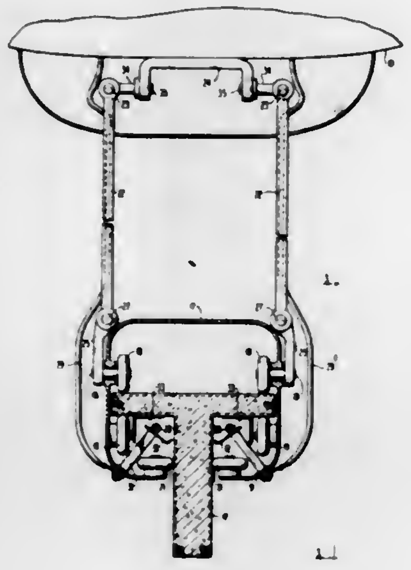
U.S. Cl. 102—92 **16 Claims**

A dart projectile with a cylinder mechanism for carrying and discharging a flowable material on impact having a hollow cylinder wall threadedly fitted with a front nose plug and a rear stabilizer tailpiece. Within the cylinder is at least one plunger piston enclosing an explosive charge. At least one fluid directing piston covers material discharge ports in the cylinder wall, and has an inner cuspidal curved surface with a removable plug inserted longitudinally therethrough for loading flowable material into the projectile. Impact fires the explosive charge, thereby moving the plunger piston and exerting pressure on the flowable material, causing the fluid directing piston to be moved clear of the material discharge ports so that the cuspidal surface on said piston may direct the flow of material through the material discharge ports.



3,715,991
MONORAIL GUIDED ELECTRIC AIRPLANE

Thomas H. Boyd, 113 Larch Ave., Hagerstown, Md.
Filed Sept. 4, 1970, Ser. No. 69,726
Int. Cl. B64f *3/02*
U.S. Cl. 104—23 R **4 Claims**

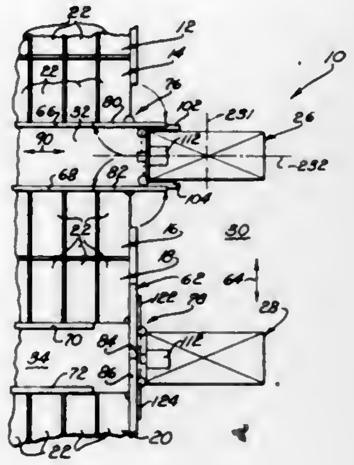


A transportation system combining the use of both a monorail and an airborne vehicle powered by electric motors from an electric power source located along the monorail. Rigid universally movable struts interconnect the vehicle with the monorail with electric cables housed by the struts for supplying electric current from a power source to the motors. Landing-loading platforms are located along designated locations at which the vehicle may be landed for the pick-up and discharge of passengers.

3,715,992
MATERIAL HANDLING SYSTEM TRANSFER ASSEMBLY

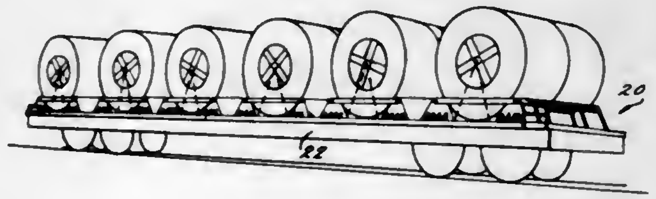
Richard J. Park, Bountiful, Utah, assignor to Kenway Engineering, Inc., Cleveland, Ohio
Filed Feb. 22, 1971, Ser. No. 117,422
Int. Cl. B61b *15/00*
U.S. Cl. 104—88 **8 Claims**

An improved material handling system includes a main track for guiding movement of a vehicle to and from aisles between adjacent rows of bins. The vehicle is transferred from the main track to tracks in a selected aisle by operating transfer arms on the vehicle to pivot transfer rails forming lengths of the main track into alignment with the aisle tracks. Once the vehicle has entered the selected aisle and moved beyond the transfer rails, biasing springs pivot the transfer rails back into alignment with the main track where the transfer rails are held in place by latch assemblies. When the vehicle starts to leave the selected aisle and is approaching the main track, the vehicle operates trip linkages to release the latch assemblies. Continued movement of the vehicle toward the main aisle operates other linkages to pivot the transfer rails back into alignment with the aisle tracks against the influence of the biasing springs.



3,715,993
CABLE REEL CAR

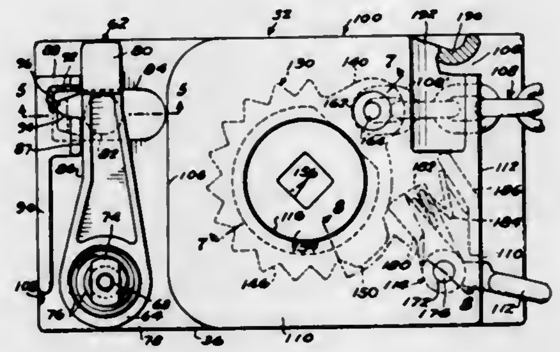
Richard D. Orlik, Jenison, Mich., assignor to The Chesapeake and Ohio Railway Company, Cleveland, Ohio, and The Baltimore and Ohio Railroad Company, Baltimore, Md.
Filed Mar. 8, 1971, Ser. No. 121,960
Int. Cl. B60p *7/08;* **B61d** *45/00*
U.S. Cl. 105—36.7 **9 Claims**



A railroad car for securing and hauling roughly cylindrically shaped loads and a method of securing such loads whereby the car bed has a plurality of sunken tracks which extend substantially from one end of the car to the other with a plurality of chock blocks mounted on the bed for movement along at least some of the tracks. The chock blocks are grouped in pairs with one block in each pair having a flat surface inclined toward one end of the car and the other a flat surface facing the flat surface of the first and inclined toward the opposite end of the car so that a load can be secured between each pair with the curved surface of the load contacting the flat surfaces of the two blocks. A number of chain anchors are also preferably mounted movably in each of the two outer sunken tracks for attachment to a chain with the portion of the chain between the points of attachment to the anchors passing through and securing the load. A plurality of adjustable lateral support members are also mounted removably on each of the flat surfaces of each block for engaging and securing the ends of the loads.

3,715,994
LOW CLEARANCE VEHICLE TIEDOWN WINDLASS MECHANISM

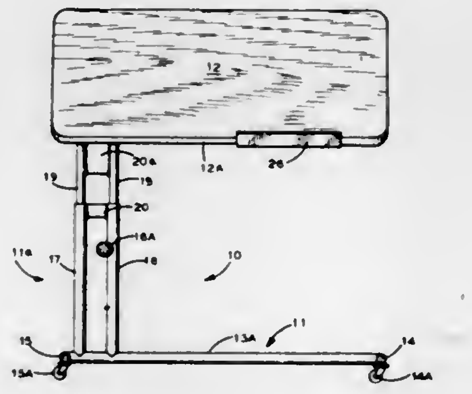
Walter F. Mietla, Dearborn, Mich., assignor to Portec, Inc., Chicago, Ill.
Filed July 13, 1970, Ser. No. 54,184
Int. Cl. B60p *7/08;* **B61d** *45/00*
U.S. Cl. 105—368 T **17 Claims**



A low silhouette vehicle tiedown windlass device having a frame plate which slidably grips the cross flange of a T-beam of a cargo carrier for movement only along the beam. A locking dog is mounted for limited pivotal movement adjacent the plate and is spring biased against the plate to insert a locking pin of the dog into registering holes in the plate and T-beam to lock the tiedown against movement along the T-beam. The device has a low silhouette pawl and ratchet windlass mechanism including a drum rotatably captured in the frame and connected to one end of a tiedown chain, the drum being rotatable about an axis perpendicular to the plate for taking up and paying out the tiedown chain.

3,715,995
OVERBED TABLE

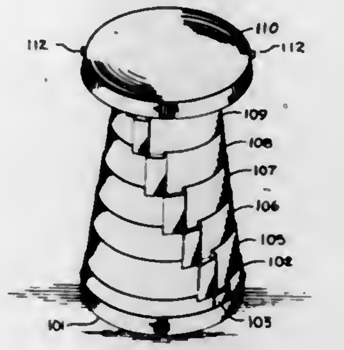
Morton I. Thomas, 125 South Street, Passaic, N.J.
Filed April 1, 1971, Ser. No. 130,097
Int. Cl. A47c *15/01*
U.S. Cl. 108—10 **6 Claims**



An overbed table having an upright leg portion of a construction which is highly effective to stabilize the table in use and includes a rigidified tubular structure; together with a tubular table mounting structure which facilitates the utilization of the table top in both its horizontal and tilted positions.

3,715,996
COLLAPSIBLE SUPPORT MEMBER

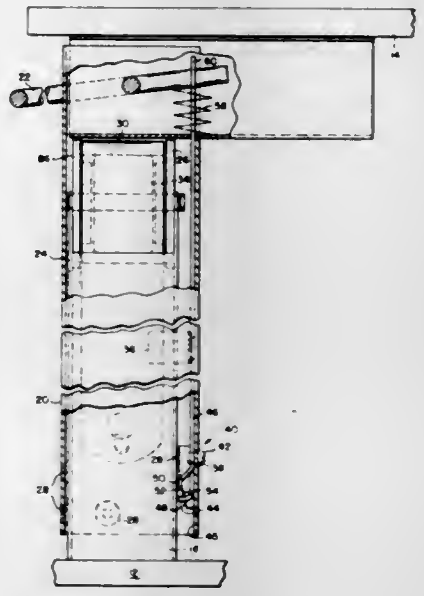
Rudolph L. Rolfshus, 1522 Circle Drive, Burnsville, Minn.
Filed Aug. 6, 1971, Ser. No. 169,722
Int. Cl. A47b *9/00*
U.S. Cl. 108—144 **11 Claims**



An apparatus is described which is collapsible and can be compactly reduced in size in its collapsed state, and which can be extended by means of telescoping sections to provide a supporting member for seats, tables, and other load-carrying objects.

3,715,997
OVERBED TABLE

David Edward Barth, Bowmansville, N.Y., assignor to Sybron Corporation, Rochester, N.Y.
Filed Oct. 12, 1971, Ser. No. 188,390
Int. Cl. A47b *9/08*
U.S. Cl. 108—146 **9 Claims**

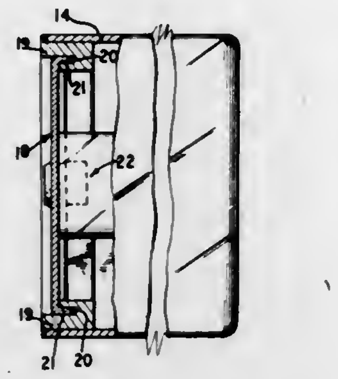


Disclosed is an overbed table, having a one-way lock mechanism including a cam member which moves a cylindrical element into a locking position during downward movement of the table top, and which permits movement of the cylinder out of the locking position upon upward movement of the table top.

3,715,998
WALL SAFE

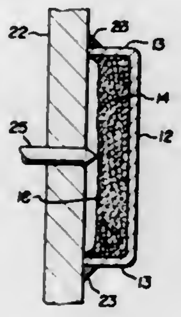
Walter Teleky, 6050 Blvd. East, West New York, N.J.
Filed June 18, 1971, Ser. No. 154,362
Int. Cl. E06b *5/10*
U.S. Cl. 109—58 **3 Claims**

A wall safe is provided having an improved cooperation of the structural configurations of the door and of the walls of the opening which is closed by the door whereby the safe is made highly resistant to attempted entry by forcing the door. The door is substantially rectangular and when it is in closed position the margins of the door substantially throughout their entire length are overlapped by recesses along the margins of the opening that is closed by the door. This is accomplished by a door which slides laterally so that it may be slid into locked position with opposite margins inserted in recesses in combination with flanges along the other two margins of the door which extend normally with respect to the face of the door and penetrate into recesses in the safe opening while at the same time permitting lateral movement of the door. With this construction it is essentially impossible for a tool to get a grip behind the door in an attempt to pry it open.



3,715,999
DRILL PROOF PLATES

Benjamin H. Shwayder, Franklin, Mich., assignor to Shwayder Chemical & Metallurgy Corporation, Detroit, Mich.
Filed May 18, 1971, Ser. No. 144,429
Int. Cl. E05g *1/02*
U.S. Cl. 109—82 **4 Claims**

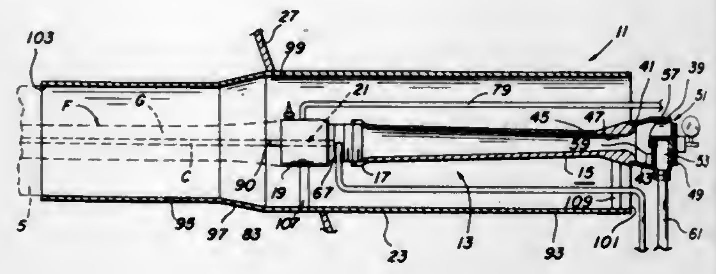


A drill proof plate formed of a shallow tray having a base and edge walls, with a layer of lumpy, irregular shaped particles of hard cemented metal carbides embedded in a brazing metal, covering the base, but with the free surface of the layer being spaced inwardly of the tray from the plane of the free edges of the wall, with the free surface being irregular and lumpy. The tray is applied against a metal support plate so that the layer free surface is spaced from the surface of the support plate, wherein the tips of drills applied through the support plate against the layer free surface are broken by the layer to prevent penetration thereof.

3,716,000
BURNER DEVICE

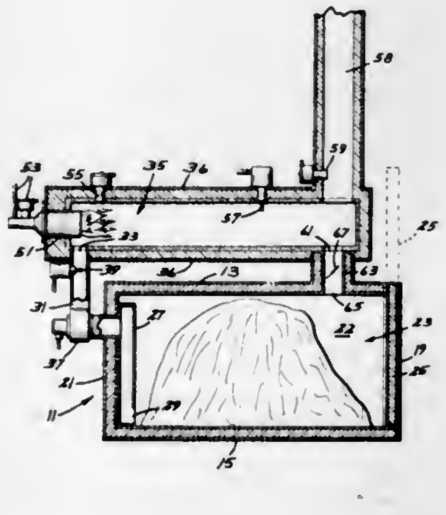
James D. Holden, Memphis, Tenn., assignor to Rees-Memphis, Inc., Memphis, Tenn.
Filed Sept. 18, 1970, Ser. No. 73,366
Int. Cl. F23b *1/28;* **F23d** *11/02*
U.S. Cl. 110—7 A **4 Claims**

A burner device used in conjunction with an incinerator for igniting the waste material therein, particularly during the start-up period. The burner device includes a venturi injector means for mixing gas and air and projecting the gas-air mixture in a stream through the forward end of the injector means. A flame retention nozzle is provided on the forward end of the venturi injector means for maintaining the gas-air mixture in an ignited condition and directing the flame forwardly. Another injector is provided for injecting a jetlike stream of high pressure raw fuel down the core of the flame to provide an elongated flame. A tubular hood means extends through an aperture in the wall of the incinerator and receives a major portion of the remainder of the burner device with the tubular hood means being in concentric and spaced relationship therewith.



3,716,001
RECIRCULATING INCINERATOR

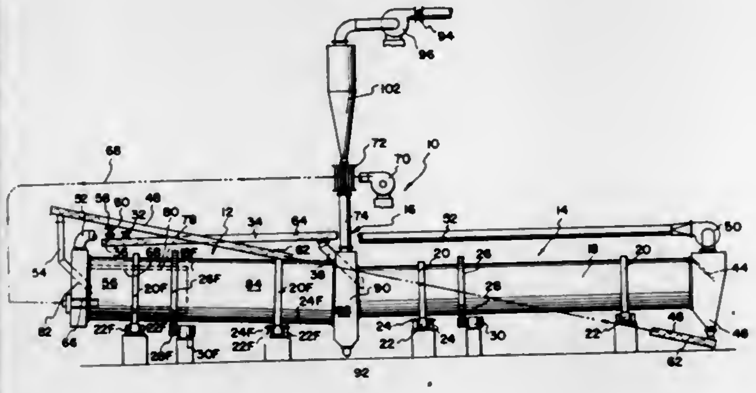
Chester J. Potasek, Fridley, and Frank Hiscocks, Minneapolis, both of Minn., assignors to Minneapolis Gas Company, Minneapolis, Minn.
Filed Feb. 9, 1972, Ser. No. 224,674
Int. Cl. F23g *5/12*
U.S. Cl. 110—8 A **7 Claims**



A recirculating incinerator system is disclosed wherein a burner is housed within a secondary combustion chamber for completing the combustion of the unburned products of combustion leaving the primary incinerator chamber, and for the supplying of the heat and oxygen for the burning of the refuse in the primary incinerator chamber. Within the system, a conduit containing a fan connects the incinerator chamber with the secondary chamber at a position near the burner in the secondary chamber. A second conduit is located near the opposite end of the elongated secondary chamber and it connects the secondary chamber with the incinerator chamber. A damper is located within the second conduit. Also located near the end of the secondary chamber is a stack for expelling the products of combustion to the atmosphere. By either manually or automatically controlling the fan and the damper, the circulating of hot gases containing oxygen from the secondary chamber into the incinerator chamber can be controlled in order to control the rate of burning of the refuse within the incinerator chamber.

3,716,002
SOLID WASTE DISPOSAL METHOD AND APPARATUS

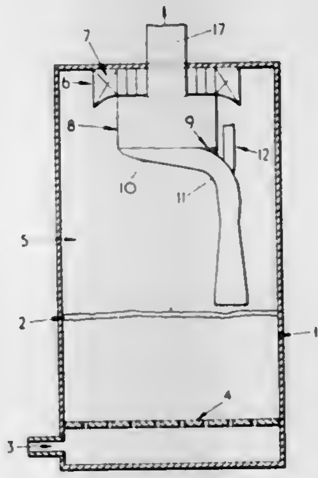
Stuart M. Porter, Denver; Ervin C. Welmer, and Harold W. Shideler, both of Wheatridge, all of Colo., assignors to Stearns-Roger Corporation, Glendale, Colo.
Filed April 1, 1971, Ser. No. 130,224
Int. Cl. F23g *5/06*
U.S. Cl. 110—14 **18 Claims**



This invention relates to a solid waste disposal apparatus that includes a rotary furnace arranged upstream of a rotary dryer in end-to-end relation to the latter but separated therefrom by a burning chamber and stationary ash removal subassembly interposed therebetween. The raw feed is mixed with a portion of the dried feed from the discharge end of the dryer and introduced into the intake end of the dryer as a moist mixture containing between approximately 40–60 percent water. The remaining dried material is introduced into the furnace. A forced draft burner at the entrance to the furnace is canted in the direction of furnace rotation so as to direct the hot products of combustion spirally along the wall thereof in concurrent flow relation to the moist mixture. Combustion takes place within the upstream end of the furnace inside a separate hollow combustion chamber that cooperates with the furnace wall to define an annulus into which the dryer gas is recycled and mixed with the products of combustion as they leave the aforesaid combustion chamber to reduce the temperature and axial velocity of the latter preparatory to delivering same to the burning chamber and ash removal subassembly complete with exhaust gas system, and dryer inlet therebeyond. The dryer is intricately baffled with a short fall fill that materially increases its efficiency. The ash removal subassembly includes a hopper into which the ashes fall and are sucked out of the top thereof and used to preheat the primary combustion airstream. The exhaust gases are exhausted through a heat recovery system and then scrubbed prior to release to the atmosphere. The invention also encompasses the novel method of treating solid wastes which comprises mixing the raw waste material with a previously dried portion thereof to make up a mixture having between approximately 40 and 60 percent moisture preparatory to drying same, drying the mixture thus produced with a heated gas mixture formed by combining within a mixing and cooling zone in the furnace the gaseous discharge from the dryer with the gaseous products of combustion generated in a combustion zone immediately upstream thereof, separating the solid products of combustion from the heated gas mixture prior to delivering a portion of the latter to the dryer, drawing off a portion of said heated gas mixture and treating it to remove entrained solids and odors prior to exhausting same to the atmosphere.

3,716,003
SOLID FUEL COMBUSTION SYSTEMS

Whalley Vowe Battcock, Bletchley, England, assignor to Coal Industry (Patent) Limited, London, England
Filed March 29, 1971, Ser. No. 128,933
Claims priority, application Great Britain, April 24, 1970, 19,873/70
Int. Cl. F23d *19/00*
U.S. Cl. 110—28 J **10 Claims**

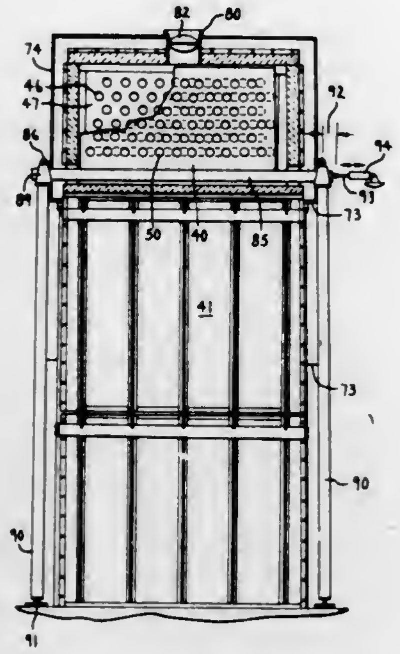


A particulate solid fuel combustion system includes a fluidized bed combustor adapted to contain a fluidized bed of inert particles in the lower region thereof. Particulate solid fuel is introduced into the bed to be burnt therein and exhaust gases derived from the combustion of the fuel are passed to a vortex combustion chamber included in the system. Fine particles of combustible material entrained in the gases are burnt within the vortex combustion chamber while relatively larger particles of combustible material are removed from the chamber to be reintroduced to the combustor at or adjacent the surface level of the fluidized bed contained therein. The invention also includes a method of operating the combustion system.

3,716,004
REFRACTORY DAMPER FOR HIGH TEMPERATURE OR CORROSIVE GASES

Allen Jacob Jones, Fall Creek, Oreg., assignor to The Community Bank, Lake Oswego, Oreg.
Division of Ser. No. 108,527, Jan. 21, 1971, Pat. No. 3,675,600, which is a continuation-in-part of Ser. Nos. 25,974, April 6, 1970, Pat. No. 3,598,067, and Ser. No. 56,447, July 20, 1970, and Ser. No. 87,806, Nov. 9, 1970, Pat. No. 3,665,894. This application March 27, 1972, Ser. No. 238,283
Int. Cl. F23l *13/06*
U.S. Cl. 110—163 **3 Claims**

A recirculating dryer system is disclosed wherein combustion gases from a waste wood-fired furnace are circulated through a wood veneer dryer or lumber dry kiln and returned to a mixing chamber for exposure to the hot gases leaving the furnace, causing incineration of volatile hydrocarbons and wood fiber picked up by the gas stream in its passage over the veneer or lumber. A novel form of damper construction is employed to provide a damper in elevated position between the fuel cell of the furnace and said mixing chamber. The damper comprises an apertured block of refractory material having an inverted pendulum support provided by a pair of pivotal columns.



3,716,005

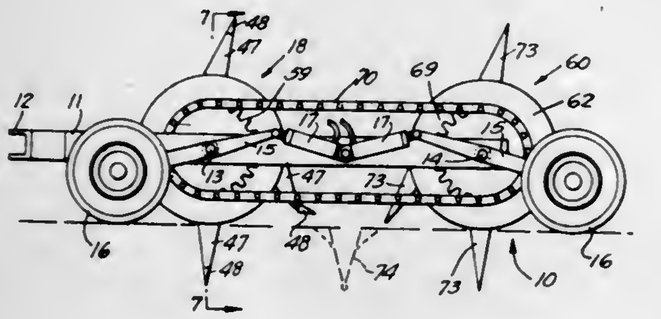
SUBSOIL AERATOR FOR DEPOSITING AND DETONATING EXPLOSIVE PELLETS

Joseph W. Fennell, R. F. D., Philipp, Miss.

Filed Oct. 1, 1971, Ser. No. 185,565

Int. Cl. A01b *45/02;* **A01c** *5/00*

U.S. Cl. 111—1 **7 Claims**



A subsoil aerator including a plurality of subsoil penetrating teeth mounted on a ground-engaging roller and arranged to penetrate the subsoil as the roller progresses across the ground. The teeth are hollow and are pivoted on the roller, so that as they swing out of a radial position with respect to the roller, the bottom of the tooth is opened to drop an explosive pellet into the hole made by the tooth. A magazine for the explosive pellets is positioned within the roller and dispenses a single explosive pellet to each tooth as it penetrates the ground. A following roller, also carrying pivoted teeth, is coupled to the first roller so that the teeth of the second roller penetrate the same hole made by the teeth of the first roller. The teeth of the second roller, on penetrating the same hole, comes in contact with the explosive pellet in the hole and causes the pellet to explode. Elevatable ground-engaging wheels are provided for moving the aerator from place to place.

3,716,006

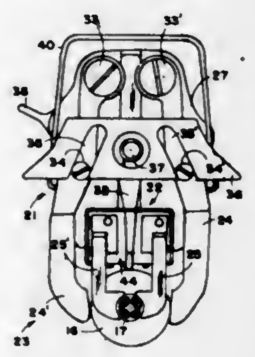
ATTACHMENT FOR THE BUTTON CLAMP OF BUTTON SEWING MACHINES, FOR HOLDING A SHANK TUBE TO BE SEWN ON TOGETHER WITH THE BUTTON

Benjamin L. Snyder, Hillside, N.J., assignor to Pentapco, Inc., Elizabeth, N.J.

Filed Jan. 18, 1971, Ser. No. 106,986

Int. Cl. D05b *3/00*

U.S. Cl. 112—114 **7 Claims**



So that the stitches securing a button shall form a shank protected in a shank tube to be sewn on with the button, an attachment which is an auxiliary clamp to hold the tubular element, is provided for mounting onto the button clamp of the button sewing machine; such auxiliary clamp having adjustment means to orient it to the button clamp.

3,716,007

AUTOMATIC STITCH-CUTTING MECHANISM FOR BAG-CLOSING SEWING MACHINES

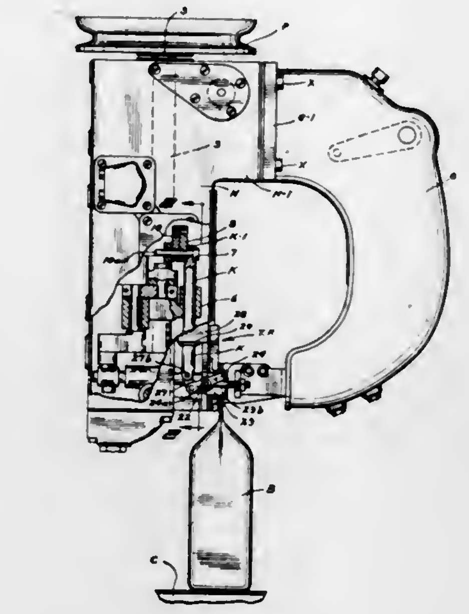
Harold Fischbein; Irving George Fischbein, and Sam Shark, all of Minneapolis, Minn., assignors to Dave Fischbein Company, Minneapolis, Minn.

Continuation-in-part of Ser. No. 55,195, July 15, 1970, abandoned. This application March 31, 1972, Ser. No. 240,030

Int. Cl. D05b *13/00*

U.S. Cl. 112—11 **3 Claims**

A mechanism for automatically and successively cutting the thread chain in a bag-closing sewing machine after the upper edges of each bag are stitched together which essentially employs: (a) a novel and special throat plate cooperating with the presser foot of the sewing machine for receiving and guiding the upper edges of filled bags as they are moved through the machine by carrier means, and for accommodating and assuring the cooperation of the needle mechanism and looper mechanism to stitch horizontally the upper edges in said guiding action; (b) at the bag delivery end of the throat plate an outwardly protruding bag-edge guiding ramp is provided, extending horizontally and spaced outwardly from the main body of the throat plate and joined with the body in an inclined, outwardly projected juncture and thereafter extending for a short distance in substantially planar form to an abrupt outer end; (c) a thread chain receiving slot extending longitudinally therein through said ramp and open at the bag delivery end of said ramp whereby stitching produced by the machine immediately following the trailing end of each stitched bag is automatically engaged in said slot and moved outwardly a slight distance with the trailing bag; (d) a thread chain cutting mechanism mounted inwardly of the ramp or at least its outer portion and comprising a movable sharp edge blade operating in a general plane perpendicularly of said slot and in position inwardly of said ramp; (e) and driving connections between the shiftable cutter blade and a powered element of the sewing machine to cause operation of the blade for each cycle of operation of the general components of the sewing machine.



3,716,008

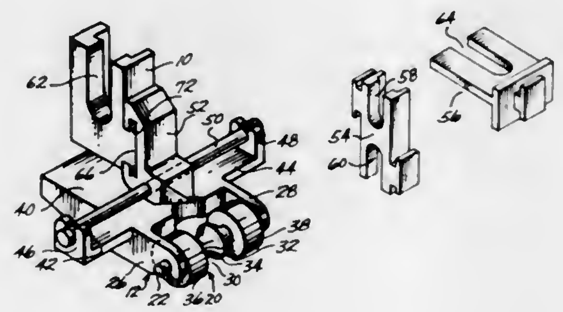
PRESSER FOOT WITH SIDEWAYS ADJUSTMENT

Robert B. Howell, 3132 Rocky Point Road, Bremerton, Wash.

Division of Ser. No. 869,836, Oct. 27, 1969, Pat. No. 3,618,547, which is a continuation-in-part of Ser. Nos. 764,453, Oct. 2, 1968, Pat. No. 3,511,201, and Ser. No. 764,518, Oct. 2, 1968, Pat. No. 3,511,200, each is a continuation-in-part of Ser. No. 501,066, Oct. 22, 1965, Pat. No. 3,349,736, which is a continuation-in-part of Ser. No. 475,486, July 28, 1965, Pat. No. 3,342,151. This application March 17, 1971, Ser. No. 125,125

Int. Cl. D05b *29/12*

U.S. Cl. 112—240 **10 Claims**



An elongated cylindrical rod is supported on an upper portion of a presser foot component. The rod extends through a transverse bore in a connector block. The connector block includes one component of a joint between it and a mounting shank. The mounting shank is adapted for connection to the presser bar of a sewing machine.

3,716,009

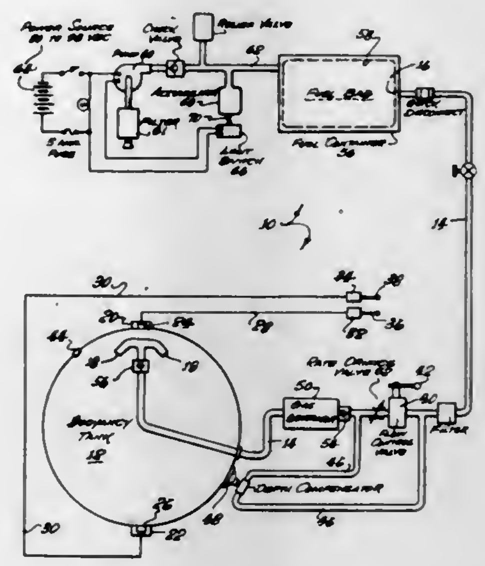
VARIABLE BUOYANCY CONTROL SYSTEM

Alvah T. Strickland, Kailua, Hawaii, assignor to the United States of America as represented by the Secretary of the Navy

Filed Nov. 24, 1971, Ser. No. 201,903

Int. Cl. B63g *8/22*

U.S. Cl. 114—16 E **8 Claims**



A variable buoyancy control system for an underwater vehicle including a buoyancy tank; a main fluid pressure line which is connected to the tank; the tank having top and bottom butterfly valves; means for selectively opening and closing the top and bottom butterfly valves; a flow control valve connected in the fluid pressure line for selectively controlling the fluid pressure to the tank; a relief valve mounted in the buoyancy tank for relieving pressure from the tank upon the occurrence of positive pressure differential of the tank over ambient; a secondary fluid pressure line connected to the main fluid pressure line across said flow control valve; and a depth compensator valve connected in the secondary fluid pressure line and pressure responsive to the buoyancy tank and ambient water for by-passing fluid to the buoyancy tank upon the occurrence of a negative pressure differential between the tank and ambient.

3,716,010

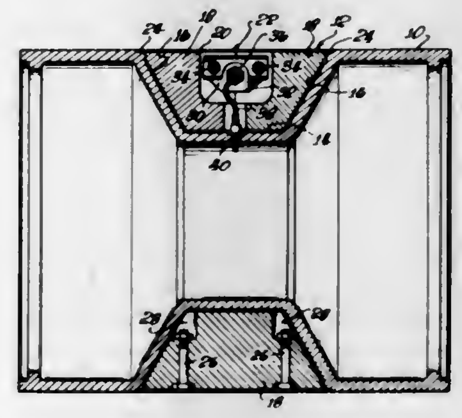
SNAP ACTING BALLAST RELEASE DEVICE

William G. Wilson, Livermore, James H. Green, Sierra Madre, and William D. White, Pasadena, Calif., assignors to the United States of America as represented by the Secretary of the Navy

Filed Oct. 21, 1970, Ser. No. 82,661

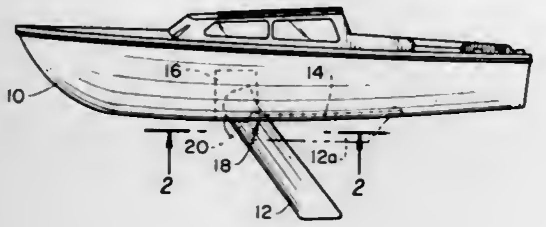
Int. Cl. F42b *15/10, 19/00*

U.S. Cl. 114—22 **3 Claims**



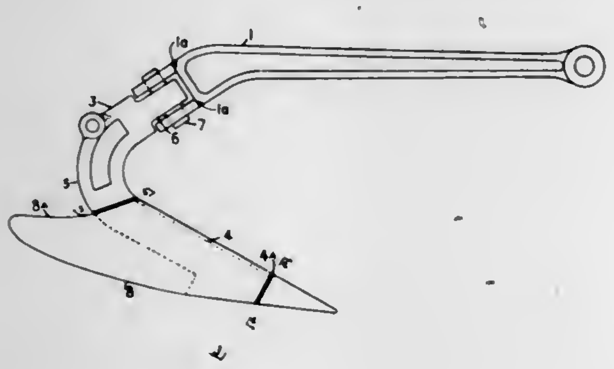
A snap acting ballast release device for a water vehicle, such as a torpedo, including: the hull of the torpedo having an annular recess; a plurality of weights disposed within the recess; a resilient band extending around the weights and secured thereto in a closed biased position; means releasably connecting the ends of the band in the closed biased position; the band being adapted, because of its resiliency, to assume a relaxed open position away from the torpedo hull, so that upon release of the ends of the band the band and its attached weights snap free of the torpedo.

3,716,011
CENTERBOARD PIVOT FOR A SAILBOAT
Frank W. Butler, Northridge, Calif.
(3807 Weatherly Circle, Westlake Village, Calif. 91324)
Filed Feb. 1, 1971, Ser. No. 111,525
Int. Cl. B63b *41/00*
U.S. Cl. 114—132 **5 Claims**



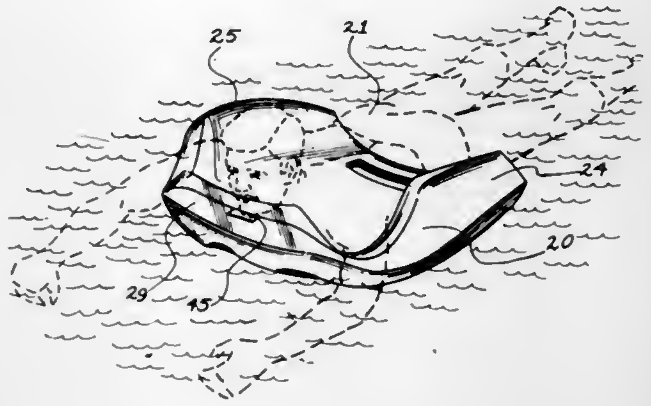
Herein described is a pivot for lowering and raising the centerboard of a sailboat. Pivot holder molds are formed into the bottom of the boat and secured thereto by a pair of nuts which are within the molds. A pair of pivot holders including the pivot rod and the centerboard of the sailboat is bolted to the nuts within the bottom of the boat.

3,716,012
ANCHORS FOR MARINE USE
Kenneth L. Wright, Coatbridge, Scotland, assignor to The Security Patent Anchor Company Limited, Whifflet, Coatbridge, Scotland
Filed June 8, 1970, Ser. No. 44,021
Claims priority, application Great Britain, June 20, 1969, 31,310/69
Int. Cl. B63b *21/34*
U.S. Cl. 114—207 **9 Claims**



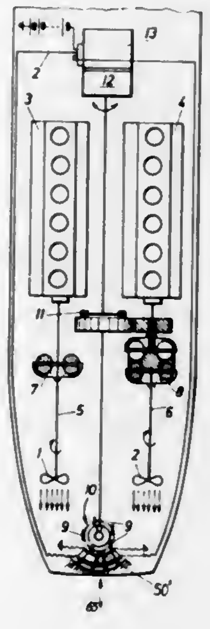
The anchor incorporates a shank and a head pivoted to the shank. The head consists of two separate end portions connected by a curved intermediate portion which is pivoted to the shank at one end. The portion of the head between the curved portion and the other end carries two sidewardly extending flukes. The flukes are formed of a plate bent about an axis of symmetry and fitted to the head portion.

3,716,013
BUOYANT POWERED SWIMMING DEVICE
Anastasios J. Vasilatos, Wilmette, Ill., assignor to A. V./American Ventures, Inc., Village of Wilmette, Ill.
Continuation-in-part of Ser. No. 765,360, Oct. 7, 1968, Pat. No. 3,543,712. This application Nov. 23, 1970, Ser. No. 92,059
Int. Cl. B63b *21/56*
U.S. Cl. 115—6.1 **11 Claims**



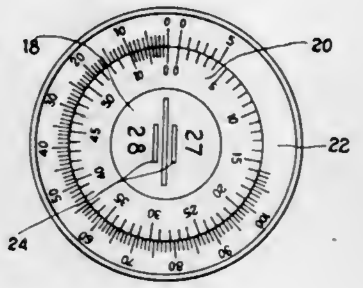
A buoyant device contoured on its upper surface to support the body of the user while permitting freedom of motion of the arms and legs. The lower side of the device is hydrodynamically streamlined taking into account the location of one or more propulsion devices located beneath the lower surfaces. Energy storage and control means are provided interior of the device and specially contoured propeller shrouds enhance efficiency.

3,716,014
SHIP PROPULSION SYSTEM HAVING SEPARATE PROPULSION UNITS FOR CRUISE AND LOW SPEEDS
Rudolf Laucks; Werner Fork, both of Heidenheim (Brenz), and Harald Gross, Sohnstetten, all of Germany, assignors to Firma J. M. Voith GmbH, Heidenheim, Germany
Filed Aug. 14, 1970, Ser. No. 63,864
Claims priority, application Germany, Aug. 16, 1969, P 19 41 652.5
Int. Cl. B63h *1/10*
U.S. Cl. 115—35 **21 Claims**



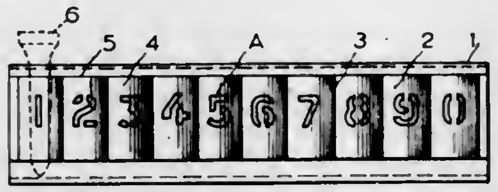
A ship is provided with a propulsion unit for cruising speed and a cycloidal propeller as a second propulsion unit used for slow speeds. The cycloidal propeller has a propeller housing and a propeller runner with the propeller blades being equidistantly spaced on a blade orbit and pivotally mounted so that the blades may be pivoted in directions parallel to the direction of travel of the ship. The cylinder propeller may be used as a non-rotating passive rudder when the ship is cruising and may also be used for steering. Structures are disclosed for pivoting of the blades into various positions.

3,716,015
MEASURING DEVICES
Peter James Godfrey, 27 Brackendale Drive, Thackley, Bradford, England
Filed Nov. 12, 1970, Ser. No. 88,536
Int. Cl. B23q *17/00*
U.S. Cl. 116—115.5 **9 Claims**



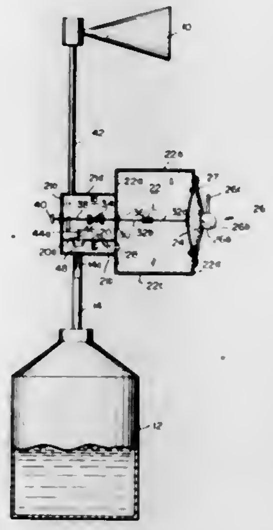
A measuring device adapted to indicate a measurement value in two different scales, e.g. a metric length scale and a British length scale, said device comprising two elements relatively movable, each of which carries a scale and a datum mark for the scale of the other element, in order to indicate therein a measurement value corresponding to a relative shifting motion of said elements, said scales extending in opposite directions to each other at the adjacent surfaces of said elements.

3,716,016
GOLF SCORE MARKER
Perry J. Aylesworth, 2721 Dominion Road, and Arthur J. Lesperance, 2720 Dominion Road, both of Windsor, Ontario, Canada
Filed Feb. 16, 1971, Ser. No. 115,218
Int. Cl. A63b *71/06*
U.S. Cl. 116—120 **1 Claim**



This invention consists of a strip of flexible material to the face of which are attached a number of circular segment pockets which are numbered consecutively starting with number one at the first of said pockets. A golf tee which is inserted into the pockets, is moved from one pocket to the next, thus denoting the number of strokes taken by the golfer to drive the ball from each tee to the cup. The numbering being consecutive, each pocket stands for one stroke.

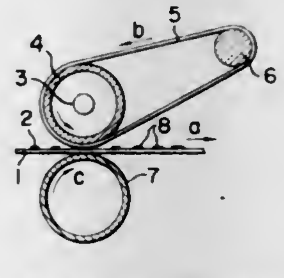
3,716,017
ACTUATING AND CONTROL SYSTEM FOR GAS-OPERATED FOG HORN
Leonard M. Greene, White Plains, N.Y., assignor to Safe Flight Instrument Corp., White Plains, N.Y.
Filed March 10, 1971, Ser. No. 122,770
Int. Cl. G10k *5/00*
U.S. Cl. 116—137 **13 Claims**



An actuating and control system for a gas blown fog horn including a source of liquified gas. The liquified gas is in continuous communication with an inlet plenum. An outlet plenum is provided which is in continuous communication with the fog horn. Operator control means controls communication between the inlet plenum and outlet plenum and when actuated places said plenums in communication so that the horn is blown. Additionally, an automatic pressure operated blow control means is provided and can be selectively operated for periodically and automatically transferring pressurized gas from the source to the fog horn.

ERRATUM
For Class 118—66 see:
Patent No. 3,716,221

3,716,018
DEVICE FOR HEATING AND FIXING TONER IMAGES UPON A RECORDING MEDIUM
Wasaburo Ohta, Yokohama, and Kazuhiko Kasuya, Kawasaki, both of Japan, assignors to Ricoh Co., Ltd., Tokyo, Japan
Filed Oct. 6, 1970, Ser. No. 78,486
Claims priority, application Japan, Oct. 9, 1969, 44/81371
Int. Cl. B05c *11/02*
U.S. Cl. 118—101 **8 Claims**



A non-adhesive endless belt is used for heating and fixing toner images upon a recording medium by mounting the belt on a roller having means for heating it and on a driving roller spaced apart from the heated roller means. The recording medium is passed closely adjacent to or with its toner-carrying surface in contact with the surface of the heated belt to fuse the toner in the form of the image on the recording medium. Cleaning means and a preheated pressure roller are also provided to improve the quality of the fused toner image.

3,716,019

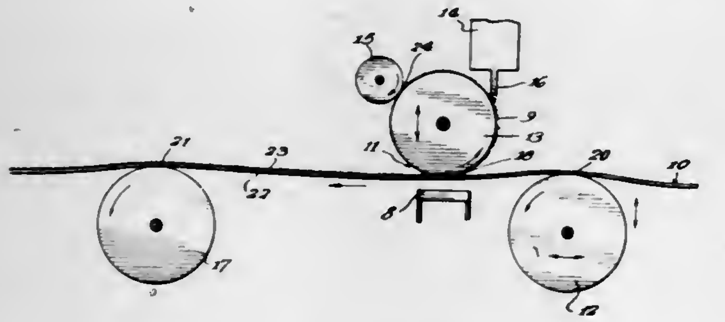
ROLLER COATING SYSTEM FOR ONE SIDE STRIP COATING

William A. Carter, Gary; William C. Sievert, Chesterton, and James L. Munson, Highland, all of Ind., assignors to Inland Steel Company, Chicago, Ill.

Filed Nov. 23, 1970, Ser. No. 91,914

Int. Cl. B05c *1/00*

U.S. Cl. 118—246 **7 Claims**



This invention relates to a new and unobvious apparatus for depositing fluids onto one side of a continuous strip and more particularly to depositing a fluid, generally of low viscosity, onto one side of a metal strip without depositing any of the fluid onto the other side of the strip.

3,716,020

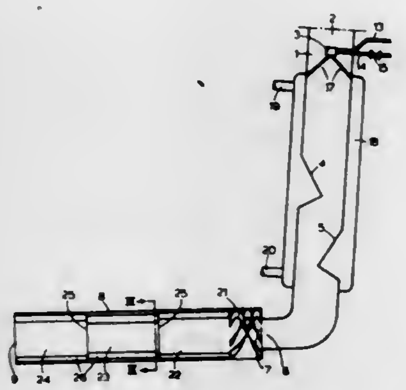
APPARATUS FOR COATING GRANULES WITH A THIN DENSE LAYER

Willem De Wit, Heerlen, and Petrus F. A. M. Hendriks, Sittard, both of Netherlands, assignors to Stamicarbon N.V.

Filed Sept. 29, 1970, Ser. No. 76,439

Int. Cl. B05b *17/00;* **B05c** *5/00*

U.S. Cl. 118—303 **4 Claims**



A method and apparatus for applying a thin, protective coating to individual granules by generating a liquid screen of the coating material at one end of a vertical shaft, passing the granules down through the screen and onto baffles disposed in the lower portion of the shaft. The liquid will pass down the walls of the shaft and onto the baffles and become entrained with the granules impinging thereon. A rotary drum is provided adjacent the discharge end of the shaft to intimately mix the materials passing out of the shaft.

3,716,021

APPLICATOR MECHANISM FOR PARTICULATE MATERIAL

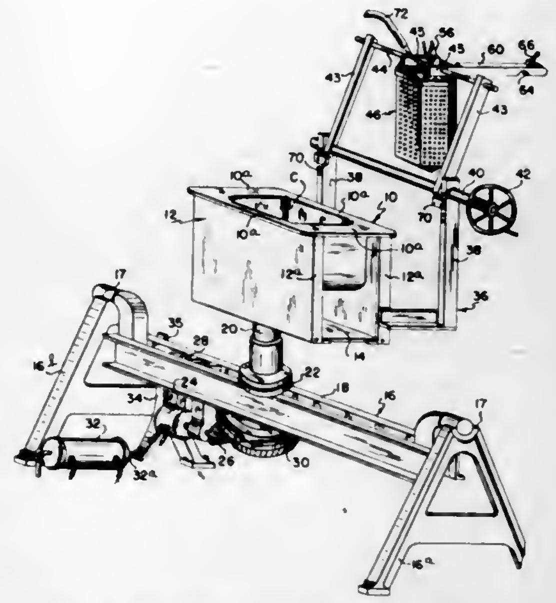
Ralph Fry, Warren, Pa., assignor to Ferro Corp., Cleveland, Ohio

Filed March 10, 1971, Ser. No. 122,802

Int. Cl. B05b *7/00;* **B05c** *5/00*

U.S. Cl. 118—308 **15 Claims**

Apparatus for applying powdered porcelain enamel to a heated hollow article. Apparatus includes a tiltable, rotatable base having means for holding the hollow article for application of the powder. A support means for a seive applicator is mounted on the base for moving the applicator into the hollow article.



3,716,022

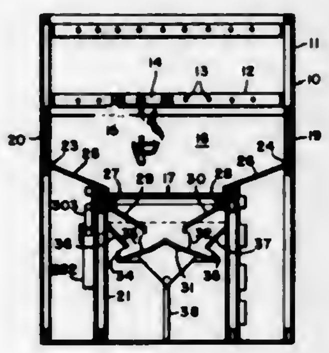
AUTOMATIC SPRAY-PAINTING MACHINE

Harry Szczepanski, 900 Clancy Ave. NE., Grand Rapids, Mich. 49503

Filed Oct. 8, 1970, Ser. No. 79,012

Int. Cl. B05b *1/28*

U.S. Cl. 118—326 **3 Claims**



A conveyor extends into a spray station from an exterior loading station. At least one fixture for supporting a mask and work pieces is engageable with the conveyor for movement into the spray station. The conveyor preferably continues the movement on through the spray station, and out the opposite side, so that the enclosure forming the spray station can be shorter than the length of the fixture assembly in the direction of movement of the conveyor. Space under one side of the conveyor is utilized for mask-washing equipment. Lateral transfer means, together with an elevator system, moves the work support and mask from the conveyor to and through the washing station. A program controller determines the painting cycle according to easily preset adjustments, and spray gun assemblies can be lifted out and installed as a unit for each job set-up. A down-draft ventilation system in the work station accommodates the wide range of painting conditions the machine is capable of handling.

3,716,023

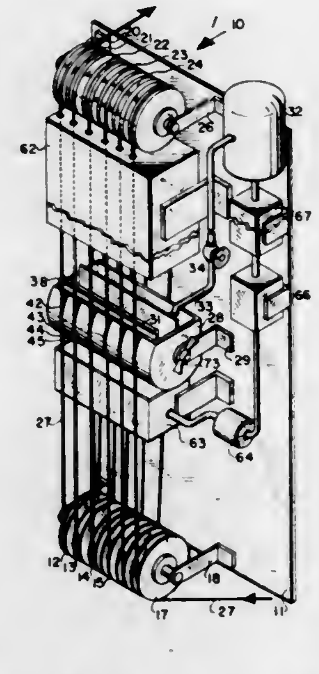
LATEX APPLICATOR

John S. Walukonis, Jr., and Donald D. Banks, both of Anderson, Ind., assignors to Anaconda Wire and Cable Company

Filed July 15, 1971, Ser. No. 162,903

Int. Cl. B05c *3/154*

U.S. Cl. 118—420 **4 Claims**



Large wires are coiled with latex by pulling them upward through curved channels down which the latex continuously flows. Flow rate is controlled by means of a weir in the tank and bubbles are broken up by flowing the latex through apertures in a submerged baffle.

3,716,024

A DEVICE FOR SPRAYING AN ELECTRIFIED POWDERED MATERIAL ONTO A STRUCTURE

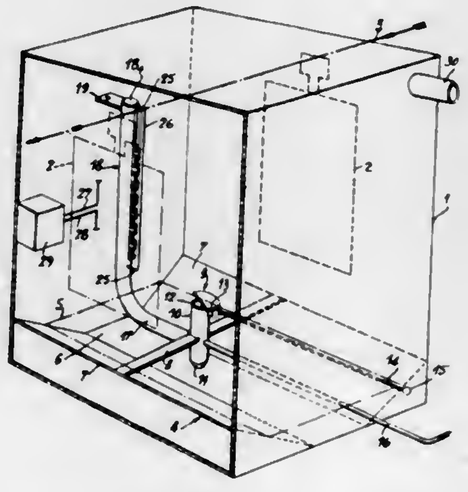
Gerald Pierre Pierson, Calvados, France, assignor to Societe Carrier, societe anonyme, Suresnes, France

Filed Oct. 27, 1970, Ser. No. 84,260

Claims priority, application France, Nov. 4, 1969, 6937914

Int. Cl. B05b *5/02;* **B05c** *11/00*

U.S. Cl. 118—630 **11 Claims**



Device for spraying an electrified powdered treating or coating material onto a structure. The device comprises a cabin through which the structure is conveyed. A mixture of the powdered material and air is sprayed onto the structure by spraying means connected to metering and mixing means placed in the bottom of a bank containing the powdered material. Means are provided for recovering the powdered material which has not been deposited on the structure and returning this material to the tank.

3,716,025

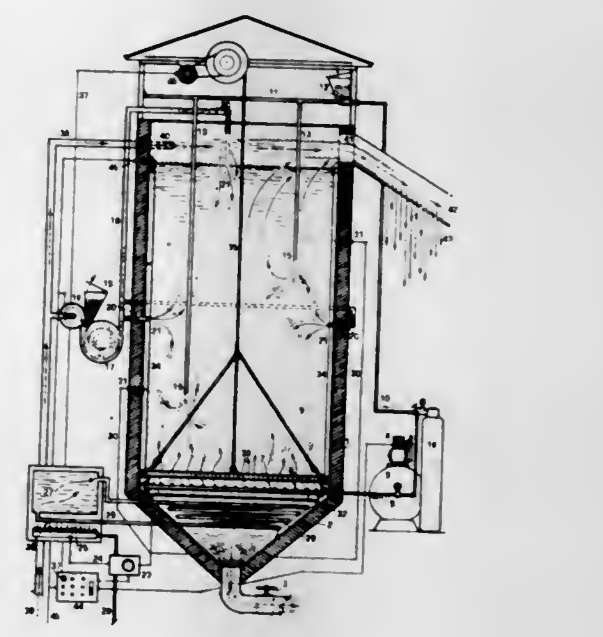
VERTICAL TANK SYSTEM FOR FISH REARING

Buford Bernard Lawson, 2994 Woodvale Drive, Memphis, Tenn.

Filed Nov. 30, 1970, Ser. No. 54,832

Int. Cl. A01k *63/00*

U.S. Cl. 119—3 **7 Claims**



A self-contained system for rearing and harvesting fish commercially, e.g., catfish or the like. The system includes a vertically disposed cylindrical tank having a roof positioned over the open upper end thereof. A cone-shaped bottom member of the tank collects toxic matter and decomposed food and provides s sump which is communicated with a closable dump valve. Also included are primary and secondary aeration units which jointly provide multilevel aeration from a source of air. An automatic portion feeder is included which is connected with an outside water source and has discharge structure communicated with the interior of the tank for conveying and discharging optimum portions of feed into the tank. The temperature of the water within the tank is thermostatically controlled within an optimum temperature range by structure provided and adapted for this purpose. A remote control panel is included which is electrically connected to certain disclosed structure to conveniently operate the totally self-contained system. Also included is a circular grid which is adapted to be raised to a discharge outlet that communicates with a loading chute. Raising the grid is effective to urge the fish through the discharge outlet hence the loading chute for loading the harvested fish onto a suitable conveyance.

3,716,026

APPARATUS FOR RAISING AND HARVESTING FISH

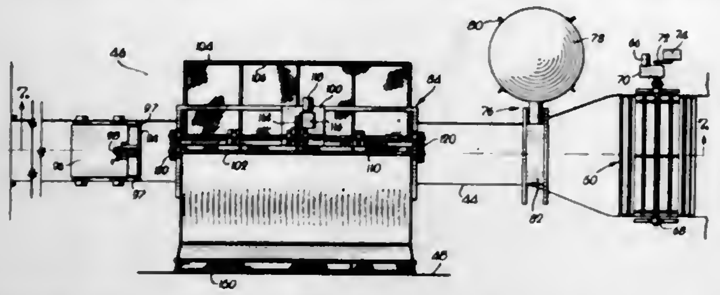
William R. Gross, P. O. Box 510, El Dorado, Kans.

Division of Ser. No. 34,244, May 4, 1970, Pat. No. 3,678,898. This application July 2, 1971, Ser. No. 159,287

Int. Cl. A01k *61/00*

U.S. Cl. 119—3 **10 Claims**

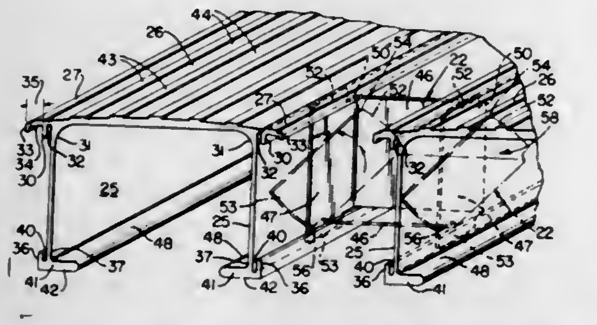
A method and apparatus for raising and harvesting fish utilizes a closed loop for confining a body of water and a paddle wheel to create an artificial current in the body of water of sufficient magnitude to induce fish in the water to swim against the current. Feeding mechanism disposed adjacent the paddle wheel is operable to introduce feed into the water. The artificial current created by the paddle wheel induces fish in the water to swim against the current and toward the food supply. A plurality of air-gathering buckets on the paddle wheel aerate the water to assure an adequate supply of oxygen for the fish. A portion of the closed loop defines an open ended container which is periodically operated to confine a number of fish when the latter have gathered to partake of the food. The container has a curved surface defining its bottom and rotatable structure is disposed longitudinally of the container for rotation over the curved surface to remove any fish confined within the container.



3,716,027
FLOOR CONSTRUCTION AND MEMBER FOR MAKING SAME

Donald E. Vickstrom and George F. Swenck, Richmond, Va., assignors to Reynolds Metals Company, Richmond, Va.

Filed Aug. 13, 1971, Ser. No. 171,527
Int. Cl. A01k *1/00*
U.S. Cl. 119—28 **20 Claims**



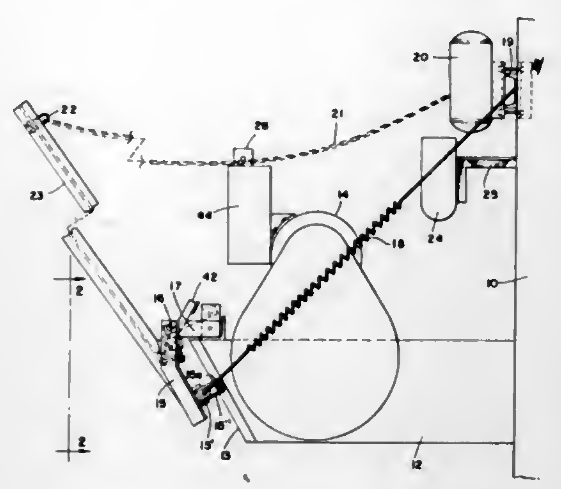
An improved floor construction is provided which is particularly adapted for an animal enclosure used to raise animals in confinement and such floor construction employs a plurality of improved floor-forming channel members capable of carrying heavy loads as well as improved connector-spacers for holding such channel members together in spaced relation. Each channel member is substantially U-shaped and is comprised of spaced side walls joined together by a top load-carrying wall which has a pair of side portions arranged outwardly of the side walls. A pair of top retaining flanges extend downwardly from the side portions and each retaining flange cooperates with a top portion of an associated side wall to define a top retaining groove therebetween. The channel member may also have a pair of bottom retaining flanges arranged outwardly of the side walls with each bottom retaining flange cooperating with a bottom portion of an associated side wall to define a bottom retaining groove therebetween. Each of the grooves is adapted to receive a portion of a connector-spacer therewithin to connect each channel member in spaced relation to an associated channel member.

3,716,028
TIME CONTROLLED DISPENSING MECHANISM FOR FEED STORAGE CONTAINERS

Henry Baskerville, Elmington Farm, Route 2, Box 203, and Marshall Edwin Davis, Elmington Farm Route 2, Box 16F, both of Powhatan County, Va.

Filed Feb. 24, 1971, Ser. No. 118,443
Int. Cl. A01k *05/02*
U.S. Cl. 119—51.11 **8 Claims**

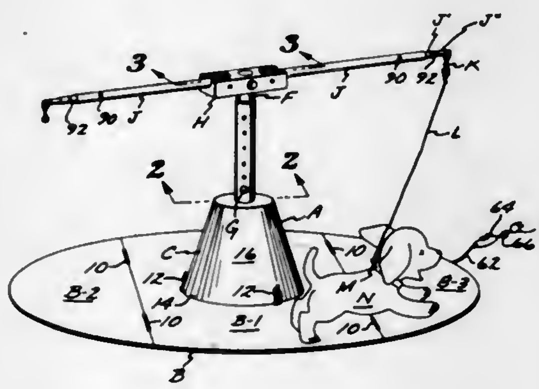
A feed storage container such as a silo is provided at its bottom with an unloader chute having a normally closed door. A time controlled dispensing mechanism includes a reversible electric motor which is operatively connected to the door for opening and closing the same at timed intervals. The reversible motor is in circuit with switch means responsive to opening and closing of the door. The electrical circuit also includes other switch means for actuating a conveyor in the unloader chute and a roller mill when the door is open.



3,716,029
ANIMAL EXERCISING DEVICE

Charles H. Pillsbury, Jr., 2253 Stonyvale Road, Tujunga, Calif.

Filed Jan. 22, 1971, Ser. No. 108,708
Int. Cl. A01k *15/00*
U.S. Cl. 119—29 **7 Claims**



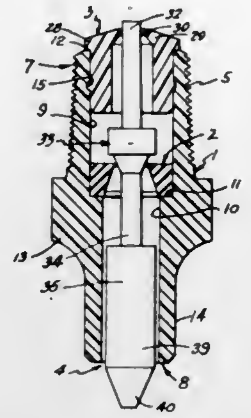
A portable power operated animal exercising device that is relatively light in weight, and can be transported to a desired destination in a collapsed condition to occupy a minimum of space. The device is adjustable both vertically and horizontally to accomodate an animal of a particular height, as well as to vary the radius of the circular path through which the animal is guided in exercising.

3,716,030
ANIMAL OPERATED WATERING DEVICE

James B. Godshalk, Yardley, and William P. Alburger, Hatfield, both of Pa., assignors to Fox Products Co., Philadelphia, Pa.

Continuation of Ser. No. 883,474, Dec. 9, 1969, abandoned. This application April 27, 1971, Ser. No. 137,987
Int. Cl. A01k *07/00*
U.S. Cl. 119—72.5 **10 Claims**

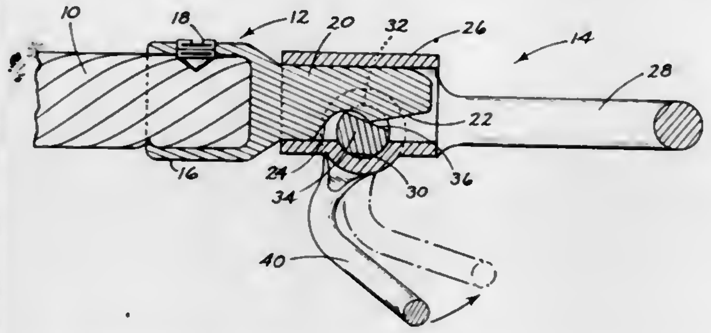
A valve assembly including a generally tubular body means having a valve means positioned therein adapted to be actuated by an animal. The valve means includes a frusto-conical member engageable with a member providing a valve seat. Said member includes a lip elastically yieldable under forces applied by said valve means to stop the flow of liquid through the assembly.



3,716,031
QUICK RELEASE LARIAT HONDA

Dayton J. Rowbury, Imnaha, Oreg., assignor to Dale A. Rowburg, Joseph, Oreg.

Filed Feb. 26, 1971, Ser. No. 119,245
Int. Cl. A01k *29/00*
U.S. Cl. 119—153 **6 Claims**



A quick-release honda for mounting on a rope in making a lariat comprises a closed eye portion dimensioned to receive the rope in running noose relation, a socket extending from the eye portion, and a ferrule mountable on the end of the rope. Two-position rotary catch means are mounted on the socket and releasably interengage the socket and ferrule. Trip means is connected to the catch means for tripping it by jerking the rope, thereby opening the noose and releasing the lariat. The catch means operates in both of its positions completely independently of the eye portion, thus ensuring the continued loose running movement of the rope therethrough.

3,716,032
SELECTIVE ANIMAL GATE

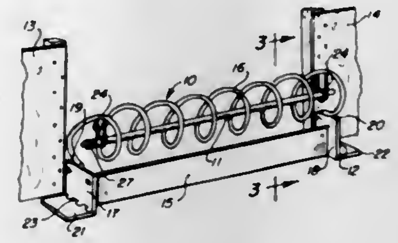
Frank R. Laurenz, P.O. Box 359, Eagle Butte, S. Dak. 57625

Continuation-in-part of application Ser. No. 50,469, June 29, 1970. This application May 26, 1971, Ser. No. 146,982
Int. Cl. A01k *29/00*
U.S. Cl. 119—155 **23 Claims**

An electric gate for animal pens is taught. It selectively obstructs passage of smaller animals and allows passage of larger or adult animals.

The gate comprises an electrode which is located within and is partially shielded by an elongated cage or housing over which a larger or adult animal may freely pass without suffering exposure to or contact with the electrode. The walls of the elongated cage have repetitive substantially transversely extending or annular-like open spaces aligned sequentially along the length of the cage. The width of these open spaces is sufficient to allow entry of a leg of predetermined smaller animals and consequent deterrent exposure to the interior electrode. To larger animals, the cage provides unsure footing, causing them to preferentially step over it.

The preferred cage is formed of bar-like material or a rod of metal spiralled or looped into a longitudinally extending helical coil.

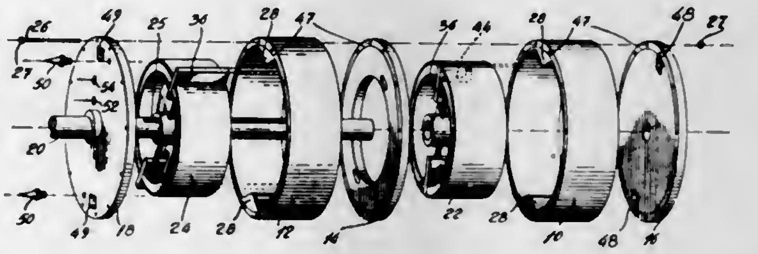


A critical feature of the invention is the elevated mounting of the cage. Means are provided for mounting it in a horizontal manner across the access opening of an animal pen and in spaced or elevated relationship above the floor surface for the access opening. Dung falling through the elevated cage onto the pen floor surface is thus readily accessible for convenient removal. A barrier wall between the cage and the pen floor surface provides an obstruction barring the escape of smaller animals underneath the elevated cage.

3,716,033
ROTARY INTERNAL COMBUSTION ENGINE

Rene Lepine, 815 Batiscan Street, Duvernay, Laval, Quebec, Canada

Filed Dec. 4, 1970, Ser. No. 95,275
Claims priority, application Canada, Jan. 26, 1970, 073126
Int. Cl. F02b *53/00*
U.S. Cl. 123—8.41 **8 Claims**



A rotary internal combustion engine comprising two aligned cylindrical housings separated by a central disc and closed by two end discs thus forming a compressor and a motor. The housings form separate stators for the compressor and the motor. A rotor is mounted coaxially within each stator and both rotors are secured to a common shaft. Each stator includes a number of inwardly extending projections and each rotor includes a number of radial blades projecting therefrom and adapted to contact the stator to form with the projections on the stator identical compression chambers in the compressor and identical combustion chambers in the motor. The blades of the rotor of the motor lead the blades of the rotor of the compressor. Conduits means are located in the central disc and cooperate with similar conduit means in the rotors for communicating the compression chambers formed between the projections and the blades of the compressor with the combustion chambers formed between the corresponding projections and the blades of the motor to transfer the medium compressed in the compression chambers of the compressor into the combustion chambers of the motor when the rotor of the compressor is at the predetermined location with respect to the stator of the compressor.

3,716,034
TEMPERATURE-DEPENDENT TIME-DELAY SWITCH

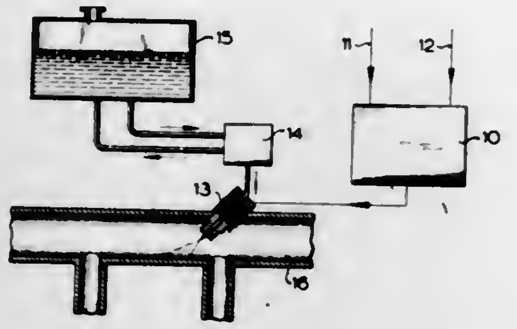
Hermann Schmid, Goeppingen, Germany, assignor to Robert Bosch, GmbH, Stuttgart, Germany

Filed Sept. 17, 1970, Ser. No. 73,040

Claims priority, application Germany, Oct. 2, 1969, P 19 49 703.1

Int. Cl. F02m *51/00*

U.S. Cl. 123—32 EA **15 Claims**



A Miller integrator is connected to the output of a circuit the output current of which is dependent on the temperature of a temperature-dependent resistor responsive to engine temperature. A switching stage which controls the current through the starting valve of the engine is turned off when the current in the Miller integrator reaches a predetermined value after a time delay that depends on the temperature of the temperature-dependent resistor.

3,716,035
FUEL INJECTION CONTROL APPARATUS FOR INTERNAL COMBUSTION ENGINES

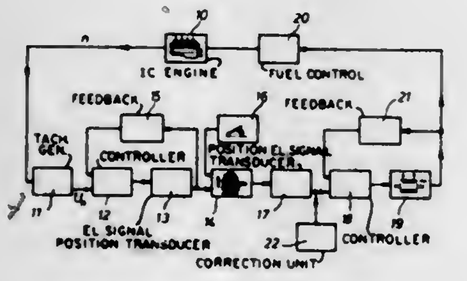
Karl-Heinz Adler, Leonberg, Heinrich Knapp, Leonberg-Silberberg, and Konrad Eckert, Stuttgart, Germany, assignors to Robert Bosch GmbH, Gerlingen-Schillerhohe, Germany

Filed Nov. 18, 1971, Ser. No. 199,946

Claims priority, application Germany, Dec. 3, 1970, P 20 59 483.6

Int. Cl. F02b *3/00*

U.S. Cl. 123—32 EA **10 Claims**



The position of a positioning member which controls the amount of fuel to be injected into an internal combustion engine is determined by deriving a signal representative of engine speed, modifying the signal to obtain an output reflecting engine characteristics, and then controlling with the modified signal the position of a cam, preferably a three-dimensional cam, the position of the cam being additionally controlled by the position of the accelerator for the engine. A signal is derived from a cam follower, and this signal is additionally affected by a correction unit correcting for changes in ambient air pressure, temperature of the engine, or ambient conditions, or the like, so that the final output controlling the setting of the positioned member which determines the amount of fuel injected will be representative of engine characteristics, the accelerator position, and ambient conditions as sensed by the correction unit.

3,716,036
VALVE ACTUATING ASSEMBLY

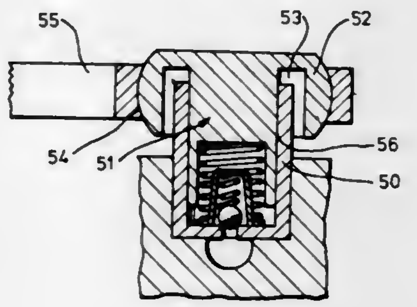
Hermann Kruger, Wolfsburg, Germany, assignor to Volkswagenwerk Aktiengesellschaft

Filed Dec. 11, 1970, Ser. No. 97,186

Claims priority, application Germany, Dec. 13, 1969, P 19 62 631.4

Int. Cl. F01l *1/18, 1/24*

U.S. Cl. 123—90.43 **1 Claim**



An internal combustion engine valve actuating assembly in which a valve actuating lever is fulcrumed on telescopically associated piston and cylinder members jointly defining an expansible chamber for reception of pressurized fluid tending to relatively extend said members. The bearing or fulcrum of the lever is located between the opposite axial ends of the slidably interengaged areas or interface of the members to minimize the creation of torque and/or tilting forces by longitudinal thrust of the lever.

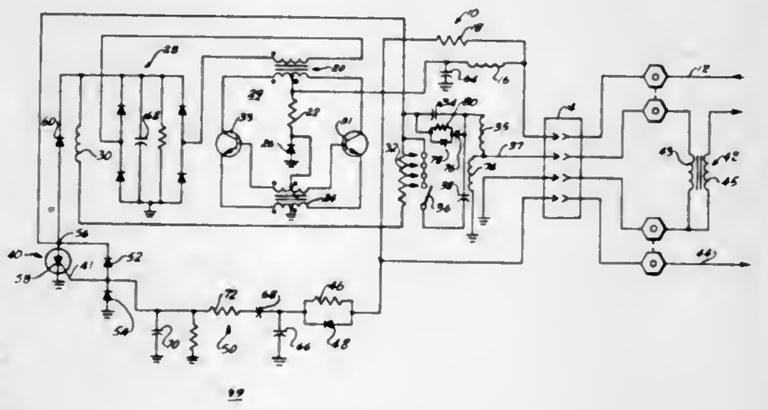
3,716,037
CAPACITIVE DISCHARGE IGNITION SYSTEM

Christopher A. Jacobs, 1328-½ West 24th Street, Los Angeles, Calif.

Filed Oct. 15, 1969, Ser. No. 866,626

Int. Cl. F02p *1/00*

U.S. Cl. 123—148 E **7 Claims**



An ignition system for internal combustion engines utilizing a capacitive discharge to supply energy to the spark plugs. Charging and discharging of the capacitor is controlled by a circuit utilizing a silicon controlled rectifier which operates in response to the contact breaker for turning on and in response to positive back-biasing for turning off. The system automatically adjusts spark characteristics to accommodate changes in engine environment and running conditions.

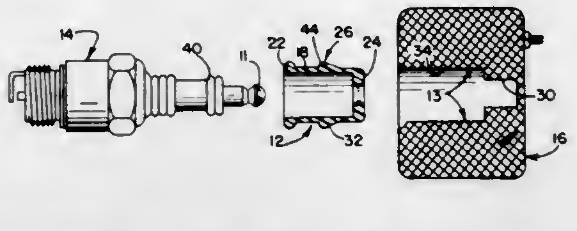
3,716,038
HIGH VOLTAGE COIL BOOT

Louis A. Bevacqua, Des Plaines, Ill., assignor to Motorola, Inc., Franklin Park, Ill.

Filed March 31, 1971, Ser. No. 129,906

Int. Cl. F02p *9/00*

U.S. Cl. 123—148 A **8 Claims**



A high voltage coil boot for connecting an ignition coil and a spark plug together comprising a tubular sleeve of resilient electrical insulating material including a collar portion intermediate the ends of the sleeve and having a ramp portion with an air vent to facilitate mounting of the coil onto the boot mounted spark plug. The portion of the collar which prevents disengagement from the coil may be either sawtooth or rounded. With the ignition coil mounted over the boot, the collar is deflected to form an inner annular lip below a spark plug rib to resist disengagement thereof. Portions on each end of the tubular sleeve provide additional sealing and shock mounting.

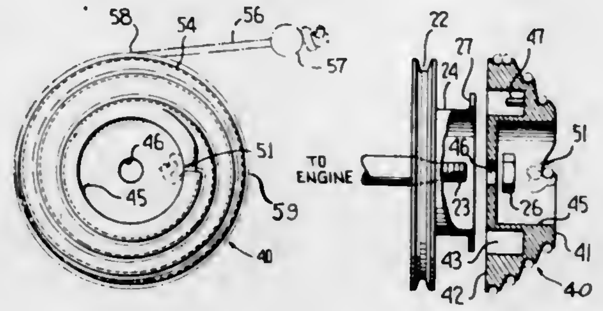
3,716,039
HAND-STARTING AUXILIARY DEVICE FOR INTERNAL COMBUSTION ENGINES

Donald R. Perry, Manderley Place, Salem, W. Va.

Continuation-in-part of Ser. No. 31,620, April 27, 1970, abandoned. This application Nov. 10, 1971, Ser. No. 197,393

Int. Cl. F02n *3/02*

U.S. Cl. 123—185 A **5 Claims**



An auxiliary device that is attached to the crankshaft of a hand-started internal combustion engine, comprising a beehive-shaped body having a base, adjacent to the engine, and a spiral groove therearound that terminates in a notch at the apex thereof within four full turns. The initial groove at the base comprises a double groove. Substantial inward progression of the groove toward the axis of the body approximately coincides with the initiation of firing by the engine, whereby high power input is sustained until firing commences, and rotational speed is increased thereafter.

3,716,040
FUEL ADDITIVE INDUCTOR FOR INTERNAL COMBUSTION ENGINE

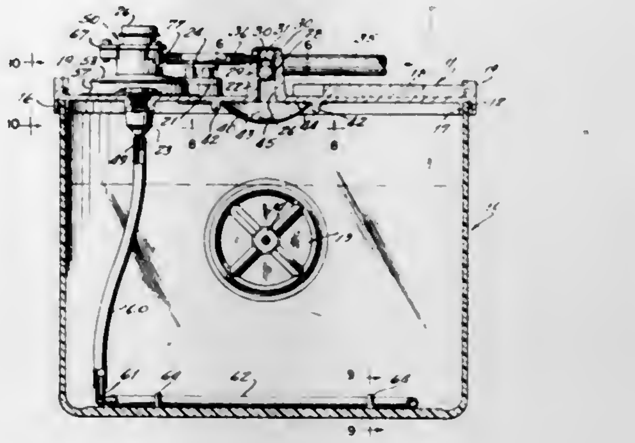
Ivey Herpin, 110 No. Ira Ave., Dallas, Tex.

Filed Aug. 21, 1970, Ser. No. 65,766

Int. Cl. F02b *47/02;* **F02m** *17/22*

U.S. Cl. 123—198 A **6 Claims**

A device for containing a liquid fuel additive, such as a water-alcohol solution, which is vaporized and induced by vacuum into the fuel system of the internal combustion engine. The device includes a container for the liquid additive composition, having an adjustable vacuum controlled air intake valve for controlling the flow of air from a manifold within the liquid to produce the vapor carried to the engine. The air is filtered before entering the container, and a baffle device prevents the flow of liquid from the container outlet.



3,716,041
GRINDSTONE DRESSING TOOL PROTECTION DEVICE

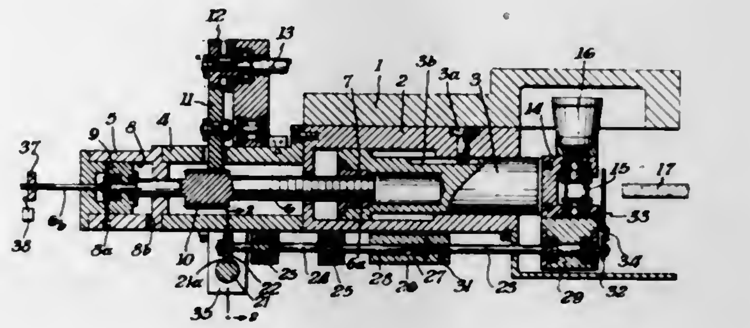
Hiroshi Ota, c/o Toyoda Koki Kabushiki Kaisha of 1,1-chome, Asahimachi, Kariya, Aichi Prefecture, Japan

Filed March 31, 1971, Ser. No. 129,876

Claims priority, application Japan, April 7, 1970, 45/29686

Int. Cl. B24b *53/00*

U.S. Cl. 125—11 **3 Claims**



Grinding machine comprises rotatably mounted grindstone and rotatable grindstone dressing device having axis of rotation parallel to axis of grindstone. Protector shield is mounted between dressing tool and grindstone for protecting dressing tool at all times except during actual dressing operation of grindstone. Motivator moves protector shield into and out of alignment with dressing tool and grindstone so that dressing tool is protected by shield when shield is positioned between tool and grindstone.

3,716,042
CONICAL RADIANT ORCHARD HEATER

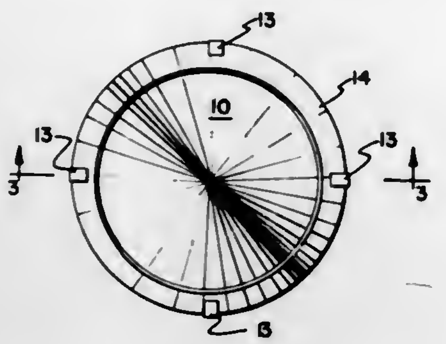
Leslie V. Smith, 112 N. 22nd St., Yakima, Wash.

Filed Jan. 25, 1971, Ser. No. 109,320

Int. Cl. A01g *13/06*

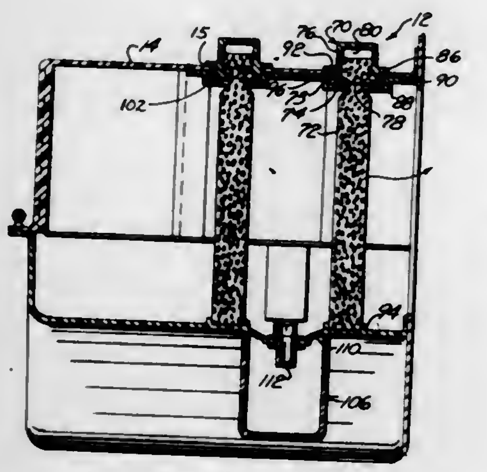
U.S. Cl. 126—59.5 **1 Claim**

The radiant orchard heater of this invention generally includes a housing having an inverted cone shaped canopy distally disposed above a substantially cone shaped base portion having legs carried thereby, and a burner assembly centrally disposed in the invert or lowermost portion of the base portion. The burner assembly comprises a pair of opposing dish-like plates spaced apart by a plurality of upstanding legs and carried by a multiplicity of posts mounted in the invert of the base portion, an elongated tube-like orifice threadably carried at one of its terminal ends by the lowermost dish-like plate having a plurality of air mixing ports distally disposed above the opposite terminal end of the orifice, and means connecting the orifice to a remote fuel supply under pressure.



3,716,043
FURNACE HUMIDIFIER

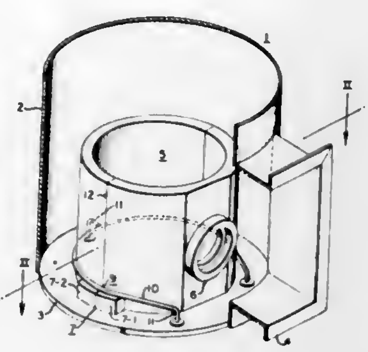
Kermit E. Chilcoat, Valley City, Ohio, assignor to Eaton Corporation, Cleveland, Ohio
Continuation-in-part of Ser. No. 858,795, Sept. 17, 1969, Pat. No. 3,612,033. This application April 19, 1971, Ser. No. 134,996
Int. Cl. F24f *3/14*
U.S. Cl. 126—113 **11 Claims**



A humidifier includes a housing in which vaporizer means for promoting vaporization of liquid is removably received. The vaporizer means includes a liquid manifold and a porous material. The liquid manifold is connected to a pump assembly by a conduit such that the manifold is supplied with a liquid thereby. The housing has an opening therein which the manifold is adapted to sealingly engage and the conduit is secured in a predetermined location with respect to that opening. The conduit and the manifold further include means for automatically sealingly engage each other in response to the manifold being inserted into sealing engagement with the opening in the housing thereby providing a fluid flow path from the conduit to the interior of said manifold. The manifold has a portion which grips the porous material such that the porosity of the material is controlled and the flow of liquid from the manifold to the porous material is regulated thereby. The manifold is configured such that the vaporizer means and manifold are removable without disassembly of the humidifier.

3,716,044
COMBUSTION CHAMBER RETAINING MEANS

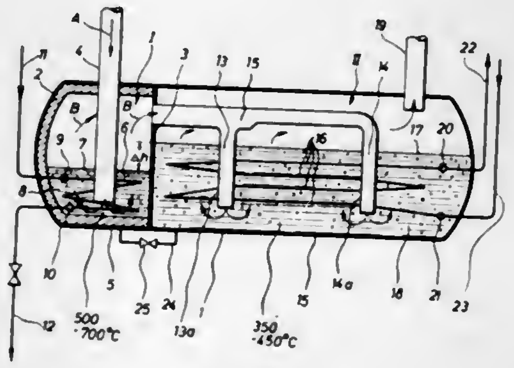
Woodrow W. Brockhurst, Cleveland, Ohio, assignor to Luxaire, Inc., Elyria, Ohio
Filed Nov. 8, 1971, Ser. No. 196,666
Int. Cl. F23m *5/00*
U.S. Cl. 126—151 **4 Claims**



This invention relates to an arrangement of retention means for positioning and retaining a combustion chamber within the external wall of a heat exchanger. The combustion chamber, which may be comprised of complementary pieces, has at least one lug projecting outwardly therefrom. In addition, the combustion chamber retention means includes an open ended ring which is attached to the base of the heat exchanger and is adapted to surround the combustion chamber and overlay the chamber lugs in order to maintain the chamber in a relatively fixed position.

3,716,045
HEAT EXCHANGER

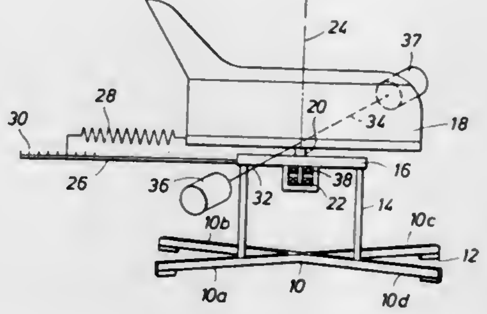
Frohmut Vollhardt, Siegen-Burbach, Germany, assignor to Siegener Aktiengesellschaft, Geisweid, Germany
Filed April 27, 1970, Ser. No. 31,928
Claims priority, application Germany, May 3, 1969, P 19 22 647.2
Int. Cl. F24h *1/20*
U.S. Cl. 126—360 A **5 Claims**



A heat exchanger for cooling hot inert gases in a metal bath while producing steam in two serially arranged chambers each containing a metal bath and heat exchanging surfaces, the arrangement being such that the gases are introduced into the respective metal bath from above and the withdrawal of the gases from said chambers is effected above the level of the metal bath while the heat absorbing medium flows through the chambers in counter-current flow to the gases, and the exchanger surfaces are so designed that the metal bath temperature in the serially first chamber is the highest.

3,716,046
APPARATUS AND METHOD FOR ROTATIONALLY INDUCING AND MEASURING NYSTAGMUS

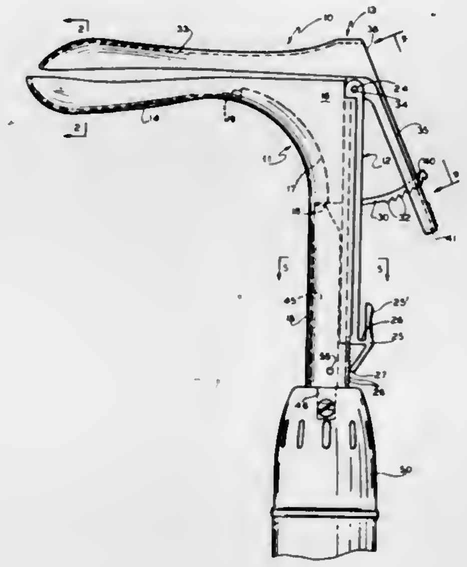
Charl E. Janeke, Brooklyn, Pretoria, Republic of South Africa, assignor to Tracoustics, Inc., Denver, Colo.
Filed April 27, 1971, Ser. No. 137,822
Int. Cl. A61b *5/04, 3/00*
U.S. Cl. 128—2.1 R **21 Claims**



Apparatus and method for rotationally inducing nystagmus in the horizontal plane, the apparatus including a chair pivotal about an upward directed axis and biased to an at-rest position, tensioning of the biasing means and adjustable lateral weights providing means for damping the periodicity of the sinusoidal chair movement.

3,716,047
DISPOSABLE LIGHT-CONDUCTIVE SPECULUM

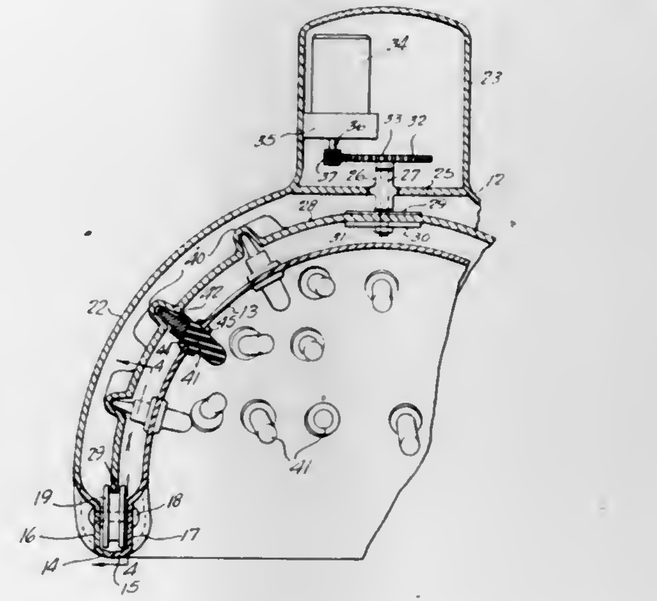
William C. Moore, Skaneateles, William S. Pilgrim, Port Byron, and Melvin R. Caldwell, Greene, N.Y., assignors to Welch Allyn Inc., Skaneateles Falls, N.Y.
Continuation-in-part of abandoned application Ser. No. 718,472, Apr. 3, 1968. This application Dec. 21, 1970, Ser. No. 99,967
Int. Cl. A61b *1/06*
U.S. Cl. 128—18 **1 Claim**



A three piece vaginal speculum including a fixed blade with integral depending hollow handle and a forked slide member carried on the handle. A pawl integral with the slide is selectively engageable with teeth on the handle. A movable blade is pivotally carried on the fork ends of the slide and has an integral lever projecting proximally. An integral slide tongue has teeth selectively engageable with an abutment on the lever. The three parts are molded plastic and a portion of the fixed blade is adapted to carry light from a source in the handle toward the blade ends.

3,716,048
HEAD MASSAGE MACHINE

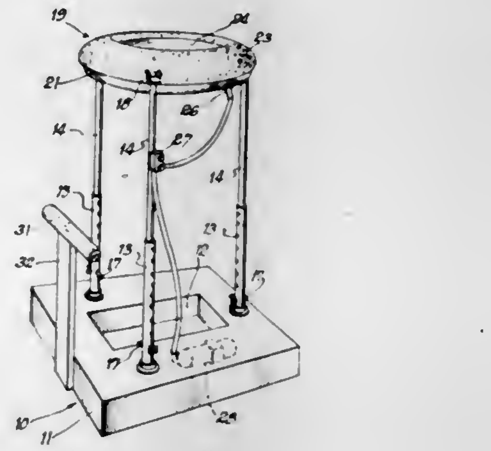
Jose Luis Alonso, Miami, Fla., assignor to Alfredo Figueras, Jr., Miami, Fla.
Filed July 30, 1971, Ser. No. 167,629
Int. Cl. A61h *7/00*
U.S. Cl. 128—49 **8 Claims**



A head massaging machine consisting of a hollow double-walled helmet having a rotary inner shell member formed with sinusoidal cam channels. Resiliently mounted in the inner wall of the helmet are inwardly projecting resilient head-massaging fingers provided with rigid follower pins engaged in the cam channels. A motor mounted in the helmet rotates the shell member, causing the massaging fingers to oscillate, to thereby provide the head-massaging action.

3,716,049
THERAPEUTIC TRACTION APPARATUS

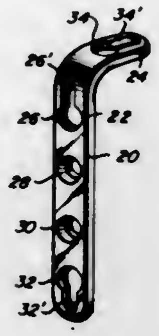
Mitchell M. Kaplan; 5240 West Cornelia Ave., Chicago, Ill.
Filed March 25, 1971, Ser. No. 127,960
Int. Cl. A61h *1/02*
U.S. Cl. 128—75 **9 Claims**



A therapeutic apparatus for applying suspension traction to a person to alleviate certain types of backaches. The apparatus includes an annular support member supporting an inflatable rubber-like tube. When the tube is in deflated condition the body of the person may be passed through the opening of the annular member. After the tube encompasses the body of the person below the armpits, the tube is inflated to engage the body in snug circumferential relation and, in such condition, the tube cooperates to support the person so that the lower portion of his body is suspended. An air compressor and controls within easy reach of the person are provided for effecting inflation or deflation of the tube.

3,716,050
OLECRANON PLATE

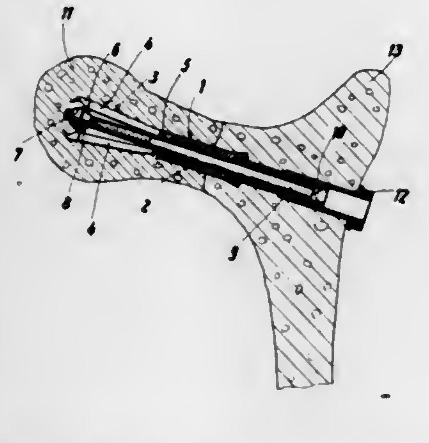
Furnie W. Johnston, 303 Whatley Dr., Dothan, Ala.
Filed Feb. 11, 1971, Ser. No. 114,454
Int. Cl. A61f *5/04*
U.S. Cl. 128—92 D **3 Claims**



A bone plate designed specifically to accomplish fixation of an olecranon fracture and consisting of a generally L-shaped plate including a first elongated flange and a second flange at one end of the first flange disposed at generally right angles relative to the first flange. The first flange includes a plurality of longitudinally spaced apertures through which bone attaching screws may be secured and the second flange also includes a single aperture. Screws or pins may be passed through the aperture in the second short flange and the adjacent aperture in the longer flange and anchored in the proximal fragment so as to fix and position the latter relative to the plate and the remaining portion of the long flange is then secured by screws or pins to the distal ulna after the fracture is compressed.

3,716,051
EXPANDIBLE CONNECTOR FOR FRACTURED BONES

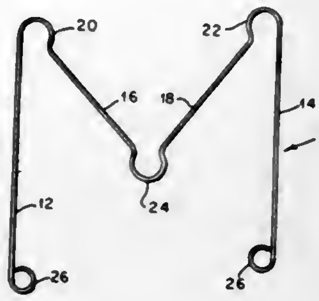
Artur Fischer, Altheimer Strasse 219, D-7241 Tumlingen, Germany
Filed Sept. 8, 1971, Ser. No. 178,598
Claims priority, application Germany, Sept. 10, 1979, P 20 44 773.8
Int. Cl. A61f *5/04*
U.S. Cl. 128—92 BB **5 Claims**



A sleeve has a trailing end portion which is to be lodged in one fragment of a fractured bone, and an open-ended expansible leading end portion which is to be lodged in the other fragment, so that the sleeve bridges the fracture. The leading end portion is subdivided by a plurality of longitudinal slots into radially expansible shanks. A threaded member extends through a central passage of the sleeve, and in this passage adjacent the leading end of the leading end portion is located an expander member an exposed end face of which faces the open end. Integral parts of the expansible shanks extend at the open end transversely of the central passage at least to a threaded bore provided in the expansion member, in which bore the threaded element engages.

3,716,052
INTRAUTERINE CONTRACEPTIVE DEVICE

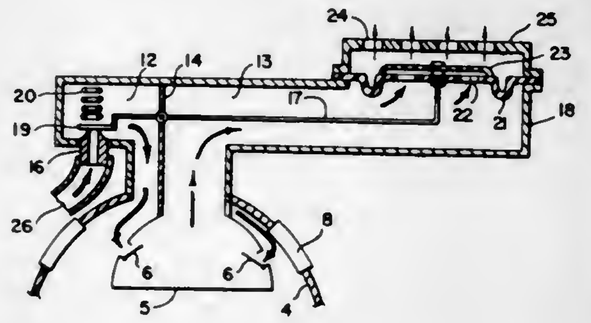
Marc E. Chaft, 8 Tripplet Road, Somerset, N.J.
Division of Ser. No. 742,984, July 5, 1968. This application April 21, 1971, Ser. No. 135,984
Int. Cl. A61f *5/46*
U.S. Cl. 128—130 **6 Claims**



An intrauterine device formed of leaf spring material. The device is in the form of an M and having enlarged rounded joints which are longitudinally offset relative one another to make possible greater compactness when compressed for insertion into the uterus.

3,716,053
BREATHING APPARATUS

Hans O. Almovist, Lidingo, Sweden, and Sigurd A. Backlund, Vasa, Finland, assignors to AGA Aktiebolag, Lidingo, Sweden
Filed March 12, 1971, Ser. No. 123,708
Claims priority, application Sweden, March 12, 1970, 3260/70
Int. Cl. A62b *7/04*
U.S. Cl. 128—142.2 **2 Claims**

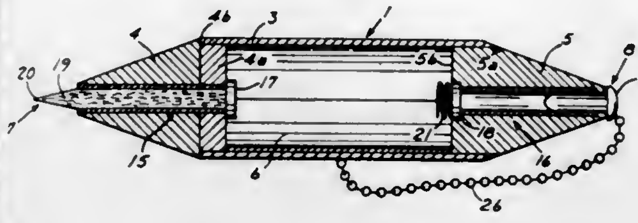


A breathing apparatus having a breathing mask which consists of an outer mask provided with eye pieces and an inner mask enclosing the mouth and the nose. A gas chamber is connected with the mask and is divided into two rooms. A first room comprises an inlet valve and is in direct gas fluid communication with the space between the outer and the inner mask, and a second room comprises an outlet valve and a membrance for controlling the inlet valve and is in direct gas fluid communication with the space inside the inner mask.

3,716,054
APPARATUS FOR APPLYING MEDICATION TO TEETH AND BODY TISSUE

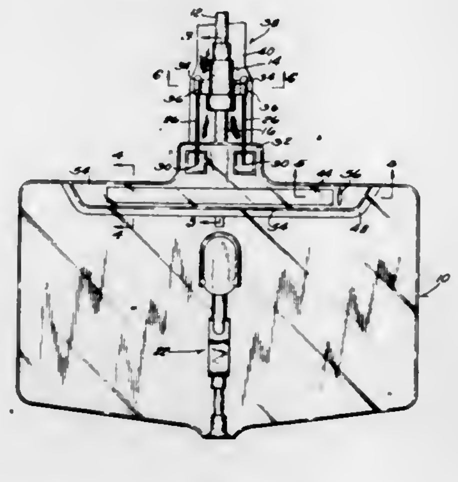
William I. Porter; Frank W. Hindsley, and James E. Hesse, all of Albuquerque, N. Mex., assignors to William A. Porter, Albuquerque, N. Mex.
Filed Aug. 11, 1970, Ser. No. 62,860
Int. Cl. A61m *5/00*
U.S. Cl. 128—172.1 **6 Claims**

Disclosed is a porous medication impregnated carrier for applying medication to a patient's teeth or body tissue. Disclosed also is structure for holding the carrier and connecting it to a D.C. voltage source, thereby to form apparatus which utilizes a small electric current to impel the medication into the patient's teeth or body tissue. The apparatus may be constructed to be portable, battery powered and for operation by the patient himself.



3,716,055
SUPPORT APPARATUS FOR A BEDSIDE DRAINAGE BAG

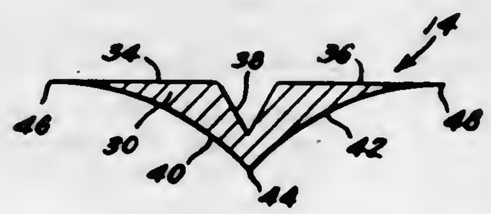
Wolfram M. Schultze, New Berlin, Wis., assignor to Plastronics, Inc., Milwaukee, Wis.
Filed Aug. 2, 1971, Ser. No. 168,209
Int. Cl. A61f *5/44*
U.S. Cl. 128—275 **8 Claims**



A support apparatus for a bedside drainage bag comprising a support member made from a length of wire bent to the desired shape and having a hook portion adapted to be hooked over a support member and a pair of vertical legs which extend through openings in the top portion of the drainage bag and then upwardly for attachment to a semi-rigid portion of the drip chamber assembly for the bag.

3,716,056
VASECTOMY PROCEDURE AND INSTRUMENT FOR USE THEREWITH

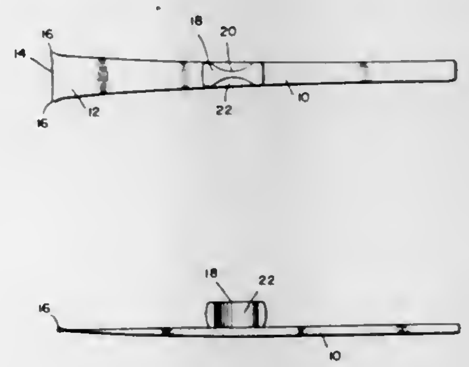
Stuart A. Brodsky, 271 Love Lane, Warwick, and Raymond A. Kelly, 19 Eddy Street, Cranston, both of R.I.
Filed Feb. 22, 1971, Ser. No. 117,579
Int. Cl. A61b *19/00*
U.S. Cl. 128—303 R **6 Claims**



A vasectomy procedure and instrument for use therewith that provides for elevating the vas deferens from the scrotal sac of the patient for severing of the vas while it is in the elevated position, the instrument having an arcuate shaped head provided with a central longitudinally extending groove that acts as a base for the severing tool during the severing operation of the vas.

3,716,057
GUARDED DORSAL OSTEOTOME WITH STABILIZER

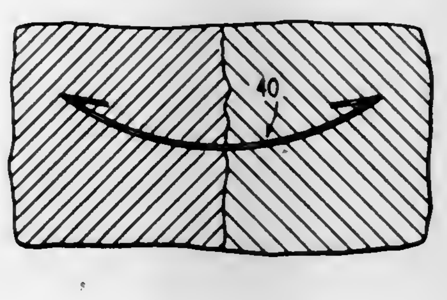
Frank F. Rubin, 795 Southern Artery, Quincy, Mass.
Continuation of Ser. No. 660,766, Aug. 15, 1967, abandoned. This application April 13, 1970, Ser. No. 28,185
Int. Cl. A61b *17/16*
U.S. Cl. 128—305 R **1 Claim**



A chisel for cutting bony tissue has a sharp cutting edge at one end. At the ends of the edge are slightly thickened and rounded elements which guard against accidental side-slips of the cutting end of the chisel. The slightly thickened ends which are called Guards also show the depth and position of the chisel in the bone. Its purpose is to prevent removing too much nasal bone as well as to prevent the chisel from cutting the skin along the edge of the chisel. A gripping element to be grasped by the thumb and a finger at an intermediate point on the chisel is effective in preventing deflection of the cutting end of the chisel by the grain of the bony tissue, which could result in removing bone from the nasal dorsum in an oblique manner.

3,716,058
BARBED SUTURE

James C. Tanner, Jr., c/o Atlanta Research Institute, Suite 705, 384 Peachtree Street N.E., Atlanta, Ga.
Filed July 17, 1970, Ser. No. 55,927
Int. Cl. A61b *17/04*
U.S. Cl. 128—337 **4 Claims**



A surgical suture useful in closing incisions, lacerations and wounds of human tissue comprising a relatively short section of rigid or flexible suture material with a return barb on both ends. The suture may be flat or arcuate and may contain single or multiple barbs on the ends. A notched and slotted needle is useful in inserting flexible sutures.

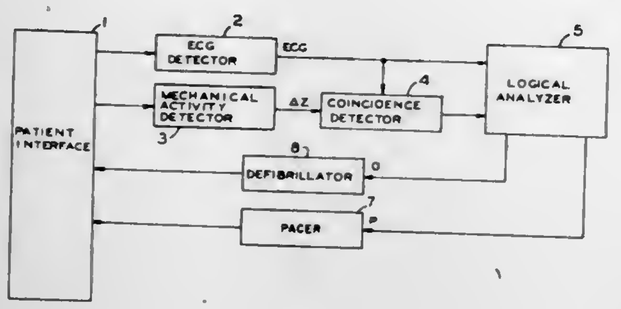
3,716,059
CARDIAC RESUSCITATOR

Warren S. Welborn, Portland, and Melvin A. Holznagel, Sherwood, both of Oreg., assignors to Cardiac Resuscitator Corporation, Portland, Oreg.

Filed Aug. 24, 1970, Ser. No. 66,189

Int. Cl. A61n *1/36*

U.S. Cl. 128—419 D **17 Claims**



A resuscitator apparatus includes means for detecting and counting the electrical and mechanical output of the heart of a suspected heart attack victim, and means for substantially immediately applying a pacing pulse or a defibrilating pulse, as required. Thus, if both electrical and mechanical outputs have low rates, or are nonexistent, a pacing pulse is automatically applied for stimulating a heart beat in time with such pulse. However, if electrical activity is present while mechanical output is absent, indicative of ventricular fibrillation, a defibrillating pulse is applied to the patient. If both electrical and mechanical activity are present, indicative of substantially normal operation. appropriate indication is given, and no corrective action is taken. The apparatus attaches to the patient for administering the correct electrical stimulation to the patient as soon as possible after the occurrence of the suspected attack.

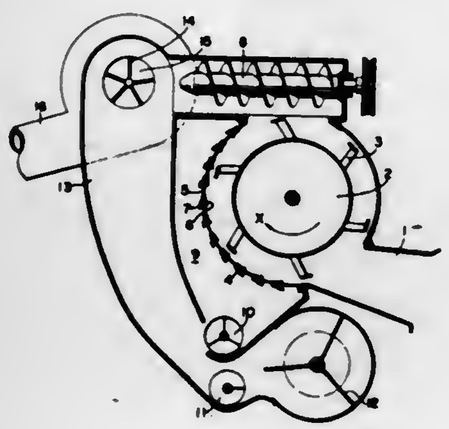
3,716,060
CONCAVE FOR TAKING OFF RACHIS BRANCH IN THRESHING MACHINE FOR COMBINED HARVESTER-THRESHERS

Miyoshi Suzue, 1343–1 Higashizaki, Nankoku-shi, Kochi-ken, Japan

Filed July 1, 1971, Ser. No. 158,950

Int. Cl. A01f *12/24*

U.S. Cl. 130—27 K **3 Claims**



This invention provides a concave for taking off rachis branch comprising the threshing blades and concave bars secured to the interior and exterior surface of the concave blank at each location between any two parallel rows of perforations provided in said concave blank, said threshing blades and said concave bars being opened to the direction opposite to the rotating direction of a threshing drum thereby to increase the threshing advantages.

3,716,061
WEIGHT BATCHING DEVICE FOR FIBROUS MATERIAL SUCH AS SHREDDED TOBACCO

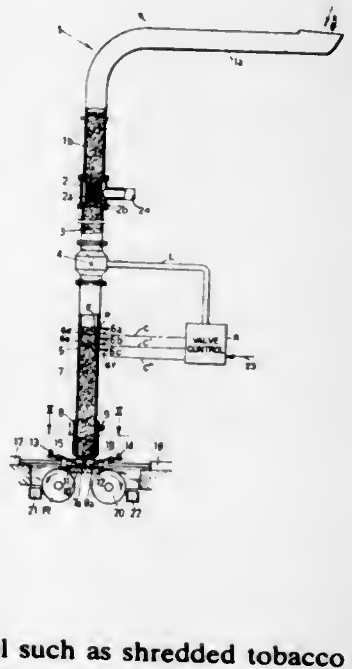
Koenraad Droogleever Fortuyn, Star Numanstraat 12, Groningen, Netherlands

Filed March 27, 1970, Ser. No. 23,181

Claims priority, application Netherlands, April 3, 1969, 6905203

Int. Cl. A24b *03/00*

U.S. Cl. 131—22 A **32 Claims**



Fibrous material such as shredded tobacco is first formed within a vertical tube into a coherent strand which possesses a uniform density and cross-sectional area as it emerges from the lower end of the tube so that the strand displays a uniform weight per unit of length. A selected length of the coherent strand is exposed below the tube and this exposed length is then evenly divided in two longitudinally divided parts which are pulled loose from the strand in opposite lateral directions to provide two substantially equal weight batches. As the batches are separated or pulled loose laterally, the coherent strand is restrained laterally just above the zone in which pulling apart is effected so that the weight of each batch is predictably related to the length of the exposed part of the strand which is below this restraining apparatus. After the batches are pulled away, the strand drops and presents a new exposed length and further batches are formed. Two or more batches may later be recombined to provide a desired-weight portion of the material.

3,716,062
CIGARETTE-MAKING MACHINES OF THE CONTINUOUS-ROD TYPE

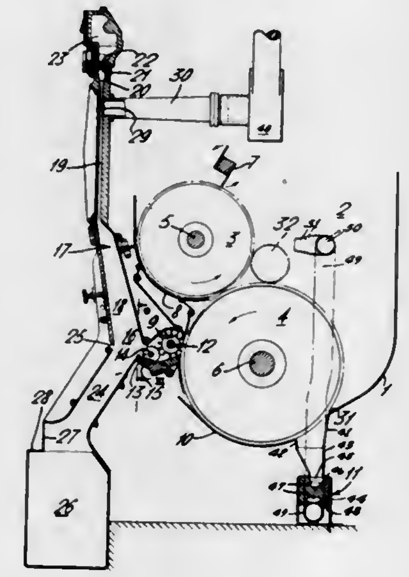
Desmond Walter Molins and Ronald Albert Ahern, London, England, and Francis Auguste Maurice Labbe, Neuilly-sur-Seine, France, assignors to Molins Limited, London, England

Continuation of application Ser. No. 770,905, Oct. 23, 1968, which is a continuation of application Ser. No. 447,368, Apr. 12, 1965, both now abandoned. This application Oct. 16, 1970, Ser. No. 81,567

Int. Cl. A24c *5/39*

U.S. Cl. 131—110 **32 Claims**

A continuous-rod cigarette-making machine of the type in which tobacco is carried by an air stream to a suction conveyor on which the tobacco filler is formed. The air stream is directed obliquely from one side into the inlet of a duct leading to the conveyor so that the air stream changes direction as it enters the duct resulting in a velocity gradient across the width of the air stream as it changes direction. A stream of tobacco is projected obliquely into the inlet and the air stream from the opposite side thereof so that the tobacco particles are first subjected to the side of the air stream having the greatest velocity resulting in improved dispersion of the tobacco particles in the air stream. The tobacco stream is fed into the air stream from a hopper having a carded drum and a refuser roll adjacent thereto, and a picker wheel to remove tobacco from the carded drum. The picker is placed adjacent to a curved plate and is arranged to advance the tobacco to a projecting roller which grips the tobacco between the trailing end portion of the plate and the periphery thereof and advances the same into the air stream at the inlet of the duct at an oblique angle thereto. Both the picker wheel and the projecting roller are covered by a second plate located opposite the curved plate, thereby forming a chamber enclosing the same.



3,716,063
SELECTIVE GAS PHASE FILTER MATERIAL

Elmer Francis Litzinger, Louisville, Ky., assignor to Brown & Williamson Tobacco Corporation, Louisville, Ky.

Filed Sept. 25, 1970, Ser. No. 75,773

Int. Cl. A24b *15/02;* **A24d** *1/06*

U.S. Cl. 131—267 **9 Claims**

An improved tobacco smoke filter material is formed from a porous particulate carrier impregnated with an additive having an affinity for volatile smoke acids and aldehydes, such as buffered polyethyleneimine, wherein the carrier particles have a pore diameter from 0.1 to 2.0 microns, a surface area of from about 1 to 15 square meters per gram, and a pore volume no less than about 0.3 cubic centimeter per gram.

3,716,064
FUEL INJECTION SYSTEM WITH TEMPERATURE-COMPENSATED CONTROL VALVE

Walter Bosch, Hohenacker, and Reinhard Schwartz, Stuttgart-Sillenbuch, both of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

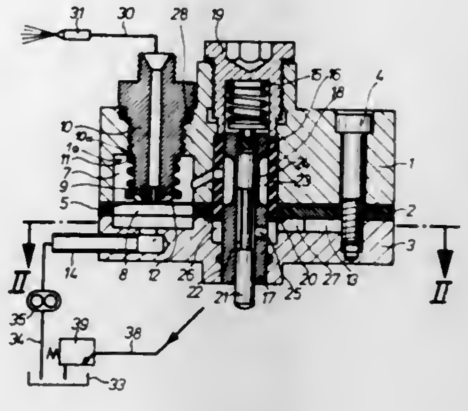
Filed Jan. 27, 1971, Ser. No. 110,051

Claims priority, application Germany, Jan. 12, 1970, P 20 06 305.2

Int. Cl. G05d *7/01*

U.S. Cl. 137—501 **3 Claims**

In a fuel distributor — in which the fuel to be delivered to a cylinder of an internal combustion engine is dosed by a metering valve — in order to maintain at a constant value the difference between the fuel pressure upstream of and downstream of the metering valve, there is provided a plurality of control valves (one for each cylinder) each having a flat seat whose flow passage section is variable by a movable membrane. One side of said membrane is exposed to the



downstream fuel pressure urging said membrane into a control valve opening direction, the other side of said membrane is exposed to the upstream fuel pressure urging said membrane into a control valve closing direction. The membrane is so constructed that temperature fluctuations do not affect its tension.

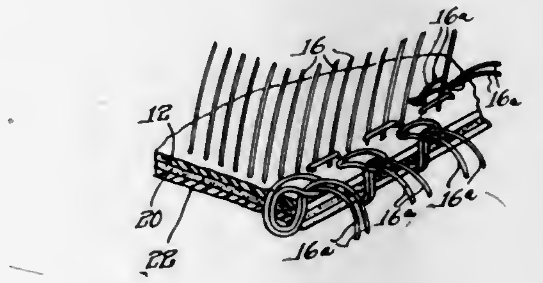
3,716,065
HAIRPIECE

Paul V. Finamore, Chicago, Ill., assignor to World of Wigs Mfg. Co. Inc., Chicago, Ill.

Filed Sept. 25, 1970, Ser. No. 75,604

Int. Cl. A41g *3/00*

U.S. Cl. 132—53 **1 Claim**



The present invention relates generally to improvements to hairpieces and more particularly to hairpieces having a novel arrangement of hair strands associated with a flexible sheet member. The embodiment of the invention disclosed herein includes a flexible or pliable sheet member having a predetermined contour and peripheral dimension conforming with a given surface area of a user's head. A plurality of adjacently positioned hairstrands are associated with the outer surface of the sheet member which, in the aggregate, afford the external appearance of natural hair. Each strand comprises a given length having sections penetrating the sheet at adjacently spaced intervals, the intermediate portion of each strand adhesively secured to the undersurface of the sheet member.

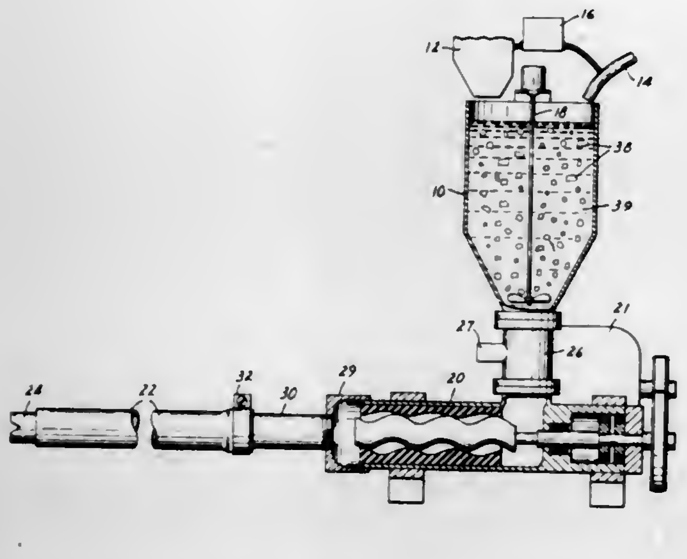
3,716,066
AIRCRAFT CLEANING

John W. Currier; Richard T. Gadbois, and Arthur G. Wilde, all of St. Paul., Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed June 2, 1970, Ser. No. 42,833

Int. Cl. B08b *7/00*

U.S. Cl. 134—7 **5 Claims**



Apparatus and method for cleaning the exterior surface of aircraft using a cleaning solution and small, light, resilient, liquid-absorbent bodies that are insoluble in the cleaning solution which are mixed in a chamber in a controlled volume ratio to produce a uniform suspension. The uniform suspension is moved from the mixing chamber and is impelled from a nozzle at a controlled velocity to impact against and clean the exterior surface of the aircraft spaced from the nozzle.

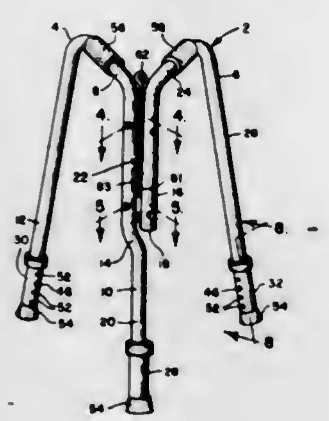
3,716,067
INVALID SUPPORT

Folke E. Skoog, 1722 West Chestnut Street, Glenview, Ill.

Filed April 20, 1971, Ser. No. 135,582

Int. Cl. A45b *1/00*

U.S. Cl. 135—45 A **8 Claims**



A foldable three-legged invalid support having a pair of U-shaped side frames, the forward legs of the side frames being pivotally interconnected to form a V and the connection having a yieldable frictional resistance which permits controlled adjustment of the spacing of the frames to the comfort of the user and stabilizes the structure.

ERRATUM

For Class 137—67 see:
Patent No. 3,716,064

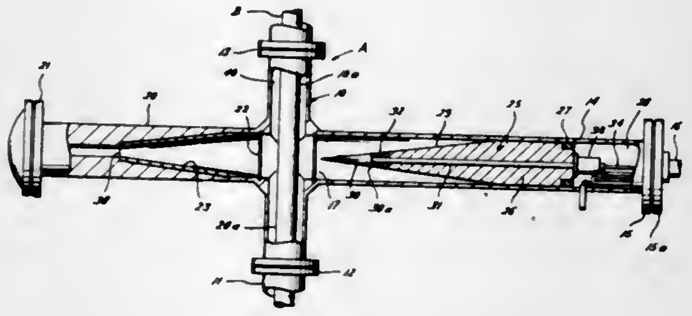
3,716,068
SURFACE CONTROLLED BLOWOUT ARRESTER

Frank F. Addison, Drawer 3743, Lafayette, La.

Filed June 11, 1971, Ser. No. 152,111

Int. Cl. E21b *29/00*

U.S. Cl. 137—67 **5 Claims**



A valve apparatus is provided for cutting into and deforming a flow line such that flow therethrough is arrested.

3,716,069
VALVES

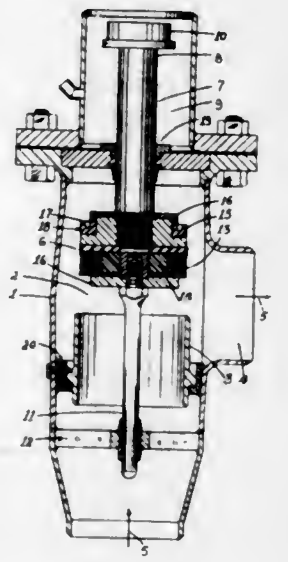
Robin Francis Norman Reynolds, Sandton, Transvaal, South Africa, assignor to African Wire Ropes Limited, Johannesburg, Transvaal, South Africa

Filed Dec. 8, 1970, Ser. No. 96,205

Claims priority, application South Africa, Dec. 10, 1969, 698598

Int. Cl. F16k *15/06*

U.S. Cl. 137—244 **8 Claims**



A valve closure member formed as a piston in a sleeve with the valve being lifted out of the sleeve to enable slurry to pass, the piston being supplied with a special wiper provided to clean the sleeve on reciprocation therein with the valve also being guided back into the sleeve on closure. A peripheral track is provided around the sleeve to act as a trap for pebbles passing through the sleeve.

3,716,070
NON-RETURN VALVE DEVICES

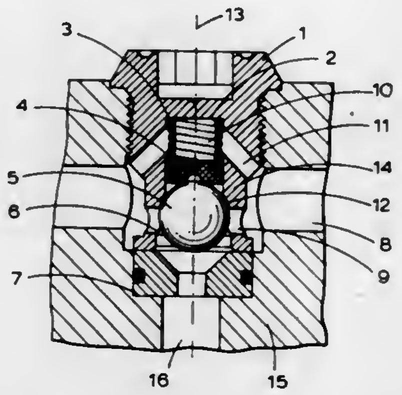
Bruno Klimkiewicz, 4628 Altlunen, and Walter Weirich, Dortmund, both of Germany, assignors to Gewerkschaft Eisenhutte Westfalia, Wethmar bei Lunen, Westfalia, Germany

Filed Dec. 31, 1970, Ser. No. 103,093

Claims priority, application Germany, March 14, 1970, P 20 12 297.8

Int. Cl. F16k *17/34*

U.S. Cl. 137—484.2 **6 Claims**



A non-return valve device with a detachable control member having a displaceable valve ball biased by a spring disposed in a blind bore against a seating to close radial cross bores communicating with main outlet passages. The seating has a through bore permitting pressure fluid to pass from an inlet passage to the outlet passages via the cross bores thereby urging the valve ball against the spring force. Relief bores extend from the blind bore to the outlet bores, and are inclined in relation to the axis of the blind bore and the clearance between the exterior of the valve ball and the guiding surface of the member is made sufficiently small so that fluid flow through the cross bores and the outlet passages will established suction in the relief bores to urge the valve ball against the spring force and remove the latter from the fluid flow path.

3,716,071
FLUIDIC LOGIC DEVICE

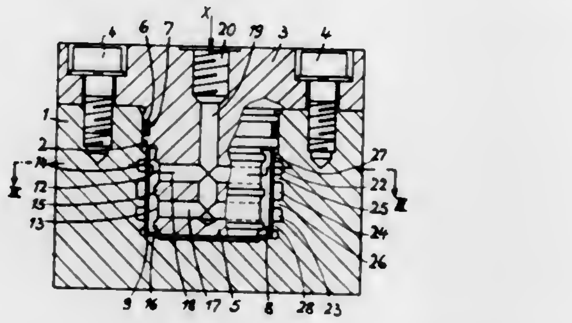
Walter Passera, Stuttgart, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

Filed Oct. 7, 1971, Ser. No. 187,431

Claims priority, application Germany, Oct. 9, 1970, P 20 49 612.2

Int. Cl. F16k *7/17*

U.S. Cl. 137—594 **20 Claims**



A pneumatically or hydraulically operated fluidic logic device wherein a housing defines a ring-shaped chamber which communicates with fluid-supplying and fluid-discharging first and second passages as well as with a third passage for admission of a control fluid stream at a variable pressure. An elastically deformable split ring is received in the chamber with freedom of radial movement to seal the first and second passages from each other in response to a rise of fluid pressure in the third passage. The third passage has one or more channels machined into the surface which surrounds or is surrounded by the chamber, and each of the first and second passages has one or more channels machined into the surface which is surrounded by or surrounds the chamber. The split ring can be expanded to seal the first and second passages from each other if the channels of these passages are provided in the surface which surrounds the chamber, and the split ring is caused to contract and to thereby seal the first and second passages from each other if the channels of the first and second passages are provided in the surface which is surrounded by the chamber.

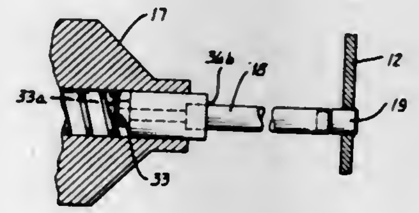
3,716,072
PRESSURE EQUALIZING VALVE

Dick M. Criswell, 529 Barbee Way, Danville, Ky.

Filed May 24, 1971, Ser. No. 146,185

Int. Cl. F16k *31/12*

U.S. Cl. 137—510 **5 Claims**



Disclosed is an assembly, including a filter and pressure equalizing valve, for relieving the interior of a burial casket of moisture and odor. The valve utilizes a thin, resilient disc or wafer, preferably formed of polyethylene, which is flexed into a substantially concavo-convex configuration to unseal an outlet port when a relatively small pressure differential (of the order of one-half inch water column) exists on the opposite sides of the disc.

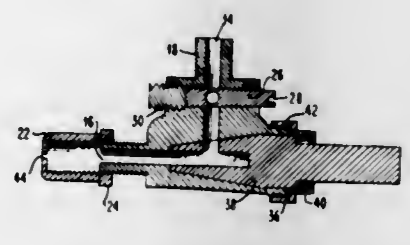
3,716,073
ROTARY PLUG SHUT-OFF VALVE ASSEMBLY

H. Alan Terwilliger, 30 Arlmont St.,
Kingston, N.Y. 12401

Continuation-in-part of application Ser. No. 501,873, Oct. 22, 1965. This application Apr. 7, 1969, Ser. No. 824,339

Int. Cl. F16k *43/00*

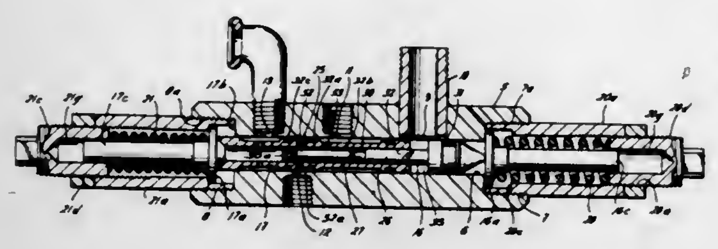
U.S. Cl. 137—613 **1 Claim**



A combined rotary plug shut-off valve includes a rotary plug section having inlet and outlet port sections at opposite ends of a flow passage for supplying domestic gas to a burner unit. A flow limiting device having an opening adapted to register with the flow passage of the valve is mounted between the inlet and outlet port sections, and adapted for rotational adjustment with respect to the flow passage for obstructing the gas flow through the rotary plug to permit servicing of said rotary plug or its associated burner unit without retarding the main gas supply.

3,716,074
COMBINATION HIGH AND LOW PRESSURE CUTOFF CONTROL VALVE

Clifford M. Peters, 16 Rockwall Drive,
Longview, Tex. 75601
Filed Sept. 7, 1971, Ser. No. 178,062
Int. Cl. F16k *11/07, 11/10*
U.S. Cl. 137—625.6 **3 Claims**



A valve for shutting off a fluid medium in response to pressure variations in a source exceeding a predetermined maximum and falling below a predetermined minimum wherein a longitudinal bore in the body communicates with an opening, inlet, and outlets in the valve body. A pair of valve means is slidably mounted in the longitudinal body bore with one of the pair of valve means being slidably and telescopically received within a bore in the other pair of valve means, and there are seal means for sealing between the valve means and for sealing between the valve means and the bore in the body on each side of the opening to form a chamber within which the pressure from the source is received to act on the pair of valve means to maintain them in a predetermined telescoped relation when the pressure in the source is between the predetermined maximum and minimum.

The valve means are provided with suitable passages and cooperating seal means so that when they are in the predetermined telescoped relation, the fluid medium passes through the valve from the inlet to one of the outlets. The valve means are provided with additional seal means and ports, or passages, so that when the pressure in the flow conduit either exceeds the predetermined maximum or falls below the predetermined minimum, the valve means move to a different telescoped relation so that the fluid pressure medium, instead of being discharged from the inlet to the outlet, is shut off in the valve body, and the outlet which was receiving the fluid pressure medium is connected to discharge to atmosphere through another outlet in the valve body. Adjustable means are provided for urging the pair of valve means to predetermined telescoped relation and for varying the predetermined relation.

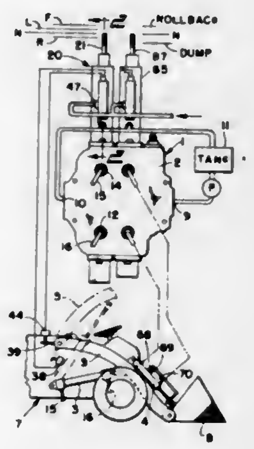
3,716,075
POWER ASSIST MECHANISM FOR FLUID CONTROL VALVES

John C. Paul, Richmond Heights, Ohio, assignor to Parker-Hannifin Corporation, Cleveland, Ohio
Filed Oct. 12, 1971, Ser. No. 188,218
Int. Cl. F16k *11/00*
U.S. Cl. 137—625.63 **9 Claims**

A power (hydraulic or pneumatic) assist mechanism for a spool valve assembly and the like characterized in that a manually actuated control valve member has a lost motion spring connection with the spool to selectively vent either side of a double acting fluid motor whose piston is connected to the spool so that fluid pressure in the unvented side of the motor is effective to move the piston and spool in the same direction as the movement of the control valve member. The invention is further characterized in the provision of a shuttle valve member which is guided in the cylinder housing of the power assist mechanism in such manner as to define annular orifices of uniform radial width between the ends of said shuttle valve member and a surrounding bore in the cylinder housing, the differential pressure drops across said orifices due to fluid flowing to the vented and unvented sides of said power assist motor being effective to move the shuttle valve member to a position restricting continued flow to the vented side of said motor.

Another characterizing feature of this invention is the provision of a power assist mechanism having a portative electromagnetic means operatively connected to the spool so as to constitute a latch or detent to retain the spool in a selected operating position until released either by operation of the aforesaid manually actuated control valve member or by de-energization of said electromagnet means.

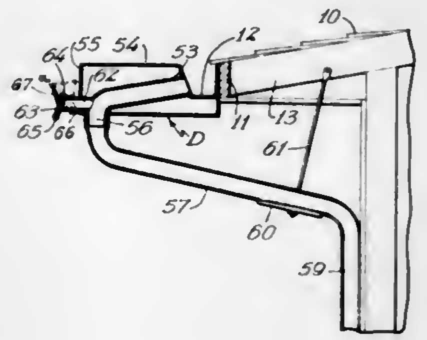
Yet another characterizing feature is the provision of a power assist mechanism having means which imparts an added load on the manually actuated control valve member to provide a sensory indication of an intermediate operating position of the spool from which the actuation of the control valve member and spool may be continued under such added load to another operating position whereat said control valve member and spool are retained by electromagnetic means until released as aforesaid.



Yet another characterizing feature is that in the case of a pneumatic power assist mechanism check valves are provided between the aforesaid shuttle valve and the chambers on opposite sides of the power assist piston, and a stabilizing orifice intercommunicates said chambers to minimize fluttering of the power assist assist piston and the spool.

3,716,076
RAIN TROUGH DEVICES

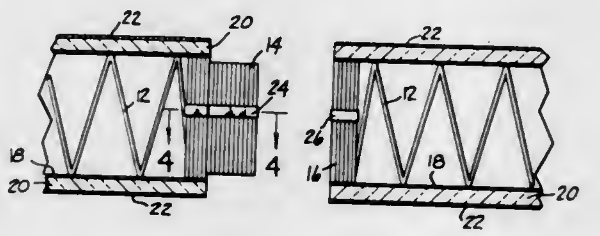
Alvin W. Franzmeier, 1042 Jenks Ave., St. Paul, Minn.
Filed Dec. 7, 1970, Ser. No. 95,610
Int. Cl. E03b *7/12;* **F16l** *53/00*
U.S. Cl. 138—32 **11 Claims**



A drain-spout is provided which communicates with the rain gutter of a building from the outside wall thereof with the ain gutter near the upper portion thereof as well as the bot-om, in order to drain water from the surface of the rain utter. The down-spout extends angularly and downwardly to eliver the water to a point spaced outwardly from the rain utter so as to prevent the dripping of water onto any sidewalk eneath the eaves. The down-spout is enclosed in an outer en-losure which is heated by the sun rays or by auxiliary means.

3,716,077
FLEXIBLE DUCT CONNECTION

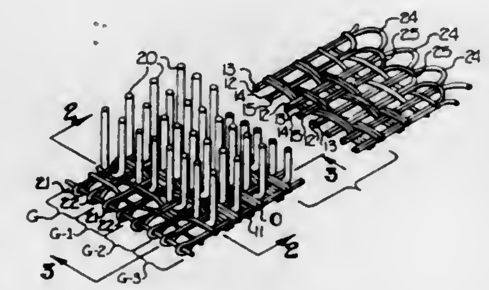
ames Webster Sherman and Terry Allen Jenkins, Toledo, Ohio, assignors to Johns-Manville Corporation, New York, N.Y.
Filed Sept. 21, 1970, Ser. No. 73,754
Int. Cl. F16l *11/10, 21/00*
.S. Cl. 138—134 **3 Claims**



A flexible insulated air duct formed by wrapping blanket insulation about a helically wound wire-like elon-gate tubular skeleton wherein the opposite ends of the elical windings are closed wound and secured together o form rigid collars of different diameters to define male nd female connections whereby sections of such duct may be axially connected one to another.

3,716,078
WOVEN PILE FABRICS

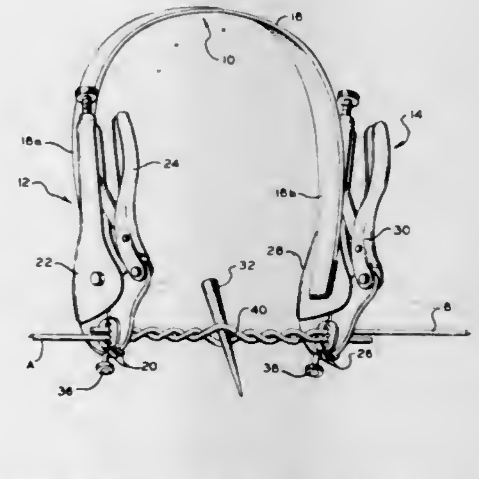
Eugene F. Clark, deceased, by Ursa W. Clark, heir, Eden, N.C., assignor to Fieldcrest Mills, Inc., Eden, N.C.
Filed Nov. 3, 1971, Ser. No. 195,293
Int. Cl. D03d *27/16*
U.S. Cl. 139—399 **10 Claims**



A pile fabric having a base formed of ground warps rranged in a pair of banks interwoven with successive roups of wefts, and each group of wefts including a plu-ality of pairs of wefts. The respective banks of warps ex-end in opposition to each other successively over and nder the successive groups of wefts with the warps cross-ng each other only at the juncture of adjacent groups of wefts, and weftwise rows of substantially U-shaped pile tufts are looped beneath only one pair of wefts in each respective group.

3,716,079
WIRE SPLICING DEVICE

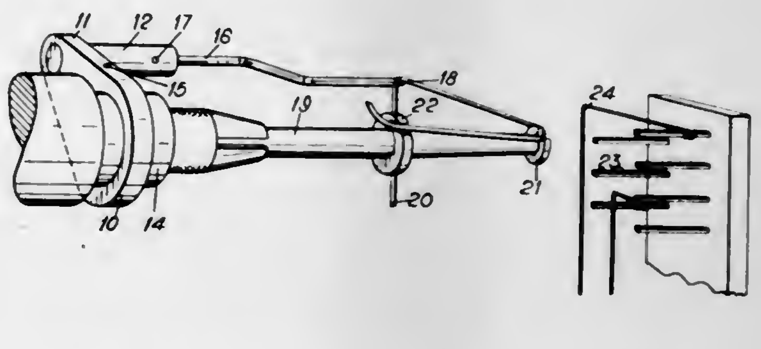
Frank J. Marshall, Sullivan Road, R.D. 2,
Oneida, N.Y. 13421
Filed Sept. 20, 1971, Ser. No. 181,665
Int. Cl. B21f *15/04*
U.S. Cl. 140—120 **8 Claims**



A device for twisting together the ends of two pieces of relatively heavy wire as in repairing broken wires in a fence. The device comprises a U-shaped spring metal strap on the ends of which are mounted a pair of locking wrenches. The ends of the two wires to be twisted together or spliced are locked in the jaws of both wrenches in overlapping side-by-side relation. A tool such as a marlin spike is then inserted between the wires, approximately midway between the wrench jaws, and rotated to twist the wires together. As the twisting is effected, the locking wrenches are drawn closer together which causes the spring strap to exert an opposite, tension force on the wires whereby a very tight union of the wires is achieved.

3,716,080
WIRING DRESSING TOOL

Ernest Victor Scaddan, London, and Alan Clifford Heard, Hoddesden, both of England, assignors to International Standard Electric Corporation, New York, N.Y.
Filed Feb. 22, 1971, Ser. No. 117,363
Int. Cl. B21f *15/00*
U.S. Cl. 140—124 **7 Claims**



A dressing tool for attachment to a wire-wrapping gun forms a bend of predetermined angularity in the wire. The tool is mounted on an eccentric collar fitted onto the wire-wrap gun shank to extend parallel to the wrapping bit.

3,716,081

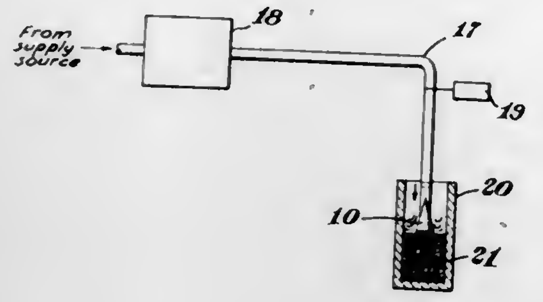
APPARATUS AND METHOD FOR TAMPING PARTICULATE MATERIALS INTO A CONTAINER

Gerald Landreville, Virginia, Minn., assignor to The Dow Chemical Company, Midland, Mich.

Filed March 29, 1971, Ser. No. 128,976

Int. Cl. B65b *1/04, 3/04*

U.S. Cl. 141—12 **10 Claims**



An apparatus is provided which when connected to the discharge end of a delivery hose for delivering free flowing particulate materials and reciprocated in a generally vertical direction during delivery of such materials compacts the materials into a container. The apparatus comprises a butt having an upper portion and a base, at least a portion of said upper portion decreasing in cross-sectional area from bottom to top, and a support means for attaching and aligning the butt below the discharge end of the delivery conduit so that the top of the butt faces the opening, and the longitudinal axis of the body is substantially in align with the longitudinal axis of the discharge end of the delivery conduit.

3,716,082

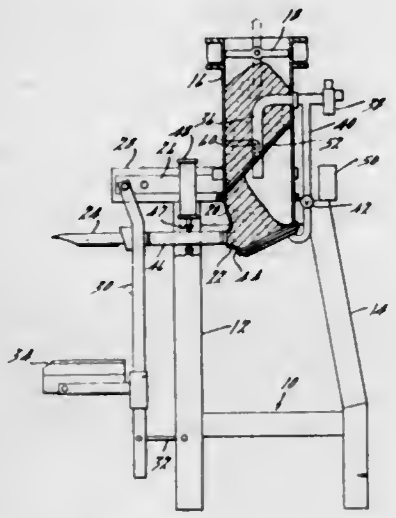
PRESSURE TYPE BAG FILLING MACHINE

John F. Green, Red Oak, Iowa, assignor to Douglas & Lomason Company, Detroit, Mich.

Filed Jan. 22, 1971, Ser. No. 108,812

Int. Cl. B65b *1/16, 1/16*

U.S. Cl. 141—68 **1 Claim**



A pressure type bag filling machine in which a pressure hopper has a downwardly directed air tube supplied with air under pressure to effect the flow of granular material from the hopper through a discharge nozzle and into a valve bag until the bag is filled with a predetermined weight of product. The air tube extends through an inclined orifice plate which extends across the hopper and allows the product to accumulate in a small pile below the orifice plate over the discharge nozzle so that the pressure air can more easily initiate motion of the product and maintain substantially uniform flow of product through the nozzle, resulting in more rapid operation and more accurate weighing.

3,716,083

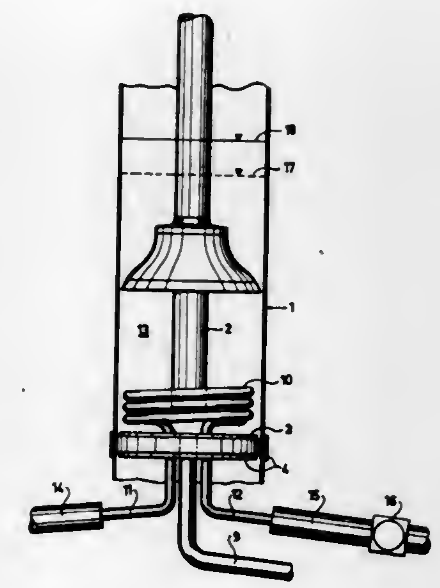
EQUIPMENT FOR CLEANSING AND/OR STERILISING THE FILLER TUBE IN PACKAGING MACHINES

Alex Tuma, Loddekopinge, and Jan Ingvar Hansson, Lomma, Sweden, assignors to AB Tetra Pak, Lund, Sweden

Original application Feb. 17, 1969, Ser. No. 799,560. Divided and this application Mar. 30, 1971, Ser. No. 129,644

Int. Cl. B65b *1/24, 3/04;* **B67c** *3/00*

U.S. Cl. 141—90 **5 Claims**



Apparatus for washing the filler tube of a liquid packaging machine with a washing agent including means for closing one end of the packaging tube to form a space thereabove and means for introducing a washing agent into the space and for heating the agent so as to cleanse and/or sterilize the filler tube extending into the packaging tube.

3,716,084

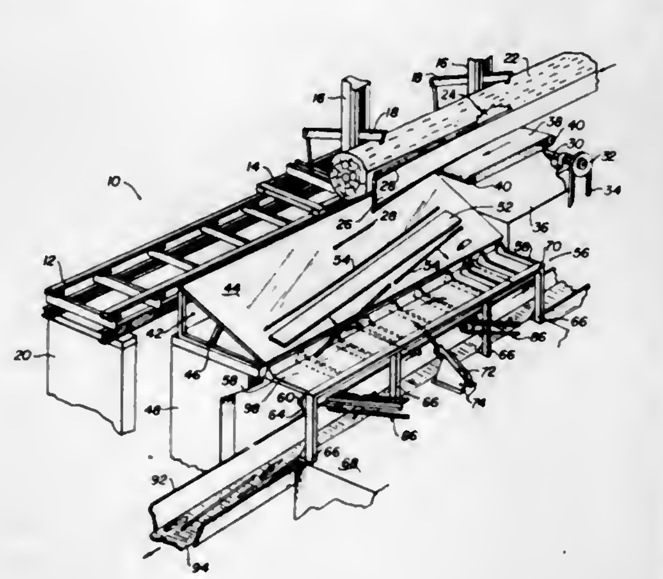
SAWMILL OFF BEARER

George W. Hartzell, and Robert J. Gunnerman, both of Piqua, Ohio, assignors to Hartzell Industries, Inc., Piqua, Ohio

Filed Feb. 13, 1970, Ser. No. 11,067

Int. Cl. B27b *31/08*

U.S. Cl. 143—157 D **9 Claims**



As boards are being cut from a log, they are moved over an inclined slide. When fully cut away from the log, the boards ll down the slide away from the cutting area. To insure that onger boards are moved away from the saw blade a horizontal helf may be mounted on the slide for temporarily supporting he leading end of the board. As the trailing end of the board is ut free, it falls down the slide and pulls the leading end off the helf.

The slide is shown in association with two board handling ystems. In one system a stop and dump assembly including rms for receiving the freshly cut board is mounted at the base f the slide. The arms are movable for also stopping the boards n the slide and for dumping trash therefrom.

The other system includes a screw roll conveyor mounted at he base of the slide adapted to convey cut boards longitudinally of the screw roll conveyor and parallel to the travel of e log from which the board is cut. Immediately adjacent the rew roll conveyor is a chain conveyor for conveying boards a direction perpendicular to the movement of the log. To osition the boards on the chain conveyor, one of the screw olls remote from the saw blade is moved to an upper position stop boards from moving longitudinally of the screw roll onveyor. The raised screw roll is still rotated so that it, along ith the other screw rolls, tends to cam or convey the freshly ut boards in a direction perpendicular to the rotation of the olls and onto the chain conveyor.

3,716,085

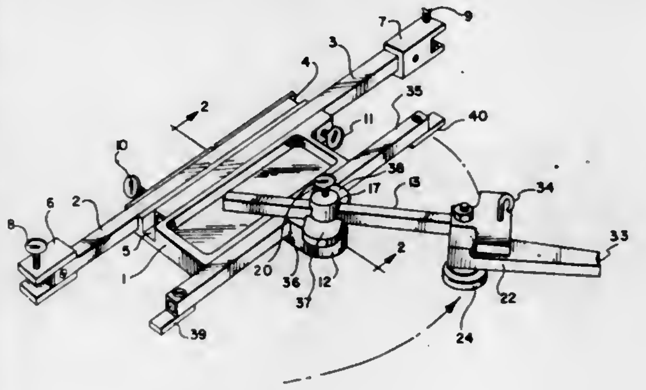
ROUTER TEMPLATE ATTACHMENT

lbert L. Wing, 1220 McKemy Street, Tempe, Ariz.

Filed Sept. 20, 1971, Ser. No. 182,009

Int. Cl. B27c *5/00*

.S. Cl. 144—144 R **2 Claims**



A router template attachment is provided for attachment to nd use in conjunction with a known type of router template r the purpose of providing the capability for routing arcuate attern portions. Adjustable arms extend outwardly for securg the attachment to the router template frame. A router support arm is fixed for pivotal movement between positions ong an arcuate path of radius determined by sliding the uter support arm over its pivot point at which it is fixed by eans of a thumbscrew or the like. Circumferential travel is mited to a maximum of 180° by means of a stop member hich slides from side to side to intercept the router support m.

3,716,086

METHOD OF MANUFACTURING TOOTHPICKS

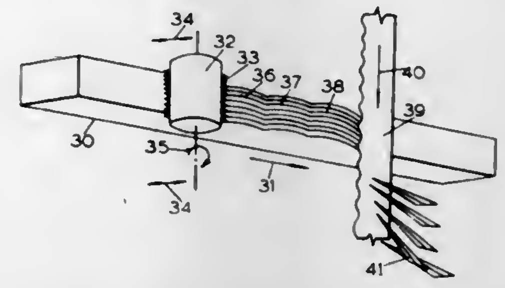
olf Barman, Olav Kyrreagk 45, Bergen, Norway

Division of Ser. No. 736,316, June 12, 1968, Pat. No. 3,563,253. This application Sept. 25, 1970, Ser. No. 75,479

Int. Cl. B27l *9/00*

S. Cl. 144—326 R **17 Claims**

A toothpick of essentially triangular cross-section and pered at both ends, one or both of the apex edge and base face thereof having an outwardly curved contour. A process for manufacturing said toothpicks involving forming V-shaped



grooves of the requisite shape in a raw material and separating the toothpicks therefrom.

3,716,087

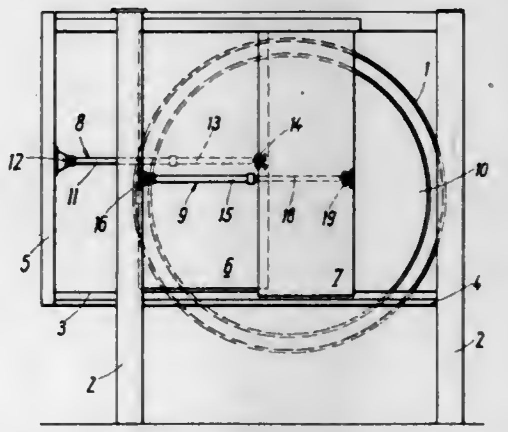
LOCK GATE OF THE REMOVAL END OF A BARKING DRUM

Rolf Erik Tuuha, Lansipuisto 20 C, Pori, Finland

Filed Nov. 6, 1970, Ser. No. 87,372

Int. Cl. B27l *1/04*

U.S. Cl. 144—208 B **8 Claims**



A foldable lock gate for the removal end of a barking drum wherein two gate segments are mounted on a frame structure to be slidable relative to each other. The movement is effected by cylinder piston devices attached to each gate segment and to the frame structure.

3,716,088

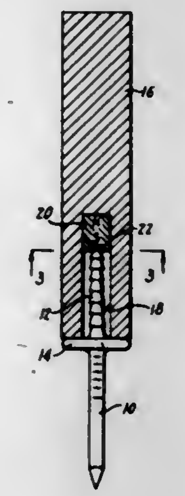
NAIL DRIVER

Virgil E. Gray, 1033 Haverhill Street, West Sacramento, Calif.

Filed March 9, 1971, Ser. No. 122,375

Int. Cl. B25c *3/00*

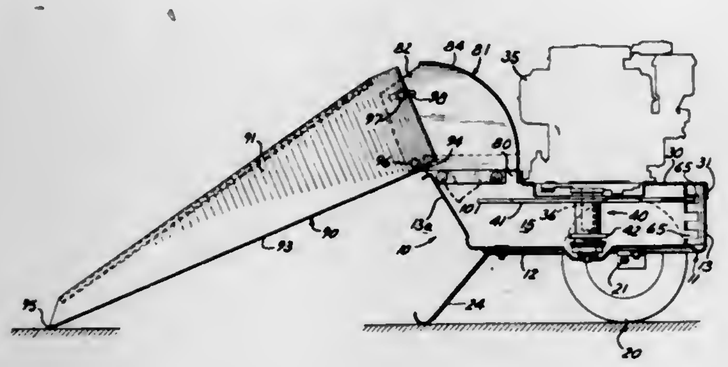
U.S. Cl. 145—46 **1 Claim**



A plain portion and a knurled portion extending from opposite sides of a washer with the knurled portion magnetically secured within the bore of a rod.

3,716,089
FEEDING ARRANGEMENT FOR SHREDDING AND BAGGING DEVICE

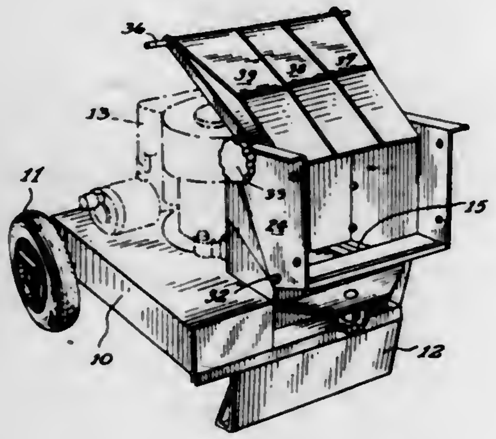
James R. Bateman, 1905 W. Court St., Kankakee, Ill.
Filed Oct. 7, 1971, Ser. No. 187,417
Int. Cl. B26d *4/28;* **B02c** *18/00*
U.S. Cl. 146—192 **7 Claims**



A device for shredding and bagging leaves and other yard and garden waste which includes a chamber having a horizontal rotary blade and arranged close to the ground with an inlet opening at the top and a conduit at the side for discharge of the shredded material. Communicating with the inlet opening is a flaring ramp which extends downwardly into ground engagement at a shallow angle so that leaves and the like may be swept from the ground directly into the inlet opening. A shield in the form of a small housing open at the front communicates with the ramp to prevent direct vertical access to the blade in the chamber. After shredding, the material is discharged from the conduit into a receiving bag made of thin plastic or the like which is supported on the ground alongside the ramp.

3,716,090
GARDEN SHREDDER WITH VARIABLE POSITION LOADING CHUTE

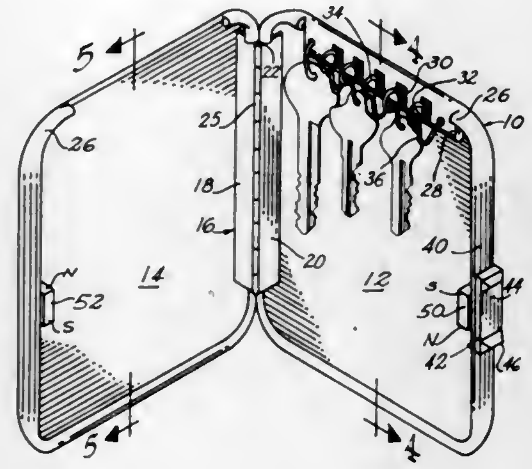
Robert D. Lautzenheiser, Bluffton, Ind., assignor to The Red Cross Manufacturing Corp.
Filed April 7, 1972, Ser. No. 242,043
Int. Cl. B26d *4/28;* **B02c** *18/00*
U.S. Cl. 56—501 **7 Claims**



A loading chute for shredders of the type used to shred lawn materials. A loading hopper is arranged with the inlet opening of the shredder for movement between an upright position and a lower position wherein material to be shredded can be swept up the chute and into the shredder. A damper is arranged with the chute to act as a guard.

3,716,091
MAGNETIC CLOSURE

Alvin M. Gaines, 219 B Shadow Park, Gwinnette County, Near Norcross, Ga.
Filed Sept. 14, 1970, Ser. No. 71,696
Int. Cl. A45c *11/32;* **E05c** *17/56*
U.S. Cl. 150—40 **3 Claims**

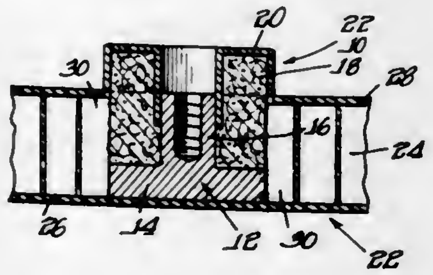


A magnetic closure for keycases, pocketbooks, wallets, and other containers which provides a positive opening as well as a closing by means of magnets with respective North and South poles so positioned as to bring opposite poles into proximity for positive closing and like poles into proximity for opening. One panel of the keycase or other container is provided with the sliding magnet and another panel of the keycase has the fixed magnet whereby manually sliding one with respect to the other causes the magnets to assume the position of similar or dissimilar polarity.

The keys are held by fixed loops and a flexible wire.

3,716,092
PANEL INSERT AND METHOD OF INSTALLATION

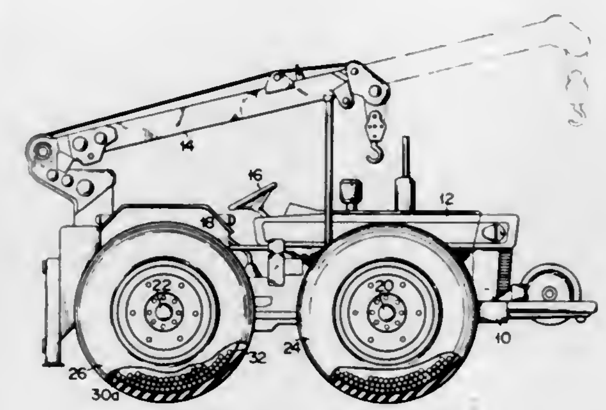
Aubrey J. Serewicz, De Kalb, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.
Filed April 14, 1970, Ser. No. 28,475
Int. Cl. F16b *37/04*
U.S. Cl. 151—41.75 **7 Claims**



The present invention relates generally to inserts for panels and methods of assembling inserts with panels, and more particularly to insert structures for installation in relatively lightweight panels comprised of a honeycomb core and skin sheets secured to the opposite edges thereof, and to improved methods of assembling insert structures with such panels. The embodiment of the invention disclosed herein comprises an insert assembly having an internally threaded section extending from a base section adapted to be positioned adjacent the inner surface of the panel skin. Said insert assembly also includes an annular thermoplastic section adjacently surrounding the periphery of the threaded section. An annular collar, such as a sheet metal collar, adjacently superimposes the outer extremity of the annular section. Heat from or through said collar causes the annular section to melt and flow into a preformed aperture in the panel.

3,716,093
WHEELS FOR ROLLING STOCK

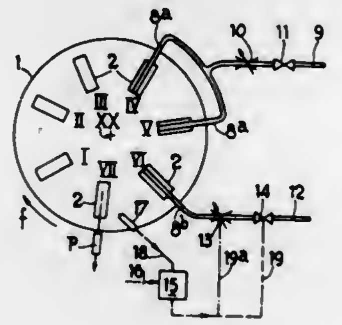
Shozo Tsuchiya, 160-4, Yugashima, Yugashima-machi, Amagi, Tagata-gun, Japan
Filed April 22, 1970, Ser. No. 30,915
Claims priority, application Japan, July 12, 1969, 44/66394
Int. Cl. B60b *19/06*
U.S. Cl. 152—330 **1 Claim**



A wheel for rolling stock such as a tractor which comprises wheel rim carrying a pneumatic tire having an annular tire avity and a plurality of substantially spherical balls having a elatively high density, a packed layer of the ball partly filling he tire cavity. When the axis of the wheel is positioned orizontally, the wheel can have a gravity center at a lower oint than the axis thereof due to the presence of the heavy alls positioned at the bottom portion of the tire cavity.

3,716,094
CASTING APPARATUS WITH REGULATED COOLING STATION

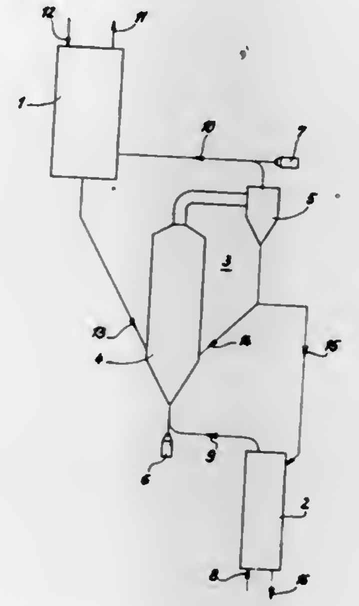
laude Fuminier, Pont-a-Mousson, France, assignor to Societe des Fonderies de Pont-a-Mousson, Nancy, France
Filed Apr. 15, 1971, Ser. No. 134,196
Claims priority, application France, Apr. 17, 1970, 7013981
Int. Cl. B22d *13/10*
.S. Cl. 164—154 **9 Claims**



A foundry mould cooling apparatus for a mould turnble conveying the moulds between successive stations cluding a cleaning station, casting station, a first mould oling station and a cast part extracting station. A mplementary cooling station is provided following on e first cooling station and adapted to supply a comementary amount of cooling water which complements minimum supply of water by the first cooling station. e amount of complementary water is governed by ntrol means responsive to the temperature of a mould, r example the mould which has just left the cooling tions.

3,716,095
PROCESS FOR HEAT TREATMENT OF FINE GRANULAR MATERIAL

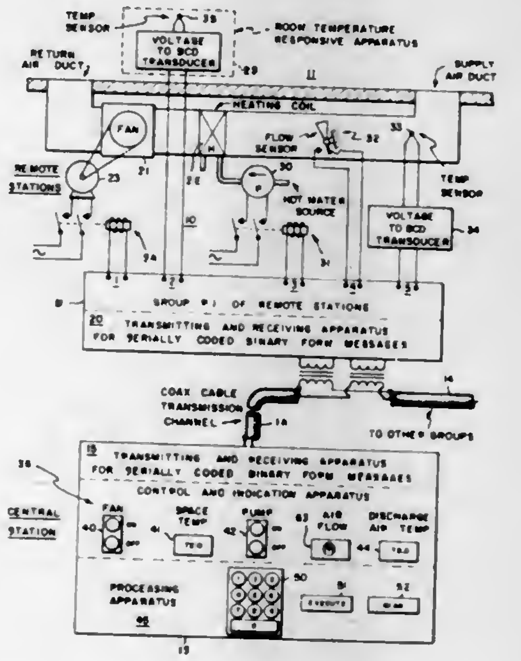
Horst Ritzmann and Wilfried Kruger, Neubeckum, Germany, assignors to Polysius AG, Neubeckum, Germany
Filed Feb. 22, 1971, Ser. No. 117,315
Claims priority, application Germany, Feb. 25, 1970, P 20 08 774.5
Int. Cl. F28
U.S. Cl. 165—1 **2 Claims**



Fine granular material is heated in a countercurrent heat exchanger. The material is maintained in circulation in a stream of hot gas during a predetermined dwell time after the material leaves the heat exchanger, and then is cooled.

3,716,096
TEMPERATURE CONTROL AND SUPERVISION SYSTEM FOR A BUILDING AIR CONDITIONING SYSTEM

James R. Berrett, Deerfield, and Roger J. Feulner, Mt. Prosepct, both of Ill., assignors to Honeywell, Inc., Minneapolis, Minn.
Continuation of Ser. No. 864,679, Oct. 8, 1969, abandoned.
This application Sept. 7, 1971, Ser. No. 178,095
Int. Cl. F24f *3/00*
U.S. Cl. 165—22 **2 Claims**


TEMP SENSOR
VOLTAGE TO BCD TRANSDUCER
ROOM TEMPERATURE RESPONSIVE APPARATUS
RETURN AIR DUCT
SUPPLY AIR DUCT
HEATING COIL
FAN
FLOW SENSOR
REMOTE STATIONS
HOT WATER SOURCE
TEMP SENSOR
VOLTAGE TO BCD TRANSDUCER
GROUP #1 OF REMOTE STATIONS
20 TRANSMITTING AND RECEIVING APPARATUS FOR SERIALLY CODED BINARY FORM MESSAGES
COAX CABLE TRANSMISSION CHANNEL
TO OTHER GROUPS
15 TRANSMITTING AND RECEIVING APPARATUS FOR SERIALLY CODED BINARY FORM MESSAGES
CONTROL AND INDICATION APPARATUS
CENTRAL STATION
FAN
SPACE TEMP
PUMP
AIR FLOW
DISCHARGE AIR TEMP
PROCESSING APPARATUS
EXECUTE

A temperature control and supervision system for controlling and supervising the operation of a building air conditioning system having a central station and a plurality of remote stations connected by a single communication channel, wherein the control and supervision is accomplished by message transmitting and receiving apparatus at the central station and each of the remote stations for generating and interrogating serially coded messages comprising a plurality of bits in binary form.

3,716,097
AIR CONDENSATION PLANT

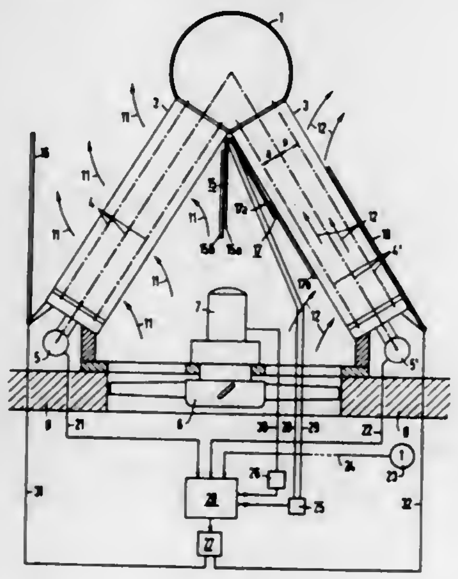
Fritz Kelp, and Hans-Heinrich Pohl, both of Erlangen, Germany, assignors to Kraftwerk Union Aktiengesellschaft, Muhlheim (Ruhr), Germany

Filed Dec. 8, 1970, Ser. No. 96,071

Claims priority, application Germany, Dec. 11, 1969, P 19 62 061.2

Int. Cl. F28b *1/06*

U.S. Cl. 165—39 **16 Claims**



Air condensation plant for condensing steam by direct air cooling includes mutually transversely disposed elongated cooling elements traversible by steam along the length thereof, means for directing a flow of air to a respective side of said cooling elements, adjustable means for covering the side respectively of the cooling elements for controlling the cooling thereof and for preventing freezing, the cooling elements having an upper part through which a preponderant quantity of the steam to be condensated flows, the adjustable covering means being located in front of the upper part of the cooling elements.

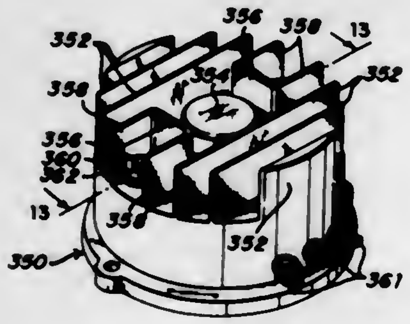
3,716,098
AUTOMOTIVE APPARATUS

Gianni A. Dotto, 3005 Claar Avenue, Dayton, Ohio

Continuation of Ser. No. 794,454, Nov. 15, 1968, abandoned, which is a division of Ser. No. 473,542, June 3, 1965, abandoned. This application Jan. 28, 1971, Ser. No. 110,667

Int. Cl. F28f *7/00*

U.S. Cl. 165—80 **3 Claims**



A semiconductor ignition apparatus including semiconductor means and a rotary capacitance means and inductance means wherein the rotary capacitor means and the inductanc means cooperates to apply a determined value of reverse voltage to the semiconductor means when the capacitance valu of the rotary capacitor means attains a determined value th semiconductor means is biased to non-conduction.

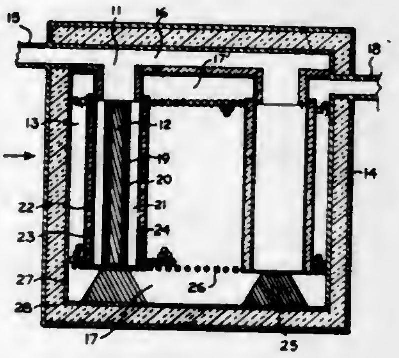
3,716,099
MEANS AND METHOD FOR OBTAINING HIGE TEMPERATURE PROCESS FLUIDS FROM LOW TEMPERATURE ENERGY SOURCES

Nicholas H. Deschamps, Reeds Ferry, N.H., Bernar Stein, Andover, Mass., and Kenneth E. Mayo, Nashu N.H., assignors to Sanders Nuclear Corp., Nashua, N.H

Filed Nov. 17, 1969, Ser. No. 877,357

Int. Cl. F28f *13/00*

U.S. Cl. 165—135 **42 Claim**



Means and methods are provided for obtaining useful heating of process fluids from a heat energy source which emits penetrating radiation to a surrounding radiation absorber. The absorber has a higher temperature than the source as a result of the penetrating radiation. The fluids are preferably passed over the source and through the absorber to obtained desired controlled heating of the fluids and simultaneous cooling of the source with the heated process fluids being capable of transmitting heat energy in a number of applications. Preferably the heat source is a beta or gamma radioisotope source with surrounding structure to maximize heat transfer to the fluid and minimize return heat flow. The absorber is preferably in a predetermined form to provide a predetermined hea transfer to the fluid under controlled conditions.

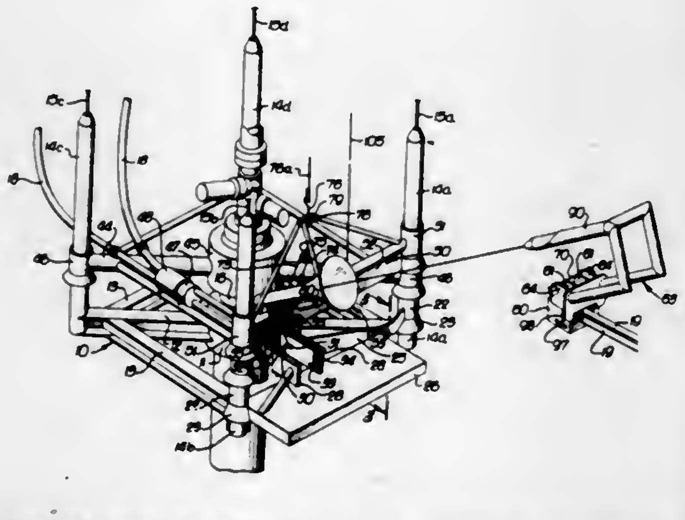
3,716,100
APPARATUS FOR ALIGNING AND CONNECTING FLOWLINES

Bobby H. Nelson, Houston, Tex., assignor to Vetco Offshore Industries, Inc., Ventura, Calif.

Filed Jan. 12, 1971, Ser. No. 105,927

Int. Cl. E21b *43/01*

U.S. Cl. 166—.6 **19 Claim**



One of more flowlines are to be connected to one or mor companion flowline loops extending from a Christmas tre isposed at the upper end of a well bore extending into the for- ation from the floor of an ocean, or other body of water, at hich a flowline guide structure has been installed. Prior to ef- cting the connection, the end portions of the flowlines are ttached to a flange or hub releasably secured to a carrier at a lowline or pipe line barge, the carrier and flowlines being ulled toward the well by being fed from the barge to maintain he flowlines in tension. The pulling apparatus includes a sin- le cable or pulling line connected to an orienting member of he carrier and passing through a guidance apparatus eleasably mounted on the flowline guide structure. The rienting member moves into the guide structure. The orient- ng member moves into the guidance apparatus to properly rient the coupling hub at the ends of the flowlines for at- achment to an alignment device on the flowline guide struc- ure which aligns the hub with a companion hub secured to the nds of the flowline loops, after which the coupling between he hubs is effected. The carrier is released from the flange nd the guidance apparatus from the guide structure to permit heir removal to the surface of the body of water after align- ent has been effected.

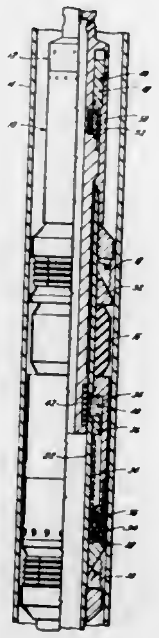
3,716,101
HEAT ACTUATED WELL PACKER

arold E. McGowen, Jr., and Gilbert H. Tausch, both of Houston, Tex., assignors to Camco Incorporated, Houston, Tex.

Filed Oct. 28, 1971, Ser. No. 193,434

Int. Cl. E21b *33/128*

.S. Cl. 166—60 **9 Claims**



A heat operated well packer in which a closed pressure chamber includes a fluid that expands on the application of heat for providing the motive force for setting the packer. A well packer having a packing seal and slips which are actuated by a piston in which a closed pressure chamber having a nonexplosive fluid which expands upon the application of heat is in fluid communication with the piston, and heating means applies heat to the closed chamber for moving the piston and setting the packer. A setting tool releasably engaging the packer and including a second closed pressure chamber having a fluid which expands upon the application of heat for actuating a second piston for releasing the setting tool from the packer when heat is applied to the second pressure chamber.

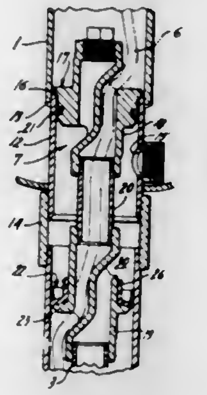
3,716,102
WELL SYSTEM SEAL

Howard A. Tubbs, 406 South Elizabeth Street, Whitewater, Wis.

Continuation-in-part of Ser. No. 130,109, April 1, 1971. This application Aug. 24, 1971, Ser. No. 174,333

Int. Cl. E21b *33/03*

U.S. Cl. 166—88 **3 Claims**



A well casing is divided into several parts by a coupling and a pair of packer bodies are hung within the casing with the coupling therebetween. Water and electrical conduit pass through the packer bodies, and the bodies are sealed to the casing wall to form a central pressurizable chamber so that water within the chamber pressurizes the inside of the coupling. A lower cup-shaped flexible sealing ring is provided with a generally vertical inner longitudinal wall, a generally flat horizontal base disposed at approximately 90° to the inner wall, and an outwardly tapering wall. The platform on which the sealing ring seats slants or is tapered substantially downwardly. When the chamber is unpressurized, the sealing ring takes its normal position, thus forming a tapered space between it and the platform. Under pressure, the ring distorts downwardly into engagement with the slanted platform, causing a substantial portion of its outer tapered wall to engage the casing, thus improving the seal.

3,716,103
SPRINKLER HEAD

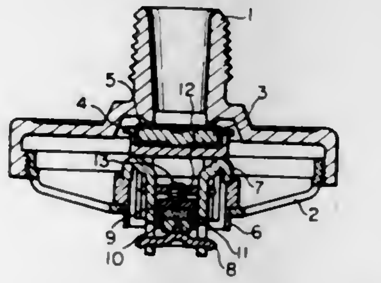
Jun Tanaka and Hiroshi Onuki, Tokyo, Japan, assignors to Senju Metal Industry Co., Ltd., Tokyo, Japan

Filed July 6, 1971, Ser. No. 159,691

Claims priority, application Japan, July 10, 1970, 45/68,332; Aug. 17, 1970, 45/81,230; Apr. 2, 1971, 46/23,635; June 28, 1971, 46/55,098

Int. Cl. A62c *37/30*

U.S. Cl. 169—42 **3 Claims**



The present invention is directed to a sprinkler head for automatically discharging fire extinguishing fluid immediately in response to heat generated by a fire or the like. The sprinkler head includes a collapsible heat sensitive assembly in which a pair of levers are provided to carry a packing support and a cylinder filled with a low melting point metal, with the packing support being held in contact with the cylinder, and wherein a support plate for supporting the levers is outwardly displaced to allow the packing support to fall down on the opening of a deflector used as cover when the metal is melted and flows.

3,716,104
CONTROL DEVICE FOR THE POWER LIFTING INSTALLATION OF A TRACTOR

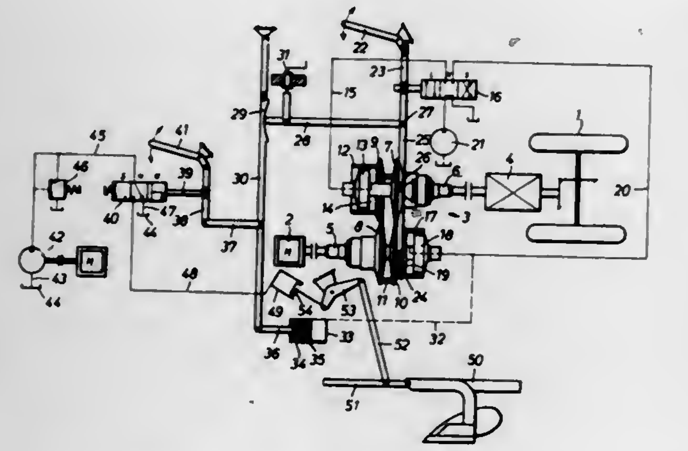
Walter Koenig, Bergisch Gladbach; Heribert Adams, Rosrath near Cologne, and Franz Heidjann, Oelinghausen, all of Germany, assignors to Klockver-Humboldt-Deutz Aktiengesellschaft, KolnrDeutz, Germany

Filed Dec. 8, 1969, Ser. No. 883,164

Claims priority, application Germany, Dec. 7, 1968, P 18 13 401.5

Int. Cl. A01b *63/112*

U.S. Cl. 172—7 **7 Claims**



A tractor with a power operated implement lift and a hydraulically adjustable speed transmission. The driving speed of the tractor is detected and the load torque on the tractor is detected and the detected driving speed and torque values are compared and produce a control movement when there is a decrease of speed of the tractor due to an increase of load torque on the tractor or vice versa. The control movement operates to cause the power operated lift to adjust the elevation of an implement connected thereto when there is a change in either the speed of the tractor or the load torque thereon without a change in the other in the same sense.

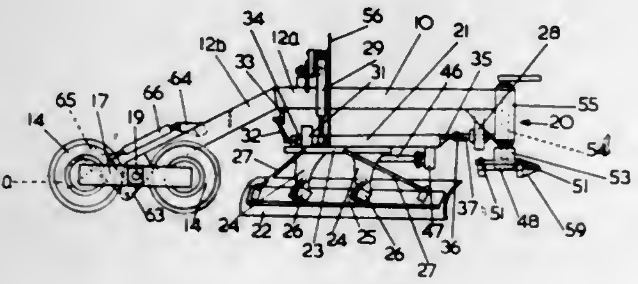
3,716,105
GRADING ATTACHMENT FOR A VEHICLE

Edwin Carey Hallam, Smeeton Westerby, England, assignor to E. C. Hallam Company, a partnership consisting of Edwin C. Hallam and Heather Hallam, Smeeton Westerby, Leicester, England

Filed Nov. 23, 1970, Ser. No. 91,928

Int. Cl. E02f *3/76*

U.S. Cl. 172—780 **12 Claims**



A trailing grading attachment for use with a tractor vehicle has its grader blade depending from the central part of a frame which is supported by rear wheels and by a forward towing connection that permits the trailer frame to pivot relatively to the tractor vehicle both about a vertical axis and about an approximately horizontal axis extending longitudinally of the tractor vehicle, and also has that part of the frame which extends forwardly from above the central part of the grader blade confined, as viewed in plan, to the region of the longitudinal center line of the trailer frame.

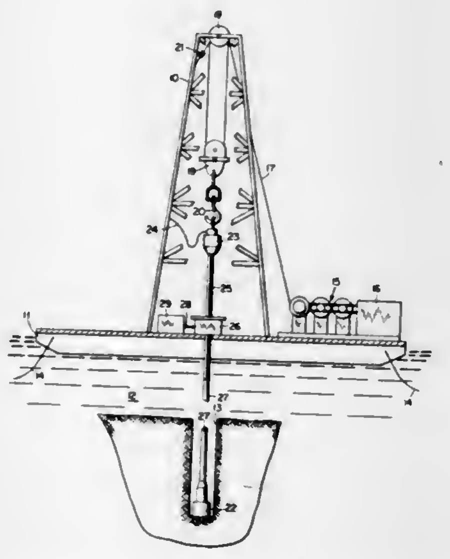
3,716,106
CONSTANTLY SLIPPING CLUTCH CONTROL FOR ROTARY DRILLING

Earl A. Peterson, 4111 Chestnut Ave., Long Beach, Calif.

Continuation-in-part of Ser. No. 810,322, March 25, 1969, abandoned. This application July 30, 1971, Ser. No. 167,713

Int. Cl. E21b *3/02, 19/08*

U.S. Cl. 173—1 **11 Claim**



A drilling system for rotary drilling. A drilling system for the rotary drilling of well bores utilizing a pair of cooperating subsystems, one subsystem providing for control of the penetration rate or weight of the drill bit, the second subsystem controlling the rotational speed or torque of the drill bit. A drawworks supporting the drill string is cooperatively engaged to a continuously slipping clutch to provide precise control over the vertical motion of the drill string and bit. The rotary drill table providing rotational power to the drill string and bit is cooperatively coupled to a continuously slipping clutch to provide precise control over the rotational motion of the drill string and attached drill bit.

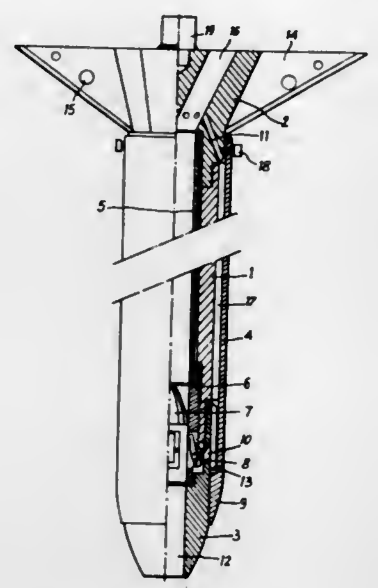
3,716,107
DEVICE FOR OBTAINING EARTH SAMPLES

Jean Liautaud, Paris, France, assignor to Entreprise de Recherches et d'Activites Petrolieres (Elf), Paris, France Continuation-in-part of abandoned application Ser. No. 887,657, Dec. 29, 1969. This application Mar. 10, 1971, Ser. No. 122,771

Int. Cl. E21b *9/20*

U.S. Cl. 175—248 **5 Claim**

Device for obtaining earth samples comprises an inner tube having cutting means at its forward end and adapted to be driven into the earth, fingers within the tube for detaching a core therewithin when the tube is pulled up an outer casing frangibly attached to the inner tube, passageways between the tube and casing for receiving water and, in a preferred embodiment, valve means for controlling the admission of water to said passageways adapted to be closed when said tube is withdrawn from the earth and broken loose from said outer casing.



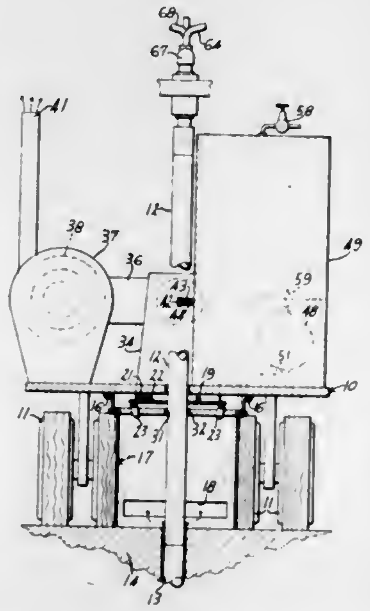
3,716,108
APPARATUS FOR SETTLING DRILL DUST

James B. Loftis, Remlap; David L. Moody, and James H. Phillips, both of Oneonta, all of Ala., assignors to Robbins Machinery Company

Filed May 14, 1971, Ser. No. 143,325

Int. Cl. E21c *7/00*

U.S. Cl. 175—205 **10 Claims**



Dust settling apparatus having a first nozzle assembly discharging an atomized mixture of water and air under high pressure toward a bole being bored with the mixture moving in direction opposite direction of movement of dust from hole. A second nozzle assembly discharges an atomized mixture of water and air under high pressure into and in same direction as moving stream of dust after passing first nozzle assembly. Water supplied to nozzle assemblies from a small tank which communicates with lower end of a large tank. Air under high pressure introduced into small tank and air under low pressure introduced into large tank with small tank being exhausted to atmosphere at intervals permitting water to flow from large tank to small tank.

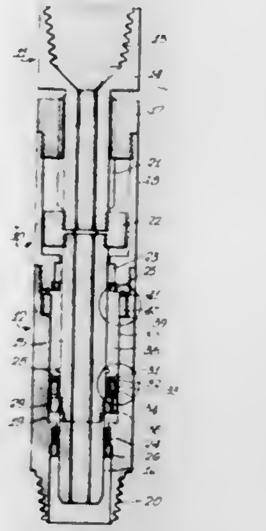
3,716,109
ROTARY JAR

William Earl Griffith, Okotoks, Alberta, Canada, assignor to Jarco Services Ltd., Calgary, Canada

Filed Feb. 22, 1971, Ser. No. 117,600

Int. Cl. E21b *1/10*

U.S. Cl. 175—297 **10 Claims**



A rotary jar is disclosed for use in well bores when a tool, attached to the jar, becomes so stuck that normal tension on the drill string will not release it. The rotary jar has an outer housing and an inner mandrel with appropriate seals therebetween defining an annular working chamber. A knocker is attached to the mandrel and an anvil is attached to the housing. The working fluid in the working chamber exhibits low viscosity changes with high temperature changes. Within the chamber are located a piston and a valve combination so arranged that when the drill string is under high tension, fluid is forced in minute quantities through the valve combination. This is actually a mutual extension of the mandrel and housing which continues until the piston and valve combination come into contact with an annular sleeve in the chamber. The sleeve moves with the piston and valve combination allowing fluid to dump therebehind, thereby allowing the knocker and anvil to come into jarring contact. Provision is made for resetting the jar so that it may be operated continuously over over long periods of time.

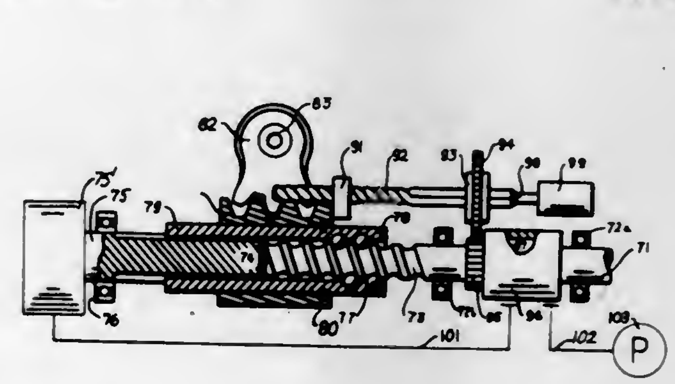
3,716,110
STEERING AND DIRECTING MECHANISM

Albert G. Fonda, 481 Stacey Drive, King of Prussia, Pa.

Filed July 22, 1970, Ser. No. 57,120

Int. Cl. B62d *5/06*

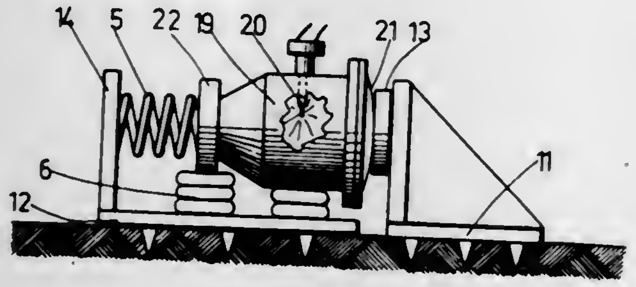
U.S. Cl. 180—79.2 R **30 Claims**



A power drive means of the motion augmentation type is provided by means of actuation of a reaction element of a kinematic machine coupling directing and dirigible members, to effect differential motions thereof in response to selected effects of directing motion. Means adaptable to rack-and-pinion steering and means adaptable to worm-and-pitman-arm steering are disclosed. The approach is adaptable to either hydraulic or electrical actuation. Stability augmentation may also be provided from sensors of vehicle maneuvering, resulting in adaptive steering.

3,716,111
METHOD FOR INDUCING SHEAR WAVES IN THE EARTH AND DEVICE THEREFOR

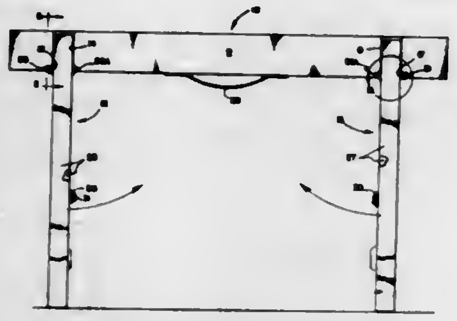
Michel Lavergne, Le Vesinet, France, assignor to Institut Francais du Petrole des Carburants et Lubrifiants
Filed Aug. 28, 1970, Ser. No. 67,873
Claims priority, application France, Sept. 2, 1969, 6929979
Int. Cl. G01v *1/14*
U.S. Cl. 181—.5 EC **14 Claims**



Method for inducing shear waves in the earth, comprising a generator producing two equal and opposed forces and means for transmitting said forces horizontally to vertical sections of the ground through the intermediary of springs of different rigidities, whereby said forces become unbalanced and the resultant force is transmitted horizontally to the ground.

3,716,112
COLLAPSIBLE SAWHORSE

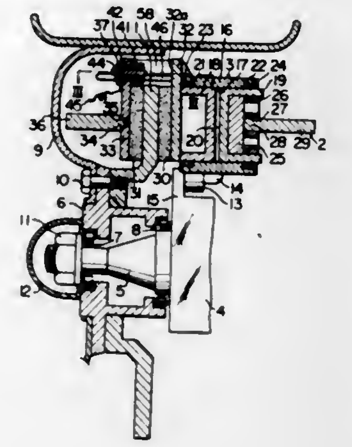
Clarence R. Lake, 22705 SW. Lois St., Beaverton, Oreg. 97005
Filed May 19, 1971, Ser. No. 144,771
Int. Cl. F16m *11/00;* **E04g** *1/32*
U.S. Cl. 182—155 **1 Claim**



A collapsible sawhorse supported by leg assemblies at each of its ends. Hinge means, carried by the sawhorse main member, attaches the legs of each leg assembly and permits inward closing movement of the legs to a position perpendicular to and offset from the main member. Additional hinge structure permits simultaneous upward movement of the legs of each leg assembly into a position alongside said main member. Hinged leg movement occurs about two separate axes. Limit stop means retain the legs in place in a collapsed configuration.

3,716,113
WARNING DEVICE FOR INDICATING WEAR OF FRICTION PADS IN DISK BRAKE

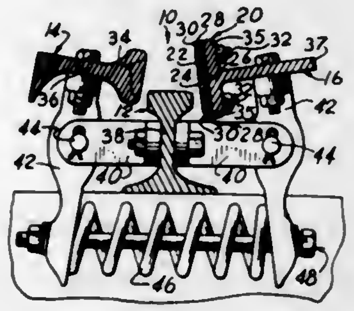
Toyoaki Kobayashi, Naoji Sakakibara, and Toshio Kondo, Kariya, Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya-shi, Japan
Filed Oct. 30, 1970, Ser. No. 85,480
Claims priority, application Japan, Nov. 1, 1969, 44/57,450; June 25, 1970, 45/24,531, 45/24,533
Int. Cl. F16d *66/02*
U.S. Cl. 188—1 A **3 Claims**



Each friction pad of a brake disk is provided with detecting switch device operating to open a detection circuit when the pad is worn to an allowable wear limit thereby to cause a warning lamp to be lit. The detecting switch device may be a switch operated by movement of a backing metal supporting the friction pad, a wire cut by abrasion thereof by the brake disk, or contacts released by abrasion or contact by the brake disk, a spring device in each case preventing the detection circuit thus opened from being closed again.

3,716,114
SILENCER FOR RAILCAR RETARDERS

George W. Beck, McLouth, Kans., assignor to The Safety Skat Company, Inc., Tonganoxie, Kans.
Continuation-in-part of Ser. No. 143,528, May 14, 1971. This application Nov. 8, 1971, Ser. No. 196,665
Int. Cl. B61k *7/02*
U.S. Cl. 188—62 **10 Claims**

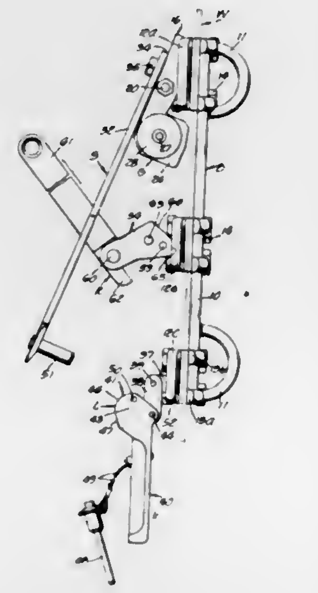


A silencing structure adapted to be used in conjunction with a railcar retarder of the kind which is composed of a pair of opposed, wheel-gripping, elongated jaws. The silencer is releasably attached to the jaw of the retarder that engages the inside face of the wheel and presents an elongated, wheel-engaging layer of frictionable, nonmetallic noise-suppressing material protected along each of its longitudinal edges by a

ange, the face of which is flush with the exposed surface of e layer. The flanges prevent unraveling of the edges of the aterial by protecting the layer from the scrubbing action of e rotating wheels thereby increasing the effective life of the lencer. The flanges also impart a substantial amount of the ressure exerted on the wheel, while at the same time, the yer serves to deaden or dampen the noise that is otherwise resent when such metal-to-metal contact is made.

3,716,115
DEVICE FOR RELEASABLY GRIPPING AN ELONGATE FLEXIBLE MEMBER

dwin C. Elsner, Kanosh, Utah, assignor to Max Fink; Floyd C. Hahn and Hugh W. Littlebury, Sr., Los Angeles County, Calif., part interest to each
Filed Nov. 27, 1970, Ser. No. 93,074
Int. Cl. B65h *59/61*
.S. Cl. 188—65.1 **11 Claims**

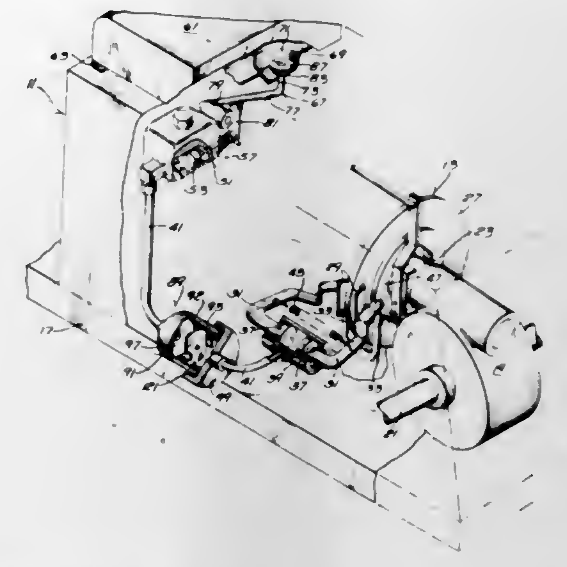


A device for releasably gripping an elongate flexible ember, such as a webbing strap extending therethrough, and herein gripping surfaces of the device are resiliently urged by loading spring into pressure engagement with the strap, anually operable camming means being provided for eleasably varying the pressure engagement resulting from the oading spring, so as to permit relative restrained movements etween the gripping surfaces of the device and the webbing trap under load stressing forces applied between the webbing trap and the device.

3,716,116
AUTOMATIC HYDRAULICALLY OPERATED SEAT BRAKE

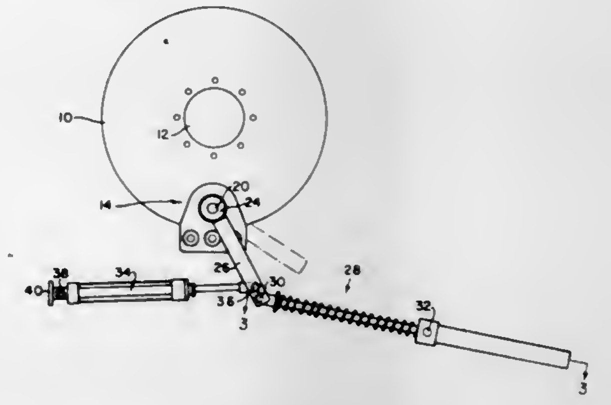
obert D. Von Seggern, Lincoln, Nebr., assignor to Outboard Marine Corporation, Waukegan, Ill.
Filed March 2, 1971, Ser. No. 120,130
Int. Cl. B60t *7/02*
.S. Cl. 188—109 **6 Claims**

Disclosed herein is a vehicle braking system including a rake shoe biased into braking engagement with a rotary ember, and displaceable by hydraulic means from braking ngagement with the rotary member, together with a pumping ylinder hydraulically communicating with said brake shoe isplacing means cylinder and including a plunger operable to ffect delivery of pressure fluid to said brake shoe displacing eans, a seat movably mounted on said vehicle for movement elative to an in-use position, and a linkage engageable with aid seat and engageable with said plunger to displace said lunger so as to deliver pressure fluid to said brake shoe displacing means and thereby to displace said brake shoe from braking engagement with the rotary member in response to movement of said seat to the in-use position, and further including means biasing said seat away from said in-use position, and means for controlling the rate of fluid flow between the pumping cylinder and the hydraulic brake shoe displacing means.



3,716,117
CONSTANT TORQUE SPRING APPLIED BRAKE

Carl E. Bricker, Cuyahoga Falls, Ohio, assignor to The Goodyear Tire & Rubber Comapny, Akron, Ohio
Filed Aug. 21, 1970, Ser. No. 65,937
Int. Cl. B60t *13/04*
U.S. Cl. 188—167 **3 Claims**

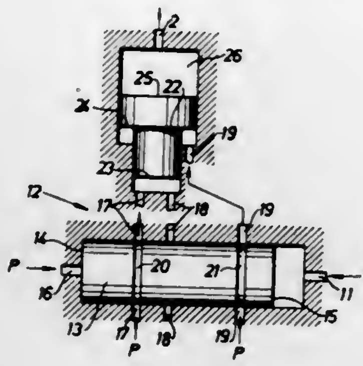


The invention discloses a piston screw brake which is applied by a spring mechanism. The spring consists of a long compression spring carried on a lever arm which pivots as the brake is applied. The spring extends the full length of the arm while the pivot point of the arm is shorter than the full length thereof.

3,716,118
APPARATUS FOR REGULATING THE OPERATION OF A BRAKE DEVICE

Erik Olov Bo Gelhaar, Kungstorget 7, Lysekil, Sweden
Filed Nov. 19, 1970, Ser. No. 91,133
Claims priority, application Sweden, Nov. 19, 1969, 15,916/69
Int. Cl. B60t *8/02*
U.S. Cl. 188—181 T **6 Claims**

A hydraulic brake actuating and control system for wheeled vehicles is disclosed. The control system senses the frictional force generated by the braking system and regulates the hydraulic pressure whenever a skid condition is sensed. When skidding occurs, a predetermined portion of the hydraulic pressure is dumped to allow the wheels to rotate. The remaining pressure generates



a substantial braking force of lower magnitude. The device is automatic and reasserts the original braking force after the skid is terminated.

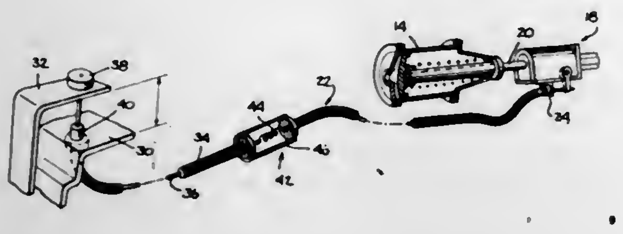
3,716,119
BRAKE MECHANISMS

Robert L. Ludington, 3419 Manitou Tr., and Robert M. Holloway, 921 North Roeske Trail, Pottawattomie Country Club Estates, both of Michigan City, Ind.

Continuation-in-part of Ser. No. 1,266, Jan. 7, 1970, Pat. No. 3,612,230. This application March 23, 1971, Ser. No. 127,277

Int. Cl. B60t *8/20*

U.S. Cl. 188—195 **16 Claims**



A load compensating unit for modifying the braking force applied to the brakes of a railway car depending on the load on the car comprising a housing, a rod slidable with respect thereto, a spring acting therebetween to transmit force from one to the other and a pawl for locking the housing and rod rigidly together under control of a cable actuated in accordance with the spacing between the car truck bolster and car frame and hence, with the car load. The load compensating unit is connected to and determines the amount of movement of a lever in the brake rigging upon application of the brakes and may be between the brake cylinder and the lever normally operated by the brake piston rod.

3,716,120
LIQUID PRESSURE LOCKING DEVICES FOR VARIABLE LENGTH STRUT MEMBERS

Kenneth Evered, and Eric Meredith, both of Leamington Spa, England, assignors to Automotive Products Company Limited, Leamington Spa, England

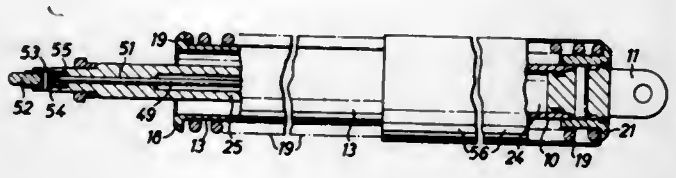
Filed Dec. 7, 1970, Ser. No. 97,464

Claims priority, application Great Britain, Dec. 8, 1969, 59,810/69

Int. Cl. F16f *9/16*

U.S. Cl. 188—300 **4 Claims**

A variable length strut member adapted particularly for use with aircraft seats and comprising an inner cylinder member and a plunger slidable within a bore in the inner cylinder member. The inner cylinder member is slidably engaged within an outer cylinder member so as to define a first chamber therebetween. A compression spring urges the two cylinder members apart so that the volume of the first chamber is increased. A second chamber is defined within the bore of the inner cylinder member and is bounded by the plunger. A non-return valve controls liquid flow between the two chambers, the valve comprising a ball spring loaded on a valve seat so as to prevent liquid flow between the two chambers and thus lock the strut member against change in length. The plunger carries a pin projection which is arranged to hold the ball off the valve seat to allow change of length of the strut member. The arrangement is such that the load of the compression spring is transmitted to the plunger component of the strut member through the liquid in the two chambers. Preferably the cross-sectional area of the first chamber is substantially equal to the cross-sectional area of the plunger.



3,716,121
ANTISKID SENSOR

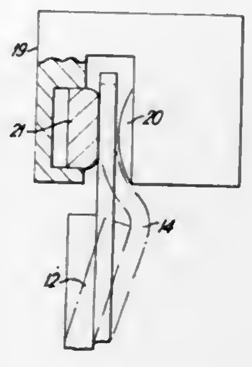
Heinz Frigger, 607 Langen-Oberlinden, Germany, assignor to ITT Industries, Inc., New York, N.Y.

Filed May 27, 1970, Ser. No. 40,972

Claims priority, application Germany, May 29, 1969, P 19 27 235.6; May 29, 1969, P 19 27 237.8

Int. Cl. B60t *8/08*

U.S. Cl. 188—181 R **9 Claims**



A sensor for vehicle antiskid systems, the sensor having a stationary reading head in direct contact with a rotating data carrier. The carrier may be a flexible edge mounted on the disc of a disc brake system or it may be a rigid carrier mounted on some other member rotating with the wheel such as the inside of the wheel hub. The data carrier has equally spaced variations in some characteristic to which the sensor responds such as magnetic spots, variable electrical resistance, or perforations which can be read by the sensing head.

3,716,122
LID LATCH FOR WASHING APPARATUS

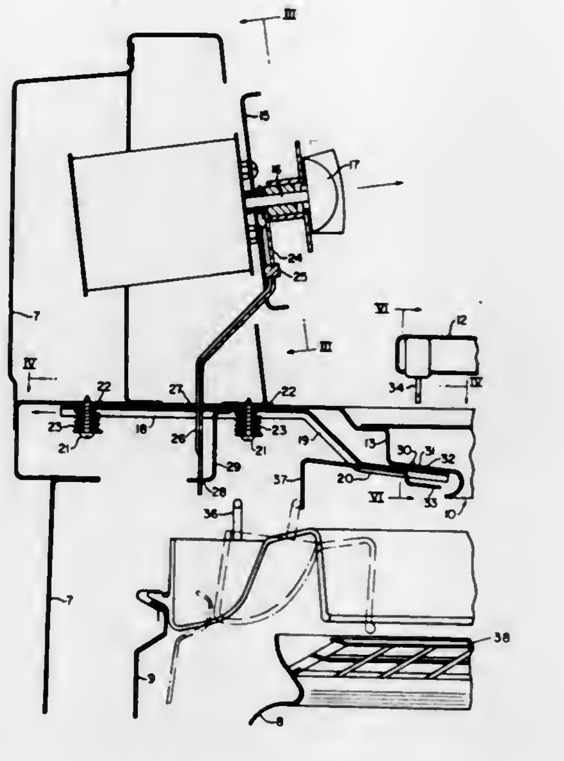
Colin J. Baker; Raymond C. Preen, and Donald W. Wilson, all of Orange, New South Wales, Australia, assignors to Email Limited, Sidney, New South Wales, Australia

Filed March 19, 1971, Ser. No. 126,090

Int. Cl. H01h *35/02;* **D06f** *37/42*

U.S. Cl. 192—136 **4 Claims**

A mechanical linkage between the line switch generally included in the timer knob, and the interior of a centerpost agitator washing machine which latches the door closed when the switch is moved to an on position and which moves the switch to an off position when contacted due to excessive gyrations of the inner tub from an unbalanced condition.



3,716,123
APPARATUS FOR SORTING ELONGATED ARTICLES

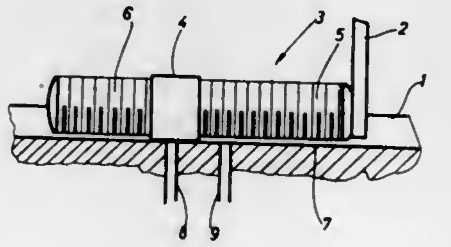
Rudolf Becker, 8 Munich 13, Germany, assignor to Knorr-Bremse GmbH, Munich, Germany

Filed Sept. 1, 1970, Ser. No. 68,668

Claims priority, application Germany, Sept. 3, 1969, P 19 44 675.4

Int. Cl. B65g *11/00;* **B23q** *7/12*

U.S. Cl. 193—40 **4 Claims**



Elongated articles, such as stud bolts, are conveyed in endwise relationship along a chute to a point of use. A fixed stop is engageable by articles within the chute. A pair of spaced airjet detectors are longitudinally spaced in the bottom of the chute and positioned at predetermined distances from each other and from the stop. When an article engages the stop, at least one or none of the airjet detectors will be covered depending on the position of the article in the chute. The detectors are connected to a pneumatic signal circuit which generates signals in response to the position of an article with respect to the said detectors.

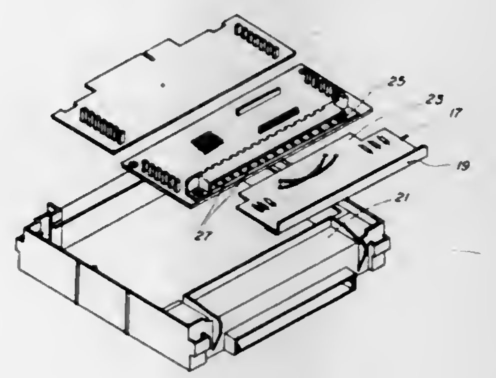
3,716,124
VENDING MACHINE PRICING CONTROL ARRANGEMENT

Casimer J. Dabrowski, Mount Prospect, Ill., assignor to The Seeburg Corporation of Delaware, Chicago, Ill.

Filed Sept. 11, 1970, Ser. No. 71,584

Int. Cl. G01f *9/08*

U.S. Cl. 194—1 N **8 Claims**



A series of pricing boards have circuit connections formed thereon to provide a variety of different pricing combinations based upon the monetary system of the country in which they are to be used and the prices of various vend items. A pricing board having the desired pricing combination is inserted into an appropriate opening in a vending machine, where it is secured to complete appropriate circuits to the pricing apparatus and the vend control mechanism of the vending machine. Controls that may be provided by a pricing board are the amount of credit to be accorded to a monetary unit, the number of credits required to obtain vending of a selected item, and the amount to be debited upon vending of a selected vend item.

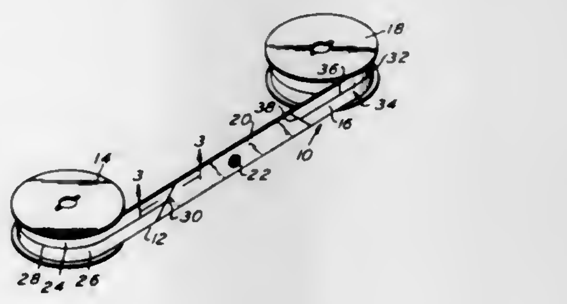
3,716,125
THREE COMPONENT PRINTING RIBBON AND METHOD OF MAKING SAME

Walter Ploeger, Jr., 1404 Dewey Avenue, North Bellmore, N.Y.; Walter Ploeger, Sr., 3675 Woodbine Avenue, and William Godlgkeit, Jr., 19 Wayside Lane, both of Wantagh, N.Y.

Filed July 22, 1970, Ser. No. 57,208

Int. Cl. B41j *31/02*

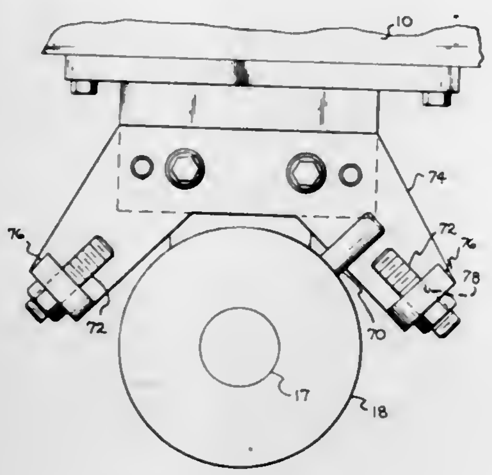
U.S. Cl. 197—172 **4 Claims**



A printing ribbon has two differently constructed portions interconnected by an uninked connector strip welded to the ends of said portions to form a three component ribbon.

3,716,126
NINETY DEGREE SWEEPOUT WITH AUTOMATIC PHASING CONTROL

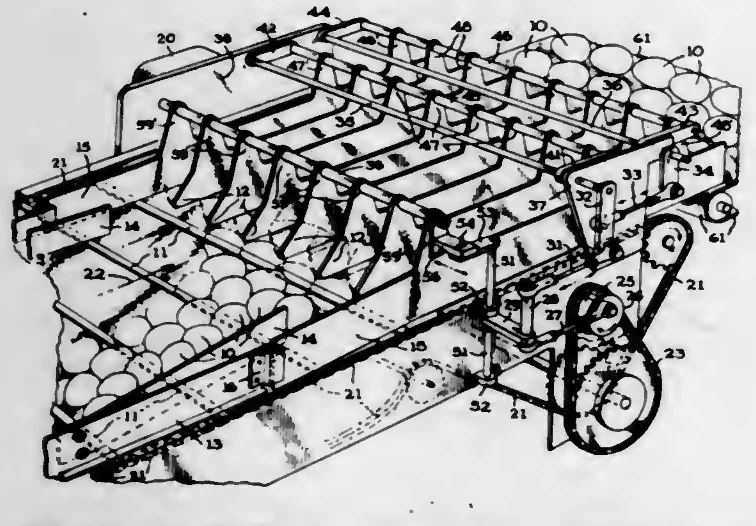
Jack I. Perry, and Bernard A. Schmader, both of Toledo, Ohio, assignors to Owens-Illinois, Inc.
Filed May 28, 1971, Ser. No. 147,847
Int. Cl. B65g *47/00*
U.S. Cl. 198—24 **8 Claims**



Apparatus and method for moving newly formed glass containers from a glass forming machine dead plate to a removal conveyor with automatic control means for the phasing of a sweep arm. Apparatus and method for automatically resetting the sweep arm of a 90° container sweepout mechanism associated with a glass forming machine is set forth and becomes operative when the sweep arm has been prevented from completing its cycle, due to an obstruction in its sweep path. In the present invention, positive stop provisions are integrated with the driven member to insure that the sweeping means cannot overtravel its normal operational limits in the event that a detent pin is slipped out of positive engagement with the driving member. In one embodiment for new mechanisms, the stop provisions are located internally of the housing carrying the main drive shaft. In an alternative embodiment, designed for utilization with existing mechanisms, the stop provisions are bolted onto the sweepout mechanism externally of the rest of the mechanism.

3,716,127
COMPOUND MOTION EGG CHANNELING DEVICE

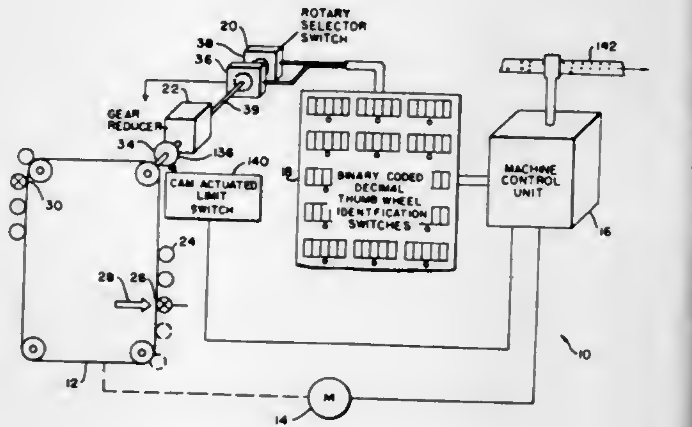
Thomas V. Loeffler, Northville, Mich., assignor to Diamond International Corporation, New York, N.Y.
Filed June 30, 1971, Ser. No. 158,415
Int. Cl. B65g *47/26*
U.S. Cl. 198—30 **9 Claims**



An egg channeling device for aligning eggs passing therethrough from a reservoir into an arrangement in rows, having flexible dividers which are moved by levers and connecting rods in both a vertical and a transverse direction thereby causing a compound movement in a sideward-upward direction of the plurality of dividers. End wall dividers on opposite sides of the conveyor are flexible enough to move along with the other dividers and still have a forward end contained by a bracket attached to the railing of the conveyor reservoir.

3,716,128
STRUCTURE FOR AND METHOD OF TOOL SELECTION

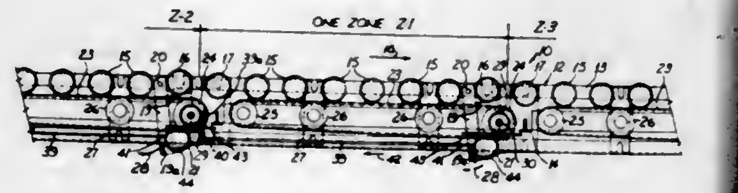
Dick O. Edge; Raymond F. Hammond, both of Madison Heights, and Robert S. Sutton, Franklin, all of Mich., assignors to Ex-Cell-O Corporation, Detroit, Mich.
Filed March 20, 1970, Ser. No. 21,419
Int. Cl. B65g *43/00*
U.S. Cl. 198—38 **11 Claims**



Tools having a code number are placed in individual tool positions on an endless conveyor from which they are to be selected. A separate identification switch associated with each tool position on the conveyor is set with a coded number representing the tool in the associated tool position on the conveyor. As the conveyor is moved, selector switch means are closed in accordance with the movement of the conveyor to sequentially qualify identification switches associated with particular tool positions on the conveyor. A light is provided adjacent each identification switch associated with each tool position on the conveyor and the selector switch means includes means for energizing the light adjacent the selector switch qualified thereby. On qualifying the identification switch associated with the position of a desired tool, the conveyor is first slowed and then stopped.

3,716,129
ACCUMULATING LIVE ROLLER CONVEYOR

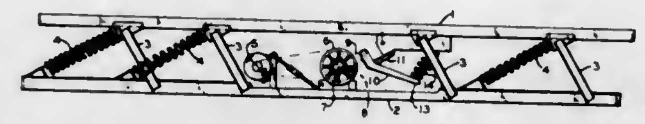
Albert Cornell Sadler, Jr., 147 Lazard, Mount Royal, Quebec, Canada
Filed April 22, 1971, Ser. No. 136,516
Int. Cl. B65g *13/02*
U.S. Cl. 198—127 **14 Claims**



Several groups of transport rollers and a depressible sensing roller (between every two adjacent groups) of transport rollers constitute an article supporting bed of the conveyor, which bed is divided into a plurality of successive zones each containing one group of transport rollers and one sensing roller. A plurality of driving belts constantly engage the group of transport rollers in the respective zones, and separate driving means independently propel the several driving belts from a common drive source. Each zone is provided with control means, responsive to depression of the sensing roller in that zone by passage of an article thereover, to disengage the driving means of the driving belt in the next preceding zone until the depressed sensing roller in the following zone is raised after passage of the article thereover.

3,716,130
VARIABLE VOLTAGE RESILIENT CONNECTING ROD DRIVE

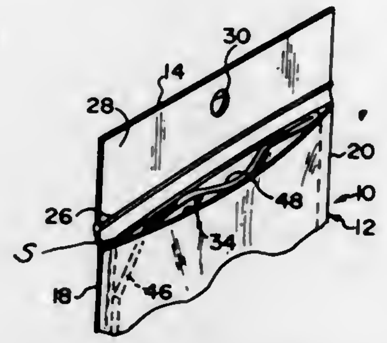
John M. Morris, Louisville, Ky., assignor to Rex Chainbelt Inc., Milwaukee, Wis.
Continuation of Ser. No. 786,286, Dec. 23, 1968, abandoned. This application April 15, 1971, Ser. No. 134,497
Int. Cl. B65g *27/18*
U.S. Cl. 198—220 DA **7 Claims**



A vibratory conveyor trough supported on resilient means to form a vibratory system having a resonant frequency is driven by an eccentric shaft and connecting rod resiliently coupled to the conveyor trough. The eccentric shaft, which may be fitted with a flywheel, is driven by a squirrel cage induction motor the speed of which is varied by adjustment of the voltage applied to the motor.

3,716,131
ENVELOPE-TYPE PACKAGE FOR FOLD-OVER TYPE COFFEE FILTER SHEETS

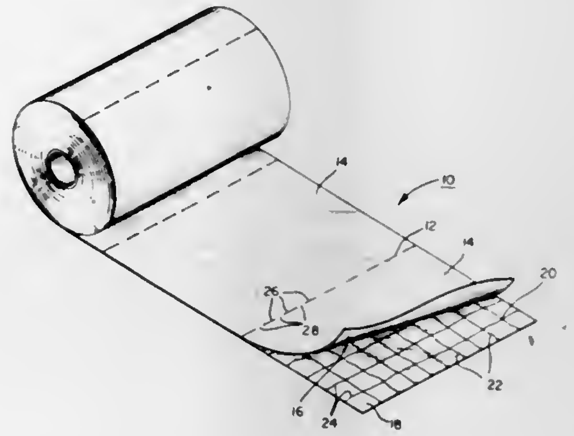
Irving Ackerman, 9226 North Kolmar Ave., Skokie, Ill.
Filed Nov. 5, 1971, Ser. No. 196,073
Int. Cl. B65d *85/04*
U.S. Cl. 206—57 **3 Claims**



A commercial envelope-type package including a quantity of once-folded coffee filter sheets of the rectangular fold-over type, the transverse width of the envelope of the package being slightly less than the transverse width of the once-folded sheets, thus creating a bulge which opens up the centerfolds of the sheets for reception of the user's forefinger thereinto and facilitates sliding of a single filter sheet from the package. A corner relief area of the folded sheets is provided in order further to facilitate proper selection of a single sheet for withdrawal purposes.

3,716,132
THREAD-REINFORCED LAMINATED STRUCTURE HAVING LINES OF WEAKNESS AND METHOD AND APPARATUS FOR CREATING LINES OF WEAKNESS

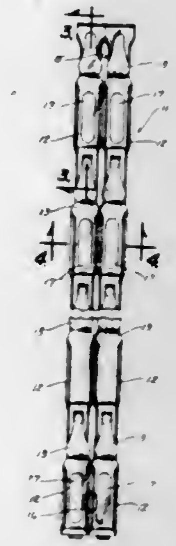
Roman Lewyckyj, Philadelphia, Pa., assignor to Scott Paper Company, Delaware County, Pa.
Filed Nov. 20, 1970, Ser. No. 91,240
Int. Cl. B32b *5/02*
U.S. Cl. 206—58 **23 Claims**



A laminated structure comprising at least one ply of cellulosic wadding with reinforcing threads secured thereto has a plurality of spaced lines of perforations separating discrete sheets of the laminated structure. Each line of perforations is defined by a series of spaced, discrete cuts spaced apart by uncut regions. The tensile strength of segments of reinforcing threads disposed in the uncut regions is substantially lower than the tensile strength of segments of reinforcing threads disposed outside of the uncut regions to thereby define lines of weakness along the lines of perforations. Method and apparatus for creating the above-described lines of weakness in the laminated structure by applying a crushing force in at least uncut regions to substantially weaken the segments of reinforcing threads disposed in the uncut regions.

3,716,133
PACKAGE FOR FRANGIBLE ARTICLES

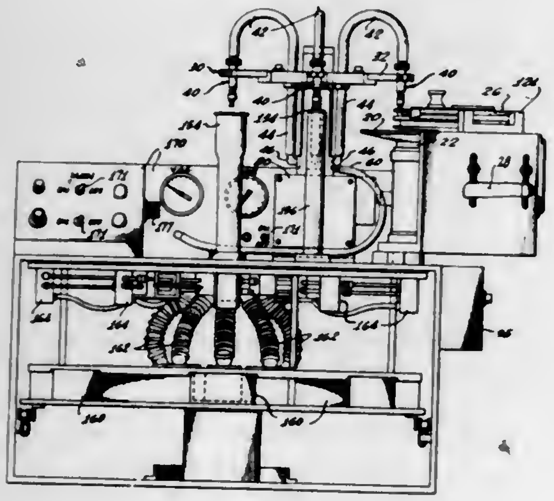
William F. Koebler, and Dale A. Frank, both of Charles City, Iowa, assignors to Salsbury Laboratories, Charles City, Iowa
Filed Feb. 10, 1971, Ser. No. 114,263
Int. Cl. B65d *71/00*
U.S. Cl. 206—65 A **5 Claims**



A package for containing and storing a plurality of frangible articles carried on elongated racks or wands. A film of transparent heat-shrinkable material is heat-shrunk about the elongated wands. Openings in the wrapping material are provided near each end of the package, and printed information readable through the wrapping material is enclosed on a label.

3,716,134
APPARATUS FOR AUTOMATICALLY TESTING AND SORTING ELECTRICAL ELEMENTS

Robert D. Campbell, La Crescenta, Calif., assignor to San Fernando Electric Manufacturing Co., San Fernando, Calif.
Filed March 8, 1971, Ser. No. 122,028
Int. Cl. B07c *5/344*
U.S. Cl. 209—73 **9 Claims**

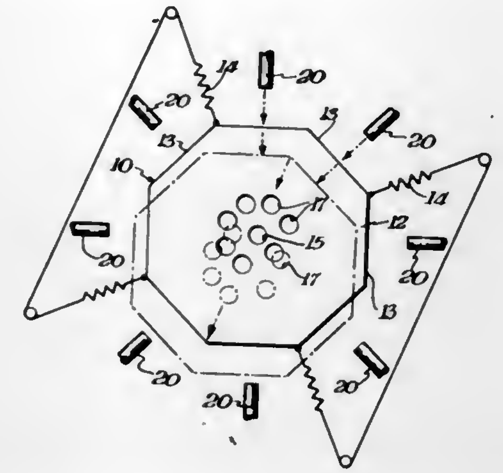


Electrical elements are moved by vibrator apparatus to a position below a multi-arm having a plurality of circumferentially spaced pickups to which respective tubes are connected. The spider is on a post that is moved in steps, and at the end of each step is raised and lowered. Via a control element around which the spider moves, each pickup tube is connected to a vacuum source as it reaches a pickup station, so that it captures a single element, and is maintained on vacuum through a test station to a drop station, where the vacuum is cut off and the element is released and directed to a receptacle selected as a result of a measurement previously made at the test station. Test contact arrangements shown include spaced spring contacts on nonconductive discs releasably mounted on a post, and spaced contacts wherein one is mounted on such a disc and the other is on the pickup. For the latter, connection to a stationary terminal is effected through a respective wiper for each contact carried by the spider structure. Also shown is photoelectric detection and associated air blast apparatus for returning components to the vibrator which do not have predetermined light reflective surfaces facing upward.

3,716,135
SORTING DEVICE

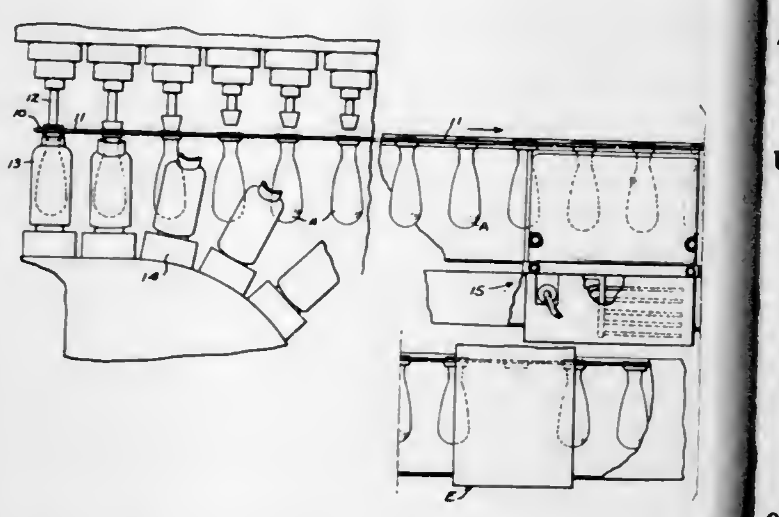
Noel C. Sears, Becket, and Roland G. Remillard, North Adams, both of Mass., assignors to Sprague Electric Company, North Adams, Mass.
Filed Sept. 16, 1970, Ser. No. 72,713
Int. Cl. B07c *3/02*
U.S. Cl. 209—74 **7 Claims**

Sorting apparatus for individual elements comprising an aperture and a shiftable body having a plurality of separate chutes each associated with a respective receptacle. The elements are passed individually through the aperture and are received in one of the chutes of the shiftable body which chute delivers the element to the respective receptacle. This delivery through the chute takes place while the shiftable member may be undergoing repositioning. While one element is in the process of being delivered to a predetermined receptacle, the procedure may be underway for receiving the next succeeding element and passing the next element to a different predetermined receptacle.



3,716,136
INSPECTING ARTICLES

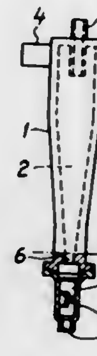
Richard A. Birner, Toledo, Ohio, Robert D. Kohler, Temperance, Mich., and Stewart M. Lang, Toledo, Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio
Filed May 28, 1971, Ser. No. 147,838
Int. Cl. B07c *5/342*
U.S. Cl. 209—82 **11 Claims**



A method and apparatus for inspecting articles to determine whether or not peripheral portions of the articles are in predetermined relation to one another which comprises moving the articles in a continuous path past an inspection station, directing a first beam of light transversely of the path of the article, causing a first portion of each article to intercept said first beam of radiant energy, directing a second beam of radiant energy which is in predetermined relation to the first beam and is adapted to have one part thereof intercepted by a second portion of the article and another part thereof pass the article if the second portion of the article is in predetermined relation to the first portion and creating a signal for reject or recording when the second beam is intercepted in its entirety or passes without intercepting the article. The method and apparatus further comprises utilizing a plurality of beams at different preselected longitudinally spaced areas of the article to determine other positions of various portions on the periphery of the article with respect to one another at each cross-section.

3,716,137
CYCLONE SEPARATOR

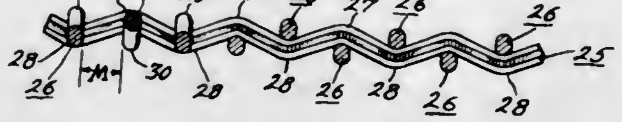
Rune Helmer Frykhult, Johanneshov, Sweden, assignor to Aktiebolaget Celleco, Tumbra, Sweden
Filed March 18, 1970, Ser. No. 20,539
Claims priority, application Sweden, March 21, 1969, 3959/69
Int. Cl. B04c *5/14*
U.S. Cl. 209—211 **3 Claims**



From the vortex chamber of a cyclone separator, a separated phase enters a discharge chamber coaxial with the vortex chamber and through which this phase flows toward a discharge opening while rotating around the axis of the chambers, thus following a screw-shaped track. Retarding means of the screw type are arranged coaxially in the discharge chamber and locked against rotation, the pitch of the retarding means being reversed relative to the pitch of the screw-shaped track of the separated phase.

3,716,138
SCREEN

Alexander D. Lumsden, Lancaster, Pa., assignor to Hoyt Wire Cloth Company, Lancaster, Pa.
Filed May 13, 1970, Ser. No. 36,974
Int. Cl. B07b *1/46*
U.S. Cl. 209—401 **8 Claims**

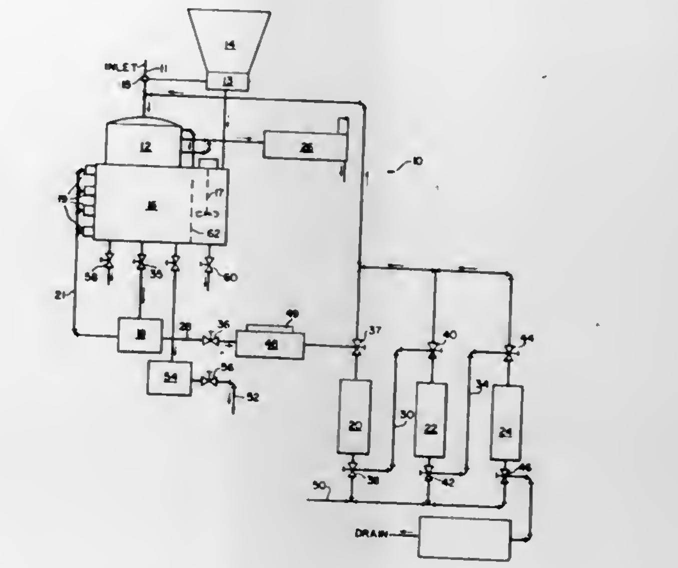


A vibrating screen woven with wire having an elliptic or oval cross section with a vertical dimension substantially greater than the horizontal dimension. In the manufacture of the screen, the individual wires are crimped prior to weaving so as to control the size of the openings provided by the interstices of the weave. The openings may have an outline which is square, rectangular (normally called oblong), or a combination (normally called long-slot) combining elongated rectangular openings with square openings.

3,716,139
WASTE TREATMENT SYSTEM

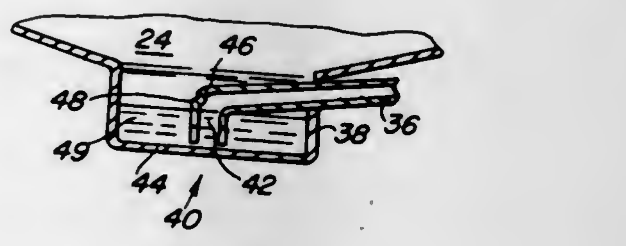
Abner B. Turner, Greensburg, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.
Filed Oct. 15, 1970, Ser. No. 80,985
Int. Cl. B01d *29/38, 15/06*
U.S. Cl. 210—104 **8 Claims**

A solids separation device consisting of a conveyor belt composed of tightly coiled springs, a dry chemical feed system, a surge conditioning tank of minimum size, an incinerator and a maximum flow filtration-absorption system comprising a filter-coagulator, a stripper column, and an absorption column compactly structured for usage under minimum available space conditions.



3,716,140
COOKING FAT FILTER WITH FAST START-UP

Richard T. Keating, 4301 West Madison Street, Chicago, Ill.
Filed April 2, 1971, Ser. No. 130,579
Int. Cl. B01d *35/00*
U.S. Cl. 210—167 **3 Claims**

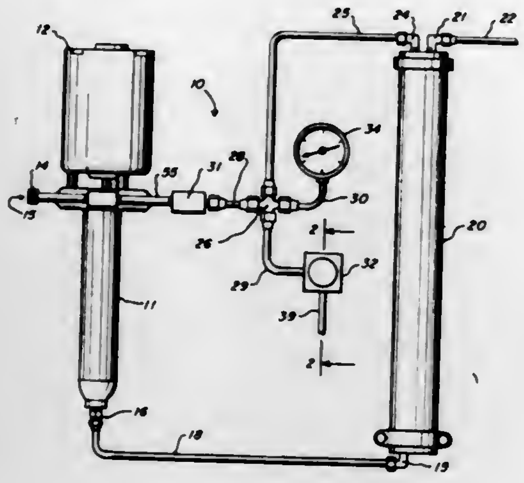


A cooking fat filter constructed with the upper edge of the fat vessel low relative to the floor so that it may be used in conjunction with fat fryers having a gravity drain, said vessel having a shallow sump subtended therefrom, there being a suction tube opening in and adjacent the bottom of the sump, said suction tube being inclined downwardly to the sump from a pump inlet and said tube having a by-pass hole opening to the sump above the level of all melted fat back-drained to the sump from pump-fryer return conduit system following filter shut-down, said hole bypassing hot liquid fat from the vessel to the suction tube during start-up and quickly melting solidified drainage fat stopped up therein, thereby dispensing with the time-consuming need to clean or drain the fat flow system after filter shut-down.

3,716,141
SOLVENT SEPARATING APPARATUS

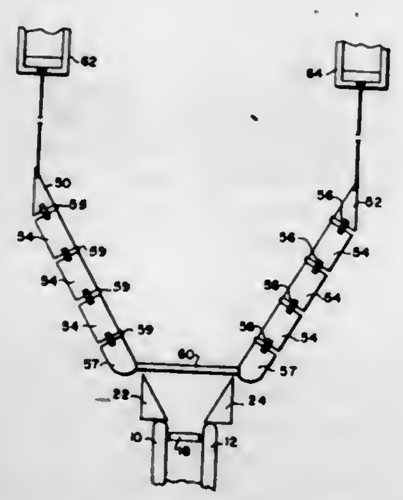
Donald Dean Spatz, Minnetonka, Minn., assignor to Osmonics, Inc., Minneapolis, Minn.
Filed Feb. 1, 1971, Ser. No. 111,189
Int. Cl. B01d *31/00*
U.S. Cl. 210—194 **10 Claims**

A solvent separating apparatus for purifying a solution by exposing said solution, under pressure, to a solvent separating means including a non-positive displacement pump for elevating the pressure of said solution prior to direction into said solvent separating means and means including two presized orifices for maintaining the desired pressure and desired flow rate of said solution through said solvent separating means and for flushing said solvent separating means periodically without the necessity of further adjustments in order to return the system to normal operating conditions.



3,716,142
LIQUID SURFACE SWEEPING APPARATUS

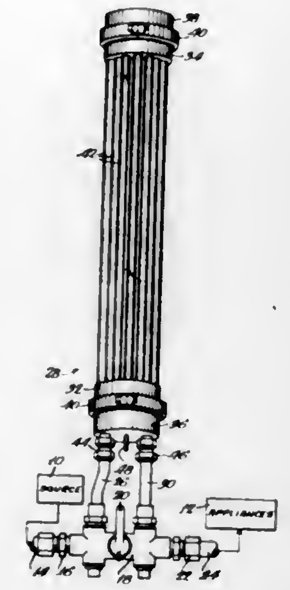
Ralph A. Bianchi, Lexington, Mass., assignor to JBF Scientific Corporation, Burlington, Mass.
Filed June 14, 1971, Ser. No. 152,662
Int. Cl. C02b *9/02*
U.S. Cl. 210—242 **11 Claims**



Buoyant sweeping members for use with a craft designed to skim floating materials, such as oil or oil-soaked sorbents from the surface of a body of water are described. These members are of two general types. The first is roughly triangular in shape when floating in the water and viewed from above. It has one planar edge surface and the underbody is curved both laterally away from this planar edge and also longitudinally. To form a sweep, two of these members are located with their planar surfaces opposing each other and converging in the direction of water flow. The points of the triangular shape point upstream and the members are articulated about a generally horizontal axis. A second member, used in conjunction with the first is generally rectangular in shape with a single planar edge surface. This member is laterally curved from the lower edge of the planar surface upwardly to the outer edge of the member. It is joined with members of the type described to form elongated booms for concentrating floating materials to then be skimmed from the water surface.

3,716,143
REVERSE OSMOSIS SEPARATION APPARATUS

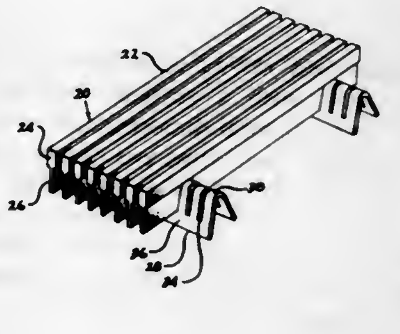
George B. Clark, Waukesha, Wis., assignor to Aqua-Chem, Inc., Milwaukee, Wis.
Filed March 30, 1970, Ser. No. 23,687
Int. Cl. B01d *31/00*
U.S. Cl. 210—321 **13 Claims**



A reverse osmosis liquid purification unit particularly adapted for home use in conjunction with low pressure water systems. The unit is adapted to receive water from a low pressure source to provide pure water that would otherwise be unobtainable for such purposes as drinking and direct all unpurified water to appliances within the home utilizing water without wastage.

3,716,144
SCREEN HAVING PARALLEL SLOTS AND METHOD

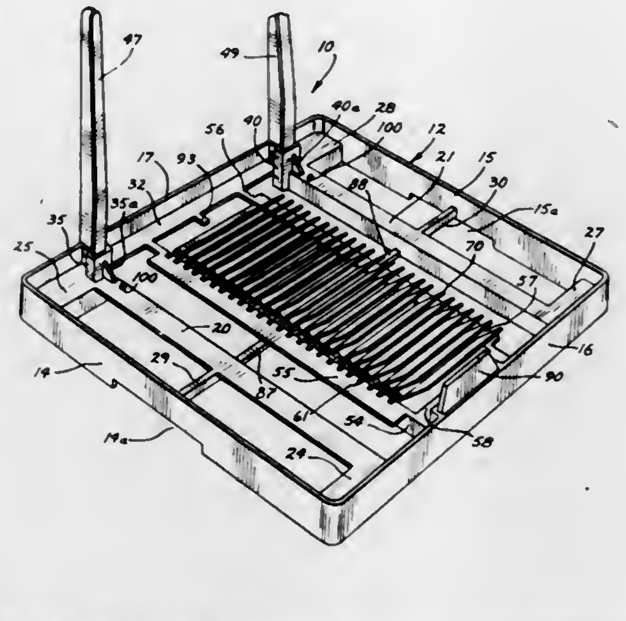
Aulden H. Bartlow, Carbondale, Pa., assignor to Hendrick Manufacturing Company, Carbondale, Pa.
Filed March 9, 1971, Ser. No. 122,441
Int. Cl. B01d *39/10*
U.S. Cl. 210—499 **7 Claims**



A screen having parallel slots therethrough comprises a plurality of rods supported in spaced parallel relation by transversely extending support members. The support members comprise spaced side walls having upper edges upon which the rods rest and bridges extending upwardly and between the rods to connect the side walls as one piece. The rods are anchored to the support members by swaging the rods at points below the elevation of said bridges in a fashion that displaces material in the rods to positions underlying said bridges, thus creating an interference lock between the rods and the bridges.

3,716,145
RECORD HOLDING STRUCTURE

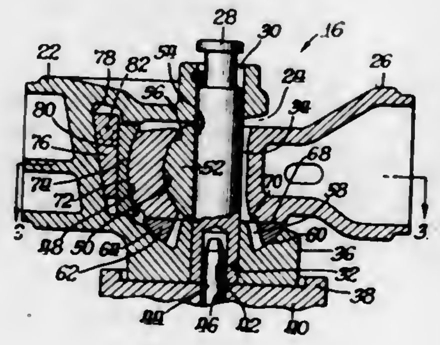
Julian Gutierrez, 6233 Brookview Ave., Minneapolis, Minn.
Filed April 29, 1971, Ser. No. 138,712
Int. Cl. A47b *81/06*
U.S. Cl. 211—40 **8 Claims**



A phonograph record holding apparatus comprising a mul-iplicity of pivotal record holding members each arranged and dapted to have lateral displacement for their insertion and emoval. Said members each comprise a yoke portion to eceive a record and have shaft portions extending from either nd thereof journaled in aligned apertures of a pair of spaced upporting members with one of said supporting members in-luding a stop member to engage and abut one shaft end of a olding member to retain said holding member in operating osition, said stop member being adapted to yield to an up-ard bias to free said shaft end and permit lateral displace-ent or movement of said holding member for removal hereof from said supporting members.

3,716,146
SLACK ADJUSTER FOR RAILWAY CAR COUPLERS

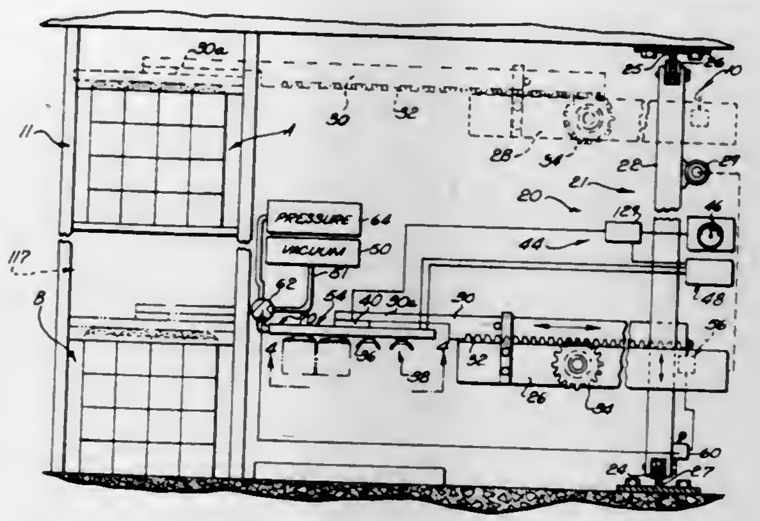
ussell George Altherr, Munster, Ind., assignor to Amsted Industries Incorporated, Chicago, Ill.
Continuation-in-part of Ser. No. 17,257, March 6, 1970, abandoned. This application Aug. 26, 1971, Ser. No. 175,107
Int. Cl. B61g *1/28*
.S. Cl. 213—75 R **6 Claims**



A gravity-feed wedge shaped shim disposed within the cou-ler, is utilized as a slack adjuster in conjunction with position-g means to establish the desired minimum clearance etween abutting parts to substantially compensate for slack ong the longitudinal axis of the coupler.

3,716,147
STACKER CRANE ORDER PICKER

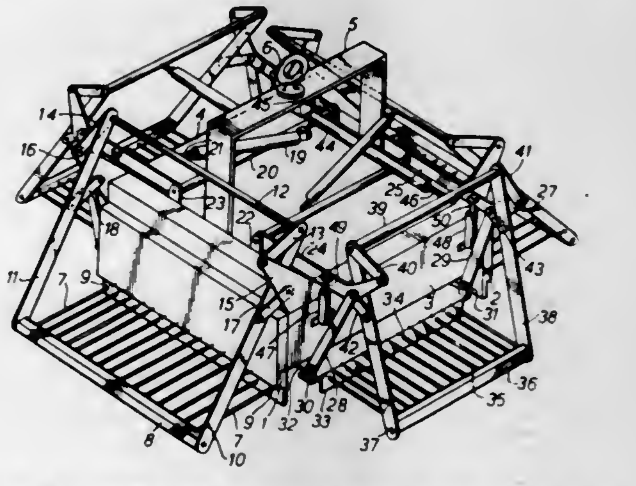
George R. Pipes, South Euclid, Ohio, assignor to Eaton Yale & Towne, Inc., Cleveland, Ohio
Filed Feb. 22, 1971, Ser. No. 117,365
Int. Cl. B65g *59/04*
U.S. Cl. 214—1 BT **7 Claims**



An article-handling apparatus removes a predetermined number of articles from a matrix of articles. The article-handling apparatus includes an article-engaging means which is movable to an article pickup position at which the article engaging means picks up articles. The article-handling apparatus also includes sensing means which is associated with the article pickup means and operates to sense the number of articles supported by the article-pickup means. The sensing means controls a means which is operable to control the number of articles picked up by the article pickup means.

3,716,148
SPLITTING AND BLENDING OF FIBROUS BALES

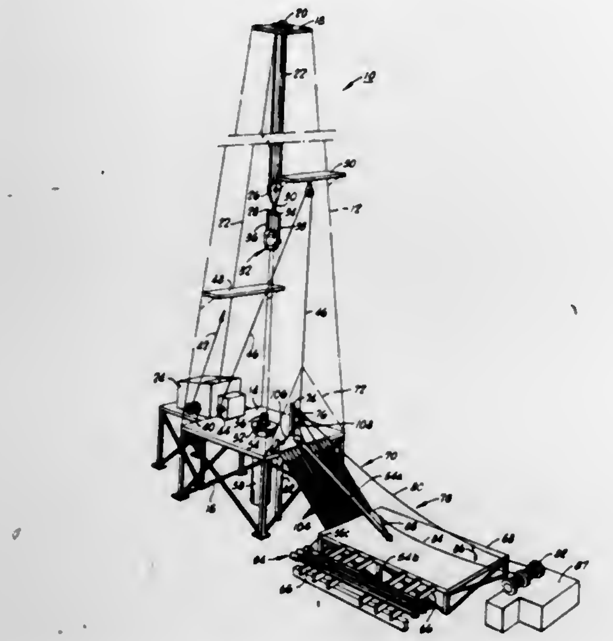
John Maximilian Jules Varga, Halifax, England, assignor to Carding Specialists (Canada) Limited, Ontario, Canada
Filed Oct. 26, 1971, Ser. No. 192,218
Claims priority, application Great Britain, Oct. 23, 1970, 50,447/70
Int. Cl. B65g *59/02*
U.S. Cl. 214—8.5 C **8 Claims**



Apparatus for separating layers of fibrous material from a bale, comprising means for pressing on the top of the bale, a pair of splitting forks facing one another in a first horizontal plane, a pair of retaining forks facing one another in a slightly lower horizontal plane and at right angles to the first pair of forks, means for forcing the two pairs of forks into a bale from four directions, and means for lifting the pressing means and splitting forks relative to the retaining forks to separate a layer from the bale, the remainder of which is retained by the retaining forks.

3,716,149
APPARATUS FOR PIPE HANDLING

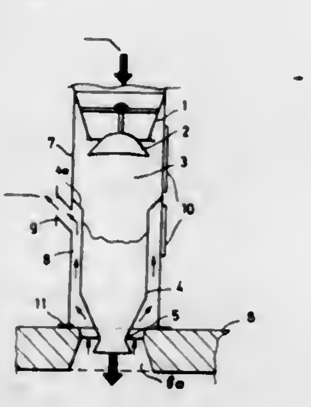
Orville C. Scaggs, 918 West Choctan, Lindsay, Okla.
Filed Nov. 3, 1971, Ser. No. 195,187
Int. Cl. E21b *19/14*
U.S. Cl. 214—2.5 **9 Claims**



Apparatus for handling oil field pipe and casing in accelerated manner and which reduces likelihood of damage to bell housing or threaded ends of pipe sections during the handling process. The apparatus consists of an endless trolley rigging secured to operate through the V-doors of the derrick assembly in coaction with the pipe racks and pipe handling area, as well as a tensioning tool and hoist line which, in turn, function interactively with the trolley cable to deliver pipe sections at the V-door at proper manipulation level while avoiding contact of the more fragile pipe ends with damaging surfaces; this procedure serves to reduce greatly loss and damage to highly expensive pipe sections.

3,716,150
DEVICE FOR CHARGING COKING OVENS

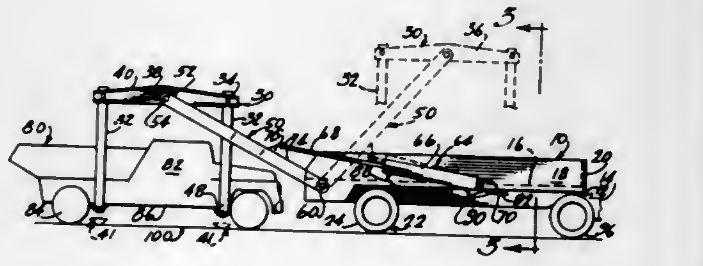
Heinrich Echterhoff, and Wilfried Herz, both of Essen, Germany, assignors to Firma Bergwerksverband G.m.b.H., Essen, Germany
Filed Nov. 8, 1971, Ser. No. 196,563
Claims priority, application Germany, Dec. 10, 1970, P 20 60 677.3
Int. Cl. C10b *31/02*
U.S. Cl. 214—35 R **6 Claims**



An outer tubular member has a lower end which is to be placed into communication with the inlet opening of the coking oven, and an upper end which communicates via a normally open back-pressure valve with a coal hopper. The valve closes if back-pressure of a certain magnitude develops in the inlet of the coking oven. An inner tubular member is concentrically accommodated in the outer tubular member and has at its upper end a flange which is connected with the inner side of the outer tubular member so that the members define between themselves an annular gap which is open at the lower end of the outer tubular member. A lower end portion of the inner tubular member converges conically outwardly beyond the lower end of the outer tubular member, and a suction vent communicates with the annular clearance for venting gases which enter the gap.

3,716,151
POWER DRIVEN LIFTING AND POSITIONING DEVICE

Homer C. Dodd, Atlanta, Ga.
(Box 1099–F, Rte. 6, Brooksville, Fla. 33512)
Filed Jan. 29, 1971, Ser. No. 111,038
Int. Cl. B60p *1/48*
U.S. Cl. 214—77 R **1 Claim**

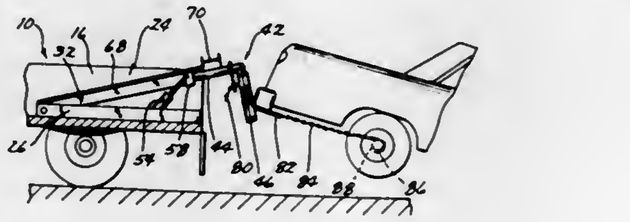


Especially suited for lifting vehicles such as automobiles and small trucks to load same on the back of another, larger vehicle such as a tractor trailer truck, a box-like lifting frame comprising a vertical, steel channel post at each of the four corners is structurally rigid by means of transverse steel rod members and a pair of longitudinal frame members across the tops of respective pairs of corner posts. Lifting supports across the bottom of the frame are constructed from metal tread plate attached by steel rods. The bottom of the box-like frame is of a size to correspond with and fit into the bed of a transport truck. Large, long lifting levers made from steel channel have one end pivotally attached to the sides of the truck bed on each of the two sides and the other end is attached substantially medially by a pivot pin to the top channels. A hydraulic cylinder on each side of the truck bed has one end pivotally attached to the truck bed and the end of the extensive cylinder rod therein pivotally attached at a point less than half the distance of the long lever. Suitable hydraulic control means is provided to be operated from a hydraulic pump controlled from the transport truck. Operation of the hydraulic cylinder in one direction causes the piston rod to extend thereby pivoting the long levers about the truck bed pivot point to place the large box frame on the ground or beneath a vehicle after which actuation of the hydraulic cylinders to return the piston rod lifts the entire frame with the vehicle thereon and places it on the bed of the truck.

3,716,152
VEHICLE TOWING MEANS

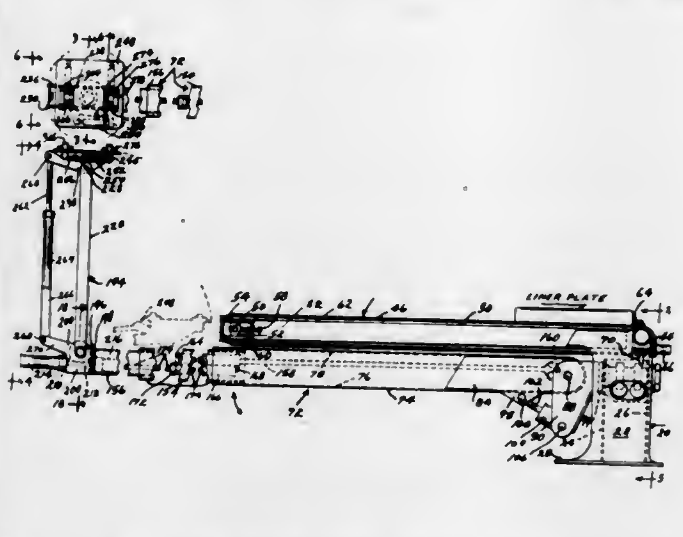
James W. Sloter, 514 E. Chubb, Algona, Iowa
Filed April 30, 1971, Ser. No. 139,086
Int. Cl. B60p *3/12*
U.S. Cl. 214—86 A **6 Claims**

A means for towing a vehicle comprising a frame means which is positioned on the floor of a truck bed with a sub-frame means being pivotally connected at its forward end to the forward end of the frame means. A normally horizontally disposed deck means is secured to the sub-frame means and extends thereover and the frame means and is spaced above the floor of the truck bed. The sub-frame means includes a tow frame member which is selectively movably mounted on the sub-frame means between stored and operative positions. The rearward end of the tow frame member is received between the deck means and the floor of the truck bed portion when in its stored position and is positioned rearwardly of the truck when in its operative position. Connection means is provided on the rearward end of the tow frame member for securing the vehicle to be towed thereto. A hydraulic cylinder means is connected to the sub-frame means for pivoting the sub-frame means about its forward end to permit the rearward end of the tow frame member to be selectively raised and lowered to raise and lower one end of the vehicle to be towed. A closure means closes the rearward end of the frame means when the tow frame member is in its stored position so that the bed portion of the vehicle may be used for other purposes when a vehicle is not being towed.



3,716,153
DEVICE FOR POSITIONING LINER PLATES UPON THE INTERIOR SURFACE OF A DRUM FOR SECUREMENT THERETO

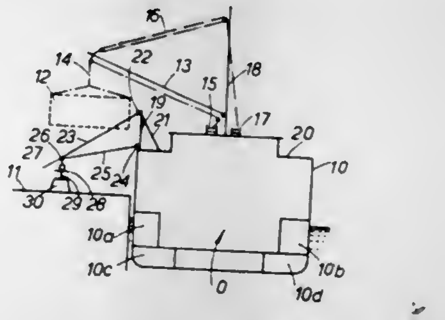
Maurice J. Bartell, Duluth, Minn., assignor to Barko Hydraulics, Inc., Duluth, Minn.
Filed Oct. 20, 1971, Ser. No. 190,970
Int. Cl. B66b *17/00*
U.S. Cl. 214—91 **19 Claims**



A device for positioning liner plates upon the interior surface of a drum for securement thereto which includes a support having a telescopic boom mounted thereon for extension into a drum, a platen on which is secured a liner plate, an elevating arm on which the platen is mounted with a gear and rack for moving the elevating arm, gear and rack means for rotating the boom on its longitudinal axis together with a hydraulic ram for pivoting the boom on the support, a ram for tilting the platen relative to the elevating arm, the platen being rotatable on the elevating arm with a hydraulic ram for rotating the platen and an endless belt mounted on the support for conveying a liner plate to the platen.

3,716,154
PROCESS OF COUNTERACTING A TILTING OF A SHIP⅛S HULL DURING LOADING AND UNLOADING OF COMPARATIVELY HEAVY CARGO UNITS AND A DEVICE TO BE USED IN SUCH PROCESS

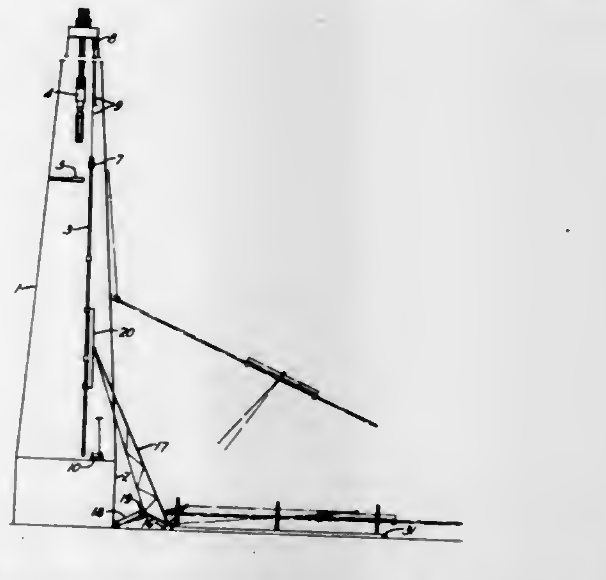
Leif Berg, Risskov, Denmark, and Ragnar Jonas Nes, Minde, Norway, assignors to Ingeniorene Lund, Mohr & Giaever-Euger, Bergen, Norway
Filed Feb. 4, 1971, Ser. No. 112,667
Claims priority, application Norway, Feb. 6, 1970, 414/70
Int. Cl. B65g *27/04*
U.S. Cl. 214—152 **2 Claims**



A process to prevent tilting of a ship's hull during loading and unloading of comparatively heavy cargo units by means of the ship's own cargo gear, using at least one supporting leg mechanism on board the ship to support the ship against a top face on a quay and using a manometer in said mechanism to control that a positive load is applied continuously in said mechanism against said top face provided mainly by trimming the ballast tanks of the ship. A supporting leg mechanism provided with a manometer and means to adjust the mechanism in relation to the quay level.

3,716,155
METHOD OF HANDLING DRILL PIPE

Homer J. Woolslayer; Joseph R. Woolslayer; Cecil Jenkins, all of Tulsa, and Erwin A. Campbell, Bixby, all of Okla., assignors to Lee C. Moore Corporation, Tulsa, Okla.
Division of Ser. No. 25,644, April 6, 1970, Pat. No. 3,613,905. This application July 12, 1971, Ser. No. 161,658
Int. Cl. E21b *19/14*
U.S. Cl. 214—152 **5 Claims**

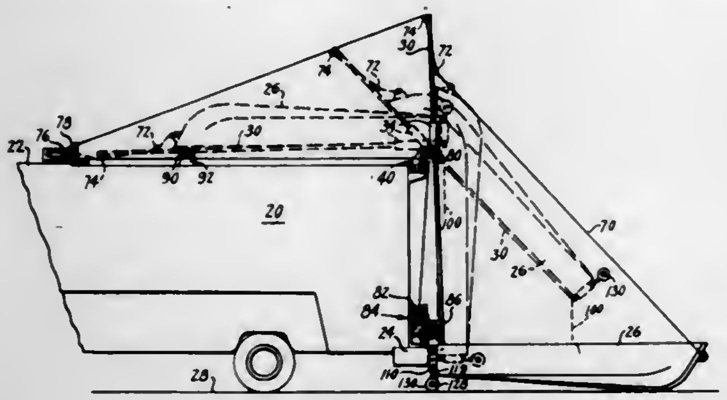


As each successive stand of drill pipe is pulled out of a well hole at the bottom of an oil well derrick, it is set back in the derrick until a multiple stand set back has been formed. Then the lower end of the setback is swung out of the derrick and away from it while the upper end of the setback is being lowered. Substantially at the same time the setback is moved bodily, lower end first, away from the derrick to lay the setback down on a support.

3,716,156

BOAT TRANSPORTER

Donald R. Risney, 2028 Richmond St., Sacramento, Calif.
Filed March 30, 1971, Ser. No. 129,335
Int. Cl. B60r *9/00*
U.S. Cl. 214—450 **4 Claims**

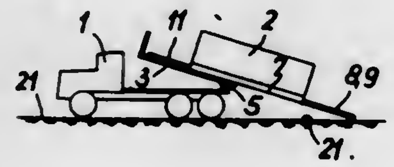


A cross piece clamped and tied to the ends of a boat, rotatable about the short axis thereof, and longitudinally movable about the long axis thereof for lifting the boat onto the roof of a vehicle. A pin-tube assembly for removably and controllably positioning wheels to the rear of a boat.

3,716,157

APPARATUS FOR LOADING OF CARGO ONTO AND UNLOADING CARGO FROM A VEHICLE

Johannes Mittler, Rheinhausen, and Karl Schardey, Rumeln-Kaldenhausen, Germany, assignors to Fried. Krupp Gesellschaft mit beschrankter Haftung, Essen, Germany
Filed Oct. 1, 1971, Ser. No. 185,775
Claims priority, application Germany, Oct. 10, 1970, P 20 49 875.3
Int. Cl. B60p *1/28*
U.S. Cl. 214—505 **11 Claims**



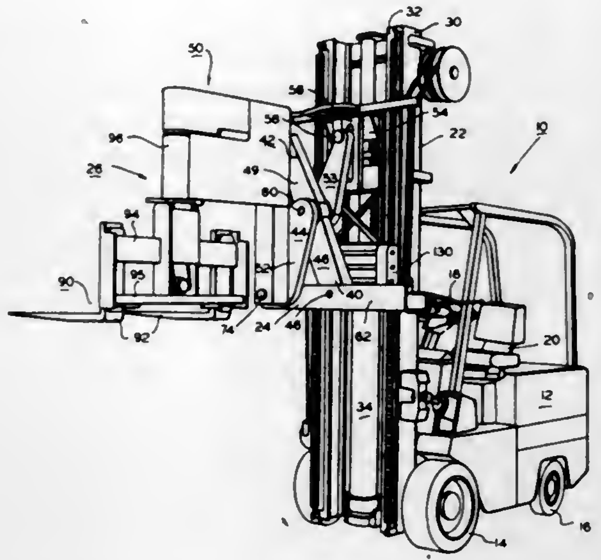
In combination with the platform of a vehicle, an apparatus for loading cargo onto and unloading the same from the vehicle, according to which a platform with pivotable means is adapted to move a cargo receiving means having front and rear extension means onto and from the vehicle, said front extension means having a pivotable supporting section.

3,716,158

LOAD EQUALIZING SYSTEM FOR LIFT TRUCKS

Howard C. Hansen, Battle Creek, Mich., assignor to Clark Equipment Company
Continuation-in-part of Ser. No. 61,672, Aug. 6, 1970. This application Nov. 11, 1971, Ser. No. 197,822
Int. Cl. B66f *9/14*
U.S. Cl. 214—730 **11 Claims**

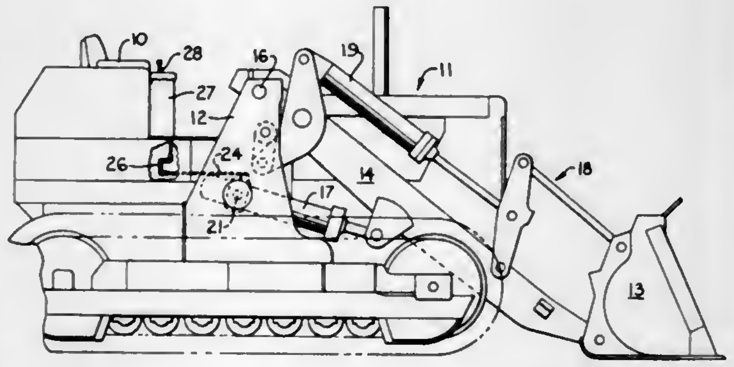
A load equalizing and stabilizing system for use with lift trucks having an upright and an attachment for handling laterally positioned loads, in which a pair of laterally spaced, vertically positioned racks are mounted on the upright on opposite sides of the center line thereof, and one or more horizontally positioned shafts extends between said racks and are journalled in the carriage and contain pinions mounted on the end thereof meshing with the racks. The pinions are mounted on the ends of the shaft in such a manner that they can tilt laterally to adjust to irregularities in the racks, this being preferably accomplished by a crowned spline structure interconnecting the shaft and pinion.



3,716,159

AUTOMATIC VALVE CONTROL MECHANISM FOR VEHICLE MOUNTED IMPLEMENTS

Stamos I. Papasideris, Bristol, and Robert A. Shiffler, West Chicago, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.
Filed Feb. 17, 1971, Ser. No. 116,114
Int. Cl. B66f *9/00*
U.S. Cl. 214—762 **8 Claims**



An automatic means for controlling the height to which a loader bucket is raised comprising a valve control mechanism supported by pivotal means adapted to be controlled by a hydraulic jack which, in turn, employs a detented control valve by which the jack is operated and means to disengage the detent to allow the valve to return to a neutral position when the implement reaches a predetermined, raised position. The latter means includes a valve-actuating lever connected to the valve by a mechanical linkage, a control link assembly having a spring-loaded, lost-motion link means as an integral part thereof, and lever means actuating the control link assembly by the pivotal movement of the jack. The lost-motion link means is operable upon adjusting the implement to a predetermined position to forcibly move the actuating lever to disengage the detent means allowing the valve to return to its neutral position.

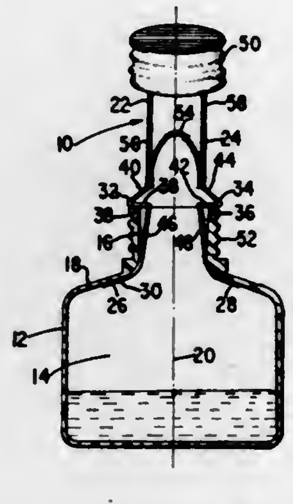
ERRATUM

For Class 214—768 see:
Patent No. 3,716,175

3,716,160

SAFETY CLOSURE DEVICE

Douglas W. Thomas, Toms River, N.J., assignor to American Home Products Corporation, New York, N.Y.
Filed Aug. 31, 1971, Ser. No. 176,631
Int. Cl. B65d *39/12*
U.S. Cl. 215—9 **5 Claims**

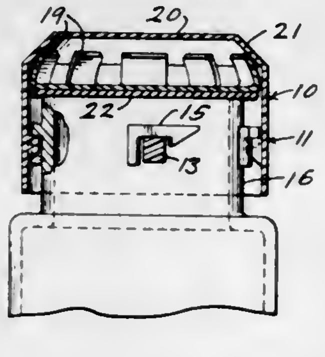


The disclosure is directed to a safety closure device for liquid containers which prevent a child from placing his mouth in contact with the discharge neck of the container but permit the contents to be poured freely. The device is comprised of a number of legs which may be connected to the cap and extend down into the bottle in the closed position. In the open position feet or lower members of the legs engage the inner surface of the neck at the bottom and lugs engage the upper surface of the neck preventing the cap from being withdrawn or pushed back into the bottle until a compression force is applied to the legs. The cap is supported on the ends of the legs above the lugs at a sufficient distance so that a child's mouth placed over the cap cannot engage the neck of the bottle to permit drinking of the contents.

3,716,161

SAFETY CLOSURE FOR A MEDICINE BOTTLE OR THE LIKE

Randall K. Julian, Elberfeld, and Peter R. Gach, Evansville, both of Ind., assignors to Sunbeam Plastics Corporation, Evansville, Ind.
Filed Oct. 26, 1971, Ser. No. 192,417
Int. Cl. B65d *55/02*
U.S. Cl. 215—9 **4 Claims**

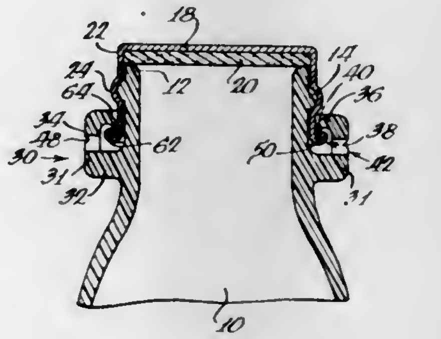


A safety closure for a medicine bottle or the like. The closure and bottle neck have cooperating lug and ramp means of the bayonet type. The closure is placed over the bottle neck, depressed onto the neck and rotated relative to the neck to engage the lugs and ramps. To remove the closure, it is pressed downwardly to disengage the lugs and then rotated in the opposite direction. The closure is biased upwardly relative to the bottle neck by the engagement of an annular conical shoulder on the closure with upwardly turned fingers on a disc-like biasing element that is positioned between the top of the closure and the end of the bottle neck.

3,716,162

TAMPER-PROOF CLOSURE ARRANGEMENT

Albert L. Botkin, 3018 W. Hood Avenue, Chicago, Ill.
Filed Sept. 20, 1971, Ser. No. 182,073
Int. Cl. B65d *41/20*
U.S. Cl. 215—42 **10 Claims**

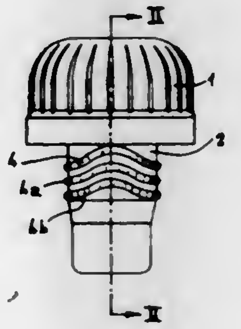


A tamper-proof seal that is located between a container and a cap received on a threaded open end of the container. The tamper-proof seal consists of a flange integral with the container wall adjacent the open end and defining an upwardly opening recess that has a reduced mouth at the upper end. The flange is divided into a fixed portion and a flexible, frangible portion. The cap has an enlarged bead on the lower end thereof that has a dimension greater than the dimension of the mouth to cause outward deflection of the frangible portion when the cap is threaded onto the container and the enlarged bead and frangible portion cooperate to define interlocking elements when the cap is placed in sealing engagement with respect to the open end of the container.

3,716,163

STOPPERS FOR PRESSURIZED CONTAINERS

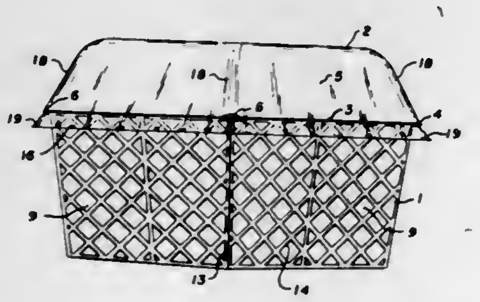
Henri Marcel, Les Cheres, France
Filed Sept. 7, 1971, Ser. No. 178,354
Claims priority, application France, Nov. 26, 1970, 7043581
Int. Cl. B65d *35/04*
U.S. Cl. 215—47 **5 Claims**



A stopper made of molded synthetic material comprises a dome-shaped head and a hollow cylindrical body depending therefrom, the said body being closed at its lower end. The periphery of the body is provided with annular protruding ribs which coact with the inside of the bottle neck to insure fluid-tightness and these ribs are of substantially sinusoidal shape, each comprising an even number of undulations or wave lengths. With such an arrangement, if the neck has a zone of somewhat restricted diameter and/or of somewhat non-circular cross-section, as such is often the case with bottles for sparkling beverages, the stopper may nevertheless be easily extracted from the bottle by rotating it within the neck while it is submitted to a pulling force.

3,716,164
BERRY BASKET AND COVER

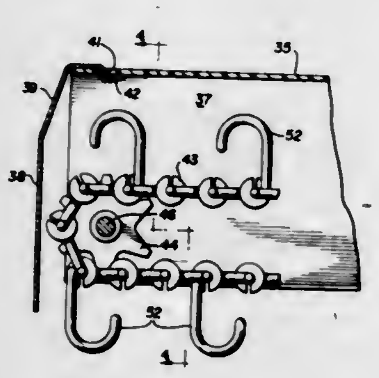
Everett Fennema, 9607-57 Street, Edmonton, Alberta, Canada
Filed Aug. 24, 1970, Ser. No. 66,281
Int. Cl. B65d *43/10*
U.S. Cl. 220—60 R **5 Claims**



A plastic lattice-work berry basket having a novel locking arrangement is provided. A T-shaped slot network is cut in each corner of the cover. The basket top ridge is provided with sharp, outwardly projecting corners. These corners each engage the vertical slot of one of the networks when the cover is pushed onto the basket. The vertical slots guide the corners into the horizontal slots, into which they snap to lock the basket and cover together.

3,716,165
MERCHANDISING DISPENSING MODULE FOR VENDING MACHINES

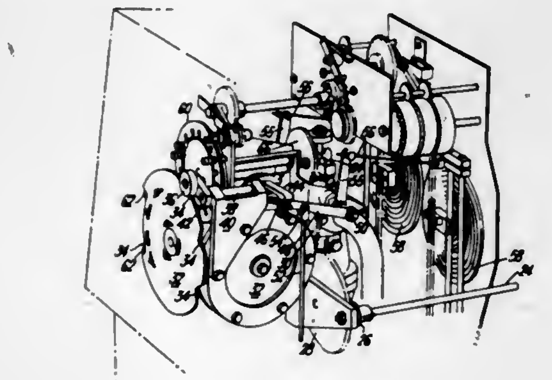
William A. Patrick, Mayflower, Ark., assignor to Polyvend, Inc., Conway, Ark.
Filed Apr. 19, 1971, Ser. No. 135,311
Int. Cl. G07f *11/58*
U.S. Cl. 221—85 **4 Claims**



A replaceable, vending machine, merchandise dispensing module having endless conveyor merchandise supporting means wherein the module is provided with a pivoted identification tab corresponding to a merchandise selector button which enables the use of a shorter module and a smaller front-to-back machine dimension while permitting the free fall of merchandise between the front end of the module and the front of the machine.

3,716,166
LIQUID DISPENSING APPARATUS

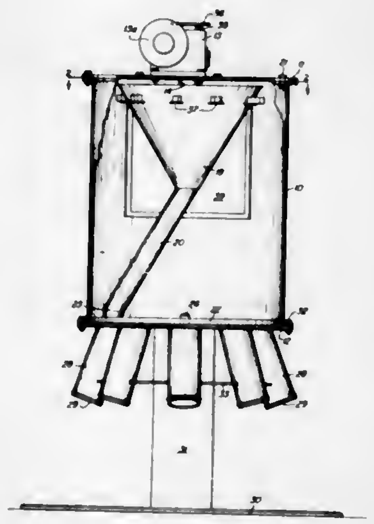
Colin Roderick Petyt, Middlesex, England, assignor to Avery-Hardoll Limited, Chessington, Surrey, and Beck & Co. (Meters) Limited, London, England
Filed Nov. 5, 1970, Ser. No. 87,043
Claims priority, application Great Britain, Nov. 11, 1969, 55,148/69
Int. Cl. B67d *5/22*
U.S. Cl. 222—15 **3 Claims**



A petrol pump for dispensing a plurality of petrols of different octane ratings having an interlock preventing operation of the motor of the pump whilst the selected blend is being changed.

3,716,167
ROTARY SAMPLE COLLECTOR

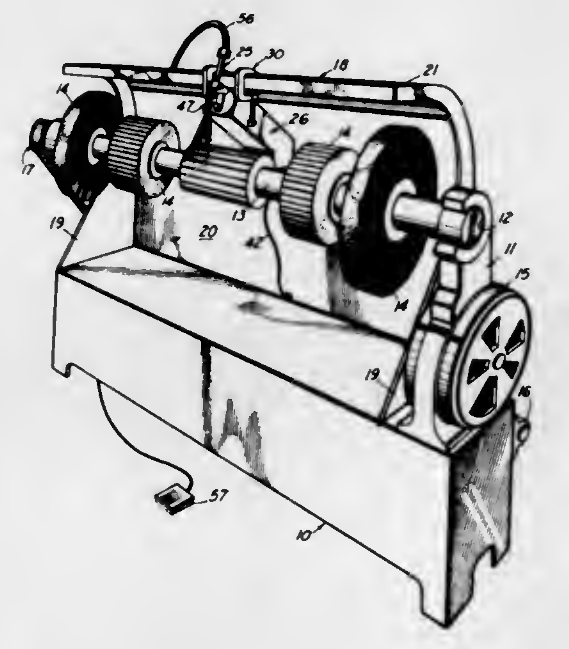
Fred R. Huntington, Salt Lake City, Utah, assignor to The Galigher Company, Salt Lake, Utah
Filed March 15, 1971, Ser. No. 123,996
Int. Cl. B67d *5/08*
U.S. Cl. 222—63 **12 Claim**



A rotary sample collector for receiving periodically collected samples of dry, granular materials is the subject of this disclosure. The collector comprises a cylindrical closure containing a rotatable, inverted cone-shaped hopper into which sample material is introduced to be discharged at the cone apex through an inclined conduit to one of a plurality of collection stations. The collection stations are disposed in a circle about the base of the collector, each station having a tubular member which communicates with the inclined conduit upon rotation of the cone-shaped hopper to sequentially align the lower opening of the inclined conduit with the upper opening of each tubular member of each collecting station.

3,716,168
SHOE POLISH DISPENSING DEVICE

Hubert H. Buice, 4 N. Clarendon Rd., Avondale Estates, Ga.
Filed Aug. 27, 1970, Ser. No. 67,341
Int. Cl. B67d *5/62*
U.S. Cl. 222—146 HE **6 Claims**

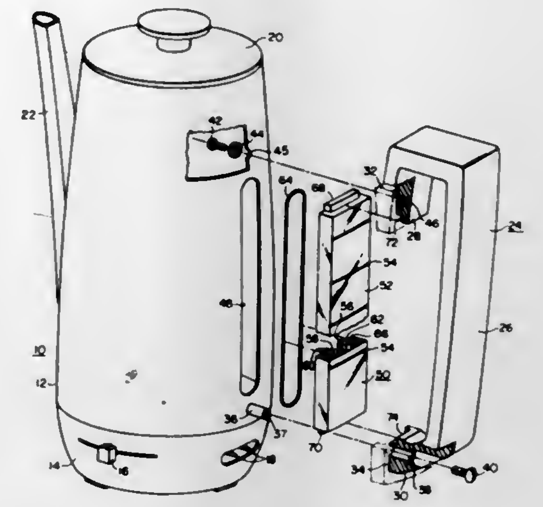


This invention relates to an improved polish dispensing device for use on a shoe working machine. More particularly, this invention includes a conduit support means removably mounted on a shoe working device at a position above a number of shoe working elements. The conduit means has a shoe polish container supported adjacent one end thereof with a shoe polish heating means located in an opposite end of the conduit. Air pressure means is operatively associated with a dispensing orifice on the shoe polish container for dispensing a quantity of shoe polish therefrom. Control means is operatively associated with the air pressure means for effecting a shoe polish dispensing operation. The shoe working machine includes hood means operatively associated with the shoe working elements and positioned relative to the shoe polish dispensing means whereby air flow created by the shoe working elements will be directed over the heating means for assistance in controlling the temperature of the shoe polish and heating means.

3,716,169
LIQUID LEVEL WINDOW FOR COFFEEMAKERS

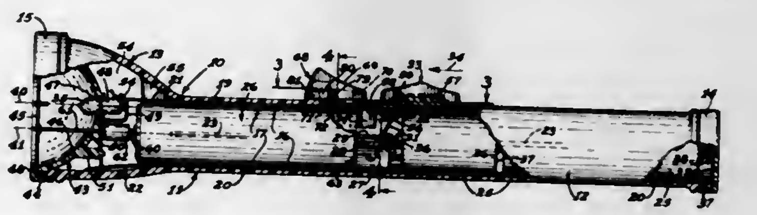
James R. Chivers, Mansfield, Ohio, assignor to Scovill Manufacturing Company, Waterbury, Conn.
Filed May 11, 1971, Ser. No. 142,301
Int. Cl. B67d *5/38*
U.S. Cl. 222—157 **2 Claims**

The invention provides a handle and liquid level window assembly for a coffeemaker characterized by a transparent or translucent molded plastic window overlapping an elongated aperture in the coffeemaker and secured in proper sealing relationship by the coffeemaker handle and its associated mounting means.



3,716,170
CHEMICAL EJECTING FLASHLIGHT

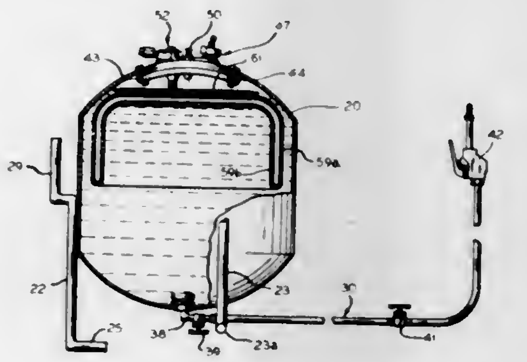
Ralph W. Mangels, Phoenix, Ariz., assignor to Daco Safety Products, Tempe, Ariz.
Filed Oct. 4, 1971, Ser. No. 186,241
Int. Cl. F21v *33/00*
U.S. Cl. 222—162 **14 Claims**



A dual purpose flashlight containing within its casing a pressurized chemical source which may be actuated to dispense a chemical within the range of the rays of its light by a trigger mounted on the exterior of its casing.

3,716,171
AIRLESS HYDRAULIC SYSTEM SUPPLY

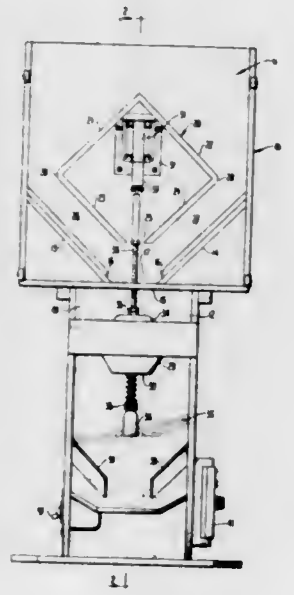
Oscar C. Blomgren, Sr., and Oscar C. Blomgren, Jr., both of North Chicago, Ill., assignors to Tuxco Corporation
Filed Feb. 19, 1971, Ser. No. 116,839
Int. Cl. B67d *5/54*
U.S. Cl. 222—396 **16 Claims**



A brake fluid supply vessel with a pressurizable expansible bladder therein for expelling fluid through the bottom of the vessel. Vents communicate with the bladder and the tank around the bladder to allow exhaustion of air therefrom.

3,716,172
AUTOMATIC FEEDER DEVICE

Huston D. Crippen, Esmont, Va., assignor to Coleswood Products, Inc., Esmont, Va.
Filed Sept. 3, 1970, Ser. No. 69,237
Int. Cl. A01k *5/02*
U.S. Cl. 222—453 **1 Claim**

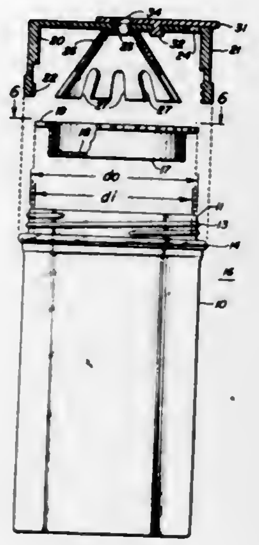


An automatic particulate material dispensing device for dispensing predetermined quantities of material such as particulate feed material at regular intervals for access by animals such as livestock, pets and the like. The dispensing device includes an upper material receiving chamber having a housing structure therein provided with a generally V-shaped bottom configuration which cooperates with inclined surfaces at the bottom of the receiving chamber to form a pair of inclined passageways leading to a discharge opening at the bottom of the chamber whereby the feed material is discharged into a material measuring and dispensing compartment for subsequent dispensing. The housing structure has an inverted V-shaped configuration on its upper end constituting baffle means to break up and divide the flow of particulate material to each of the passageways. A valve located in the compartment is operated by a solenoid located within the housing structure. A valve stem connects the valve to the solenoid and extends through the receiving chamber discharge opening, whereby the valve stem assists in preventing clogging or bridging of material.

3,716,173
DISPENSING DEVICE

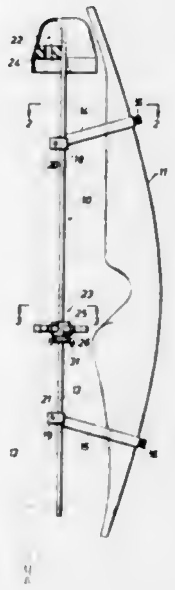
George H. Yasso, 116 Russell Avenue, Fountain Hill, Pa.
Filed Dec. 16, 1971, Ser. No. 208,841
Int. Cl. G01f *11/26*
U.S. Cl. 222—455 **8 Claims**

A dispenser for sugar and the like includes a cylindrical container having a male thread near its rim and a circumferential bead below the thread. A substantially cylindrical cup having a closed bottom and a serrated flare at its top rests on the rim of the container and extends into the container to a depth in proximal alignment with the bead in such a manner that passageways are formed with the interior of the container via portions of the serrated flared top. A circular cover, removably mounted on the container in cooperating relation with the male thread, holds the cup in place. The cover has central and off-center discharge openings therein. A measuring funnel is connected to the cover and communicates with its central opening. The funnel has a plurality of spaced notches at its lower end and rests on the bottom of the cup. A valve, for controlling the openings, includes a disk for closing the openings. The disk, rotatably secured to the cover at a point between the two openings, has an opening therein for selective registry with the first named openings. A portion of the disk projects beyond the cover for manual actuation.



3,716,174
BOW-MOUNTED ARROW QUIVER

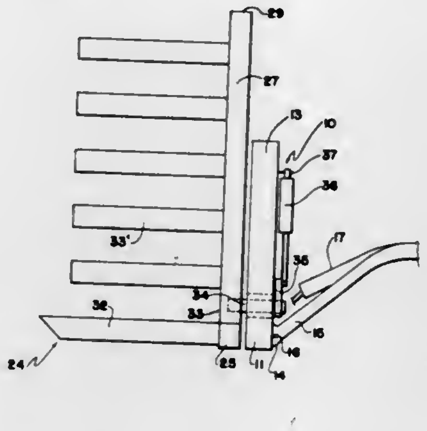
Harry C. Ehlert, 5223 Caversham, Houston, Tex.
Filed Jan. 12, 1970, Ser. No. 2,234
U.S. Cl. 224—1 B **9 Claims**



As a preferred embodiment of the present invention, a new and improved arrow quiver is adapted for detachable mounting on any bow irrespective of the style or size of the bow. To accommodate various lengths and diameters of the arrows carried in an upright position thereon, the quiver includes upper and lower spatially-disposed gripping members which can be selectively positioned and adjusted as desired.

3,716,175
STOOK INVERTOR

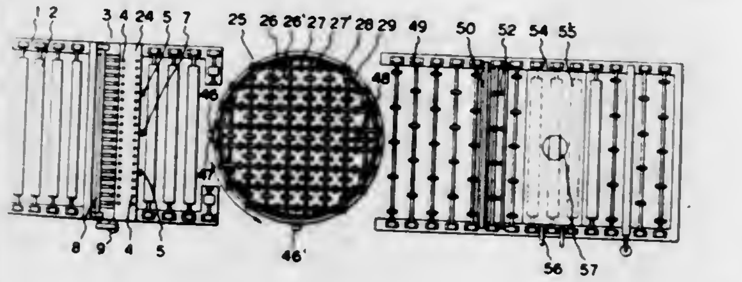
Floyd Reed Smith, P.O. Box 154, Hillspring, Alberta, Canada
Filed Feb. 3, 1971, Ser. No. 112,281
Int. Cl. B65g *7/00*
U.S. Cl. 214—768 **12 Claims**



A triangular stook invertor picking up a stook consisting of a plurality of bales in triangular formation, and the invertor of turns of stook upside down so that it will nest between two adjacent, normally positioned stooks thus enabling a relatively large stook to be built.

3,716,176
METHOD FOR CUTTING GLASS SHEETS

Tunehiko Yamada, Osaka; Seiji Egami, Nara; Harumi Sasatani, Osaka; Hideaki Matsuoka, Osaka; Saburo Emoto, Osaka, and Kunio Okamura, Osaka, all of Japan, assignors to Central Glass Company, Ltd., Yamaguchi-ken, Japan
Division of Ser. No. 22,126, March 31, 1970, abandoned, which is a continuation of Ser. No. 680,818, Nov. 6, 1967, abandoned. This application May 3, 1971, Ser. No. 139,795
Claims priority, application Japan, Feb. 8, 1967, 42/7657
Int. Cl. B26f *3/00;* **B26d** *3/08*
U.S. Cl. 225—96.5 **7 Claims**

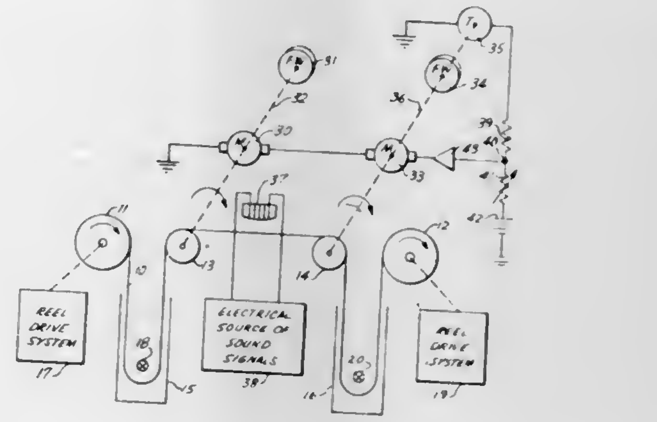


A method for cutting glass sheets, comprising the steps of producing breaking lines longitudinally of and into a face of a glass sheet moving horizontally after being cut from a continuous ribbon of glass transversely thereof into sheets of a predetermined size by a known method, changing the position of said glass sheet relative to the direction of its movement, snapping the glass sheet apart at the breaking lines, and washing and drying the glass sheets thus severed.

3,716,177
FILM TRANSPORT

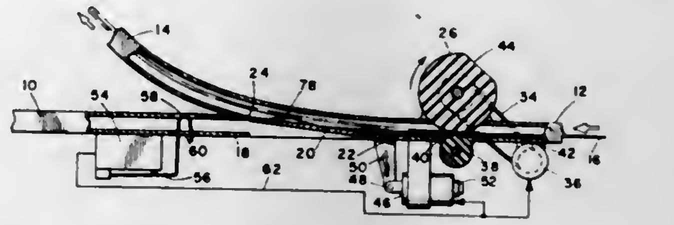
Minard A. Leavitt, Sepulveda, Calif., assignor to Cutler-Hammer, Inc., Milwaukee, Wis.
Filed April 23, 1971, Ser. No. 136,867
Int. Cl. B65h *17/20*
U.S. Cl. 226—1 **17 Claims**

Film is guided in a path that extends across two spaced apart capstans in non-slipping contact therewith. A buffer disposed between a supply reel and one capstan, and a buffer disposed between a pickup reel and the other capstan serve to isolate the film between the capstans from tension variations imposed by the reel drive systems. The capstans are driven by motors that are electrically connected in series. The motors are actuated by a control signal representative of the deviation between the actual film transport speed and a desired value thereof. The torque responses of the motors and the resultant moments of inertia of the motors and their respective capstans are matched to each other. The film bears a coating of magnetic material suitable for recording sound signals and a recording station is disposed between the capstans in recording proximity to the magnetic coating.



3,716,178
WEB GUIDING AND CORNER FOLDING APPARATUS

Lawrence E. Shimmin, San Diego, Calif., assignor to Copley Press, Inc., La Jolla, Calif.
Filed Dec. 9, 1971, Ser. No. 206,334
Int. Cl. B65h *17/20*
U.S. Cl. 226—11 **10 Claims**

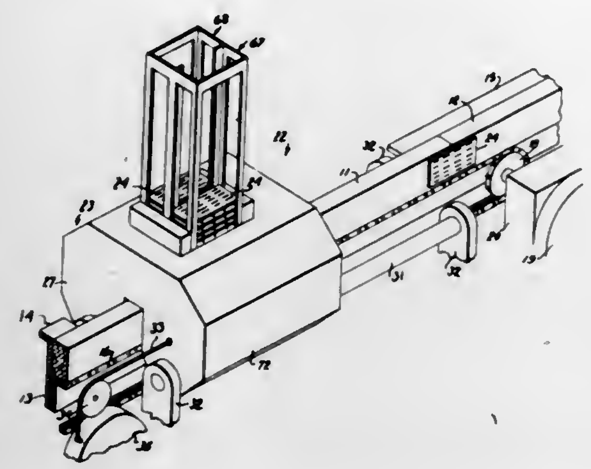


Apparatus for guiding a moving web of material, such as paper, film, or the like, and folding the corners of the leading edge of the moving web to stiffen the leading portion and facilitate automatic feeding through processing means. Folding is accomplished by a guide plate having shaped apertures into which the leading corners of the web are guided as the web advances. With the corners retarded in the apertures, continued motion of the web causes the corners to be folded back. The folding action is assisted by deflection of the web by moving the guide plate.

3,716,179
APPARATUS FOR FASTENING STRUCTURAL MEMBERS TOGETHER

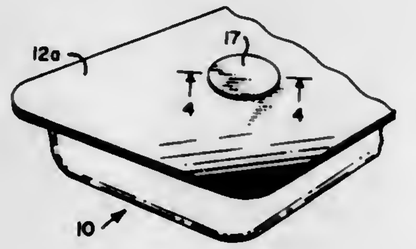
Donald V. Frydenberg and Troy D. Cain, both of Arlington, Tex., assignors to Clary Corporation, San Gabriel, Calif.
Filed May 3, 1971, Ser. No. 139,579
Int. Cl. B27f *7/02*
U.S. Cl. 227—48 **13 Claims**

Apparatus for attaching wooden structural members together in end-to-end relation using nail plates, in which the members are moved continuously through a fastening station. A carriage, located at the station, is clamped to one of the wooden members and a floating press carried by the carriage is actuated to embed the nail plates into opposite sides of adjoining members during movement of the carriage along with the members. Following the embedding operation, the carriage is released and spring returned to an initial position.



3,716,180
PACKAGING

Robert P. Bemiss, Hillsborough, and Alexander Donald, Woodside, both of Calif., assignor to Robalex, Inc., San Francisco, Calif.
Filed June 1, 1970, Ser. No. 41,921
Int. Cl. A47j *27/04*
U.S. Cl. 229—43 **6 Claims**

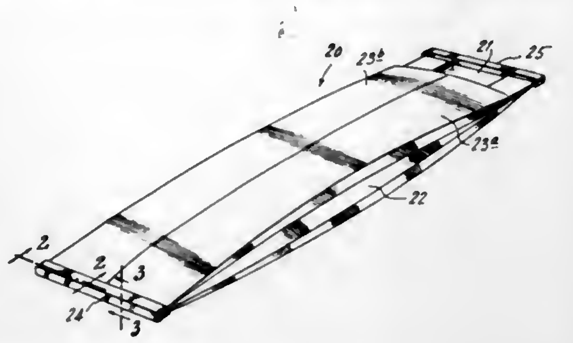


The carton and package provide a heat-releasable connection for a closure for a package which is to be heated for use wherein the heat sealed connection will become ineffective when subjected to boiling water conditions. In one form, the closure is a lid for a tray type container. In the second form the closure is a small closure for a small aperture in the lid wherein the size of the aperture is such that it will act as a one-way valve when the package is heated underneath the surface of the water to allow escape of steam or vapor under pressure and to prevent the ingress of water.

3,716,181
PAPER BAG CONSTRUCTION

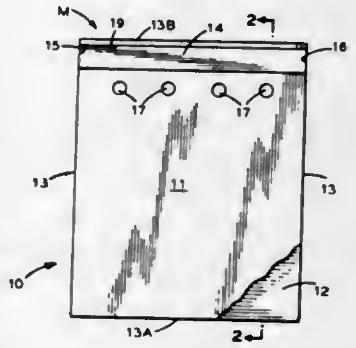
Dominick Terzuoli, 2258 East 70th Street, Brooklyn, N.Y.
Filed March 9, 1971, Ser. No. 122,321
Int. Cl. B65d *31/10*
U.S. Cl. 229—57 **3 Claims**

A bag, for example, for dust collection in a vacuum cleaner, is comprised of a paper tube which is flattened at least at one end to there provide superposed paper plies and end edges of the paper plies are embedded in an elongated, self-supporting cap of thermoplastic material which extends across the flattened end of the tube and at least partly closes such end. The paper tube may have its end fully closed and sealed by the thermoplastic cap or the latter may merely restrict the opening of the bag end.



3,716,182
COMBINATION BAG AND CLOSURE

Meyer Korn, 1980 South Ocean Drive, Hallandale, Fla.
Filed April 12, 1971, Ser. No. 133,249
Int. Cl. B65d *33/16*
U.S. Cl. 229—62 **8 Claims**



A plastic film bag provided with an accompanying closure member; the closure member being a flexible tie strip detachably secured to the bag; the mouth of the bag being formed with openings for threading the tie strip therethrough to constrict the mouth of the bag.

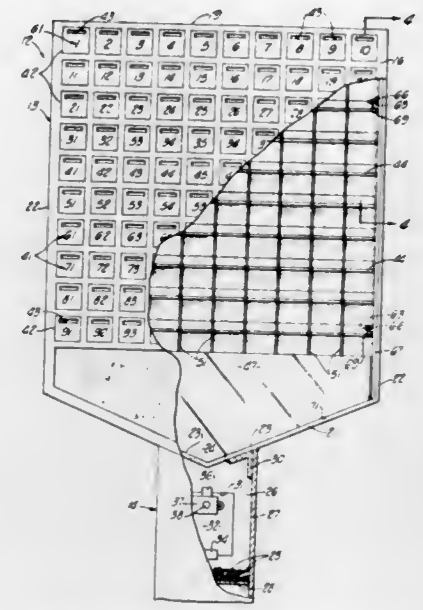
ERRATA

For Classes 235—7, 235—26 and 235—70 see:
Patents Nos. 3,716,694, 3,716,695 and 3,716,702

3,716,183
PARKING LOT COIN RECEPTACLE

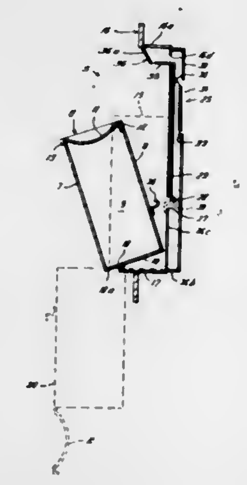
Manuel J. Chaves, Huntington Beach, Calif., assignor to Parking Company of America, Santa Ana, Calif.
Continuation of Ser. No. 851,984, Aug. 21, 1969, abandoned. This application Oct. 13, 1971, Ser. No. 189,020
Int. Cl. G07b *15/00*
U.S. Cl. 232—1 R **5 Claims**

A closed box has formed on one wall a plurality of numbered slots to receive coins. The slots are in register with corresponding pigeonhole compartments inside the box, the compartments having sloping bottom walls. Each numbered slot relates to a corresponding stall in a self-service parking lot o which the box is located. After parking in a numbered stall, customer goes to the box and inserts the appropriate coin through the correspondingly numbered coin slot. At intervals an attendant arrives to inspect the coin compartments through a transparent rear cover to see that all occupied stalls are properly paid for. The coins are thereupon released by moving the transparent cover away from the compartments, allowing the coins to drop from the sloping bottom walls through restricted opening into a receptacle, and warning notes are placed on nonpaying vehicles. Access to the interior of the box is afforded by an opening covered by a locked member, but the coin compartments and the receptacle cannot be reached by the servicing attendant.



3,716,184
TRASH RECEPTACLE

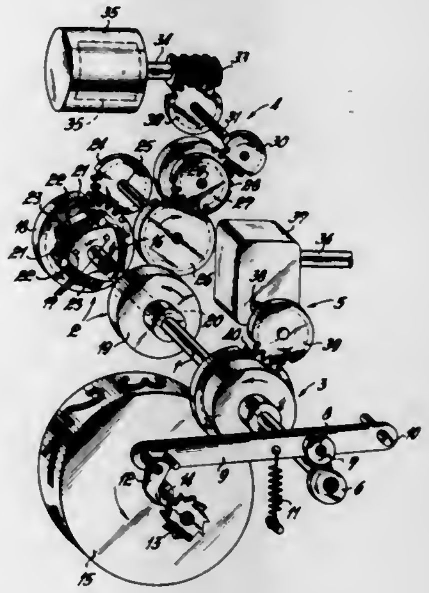
Ralph Beach Mott, Sr.; Ralph Beach Mott, Jr., and Richard C. Cantella, all of Houston, Tex., assignors to Reserv-A-Roll Co.
Filed March 11, 1971, Ser. No. 123,323
Int. Cl. B65d *91/00*
U.S. Cl. 232—43.1 **1 Claim**



A trash receptacle including a hinge cover for the top, said container being carried on a support which extends therebeneath with hinge means for connecting the support to the bottom of the container to enable the container to be pivoted forwardly and downwardly for emptying of the container. Concealed latch means are provided to retain the container in a normally upright position for receiving trash, such concealed retaining means including hook means mounted on the back of the container, which hook extends through an opening in an adjacent plate carried by the support. Spring loaded plunger means is normally engaged with the hook means by an operating tab that is connected with the plunger means and extends laterally therefrom. The operating tab is actuated by a portion of the spring loaded plunger means, which portion is concealed from view but which may be engaged for movement of the spring loaded plunger to disengage the hook means from the spring loaded plunger to enable the container to be pivoted forwardly and downwardly for emptying.

3,716,185
TAXIMETER DRIVE WITH CONSTANT TIME DRIVE SPEED

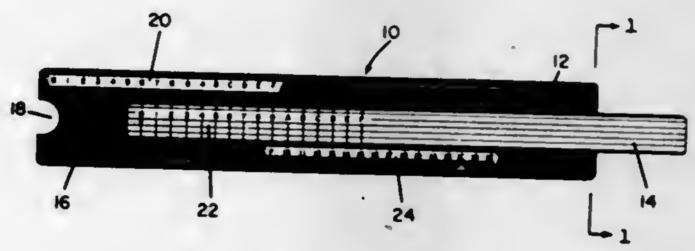
Heinz Kelch, Buchenberg, and Eduard Schuh, Villingen, Germany, assignors to Kienzle Apparate GmbH, Villingen, Germany
Filed Apr. 30, 1971, Ser. No. 138,955
Claims priority, application Germany, May 2, 1970, P 20 21 598.9
Int. Cl. C07b *13/00*
U.S. Cl. 235—30 R **5 Claims**



The fare representing shaft of a taximeter is driven by one-way clutches from distance and time drive means. While the distance drive means drive the shaft at varying speeds, the time drive means has a motor which rotates at a continuously constant speed so that undesired simultaneous driving of the shaft by both drive means, can take place only momentarily when, during driving of the shaft by the distance drive means, the varying speed of the shaft is momentarily equal to the constant speed at which the time drive means drives the shaft.

3,716,186
HEXADECIMAL SLIDE RULE

Kent B. Comfort, Tulsa, Okla., assignor to Mar-Com Development, Inc., Tulsa, Okla.
Filed Nov. 17, 1971, Ser. No. 199,495
Int. Cl. G06g *1/02*
U.S. Cl. 235—70 R **3 Claims**



Disclosed herein is a method for the rapid addition and/or subtraction computation of higher order mathematics. The method is particularly applicable for alphameric manipulations, for example, for the operations of hexadecimal subtraction and addition.

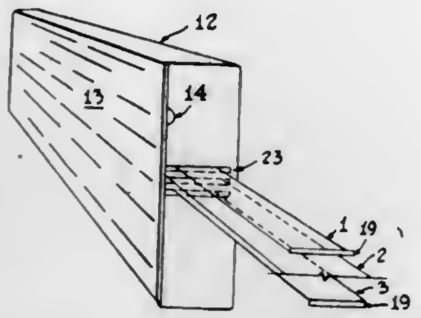
3,716,187
TAPE CALCULATOR

Dan Olof Jonsson, deceased, late of Coquitlam, British Columbia, Canada, and by Kajsa Greta Jonsson, administratrix, c/o Lennox Associates & Co., P.O. Box 8717, Station H, Vancouver 5, British Columbia, Canada

Filed May 14, 1970, Ser. No. 37,319

Int. Cl. G06c *27/00*

U.S. Cl. 235—71 A **1 Claim**



A tape calculator used for mathematical calculations and conversions having three tapes bearing preselected indicia. Each of the tapes is attached to a spring biased reel mounted in a case. The reels are arranged such that the tapes are withdrawn from the casing in three geometric planes, one above the other. A locking member is provided to maintain the tapes in preselected positions and a cleaning member on the casing reduces wear on the tapes and keeps the tape surface clean.

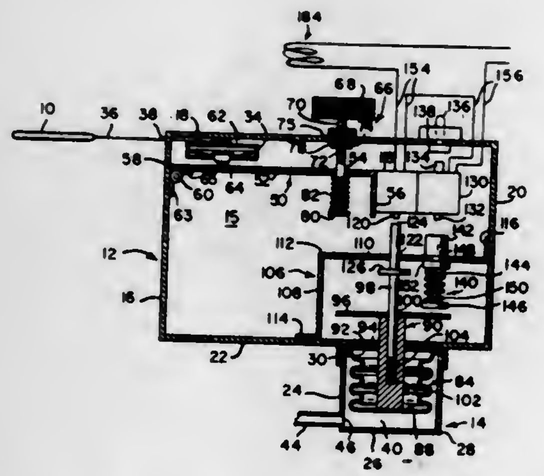
3,716,188
STEAM GENERATOR CONTROL

Robert J. Shulz, Brookfield, Ill., assignor to Vischer Products Company

Division of Ser. No. 765,351, Oct. 7, 1968, Pat. No. 3,571,563. This application April 10, 1970, Ser. No. 31,450

Int. Cl. G05d *16/02, 27/00*

U.S. Cl. 236—92 R **6 Claims**



A steam chamber and heater for generating steam to fill said steam chamber in combination with a control system therefor. The control system automatically energizes the heater in response to a combined signal, incorporating both temperature and pressure measurements, when the combined signal is below a predetermined level and automatically deenergizes the heater when the combined signal exceeds said predetermined level. The control system also deenergizes the heater in response to signals indicating maximum individual predetermined levels of temperature or pressure, and thereby acts as a temperature and pressure override safety system. Deenergization of the heater by one of the override controls requires manual reenergization of the heater.

3,716,189
METHOD OF AN APPARATUS FOR ATOMIZING LIQUID DROPLETS IN THE SPRAYJET OF A SPRAYING DEVICE

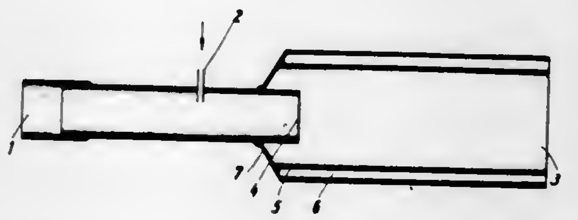
Otto Locher, Isny/Allgau, Germany, assignor to Heimo Geratebav Gesellschaft mit beschrankter Haftung, Isny/Allgau, Germany

Filed Oct. 13, 1970, Ser. No. 80,399

Claims priority, application Germany, Oct. 14, 1969, P 19 51 812.8

Int. Cl. B05b *7/00*

U.S. Cl. 239—8 **8 Claims**



An arrangement for atomizing a liquid spray in a gaseous jet, according to which the liquid spray to be atomized is introduced into a flow of a gaseous jet so as to create a region of mist preparation into which fine droplets collected in the marginal area of the atomized mist are returned from the area of ejection of the atomized mist.

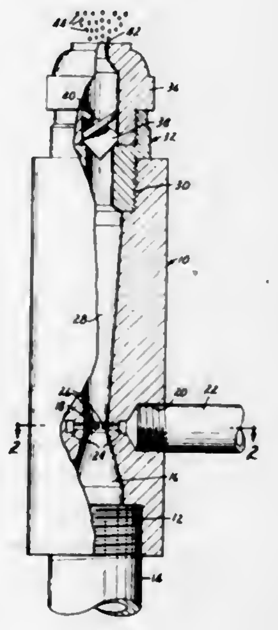
3,716,190
ATOMIZING METHOD

James A. Lindlof, White Bear Lake, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Oct. 27, 1970, Ser. No. 84,509

Int. Cl. A01g *15/00*

U.S. Cl. 239—2 S **9 Claims**



A method for atomizing a liquid which comprises the steps of 1) forming a dispersion of minute gas bubbles in a flowing enclosed pressurized liquid, said liquid and gas being the continuous and dispersed phases respectively, and 2) subsequently forcibly expelling the dispersed system through a hydraulic atomizing nozzle into an ambient atmosphere to provide an expanding stream of minute droplets. The preferred apparatus for carrying out the method of the invention is a venturi tube fitted at one end with an hydraulic atomizing nozzle, the compressed gas being introduced into the liquid at the throat of the venturi.

3,716,191
LIQUID SPRAYING GUNS

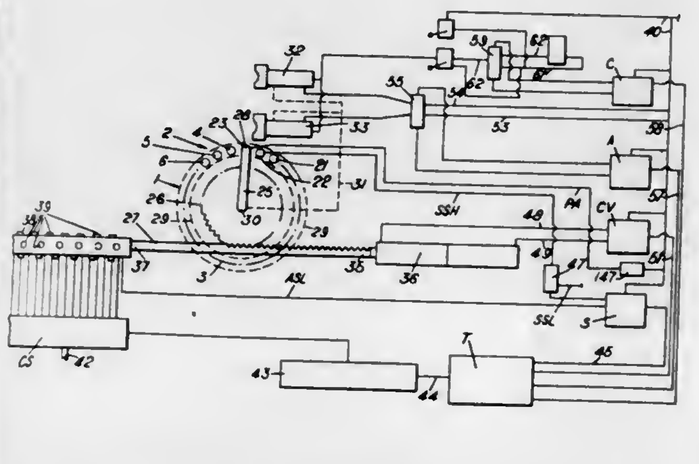
Howard Richard James Knight, Hampton, England, assignor to Carrier Engineering Company Limited, London, England

Filed Aug. 28, 1970, Ser. No. 67,869

Claims priority, application Great Britain, Sept. 3, 1969, 43,668/69

Int. Cl. B05b *1/30*

U.S. Cl. 239—112 **9 Claims**



A spray gun for spraying articles such as automobile bodies fed in succession is automatically controlled by a selectively operable valve having a plurality of liquid delivery ports and gun purging ports. The liquid delivery ports are connected one each to sources of liquid of different colors and the gun purging ports to a source of compressed gas and a source of solvent. A single hollow arm connected by a feed hose to the gun is movable relative to the ports of the valve under control of a program unit and a timer in a manner such that when the program unit signals the requirement for a change of color the timer causes the hollow arm to be moved from the current liquid delivery port first to the compressed gas gun purging port so that a slug of air is delivered into the hollow arm and then to the solvent gun purging port so that solvent is delivered to complete the emission of colored liquid from the arm, the feed hose, and the gun and to effect cleansing of these parts preparatory to the delivery of liquid of a different color. The compressed gas and solvent is fed at a pressure sufficient to maintain the feeding pressure of liquid remaining in the arm, the feed hose, and the gun until the liquid is emitted from the gun.

3,716,192
EXTENDED RANGE SPRINKLER HEAD

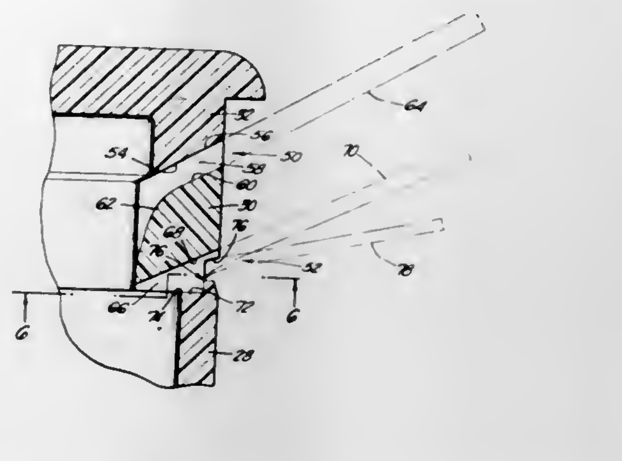
Edwin J. Hunter, Riverside, Calif., assignor to Moist O'Matic Division of Toro Manufacturing Corporation, Minneapolis, Minn.

Filed May 27, 1971, Ser. No. 147,515

Int. Cl. B05b *1/34*

U.S. Cl. 239—205 **9 Claims**

An irrigation sprinkler head having two sets of nozzle holes arranged one above the other, the top nozzle holes being inclined upwardly at an angle to attain maximum range, and being designed to produce minimum turbulence so that the streams are coherent and break up at a considerable distance out from the head. The lower nozzle holes throw their streams at a slightly flatter angle for shorter range, and are designed to produce some turbulence so as to cause their respective streams to break up at a shorter distance out from the head. The streams issuing from the lower nozzle holes fan out laterally and strike a deflector shelf having a flatter angle than the streams, and this causes a portion of the streams to break up immediately to cover the area closest to the head.



3,716,193
LIQUID DISTRIBUTOR FOR FEEDING LIQUID TO A ROTATING ATOMIZER

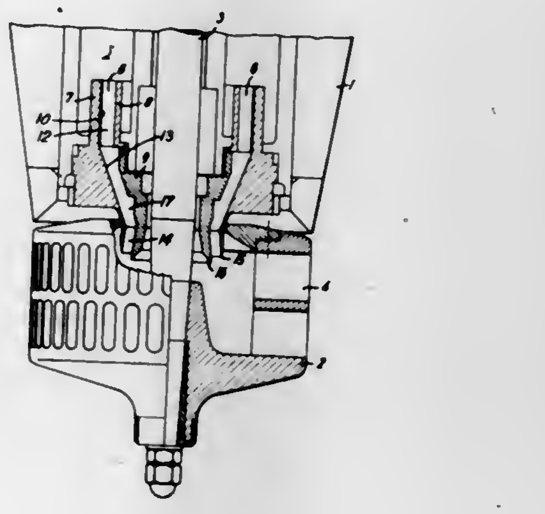
Keith Masters, Skovlunde, and Orla Straarup, Birkerod, both of Denmark, assignors to Aktieselskabet Niro Atomizer, Gladsaxevej, Soborg, Denmark

Filed May 10, 1971, Ser. No. 141,560

Claims priority, application Denmark, May 15, 1970, 2516/70

Int. Cl. B05b *3/02;* **F23d** *11/04*

U.S. Cl. 239—222 **5 Claims**



A liquid distributor for feeding liquid to a rotating cup-shaped atomizer wheel, in the sidewall of which a plurality of ejection apertures of ducts are provided uniformly distributed along the circumference. The distributor consists of a body mounted coaxially with the atomizer wheel, said body being provided with a number of helical ducts, the helical axis of which coincide with the axis of the atomizer wheel and terminate in an annular conduit which is coaxial with the atomizer wheel and terminates with an ejecting edge inside the wheel. The helical ducts impart a rotating motion in direction of atomizer wheel rotation to the liquid which is finally flung out from the ejecting edge against the sidewall of the cup-shaped wheel.

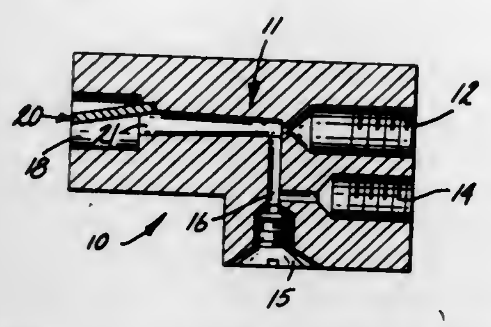
3,716,194
COMBINATION HIGH PRESSURE VENTURI AND SPRAY FORMING NOZZLE

Carl A. Miller, St. Paul, Minn., assignor to Economics Laboratory, Inc., St. Paul, Minn.

Filed Sept. 16, 1970, Ser. No. 72,621

Int. Cl. B05b *7/30*

U.S. Cl. 239—318 **6 Claims**



A combination venturi and spray nozzle for drawing a liquid cleanser into a high pressure water flow and then forming the combined flow of water and aspirated cleanser into a spray pattern for use in a cleansing operation.

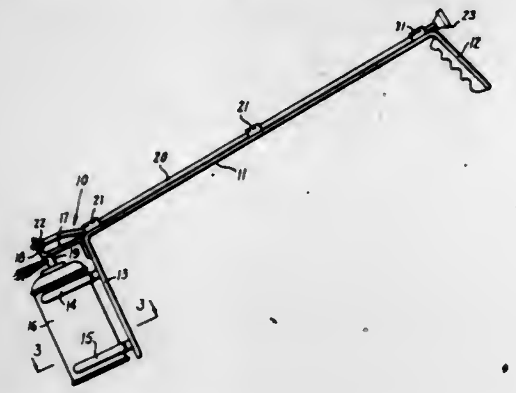
3,716,195
EXTENSION HAND SPRAYER DEVICE

George E. Silva, 1857 41st Ave., Sacramento, Calif.

Filed July 29, 1971, Ser. No. 167,119

Int. Cl. A01g *25/14*

U.S. Cl. 239—375 **1 Claim**



An extension hand sprayer device for spraying a line on the pavement while standing erect which includes a spray can holder, an extension arm secured thereto and extending a substantial distance therefrom terminating in a handle. A push button mounted for sliding movement on the arm is connected to a member which is adapted to press against the push button of the spray can when actuated by thumb pressure on the push button mounted on the arm.

ERRATUM

For Class 241—1 see:
Patent No. 3,715,983

3,716,196
METHOD OF OPERATING AN IMPACT COMMINUTOR

Herbert Motek, Essen-Werden, and Jakob Jobkes, Muenster-Westfalen, both of Germany, assignors to Hazemag, Hartzerkleinerung-Und Zement-Maschinenbau-Gesellschaft M.B.H., Munster, Germany

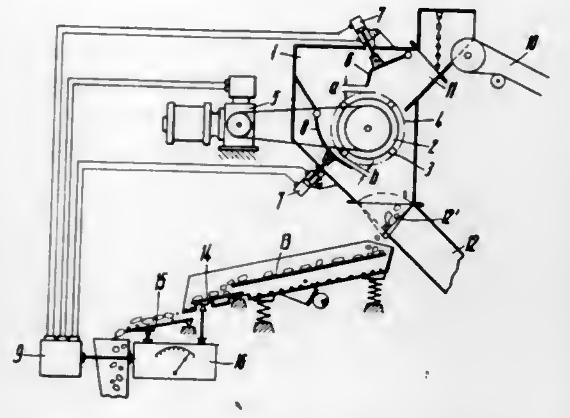
Filed April 14, 1971, Ser. No. 133,973

Claims priority, application Germany, April 17, 1970, P 20 18 496.7

Int. Cl. B02c *13/09*

U.S. Cl. 241—27 **9 Claims**

An impact comminutor has a rotor element and movable comminuting elements mounted outwardly and circumferentially spaced about the rotor element. Material to b comminuted is admitted into the apparatus to thereby un dergo comminution into larger and smaller fractions and i this shape leave the machine. The comminuted material i then subjected to measurements to determine the proportio of a selected one of these fractions with reference to the sum of all other fractions, and the speed of rotation of the roto element and/or the positioning of the comminuting element with reference to one another and with reference to the roto element are adjusted as a function of the measured value thu obtained.



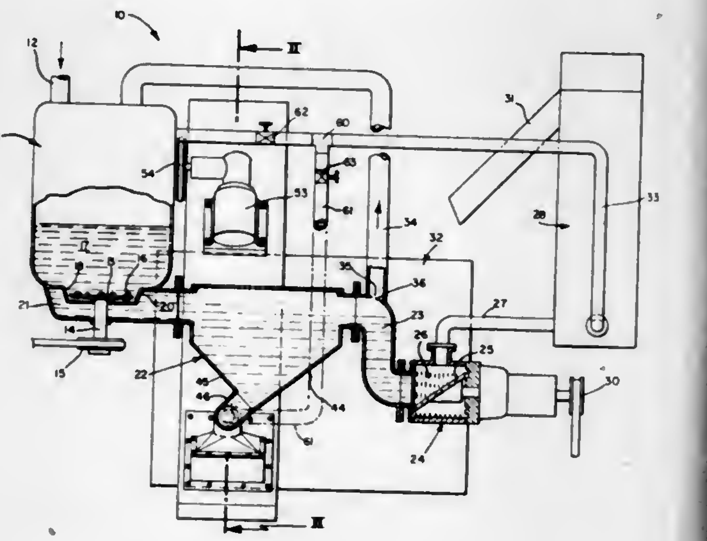
3,716,197
WASTE DISPOSAL APPARATUS

Sam N. Craig, Devon; Ellis R. Warner, Jr., West Chester, an Wayne T. Buckman, Pipersville, all of Pa., assignors t Wascon Systems, Inc., Hatboro, Pa.

Filed Nov. 16, 1970, Ser. No. 89,852

Int. Cl. B02c *18/40*

U.S. Cl. 241—43 **6 Claim**



An apparatus is provided, wherein waste solids are prepare for disposal. The solids are wet pulped into a slurry form, hav ing some solid material therein, with the solids then passin into a trap, whereby larger solid particles that have not bee sufficiently reduced in size in the pulper may be collected a the bottom, for carriage by an ejector toward which the parti cles may optionally receive assistance from a water line, t discharge receptacle. The slurry passes from the trap int another apparatus which further comminutes solids carried b the slurry, for delivery to a press, whereby water is extracte therefrom, with the water then being recycled to the pulpe and with the compacted solids from the press being discharge into the discharge receptacle. A vent is provided, at the outl of the trap.

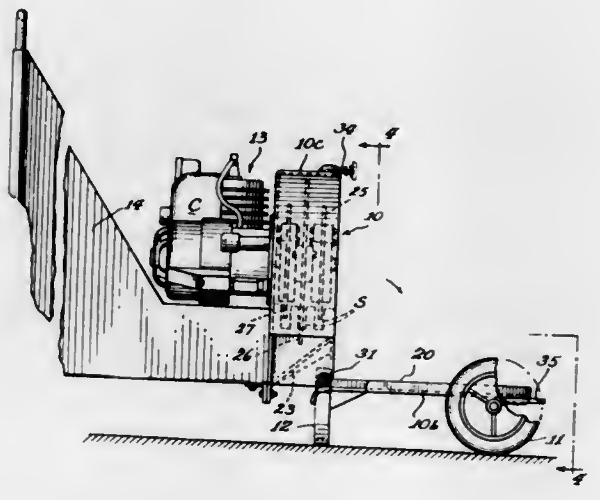
3,716,198
SHREDDER

obert D. Lautzenheiser, Bluffton, Ind., assignor to The Red Cross Manufacturing Corp.

Filed April 9, 1971, Ser. No. 132,657

Int. Cl. B02c *18/06*

.S. Cl. 241—188 R **7 Claims**



A leaf shredder with a motor, hopper, shredding top wall nd side wall hinged to a wheeled bottom wall to allow exposure of shredding knives and cooperating elements for inspecon.

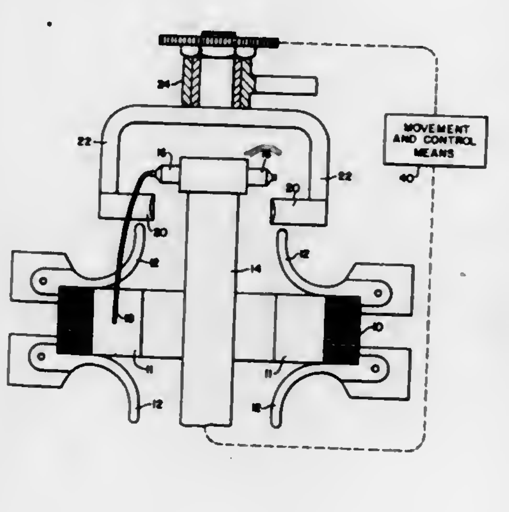
3,716,199
STATOR WINDING MACHINE

ene S. Ericson, Cridersville, Ohio, assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 842,648, July 17, 1969, abandoned. This application Dec. 1, 1971, Ser. No. 203,816

Int. Cl. H02k *15/09*

.S. Cl. 242—1.1 R **8 Claims**



In a stator coil winding machine having a wire dispensing n rotatable about the stator core axis, there is provided a oving form separately rotatable about the same axis as the n and shaped to force wire radially outwardly about fingers rresponding to core slots. When the moving form is thdrawn and the gun axially reciprocated to the other core d, the wire is seated deeply in the core slot with minimum d turn length of the coils. The form may be configured so that it is versatile over a wide coil span and winding the various coils of a single stator may be accomplished with a single form.

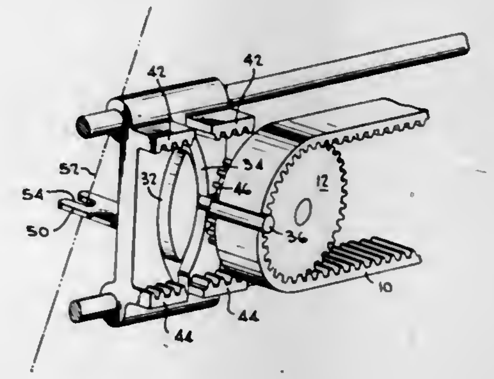
3,716,200
APPARATUS FOR RECIPROCATING A TRAVELLER

Roland Ernest Sartori, Riorges, France, assignor to Ateliers Roannais de Constructions Textiles, Roanne, France

Filed Oct. 21, 1971, Ser. No. 191,227

Int. Cl. B65h *54/30*

U.S. Cl. 242—43 **6 Claims**



Apparatus for reciprocating a traveller carrying a yarn guide for delivering yarn to be wound on a bobbin including an endless belt driven by a pair of pulleys and carrying a shoe slidably engaging a groove in the traveller, the groove having a pair of symmetric curved branches for alternately receiving the shoe as the shoe is moved around the pulleys, whereby the sinusoidal change in linear speed of the traveller as the shoe moves around the pulleys is compensated.

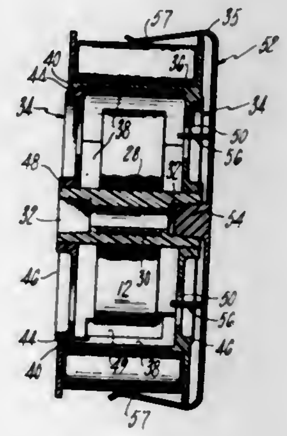
3,716,201
COILABLE RULE AND REPLACEMENT CARTRIDGE THEREFOR

Robert F. West, Simsbury, Conn., assignor to The Stanley Works, New Britain, Conn.

Filed May 4, 1970, Ser. No. 34,080

Int. Cl. B65h *75/48*

U.S. Cl. 242—107 **8 Claims**

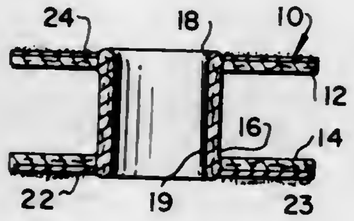


A coilable rule is provided with a casing and a self sustaning replacement cartridge comprising a spool member rotatably mounted on a separate hub which has recesses in its end for non-rotatable engagement with truncated studs in the casing, a coiled blade, and a recoil spring attached to the blade and the hub. The spring tension is factory adjusted and maintained until assembled in the casing by a keeper.

3,716,202
MAGNETICALLY ATTRACTED BOBBINS

Charles C. Thomas, Starkville, Miss., assignor to Mississippi State University Development Foundation, Inc., State College, Miss.

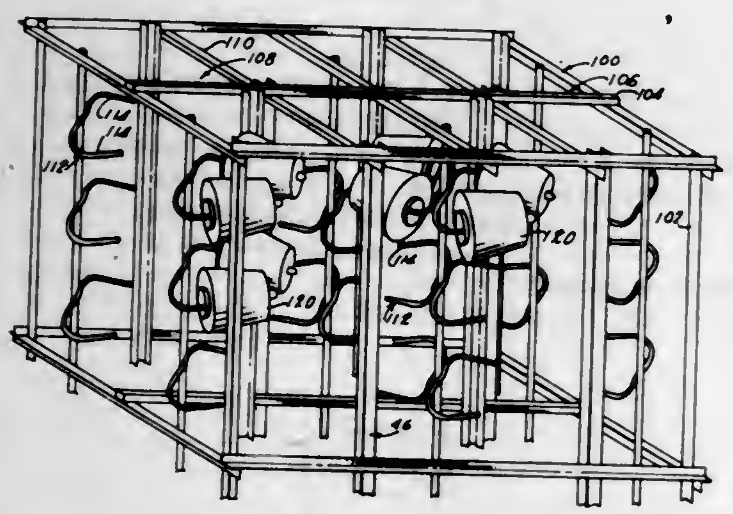
Filed Jan. 13, 1971, Ser. No. 106,026
Int. Cl. B65h *75/14*
U.S. Cl. 242—118.7 **7 Claims**



Disposable magnetically affected sewing bobbins formed of paper or plastic impregnated or coated with particulate iron powder or other magnetically affected material.

3,716,203
BOBBIN CREEL

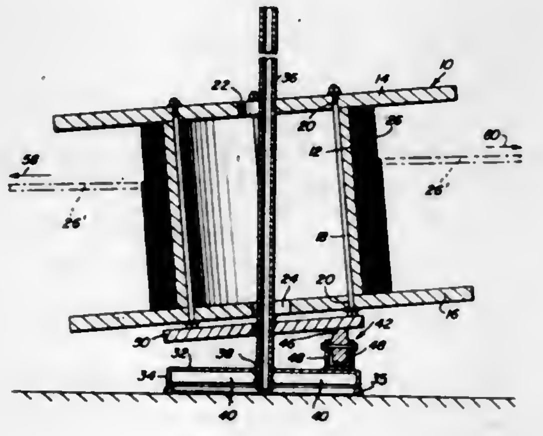
Max M. Beasley, Chattanooga, Tenn., assignor to Tuftco Corp., Chattanooga, Tenn.
Filed Feb. 8, 1971, Ser. No. 113,551
Int. Cl. B65h *49/02;* **D02h** *1/00;* **D03j** *5/08*
U.S. Cl. 242—131 **11 Claims**



Especially suited for use with carpet tufting machines which use a number of individual continuous yarns, but also useful for other purposes such as weaving and knitting processes, the direction of the take off points of the yarns are arranged on the rack so that the converging triangles formed by the axes of the yarn cones are nested together thereby conserving a considerable portion of the lost triangle of space present in previous creel designs. In one form of the present creel arrangement a rack is constructed from vertical and horizontal angle iron members and the bobbins are removably supported on cone holder brackets bent in a shape similar to bicycle handlebars which are welded in the middle to a post and each handle provides a member on which a bobbin or yarn package is removably supported. The direction of the take off points of the yarn is so arranged alternately so that the converging triangles formed by the axes of the yarn cones are nested together and in one form space is conserved within the rack but more aisles are necessary which is a most convenient creel to service because all the distances are reduced and it is easy to reach every point in the creel. Another form saves over 20% of floor space compared to an old style creel. There is no aisle inside the rack and all servicing is performed from the floor around the rack. The yarn support brackets are angled with respect to one another so that the axes of the yarn package support members on each bracket converge on opposite sides of ~~the section of the rack~~.

3,716,204
WIRE SPOOL AND SUPPORT WITH INHERENT DRAG BRAKE

Donald L. Klingbeil, 121 Atwood Drive, Mankato, Minn.
Filed Dec. 13, 1971, Ser. No. 207,342
Int. Cl. B65h *59/04*
U.S. Cl. 242—156 **8 Claims**

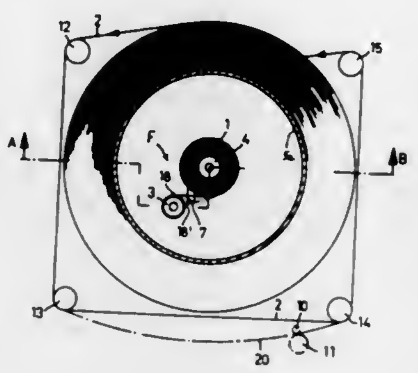


A support for a wire spool of the type having opposite end walls provided with aligned generally axial bores. The support includes a base provided with a central upright downwardly over which the spool is loosely telescopingly receivable and the base is provided with upwardly projecting anti-friction rollers disposed on one side only of an upstanding plane containing the upright and the rollers are spaced radially outwardly from the upright whereby the spool will be supported on only one side from the rollers and will thus be cocked relative to the upright so that the surfaces of the spool defining at least one of the aforementioned axial bores will frictionally engage the upright and thus retard rotation of the spool relative to the support and upright for the purpose of maintaining wire being unwound from the spool in a reasonably taut condition.

3,716,205
CASSETTE FOR MAGNETIC TAPE OR THE LIKE

Winfried Geuder, Furth-Sack, Germany, assignor to Grundig E.M.V. Elektro-Mechanische Versuchsanstalt Inh. Max Grundig, Furth-Bay, Germany
Filed Aug. 28, 1970, Ser. No. 67,855
Claims priority, application Germany, Oct. 20, 1969, P 19 52 723.3
Int. Cl. G11b *23/10*
U.S. Cl. 242—194 **9 Claims**

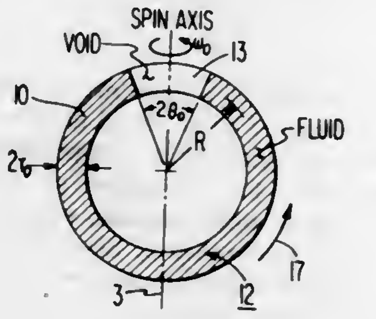
A tensioning device for the non-convoluted portion of magnetic tape whose ends are secured to the cores of coaxial supply and takeup reels mounted in the housing of a cassette or cartridge. The tensioning device has an S-shaped spring one end portion of which is convoluted on a roller which is coaxial with and supported by the supply reel. The other end portion of the spring is convoluted on a roller which is eccentric to and supported by the supply reel. The width of the end portions exceeds the width of the major central portion of the spring and such end portions form shoulders which can abut against complementary shoulders provided on a stop which is integral



with the takeup reel. The stop prevents excessive unwinding of the end portions from the respective rollers to thus prevent undue flexing and breakage of the spring ends. The spring winds itself onto the roller of the takeup reel when the rotational speed of the takeup reel exceeds the speed of the supply reel during the first half of transfer of tape onto the takeup reel, and thereupon onto the roller of the supply reel when the speed of the supply reel exceeds the speed of the takeup reel.

3,716,206
NUTATION DAMPER

Ralph Sylvester Lynch, Trenton, and Khaled Bou Ayache, Cranbury, both of N.J., assignor to RCA Corporation
Filed Nov. 16, 1970, Ser. No. 89,936
Int. Cl. B64g *1/10*
U.S. Cl. 244—1 SA **14 Claims**

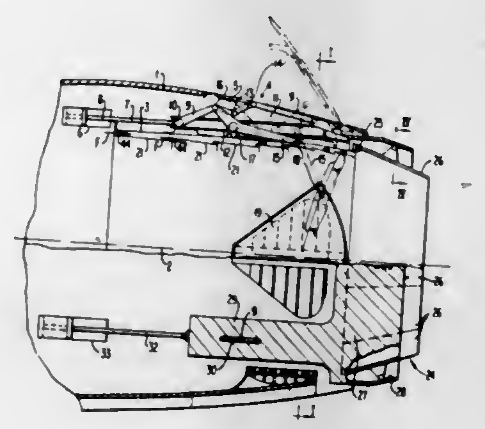


A damper in the form of a generally ring-like container of iscous fluid filling a substantial portion of the container the emaining portion of which defining a void or bubble. The ontainer is spun by being oriented within a spinning portion f a spacecraft or is provided with means to spin relative to the able body portion of a spacecraft. Centrifugal forces on the uid in the presence of nutational motions will develop oscil- tions of the bubble relative to the spinning axis of the con- iner to generate energy losses thereby reducing nutation mo- on. Fluid resonance is developed with bubbles of selected ze in ring-like containers. Resonance is also developed in a -shape configuration having different sized cross-sectional rtions.

3,716,207
AIRCRAFT WITH ONE OR SEVERAL TURBOJET ENGINES HOUSED IN THE FUSELAGE AFT SECTION IN PODS PROVIDED WITH THRUST-REVERSING DEVICES

Ludwig Schweikl, 8052 Moosburg, and Alfred Japs, 8031 Grobenzell, both of Germany, assignors to Motoren-und Turbinen-Union Muenchen GmbH, Postfach, Munich, Germany

Filed May 27, 1970, Ser. No. 40,763
Claims priority, application Germany, May 29, 1969, P 19 27 280
Int. Cl. B64d *27/00*
U.S. Cl. 244—53 R **9 Claims**

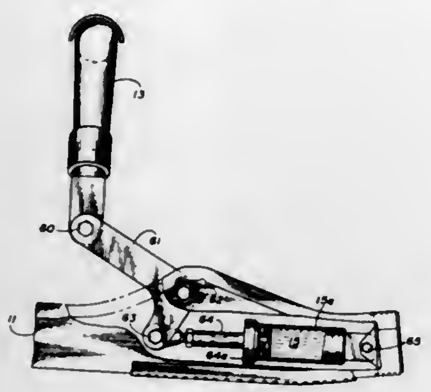


An aircraft with one or several turbo-jet engines arranged in the aft section of the fuselage or in pods and equipped with thrust-reversing devices which include rearwardly directed after-burner jet pipes with associated adjusting thrust nozzles; several gas discharge apertures are provided in the engine fairing which are adapted to be opened and closed by inner flaps and outer flaps or deflecting scoops constructed as component parts of the outer wall of the engine fairing; the inner flaps close the gas discharge apertures in the position for forward thrust conditions and open the same in the position for thrust reversal while simultaneously deflecting the engine gases in the direction of the gas discharge apertures; the outer flaps or deflecting scoops which open or close the gas discharge apertures operate in unison with the adjusting movement of the inner flaps; the thrust-reversing installation is arranged within an area directly upstream of the adjusting thrust nozzle of the after-burner jet pipe of a respective engine while the inner flaps form triangular sectors of the after-burner jet pipe wall and the associated heat shield which substantially completely close the after-burner jet pipe by the circular area formed thereby when the outer flaps or deflecting scoops are in the fully open position.

3,716,208
ENERGY ABSORBING LANDING GEAR

Castle H. Fagan, Irving, and Robert R. Lynn, Arlington, both of Tex., assignors to Textron, Inc.
Filed June 11, 1970, Ser. No. 45,363
Int. Cl. B64c *25/52*
U.S. Cl. 244—108 **15 Claims**

A landing gear for helicopters in which a member having a static spring rate and plastic yielding characteristics is mounted in series with a member having a static spring rate and a velocity-sensitive restraining force. The combination serves to provide for appropriately "soft" landings under conditions of light gross weight and/or low vertical descent speed, and is also capable of absorbing the forces generated during "-hard" or crash landings under conditions of heavy gross weight and/or high vertical descent speed. By designing the yield point of the plastic yielding member to a force approximately equal to the resistance offered by the velocity-sensitive unit at the time that is "bottoms out," the efficient energy ab-



sorbing properties of the plastically yielding member are employed to extend the energy absorbing capabilities of the gear.

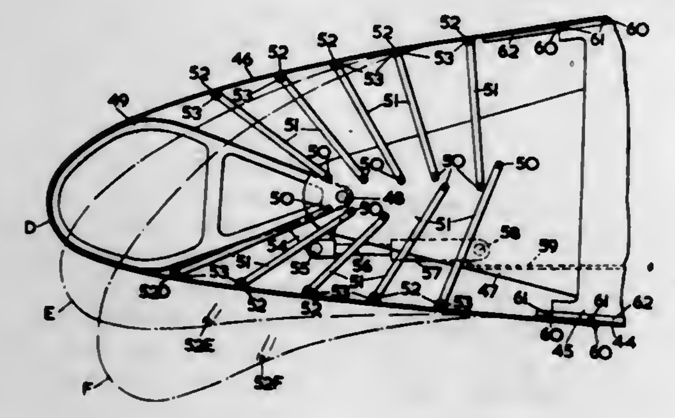
3,716,209
FLUID DYNAMIC LIFT GENERATING OR CONTROL FORCE GENERATING STRUCTURES

Donald Pierce, Aldershot, Hampshire, England, assignor to Minister of Technology in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed June 1, 1970, Ser. No. 42,082

Int. Cl. B64c *3/48*

U.S. Cl. 244—123 **9 Claims**



In a fluid dynamic structure having an outer wall or skin defining a fluid dynamic profile part of the outer wall is flexible and has movable support apparatus and power apparatus are provided for effecting movement of the support apparatus and the flexible part whereby the fluid dynamic profile of the structure is changed.

The invention is applicable to the leading edge of an aircraft wing and also to auxiliary control surfaces such as flaps and ailerons.

3,716,210
PC CONCRETE PIPE REINFORCEMENT STRUCTURE

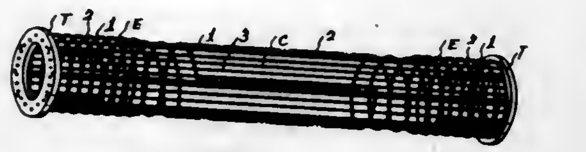
Yoshikiyo Fukushima, Yasushi Ishihara, and Kenzo Momota, Tokyo, Yasuo Usui, Chigasaki, and Tuyoshi Sakamura, Satoru Sogo, and Koji Nunokawa, Tokyo, Japan, assignors to Nippon Concrete Industries Co., Ltd., Tokyo, Japan

Original application Jan. 29, 1969, Ser. No. 794,900. Divided and this application Jan. 18, 1971, Ser. No. 107,582

Int. Cl. E04c *5/08*

U.S. Cl. 245—1 **5 Claims**

PC concrete pipe reinforcement having tensioned vertical reinforcements attached to end fittings, freely movable cage shaped bodies within the tension reinforce-



ments, and cage shaped bodies around the freely movable body and attached to the fittings.

3,716,211
FOLDABLE STAND

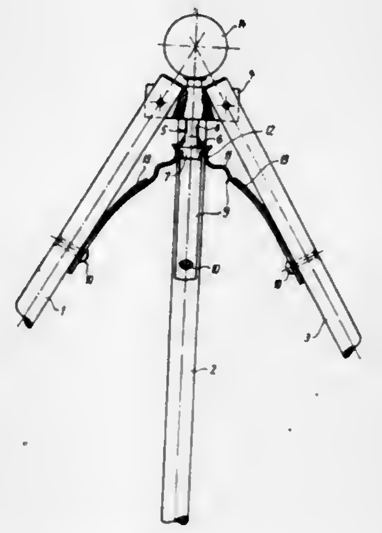
Josef Butz, Muhletsbelstrasse 20, Rorschach, Switzerland

Filed Feb. 11, 1971, Ser. No. 114,489

Claims priority, application Switzerland, Feb. 12, 1970, 2033/70

Int. Cl. F16m *11/38*

U.S. Cl. 248—168 **2 Claims**



A foldable stand having a head member and at least three legs pivotally connected to the head member so that the legs can be spread from each other in a position of use and adjacent to each other for a position of non-use. The head member has a central rotary member secured to and depending therefrom and a plurality of blade springs are provided secured to each leg at one end and the other end pressing in contact with the head member.

3,716,212
SPRAYER BOOM LEVELING AND FOLDING APPARATUS

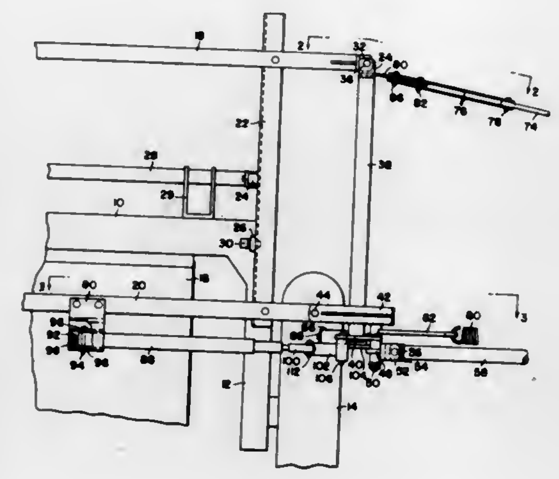
Robert Eugene Fox, Minburn, Iowa, assignor to Deer & Company, Moline, Ill.

Filed Sept. 27, 1971, Ser. No. 183,879

Int. Cl. B05b *1/20*

U.S. Cl. 248—278 **13 Claims**

A sprayer boom is pivotally connected to a generally upright support member for movement about an upright axis between working and transport positions. The support member is pivotally connected at its upper end to a boom mounting frame. A hydraulic cylinder is interconnected with the support member and boom to move the support member outwardly upon initial extension and to fold the boom from its working position to its transport position upon additional extension. The construction per-



mits the use of a single cylinder to control both the leveling and folding of the sprayer boom.

3,716,213
VEHICLE SEATS HAVING RESILIENT MOUNTINGS

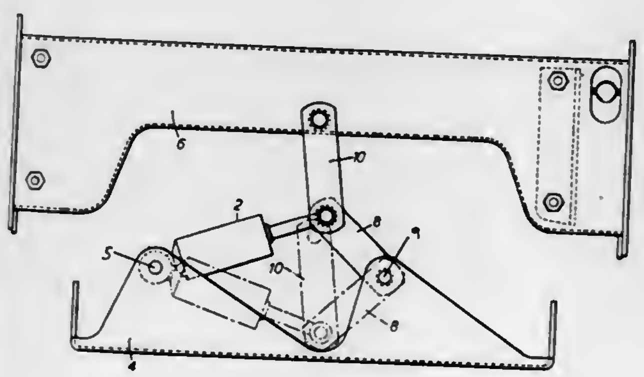
Robert R. Lacey, Northampton, England, assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed Feb. 19, 1971, Ser. No. 117,025

Claims priority, application Great Britain, Feb. 21, 1970, 8,426/70

Int. Cl. F16m *11/00*

U.S. Cl. 248—399 **4 Claims**



A vehicle seat comprises a seat part resiliently mounted for upwards and downwards movement relative to a base part, a vibration damper being connected between the seat part and base part by a linkage which acts to produce an increasing damping effect with increasing travel of the seat part upwards or downwards from a Ride-position.

3,716,214
TELEPHONE DIRECTORY HOLDER

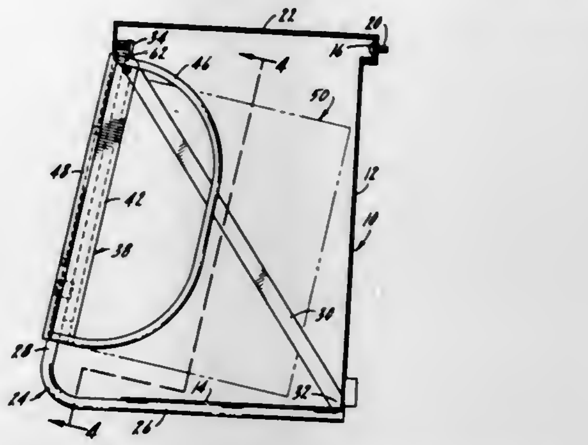
Leslie A. Hannula, Waukegan, Ill., assignor to Acoustics Development Corporation, Northbrook, Ill.

Filed Feb. 24, 1971, Ser. No. 118,234

Int. Cl. A47b *27/04*

U.S. Cl. 248—447 **3 Claims**

A telephone directory holder in which the directory is pivotally mounted on a generally upright, inwardly directed tube which, in combination with a stop limiting the outward movement of the directory holder, assures that the directory



holder will always be returned to its inner position when it is released by the user.

3,716,215
VALVE ASSEMBLY

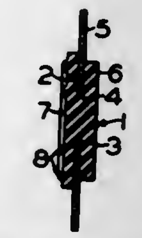
Jack Washbourn, Malmesburg, and Philip Norman Paginton, Chippenham, both of England, assignors to Westinghouse Brake & Signal Company, Ltd., London, England

Filed March 24, 1971, Ser. No. 127,449

Claims priority, application Great Britain, April 17, 1970, 18,455/70

Int. Cl. F16k *51/00*

U.S. Cl. 251—358 **3 Claims**



A valve assembly characterized by a valve element including a rigid circular support member provided with a central opening and on which support member a shaped body of resilient material passing through the central opening and disposed on both sides of the support member is bonded, the peripheral portion of the support member being deformable to permit clamping or securing of the valve element to a valve carrier member.

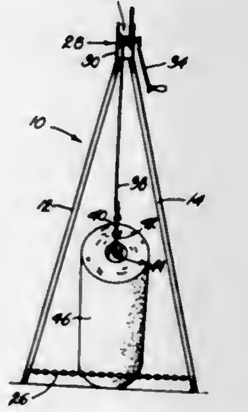
3,716,216
METHOD AND APPARATUS FOR LIFTING ONE END OF A ROLL OF CARPETING OR THE LIKE

George A. Kirkpatrick, P.O. Box 693, Ridgecrest, Calif.

Filed April 17, 1970, Ser. No. 29,426

Int. Cl. B66c *23/60*

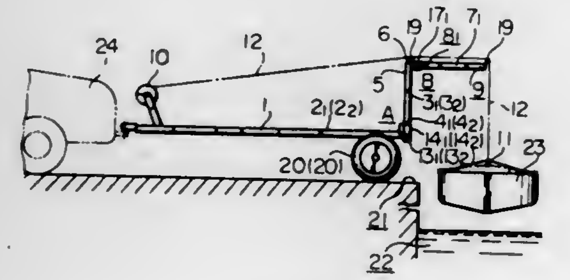
U.S. Cl. 254—139.1 **1 Claim**



A portable hoist comprising a frame having two legs that converge upwardly, and a winch at the upper end, having a depending lift cord. The legs of the frame are placed one on either side of a long, heavy roll of carpeting at one end thereof, and the lift cord is attached to a pole, or pipe, that is inserted into the roll. As the one end of the roll is lifted, its other end bears on the ground at a point spaced laterally outward from the two legs and the roll thus serves as a third leg to stabilize the hoist.

3,716,217
TRAILER CAPABLE OF LIFTING AND LOWERING BOATS OR THE LIKE

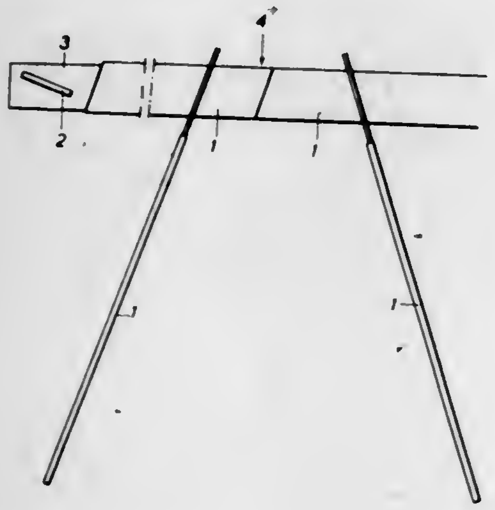
Masahiro Watabe, Kawanishi, Japan, assignor to Usui Kokusai Songyo Kabushiki Kaisha, Sunto-gun, Shizuoka-ken, Japan
Filed Dec. 1, 1970, Ser. No. 93,935
Int. Cl. B66c *23/60*
U.S. Cl. 254—139.1 **2 Claims**



A trailer capable of lifting and lowering boats or the like which includes a trailer body of the type known per se having a winch device mounted thereon, and a foldable crane assembly pivotally connected to the rear end of the trailer body, whereby the crane assembly can be moved between a raised or operative position and a folded or inoperative position.

3,716,218
MEANS FOR CONSTRUCTION OF COLLAPSIBLE RAILINGS

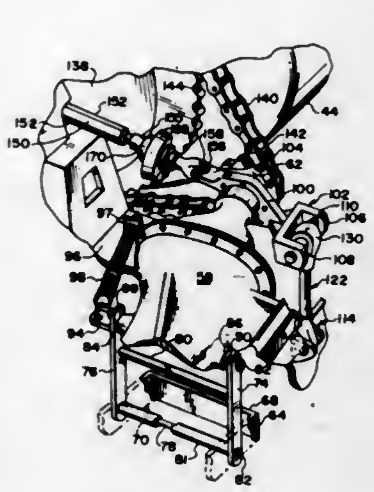
Odmund Sanne, Oslo, Norway
Filed Mar. 9, 1971, Ser. No. 122,480
Claims priority, application Norway, Mar. 16, 1970, 94,070
Int. Cl. E01f *13/00*
U.S. Cl. 256—64 **5 Claims**



Means for the construction of barricades, road barriers etc., in which a plurality of identical members may be assembled to supports and rails as desired.

3,716,219
ROLLER ALIGN DRIVE

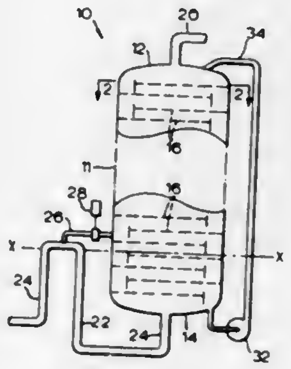
Eugene J. Miller, 3912 W. Oak St., McHenry, Ill.
Filed Sept. 20, 1971, Ser. No. 181,770
Int. Cl. B28c *5/18, 5/42;* **F16h** *7/14*
U.S. Cl. 259—177 R **18 Claim**



A mounting is disclosed imparting several degrees of freedom to fixed or semi-fixed drive units which maintains coplanar relationship between a drive sprocket or sheave and a driven sprocket or sheave and overcomes the tendency of the drive chain or belt to become detached or subject to extreme wear under the influence of displacement forces acting on their spaced axes. In one embodiment the mounting includes a traversing radial torque anchor in combination with a radial follower arm to support the drive member axis parallel to the axis of the driven member and to maintain the drive axis in a relatively fixed circumferential position to the driven axis. The follower arm has a roller intermediate its ends which rolls against the side of the driven member under bias and the extended end is pivoted to the journal holding the drive member in its drive position. Other embodiments are disclosed.

3,716,220
TOWER VAPOR FEED SYSTEM

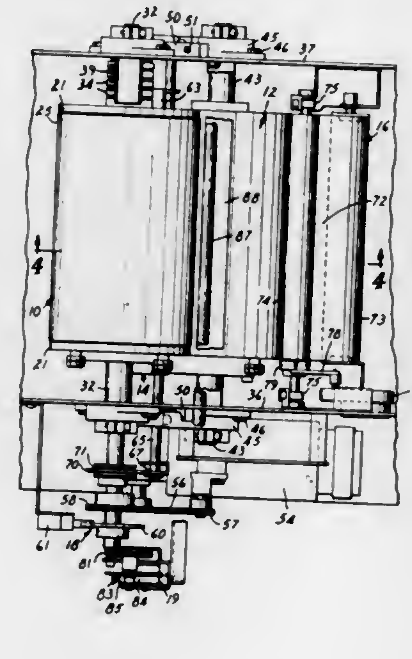
Marvin S. Bloomsburg, Wilmington, Del., and Don Barkley Nazzer, Port Hawkesbury, Nova Scotia, Canada, assignors t Canadian General Electric Company Limited, Toronto, Ontario, Canada
Filed March 12, 1970, Ser. No. 18,944
Int. Cl. B01d *59/32*
U.S. Cl. 261—36 R **4 Claim**



A tower for counterflow contacting of downflow liquid wit up-flowing gas is provided with a U-bend bottom gas entr located to trap the liquid inventory of the tower in the ben and the drain-down portion of the tower. A gas bypass co nects the U-bend to the tower at a level above the drain-dow level, to permit ready circulation of gas in the tower before th liquid inventory is displaced from the trap.

3,716,221
FUSING DEVICE

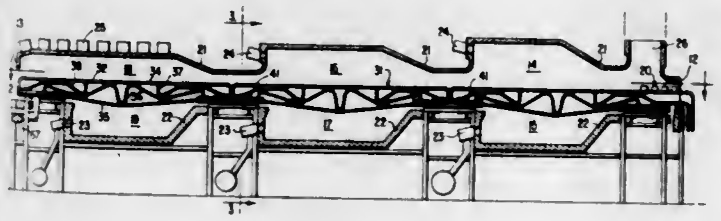
Donald J. Gorka, Mahtomedi, and Harold B. Laskin, Brighton, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed Jan. 4, 1971, Ser. No. 103,725
Int. Cl. G03g *13/20, 15/20*
U.S. Cl. 118—60 **10 Claims**



A fusing device for fusing thermoplastic resinous particulate material to a receptor sheet. The fusing device includes a fusing roller having a resilient fusing blanket supported on the periphery thereof and heating means to heat the fusing blanket to a temperature sufficient to fuse the particulate material. A backup roller is urged toward engagement with the deformable fusing blanket to press the receptor sheet carrying the particulate material into contact with the fusing roller. The fusing roller is coated with an off-set preventing liquid which is applied thereto from the backup roller at predetermined intervals during operation of the fusing device.

3,716,222
HEATING FURNACE

Robert James Anderson, Pittsburgh, Pa., assignor to Rust Furnace Company, Pittsburgh, Pa.
Filed Feb. 23, 1971, Ser. No. 118,027
Int. Cl. F27b *9/14*
U.S. Cl. 432—133 **27 Claims**



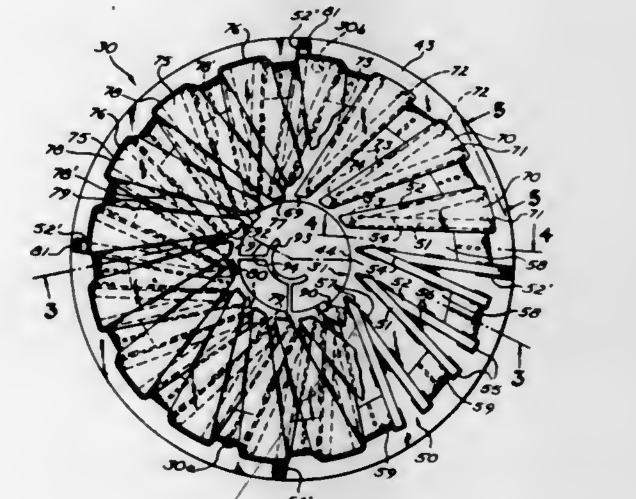
A heating furnace comprising a hearth which includes charge supporting members each comprised of an upper tubular member and a lower tubular member connected together by an intermediate tubular member to form a rigid, water cooled truss. The furnace may be divided into a series of heating zones by top and bottom partitions from which the furnace is end fired.

In one embodiment a first series of trusses is movable longitudinally while a second series of trusses is alternately movable vertically to convey a charge through the furnace. Alternatively, certain of the trusses may be fixedly mounted, while others are mounted for movement both longitudinally and vertically in the furnace. The trusses are supported at each bottom partition with the movable trusses being mounted on a carriage which is movable in and forms a traversing seal over a slot in the bottom partition. A reverse fired bottom soaking zone and a downtake flue adjacent the discharge end of the furnace insure heating of the charge by hot gases until discharge.

Another embodiment includes charge supporting members movable both longitudinally and vertically in the furnace and constructed of two sections connected together to permit independent relative vertical movement with respect to each other to cause closely packed charges on the first section to become spaced as they move to the second section. A downtake flue positioned in a preheat zone underneath the first section draws hot gases over the top of the charges on the first section towards the charge end of the furnace and back underneath the charges to heat the bottom.

3,716,223
LOAD SUPPORT DIFFUSER AND METHOD OF MANUFACTURE

Robert Lee Corbett, Jr., 22732 Westlake Road, Rocky River, Ohio 44116
Filed Feb. 10, 1971, Ser. No. 114,151
Int. Cl. F27d *5/00*
U.S. Cl. 432—260 **9 Claims**

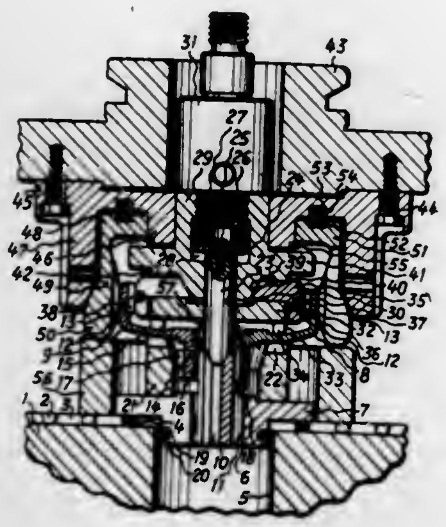


There is disclosed herein a load support diffuser adapted to support a vertical stack of coils in an annealing furnace and diffuse a protective atmosphere gas within said furnace, the diffuser comprising a flat circular base plate, V-shaped flow divider members mounted on top of the plate and having the apices thereof directed inwardly to define a central opening for a blower and defining outwardly directed flow passages, deflectors for diffusing the gas upwardly at the outer ends of the flow passages, and a double layer of oppositely skewed support bars carried by the flow divider members.

3,716,224
DEVICE FOR HOLDING A WORKPIECE

Max Gross, Winterthur, Switzerland, assignor to Werkzeugmaschinenfabrik Oerlikoon-Buhrle AG, Zurich, Switzerland
Filed July 22, 1970, Ser. No. 57,075
Claims priority, application Switzerland, July 23, 1969, 11241/69
Int. Cl. C21d *9/32, 1/64*
U.S. Cl. 269—48.1 **3 Claims**

A holder for a workpiece having a tubular portion to be used during quenching when hardening the same. A centering element grips the workpiece from the inside and clamping means grips the tubular portion from the outside at the level of the centering element. The clamping means has an adapter with a clamping bell movable axially therein. The bell is resiliently radially deformable with its internal diameter substantially equal to the external diameter of the workpiece to be quenched. The wall of the clamping bell is divided by axial incisions into a plurality of fingers which have convexly shaped inner and outer surfaces and the transverse dimension of the wall is less between the base of the bell and the fingers than that of the fingers. The adapter has a skirt circling the clamping bell and the inner surface of the skirt has a conical face for cooperation with the convexly shaped outside surfaces of the fingers.



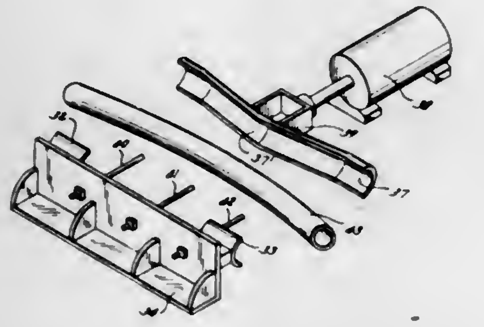
3,716,225
HOSE STRAIGHTENING FIXTURE

Phillip P. Percich, Worthington, Ohio, assignor to Amerace Esna Corporation, New York, N.Y.

Filed Feb. 22, 1971, Ser. No. 117,483

Int. Cl. B25b *1/24*

U.S. Cl. 269—269 **5 Claims**



A fixture for holding curved rubber hose so that the ends thereof are substantially aligned comprising a pair of spaced members each of which is formed in the vertical plane in the configuration of an arc with said members having the same axis and a third member which is also arcuate in the vertical plane and which in the horizontal plane is in the configuration of a wedge, said third member being relatively movable toward and away from said spaced members whereby the point of the wedge can intercept the axis of the spaced members and press against a hose outside curvature to reverse the curvature of the hose.

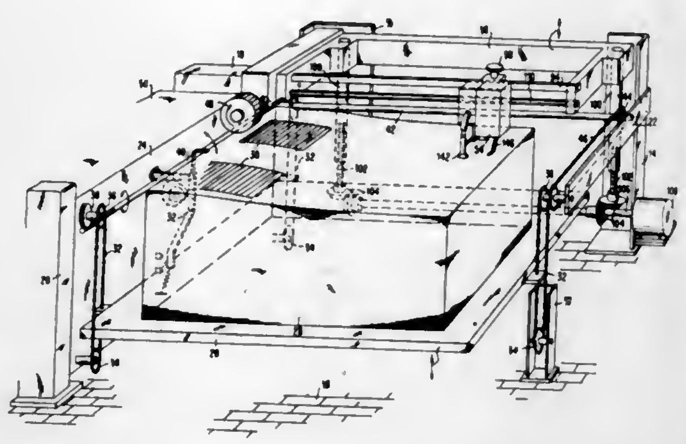
3,716,226
SHEET FEEDER

Hermann Kistner, Neckarweihingen, Germany, assignor to Maschinebau Oppenweiler GmbH, Oppenweiler near Backnang, Germany

Filed Nov. 23, 1970, Ser. No. 91,702

Int. Cl. B65h *1/18*

U.S. Cl. 271—31 **12 Claims**



A device for feeding sheets of paper or the like from a pile of such sheets, the device comprising means for lifting a pile of sheets; first means for sensing the height at the front margin of the top sheet of such pile; lifting, separating and suction means at the rear margin of said pile; means arranged at the front margin of said pile for receiving and transferring the sheets one after the other from said pile; second sensing means for sensing the height of the pile at its rear margin; control means for stepwise changing the height of the separating and lifting means at the rear margin of the pile of sheets under the influence of said first sensing means; and means operated by said lifting means controlling the raising of said pile so as to hold also its front margin at the proper height for the reception of the top sheet by said receiving and transferring means.

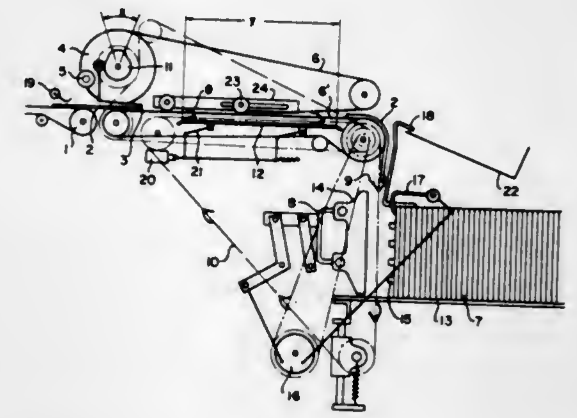
3,716,227
SHEET CONVEYING DEVICE

Rolf Bottcher, Markkleeberg-Ost, Germany, assignor to VEB Polygraph Leipzig Kombinat fur Polygraphische Maschinen und Austrustungen

Filed Feb. 8, 1971, Ser. No. 113,468

Int. Cl. B65h *29/28, 9/14*

U.S. Cl. 271—79 **6 Claims**



Control system for the conveying of sheets, comprising sheet conveying means defining a sheet conveying path, means in the sheet conveying path for stopping and releasing the sheets with a predetermined periodicity and means for equalizing the distance between consecutive sheets subsequent to the release of the sheets from the sheet stopping and releasing means.

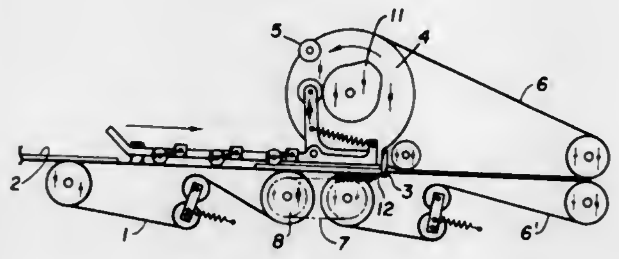
3,716,228
APPARATUS FOR CONNECTING AN UNCADENCED APPARATUS TO A FOLLOWING CADENCED APPARATUS FOR THE HANDLING OF SHEETS

Rolf Bottcher, Markkleeberg-ost, Germany, assignor to VEB Polygraph Leipzig Kimbinat fur Polygraphische Machinen und Ausrustungem, Leipzig, Germany

Filed Feb. 8, 1971, Ser. No. 113,466

Int. Cl. B65h *7/02, 9/14*

U.S. Cl. 271—47 **2 Claims**



In a method of conveying sheets along a sheet conveying path from means for non-periodically delivering the sheets to means for receiving the sheets with a predetermined periodicity comprising stopping the sheets in the path and releasing the sheets with the same periodicity as the receiving means, the improvement comprising operating the receiving means at a higher rate of sheets receivable per unit time than the average rate of sheets delivered per unit time at which the delivering means is operated.

3,716,229
RECREATIONAL APPARATUS

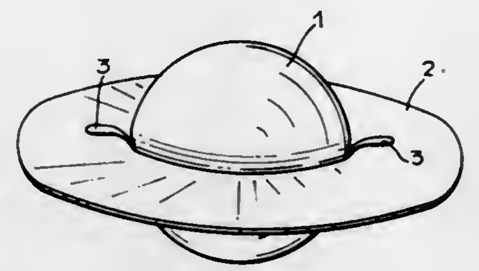
Rafael J. J. Van Der Cleyen, Erwetegem, and Wilfried F. Ribbens, Hillegem, both of Belgium, assignors to Les Usines Fabelty Societe Anonyme, Bastogne, Belgium

Filed March 26, 1970, Ser. No. 22,749

Claims priority, application Belgium, March 31, 1969, 730763

Int. Cl. A63b *25/08*

U.S. Cl. 272—57 E **11 Claims**



The present invention relates to a recreational apparatus comprising a resilient ball and foot supports connected to the ball on opposite sides of the vertical axis of the ball, such that in use a person disposed on the foot supports is capable to bounce above a floor surface. The foot supports are for example provided by a single rigid annular platform encircling the resilient ball.

3,716,230
EXERCISING COT

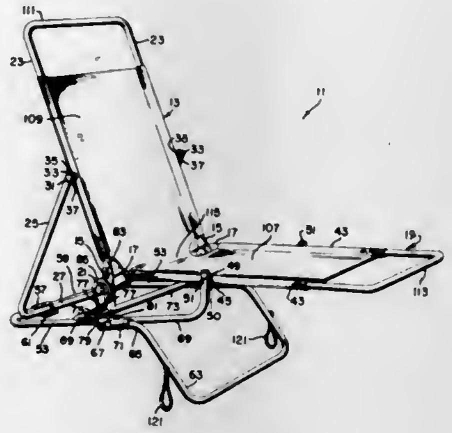
Morris Mark, 4147 Mantova Drive,
Los Angeles, Calif. 90008

Filed Mar. 8, 1971, Ser. No. 122,037

Int. Cl. A63b *23/02*

U.S. Cl. 272—58 **10 Claims**

An exercising cot convertible to a fixed chair, a slant board, and a flexible body supporting exerciser and having a pair of body supporting fabric covered and pivotally interconnected frame sections, one of such frame sections being supported intermediate its length by a first pivotally connected leg member and the other such frame section being supported intermediate its length by a pivotally connected frame supporting member having its end pivotally interconnectible to the ends of the first leg member, the frame supporting member being in turn supported by a second leg member pivotally connected to the frame supporting member intermediate its length but restricted in its pivotal movement thereabout.



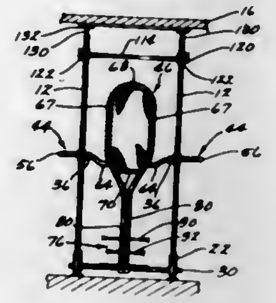
3,716,231
USER CONTROLLED EXERCISER FRAME

Robert M. Martin, 90 N. Hudson Ave.,
Pasadena, Calif. 91101

Original application July 23, 1970, Ser. No. 57,532. Divided and this application Aug. 9, 1971, Ser. No. 170,028

Int. Cl. A63b *23/02*

U.S. Cl. 272—58 **10 Claims**

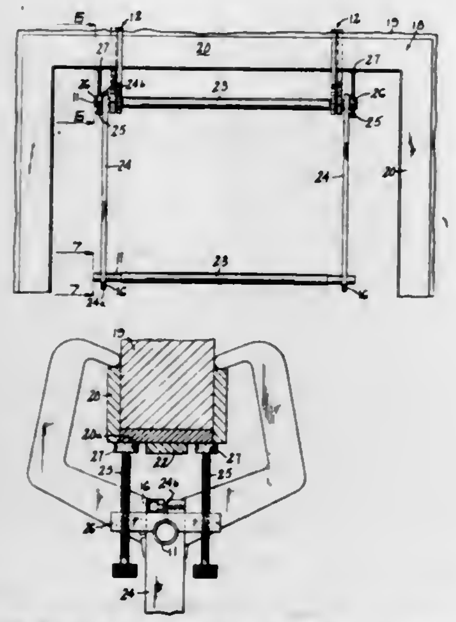


An exercise device including a pair of upright poles interconnected by top and bottom cross members. U-shaped members are pivotally and slidably connected to the poles to provide parallel handles when pivoted to an inwardly extending position and provide supports for a pivotal bed frame when the U-shaped members are pivoted outwardly. The bed frame is pivoted such that the center of gravity of the exerciser will be shifted back and forth across the pivotal axis by moving the hands from the sides towards the head. A canvas material supports the buttocks, back and head while a pair of cross elements engage the ankles and the feet. The cross elements are adjustable along the length of the body frame and with respect to each other. A pair of U-shaped hooks may be secured to the exerciser's ankles and engage the top cross bar to suspend the exerciser in an inverted position or engage one of the cross elements on the body frame to hold the exerciser satationary on the body frame as he pivots from an upright position to an inverted position.

3,716,232
EXERCISE APPARATUS FOR ATTACHMENT TO AN OVERHEAD FRAME

Donald A. Johnson; Louis V. Milani, and Anthony L. Massini, all of North Haven, Conn., assignors to Micron Research and Development Corporation, Hamden, Conn.

Filed June 5, 1970, Ser. No. 43,856
Int. Cl. A63b *1/02*
U.S. Cl. 272—63 **10 Claims**

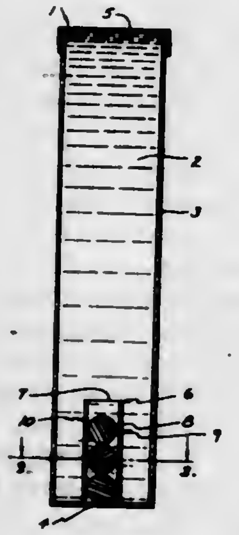


Exercise apparatus for attachment to an overhead support or frame comprising a pair of clamps and an elongated bar held horizontally at each end thereof by the clamps. Each clamp comprises a pair of support members having apertured lower ends concentrically overlapping to receive an end of the bar. Intermediate portions of the support members are angled such that the apexes of the angles point away from each other. The clamps are further secured on the bar by a pair of yokes disposed one across each end of the bar. A pair of set screws through each of the yokes abut the underside of the overhead frame so as to stabilize the position of the clamps below the frame.

3,716,233
GAME APPARATUS

Donald J. Koterwas, 14838 Leicester Court, Centreville, Va. 22020, and Theodore L. Koterwas, P.O. Box 5574, W. Village Branch, Aspen, Colo. 81611

Filed June 28, 1971, Ser. No. 157,425
Int. Cl. A63f *7/04*
U.S. Cl. 273—1 L **4 Claims**

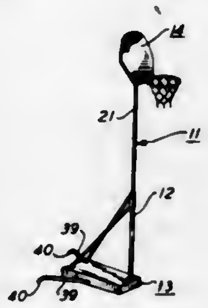


A game apparatus providing a test of manual maneuvering skill comprises a liquid filled chamber defined by a transparent side wall and closed opposite ends and a tubular receptacle mounted on and extending from one end of the chamber and having an open end in facing relation with the other end of the chamber to receive in a selected order each of a plurality of objects therein after turning the chamber end-for end. The objects each have a different specific gravity and thereby a different rate of fall or downward movement through the chamber.

3,716,234
BASKETBALL EQUIPMENT SUPPORT WITH CARRYING CASE

Joseph J. Lancellotti, 1-G Graden Terrace, North Arlington, N.J.

Filed Oct. 29, 1970, Ser. No. 85,027
Int. Cl. A63b *63/02*
U.S. Cl. 273—1.5 R **2 Claims**

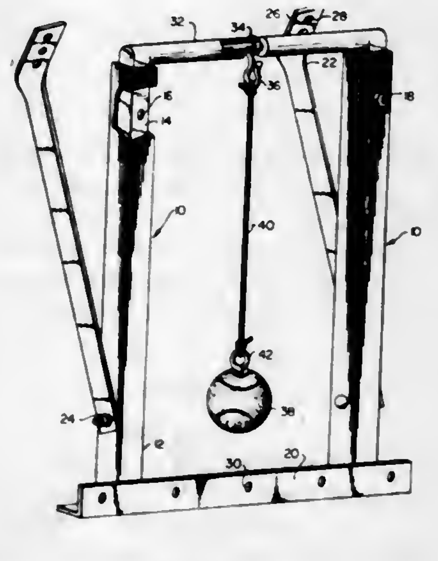


A collapsible basketball goal comprising a backboard made up of two pivoted sections held in their assembled position by means of stirrup members mounted to the respective sections with support straps extending therebetween. The backboard is mounted on a collapsable tubular upright support which in turn is mounted through an aperture to an anchor shoe in the base by shoe hinge couplings. Braces extend from the tubular support through further apertures in the base to further anchor shoes. The base comprises a first slidable member having the aforesaid apertures and a second slidable member over the first to keep the pieces from falling out of the base when stored therein.

3,716,235
BALL PRACTICE DEVICE

John W. Yerkie, Jr., Box 408, Route No. 1, Clinton, Md.

Filed June 16, 1970, Ser. No. 46,772
Int. Cl. A63b *69/40*
U.S. Cl. 273—26 E **2 Claims**

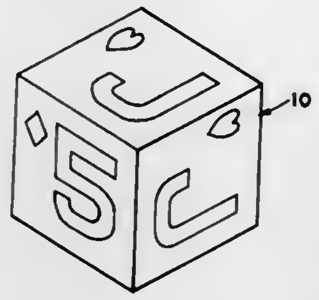


Ball practice support structure providing high strength, durability, and adjustable features while being collapsible for shipment and storage. This support structure is adaptable to either overhead, sidewall, or combination of overhead and sidewall mounting. Telescopic support arms permit adjustment of the position of a tethered ball in relation to overhead or sidewall.

3,716,236
DICE APPARATUS FOR PRACTICING BIDDING AND PLAY IN CONTRACT BRIDGE

Wayne O. Pangborn, 1974 Sea View, Del Mar, Calif. 92014

Filed Sept. 30, 1971, Ser. No. 185,217
Int. Cl. A63f *1/00, 9/04*
U.S. Cl. 273—138 R **7 Claims**

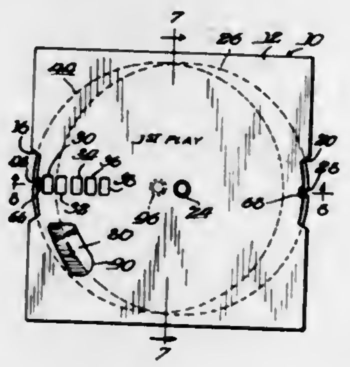


For practicing bidding and planning the play of the hand in contract bridge, a game-like apparatus comprises twenty-six dice. Each of the dice has representations of two cards of different suits on selected ones of its six faces. Only one honor card is represented on any one die, and on each die having an honor card represented thereon the honor card is represented on a majority of the faces of such die. By not having two cards of the same suit on any one die a "perfect" hand of all one suit is possible, and by having the honor cards represented on a majority of the die faces, chance favor hands which are stronger than average, thus providing better bidding situations and fewer hands "passed out." A pair of racks preferably are provided to hold in alignment the thirteen dice of each of two persons, acting as partners, and seated on opposite sides of a table.

3,716,237
PLURAL ROTATABLE DISC INFORMATION DISPLAY DEVICE

Richard E. Locher, 921 Heatherton Drive, Naperville, Ill.

Filed July 7, 1970, Ser. No. 52,956
Int. Cl. A63f *1/00, 5/04*
U.S. Cl. 273—142 H **4 Claims**

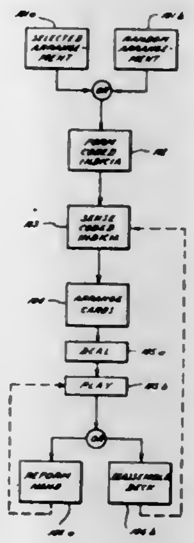


A novel device for displaying selected information comprising two partially superimposed rotatable discs mounted on independent axes between two apertured cover panels. Information indicia are disposed on the discs and are visible through the apertures in the cover panels and through selected apertures in the discs. Movable closure means are provided to conceal portions of the indicia beneath the cover panel apertures until the player shifts the position of the closure means simultaneously revealing first a portion of the information, and then the remaining information.

3,716,238
METHOD OF PREARRANGING PLAYING CARDS FOR EDUCATIONAL AND ENTERTAINMENT PURPOSES

Brooks W. Porter, 9102 Tooley, Houston, Tex.

Filed July 13, 1970, Ser. No. 54,431
Int. Cl. A63f *1/14*
U.S. Cl. 273—149 P **2 Claims**

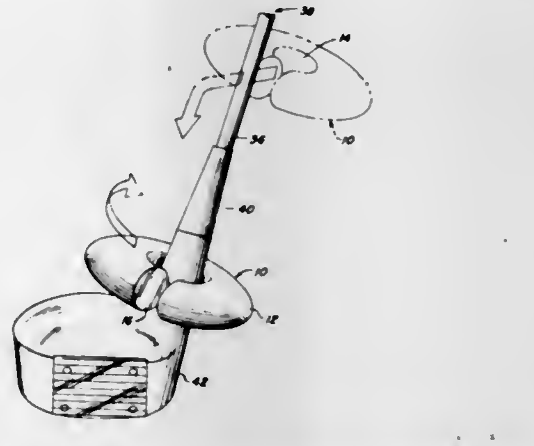


A playing card having indicia arranged thereon permitting arrangement of a deck of such cards into a plurality of predetermined dealing sequences by a new and improved method of forming the indicia in a deck of the cards, and prearranging the deck for dealing in accordance with the indicia, which arranges decks of cards in predetermined sequences and which results in selected playing hands for educational or entertainment purposes.

3,716,239
WEIGHTING DEVICE FOR GAME CLUB INCLUDING TAPERED SHAFT

Noel G. Goudreau, Kankakee, Ill., assignor to Goudreau-Behan Incorporated

Filed Jan. 7, 1972, Ser. No. 216,026
Int. Cl. A63b *69/36*
U.S. Cl. 273—194 A **5 Claims**

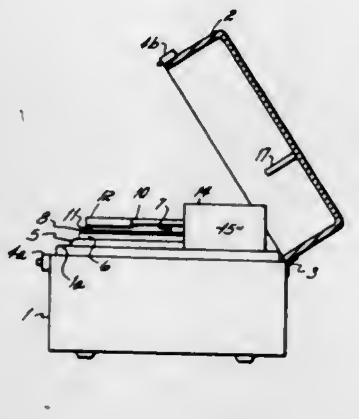


A warm-up weight for athletic implements such as golf clubs having an enlarged head with a tapered stub having its point of smallest diameter connected to a tapered shaft having its narrower end connected to the stub. The warm-up weight includes a rigid generally annular core having a compressible casing thereon and including an axial passage and a generally radial channel permitting insertion of the weight onto the implement. In use, the narrower end of the tapered shaft is passed through the radial channel into the axial passage, the weight is slid down along the tapered stub into frictional engagement therewith, and the weight is rotated approximately 90°.

3,716,240
RECORD PLAYER HAVING A CHILD-PROOF DEVICE

Edward G. Freeman, 163 Yamate-cho, Nak-ku, Yokohama, Japan

Filed Sept. 8, 1970, Ser. No. 70,312
Int. Cl. G11b *1/00*
U.S. Cl. 274—2 **3 Claims**

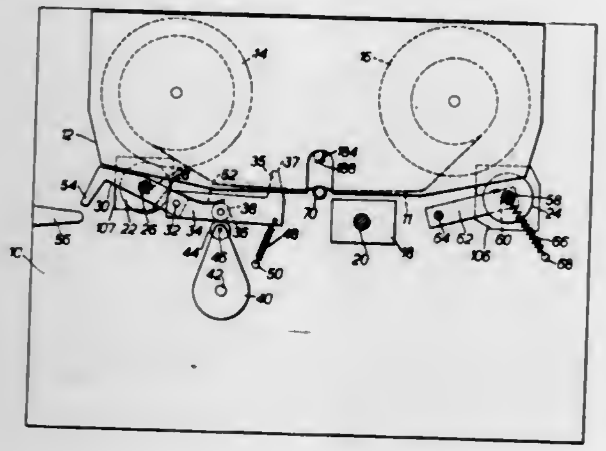


A "child-proof" device incorporated in a record player is comprised of a vertically displaceable arm carrier having a self-positioning means for a pickup arm and to be depressed upon closure of a cabinet lid so that the stylus of a pickup head automatically engages with a starting point of the recorded groove of a record mounted on a turntable. A first switch means is provided which becomes operative upon closure of the lid to close a circuit including an electric motor and a power supply therefor. Second and third switch means become operative to close the circuit only when the pickup arm is positioned correctly by the self-positioning means. Upon termination of the sound reproduction of the entire recorded groove of the record, the pickup head is automatically lifted above and away from the record surface as then the pickup arm slides upwardly on a tapered face means.

3,716,241
DRIVE APPARATUS FOR TAPE PLAYBACK APPARATUS

Wilfred H. G. Rayner, London, England, assignor to Clarke and Smith Manufacturing Company Limited

Filed April 9, 1970, Ser. No. 26,901
Claims priority, application Great Britain, April 11, 1969, 18,762/69
Int. Cl. G11b *15/44, 27/00*
U.S. Cl. 274—4 D **7 Claims**

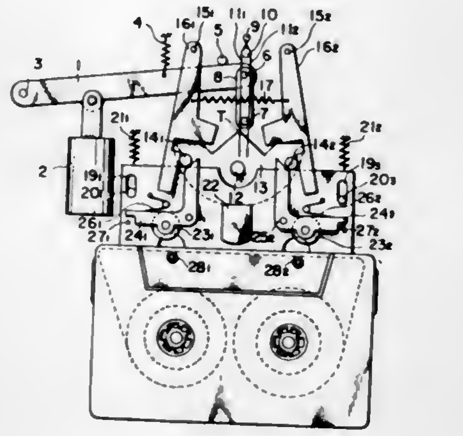


In a tape recording and playback machine for language teaching or for a dictation system, the tape can be fed at both fast and slow forward and reverse speeds. Sound recorded on the tape can be reproduced during slow reverse winding as well as slow forward winding. The drive shift mechanism can be controlled by solenoids, remotely or at the machine.

3,716,242
TAPE DRIVE REVERSAL MECHANISM FOR TAPE RECORDER

Yoshio Maruyama, Tokorozawa, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Claims priority, application Japan, Sept. 29, 1969, 44/76900
Int. Cl. G11b *15/20*
U.S. Cl. 274—4 D **5 Claims**

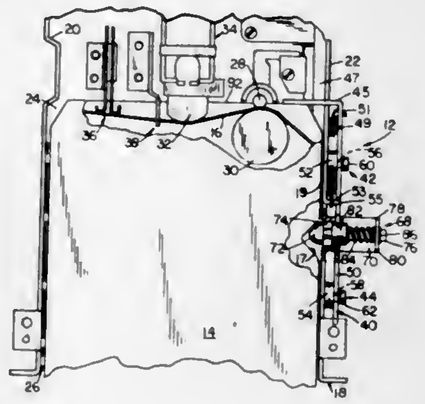


A tape drive reversal mechanism for a tape recorder using two reels is initiated by actuation of a plunger and the like. In response to the actuation of the plunger, an eccentric cam is rotated in either clockwise or counterclockwise direction a certain angle alternatively and locked in position, whereby, through appropriate mechanisms, driving of either one of the two reels is effected, and a head and one of pinch rollers are set in operative position or out of operation.

3,716,243
CARTRIDGE LOCKING MECHANISM

Donald V. O'Neal, Rivergrove, Ill., assignor to Motorola, Inc., Franklin Park, Ill.

Filed Jan. 18, 1971, Ser. No. 107,201
Int. Cl. G11b *5/00*
U.S. Cl. 274—4 B **12 Claims**

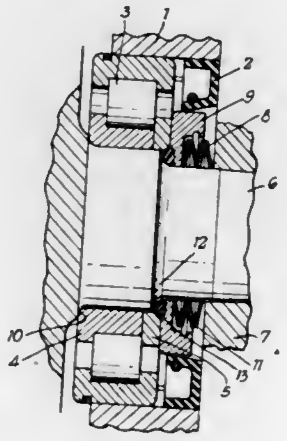


A cartridge locking mechanism for a tape player having a tunnel for receiving a tape cartridge, comprises an actuator arm mounted for movement in the direction of insertion and withdrawal of the cartridge in the tunnel and a plunger mounted for movement into and out of the tunnel in accordance with the movement of the actuator arm for receipt in a groove in the cartridge wall to secure the cartridge in the tunnel. The actuator arm includes a portion extending into the tunnel in the path of the cartridge for engagement therewith. The arm is resiliently biased toward the open end of the tunnel and includes a key-hole shaped aperture therein. The plunger passes through the key-hole aperture and is captured normally in the smaller portion thereof, out of the tunnel. The plunger, being resiliently biased toward the tunnel is prevented from movement thereinto. When a cartridge is inserted into the tunnel, the extension portion of the actuator arm is engaged by the cartridge, moving the actuator arm to align the larger portion of the key-hole aperture with the plunger, permitting the latter to pass therethrough and into the groove in the cartridge wall. Removal of the cartridge forces the plunger out of the groove and permits the actuator arm to spring back to its normal position, recapturing the plunger.

3,716,244
SHAFT SEAL

Karl Hellwig, Weinheim, Germany, assignor to Farymann Diesel, Farny & Weidmann, Lampertheim, Germany

Filed Dec. 16, 1970, Ser. No. 98,763
Int. Cl. F16j *15/38*
U.S. Cl. 277—65 **3 Claims**

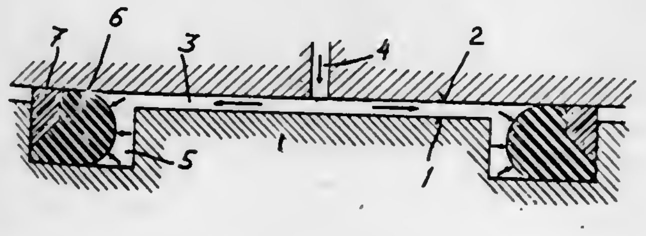


A seal, shaft and housing assembly in which a shaft end projecting from a machine housing bore carries a first rotary member. A second rotary member carried on the shaft is held against a collar portion of the shaft internally of the housing by an axial preload element in the form of a cup spring. The cup spring fits in a recess in an abutment ring which is carried on the shaft and which contacts the second rotary member, and acts between the abutment ring and the first rotary member. An elastic seal is disposed around the shaft in a seating between the abutment ring, second rotary member and a shoulder on the shaft and is deformed to abut in force-locking and sealing manner on the abutment ring, second rotary member and shaft shoulder. A sliding ring sealing element provides a seal between the machine housing bore and the abutment ring.

3,716,245
RING SEAL

Marco Turolla, 213, Via Toscana, Bologna, Italy

Filed March 4, 1970, Ser. No. 16,408
Claims priority, application Italy, March 10, 1969, 6862 A/69; March 29, 1969, 6914 A/69; May 8, 1969, 7009 A/69; Feb. 14, 1970, 12477 A/70
Int. Cl. F16j *9/06, 15/00*
U.S. Cl. 277—176 **5 Claims**

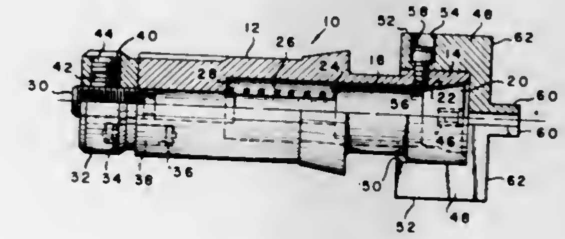


In a ring seal for effecting a seal between two opposed sealing faces, which may be plane or curved faces, one of the sealing faces is provided with a groove the opening from which faces the other of the sealing faces. In the groove there are located an annular rubber-elastic sealing element which is compressively pre-loaded and a locating element made of a material harder than that of the sealing element. On compression of the sealing element to a predetermined degree above that of the pre-load the sealing element urges the locking element partly out of the groove to abut the sealing face opposite the opening from the groove.

3,716,246
EXPANDING COLLET AND WORK GRIPPING ADAPTOR THEREFOR

Anders Adolf Peterson, Elmira, N.Y., assignor to Hardinge Brothers, Inc., Elmira, N.Y.

Filed Sept. 29, 1970, Ser. No. 76,431
Int. Cl. B25b *3/00*
U.S. Cl. 279—2 **12 Claims**

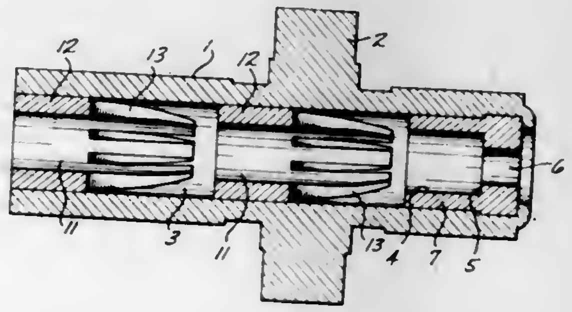


An expanding collet for machine tools including a tubular body portion having a longitudinal axis and a plurality of slots dividing the tubular body portion into a hub portion and a plurality of fingers extending from the hub portion and having inner and outer surfaces, an adaptor member mounted on the outer surface of the free end of each of the fingers and extending beyond the free end of each of the fingers, each of the adaptor members having an inner surface coincident with the outer surface of the fingers, the adaptor members each including a portion beyond the free end of the fingers and extending radially inward toward the longitudinal axis, the adaptor members each including an outer surface longer than its respective inner surface.

3,716,247
METAL CHUCK FOR USE IN A DENTAL HANDPIECE

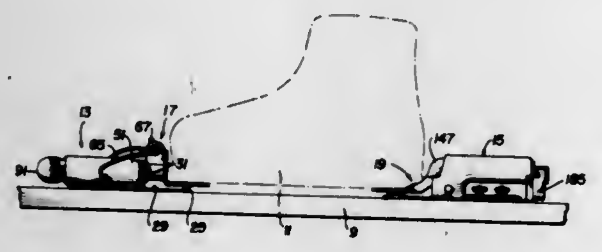
Kenzo Sato, Kyoto, Japan, assignor to Kabushiki Kaisha Morita Seisakusho, Kyoto, Japan

Filed Dec. 11, 1970, Ser. No. 97,179
Claims priority, application Japan, Dec. 25, 1969, 44/104553
Int. Cl. B23b *31/08*
U.S. Cl. 279—15 G **3 Claims**



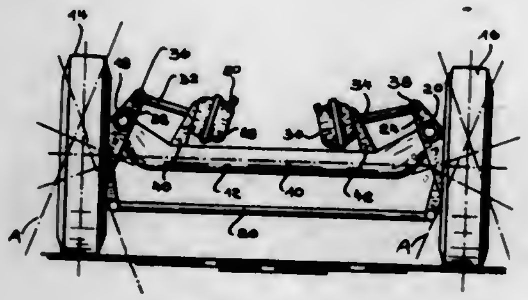
A metal chuck for use in a dental handpiece for holding a dental tool which comprises a tubular body and a plurality of claws integral with the body. The chuck is secured in the axial through bore of the air-turbine rotor enclosed in the handpiece. A dental tool is inserted through the tubular body to be secured by friction between the contacting surfaces of the body and the tool, with the claws resiliently clamping the tool thereby holding the same all the more securely in the chuck.

3,716,248
TENSION ADJUSTABLE RELEASABLE SKI BINDING AND METHOD
Philip K. Wiley, 326 West 7th Street, Traverse City, Mich.
Filed July 29, 1970, Ser. No. 59,207
Int. Cl. A63c *9/00*
U.S. Cl. 280—11.35 T **11 Claims**



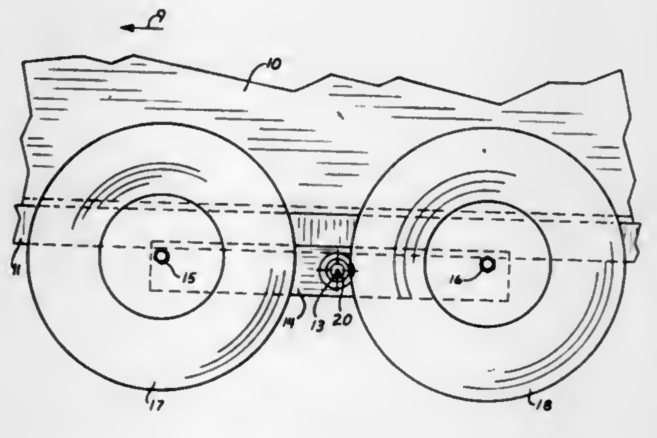
The present invention relates to releasable ski bindings for retaining boots to skis during normal skiing and releasing the boots from the skis under abnormal conditions. Forward and rear boot mounts cooperate with forward and rear ski mounts through a multiple action toggle at the rear ski mount to permit lateral heel release from beneath the toggle against the forward resilient force but heel roll out and vertical release are enabled through toggling of the toggle means upwardly and backwardly. Momentum or decelerating release is facilitated through telescoping the forward boot mount into the forward ski mount against the resilient force.

3,716,249
ARRANGEMENT FOR STABILIZING TRAILING VEHICLE AXLES
Friedrich Schaeff, Bensheim-Auerbach, Germany, assignor to Sauer, Otto Achsenfabrik, Keilberg uber Aschaffenburg, Germany
Filed Sept. 9, 1970, Ser. No. 70,675
Claims priority, application Germany, Sept. 9, 1969, P 19 45 589.1
Int. Cl. B62d *15/00*
U.S. Cl. 280—81 A **4 Claims**



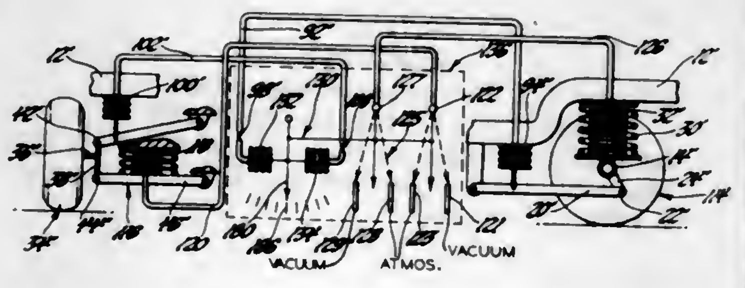
A trailing vehicle axle having telescopic piston rods connecting the steering knuckles with the pistons of pneumatic cylinders, the pistons during straight-ahead motion holding the wheels in fixed position subject to the air pressure. In a turn, one piston rod lengthens telescopically without effort and the other enters the cylinder against the air pressure.

3,716,250
BOGIE AXLE
Thomas J. Gorres, Benson, Minn.
Filed March 1, 1971, Ser. No. 119,553
Int. Cl. B62d *61/00*
U.S. Cl. 280—104.5 A **2 Claims**



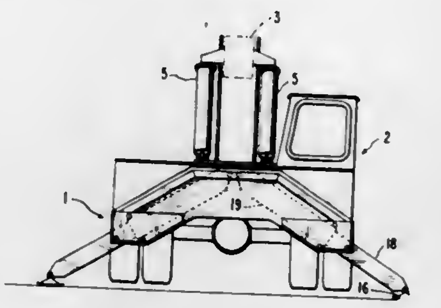
The present invention relates to a construction in a bogie or tandem axle of the walking beam type wherein the axis of pivoting of the walking beam is specifically located with respect to the axes of the wheels being supported to minimize bouncing of the walking beam, improve towing characteristics, and to develop improved flotation characteristics over conventional walking beam systems.

3,716,251
VEHICLE PITCH CONTROL DEVICE
Gerard T. Klees, Rochester, Mich., assignor to General Motors Corporation, Detroit, Mich.
Filed July 19, 1971, Ser. No. 163,833
Int. Cl. B60g *17/04*
U.S. Cl. 280—124 F **6 Claims**



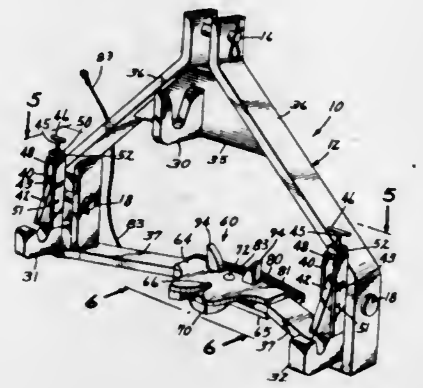
A preferred embodiment of a pitch control device for a vehicle leveling system includes a pair of leveler unit associated with primary suspension springs in the rear suspension of a vehicle. The pitch control includes sensing bellows at the front and at the rear of the vehicle which are operative to produce a pressure differential when the vehicle frame and chassis are pitched either from front to rear or from rear to front of the car and wherein a valve controller responds to the pressure differential to regulate the levelers to compensate for the pitched relationship. Other embodiments are illustrated.

3,716,252
DUAL POSITION HYDRAULIC OUTRIGGER ASSEMBLY
LeRoy J. Johnson, Fayetteville, Pa., assignor to Walter Kidde & Company, Inc., Clifton, N.J.
Filed March 1, 1971, Ser. No. 119,502
Int. Cl. B60s *9/12*
U.S. Cl. 280—150.5 **10 Claims**



A hydraulic outrigger assembly for mobile cranes wherein the outriggers are constructed and arranged to be selectively extended to operative position in either a divergent or substantially vertical attitude relative to the vehicle being stabilized.

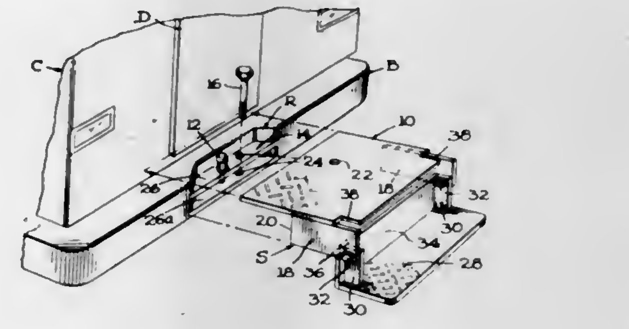
3,716,253
TRACTOR HITCH APPARATUS
Glenn D. Gniffke, and Harold A. Fratzke, both of Cottonwood, Minn., assignors to Metro Hydraulics Inc., Minneapolis, Minn.
Filed Jan. 27, 1971, Ser. No. 110,119
Int. Cl. B60d *1/00*
U.S. Cl. 280—415 A **6 Claims**



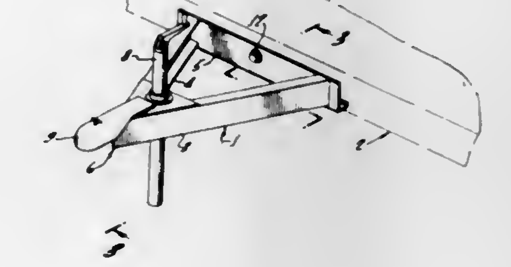
Tractor hitch apparatus including an automatic three-point hitch and a self-hooking draw-bar hitch is described. The hitch apparatus is adapted for attachment to a conventional three-point tractor hitch system.

3,716,254
DETACHABLE FOLDING CAMPER STEPS
Edward M. Tarvin, Route No. 1 Box 74A, Terra Bella, Calif.
Filed Jan. 29, 1971, Ser. No. 111,030
Int. Cl. B60r *3/02*
U.S. Cl. 280—166 **17 Claims**

A detachable pair of folding steps for use with a rear bumper of a camper vehicle and attachable thereto so that the top step is supported on and projects substantially coextensively beyond the bumper's upper horizontal surface by use of the conventional drop-in hitch pin as provided with many such bumpers, and which pin passes through an aperture customarily provided in alignment with the hitch pin. The lower step is foldable about pivot bolts in the upper portions of oppositely spaced brackets affixed thereto and is connected with complementally disposed side brackets affixed to and depending from the rearward underside of the top step. The top step plate is notched at its rearwardmost, laterally opposite sides to complementally receive, in a light friction fit manner, the side brackets of the lower step when folded up into overlying condition with the tread surface thereof laying face down on the face-up tread surface of the upper step. A riser plate is affixed to the rearward edge of the lower step and its side brackets, as viewed when facing said steps for use, and is of at least the same lateral extent as the outside span of the upper step's side brackets. The riser plate is notched out at its opposite outer and upper ends just sufficiently to complementally receive the upper brackets and to provide suitable support for holding the lower step in its unfolded horizontal use condition. The respective pairs of pivotally connected side brackets are of a height approximating slightly more than about one-half the overall riser height so that the lower step will fold over and rest upon the upper step when not in use.



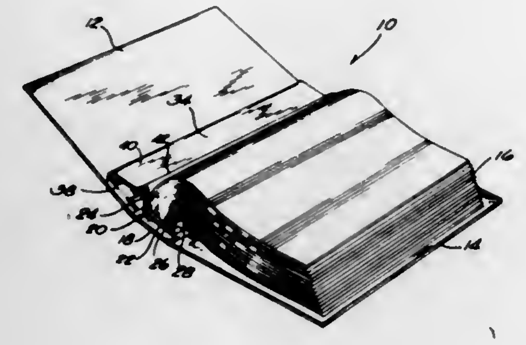
3,716,255
REMOVABLE TRAILER HITCH
Billy R. Morris, 2538 Northmoor Drive, Corona, Calif.
Filed May 14, 1971, Ser. No. 143,322
Int. Cl. B60d *1/16*
U.S. Cl. 280—491 E **10 Claims**



An easily removable trailer hitch which provides for the uniform distribution of the loading forces over the entire length of the transverse horizontal member.

3,716,256
BOOK BINDING
Oliver K. Moore, Greenfield, Wis., assignor to Display Corporation International, Milwaukee, Wis.
Filed May 25, 1970, Ser. No. 40,061
Int. Cl. B42d *3/00*
U.S. Cl. 281—29 **3 Claims**

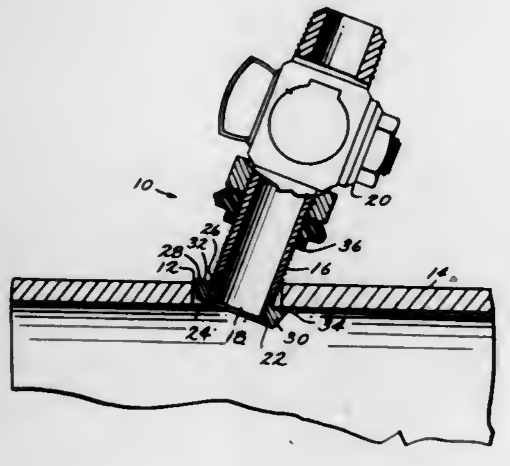
A front and back cover are hingedly connected to the backbone permitting the covers to be opened towards a planar position. A generally U-shaped binder is affixed to the interior of the backbone for receipt of the pages or leaves. A foldable



strip is connected between the front cover and binder which limits opening movement of the front cover relative to the backbone and binder over a preselected arc. Further opening movement of the front cover results in joint rotational movement of the binder and backbone with the cover. The front cover is prevented from becoming coplanar with the backbone thereby reducing the amount of rotation of the pages as they are turned and providing a relaxed and stable paging of the book.

3,716,257
PUSH-IN FITTING FOR PLASTIC PIPE

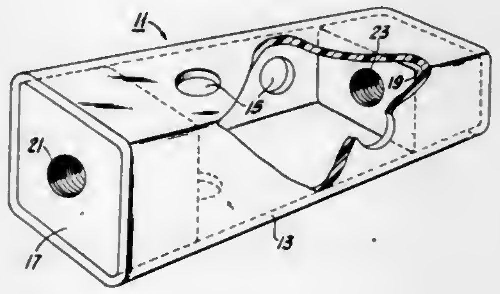
Frank C. Hackman, and Robert R. Roos, both of Decatur, Ill., assignors to Mueller Co., Decatur, Ill.
Filed March 15, 1971, Ser. No. 124,056
Int. Cl. F16l *5/02*
U.S. Cl. 285—210 **7 Claims**



A fitting is provided for establishing a fluid connection with a main, the fitting being of the type having a tubular member with a through bore and a collar secured at one end thereof; the collar is formed with diametrically extending ears, the overall dimension of which is greater than the aperture in the main through which the fitting is to be inserted; the exterior of the tubular member is threaded and carries a threaded nut and an annular gasket and centering ring; the radial thickness of the ring is such that it is substantially equal to the difference between the radius of the aperture in the main and the exterior radius of the tubular member so that when the fitting is disposed in the aperture of the main the centering ring will function to dispose the tubular element concentrically with respect to the aperture; the annular gasket is provided with a depending neck portion of a thickness substantially equal to the thickness of the centering ring so as to completely occupy the space between the wall of the aperture and the exterior surface of the tubular fitting.

3,716,258
TURNBUCKLE BODY

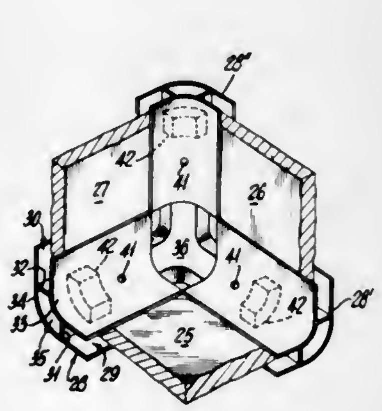
Henry F. Lange, 24 Merion Road, Cherry Hill, N.J. 08034, and Stuart L. Adler, 1 Dorchester Drive, Apt. 602, Pittsburgh, Pa. 15241
Filed Jan. 20, 1971, Ser. No. 108,083
Int. Cl. F16b *7/06*
U.S. Cl. 287—60 **1 Claim**



A length of fiber reinforced plastic tubing, which may have a round, square or rectangular cross section, is plugged at both ends by axially threaded blocks that are fixed in the end portions of the plastic tubing. The tubing has a plurality of perforations in it and the blocks are right and left hand threaded.

3,716,259
BONDED CONSTRUCTION

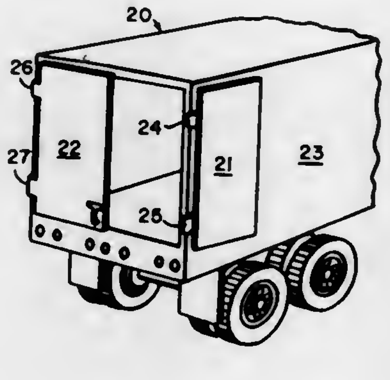
Robert L. Weill, and George B. Parsons, both of Port Jervis, N.Y., assignors to Skydyne, Inc., Jervis, N.Y.
Filed Nov. 23, 1970, Ser. No. 91,819
Int. Cl. F16b *5/00*
U.S. Cl. 287—189.36 D **21 Claims**



The invention contemplates a bonded assembly of plural parts having regions of channel-socket or telescoping fit with each other. One or more small apertures are provided to vent the overlap region of such fit, and the aperture assists in the pressurized liquid-phase introduction of hardenable bonding material. Depending upon the nature of the assembly or joint, (a) the parts may be fabricated to naturally and substantially close or dam the open annulus attributable to clearance between the overlapped parts at the open end of the region of overlap, or (b) expendable rings or solid plugs may be used to confine to the overlap region the flow of injected bonding material. After such injection and flow, the bonding material is cured to hardness.

3,716,260
HOLD-OPEN LATCH

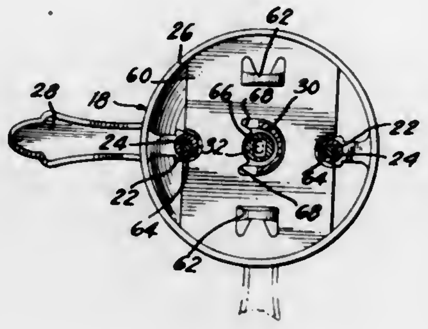
Robert J. Herlein, Box 1172, Route 1, Custer, Mich.
Filed March 4, 1971, Ser. No. 120,808
Int. Cl. E05c *19/10*
U.S. Cl. 292—103 **5 Claims**



A latch having a keeper housing provided with a resilient pad to cushion the engagement of the latch hook, and hold it in engagement with the keeper.

3,716,261
ANTI-VIOLATION MEANS FOR LEVER ACTUATED LATCH

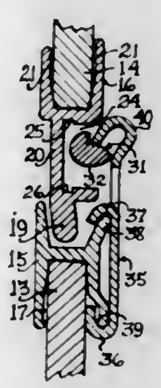
John R. Gerlach, Monterey Park, Calif., assignor to Emhart Corporation, Bloomfield, Conn.
Filed Aug. 19, 1970, Ser. No. 65,079
Int. Cl. E05c *13/00*
U.S. Cl. 292—169.23 **2 Claims**



A usual longitudinally extending latch unit has a longitudinally reciprocal bolt and stationary frame parts are spaced transversely of the latch unit at opposite sides thereof mounting a half round spindle extending from one frame part through the latch unit to the other frame part. The frame parts mount the spindle for limited rotational movement from a normal intermediate non-operating position in either rotational direction to opposite operating positions, the spindle being operably connected with the bolt positioning the bolt extended in spindle normal non-operating position and retracted in either of the spindle operating positions. An anti-violation plate is mounted stationary on one of the frame parts by slidable engagement with spaced lugs on said frame part and telescopes the spindle spaced between that frame part spindle rotational mounting and the latch unit. The spindle extends through a plate opening having spaced abutment surfaces on the plate bordering said opening positioned engageable by the spindle when the spindle is moved to either of its operating positions, but the plate otherwise remaining free of contact with the spindle. The anti-violation plate thereby retains the spindle and bolt against movement in excess of that intended.

3,716,262
CONCEALED LATCHING MECHANISM

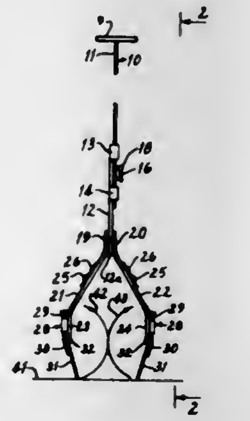
Chester H. Wickenberg, 164 Division Street, Elgin, Ill.
Filed April 29, 1971, Ser. No. 138,484
Int. Cl. H01r *3/14*
U.S. Cl. 292—218 **6 Claims**



A self-operating concealed latching mechanism for releasably securing separate portions of a container, such as luggage and the like, together, having a concealed latching rod and catches so constructed as to provide an intermediate latched position that facilitates complete closing and locking of the separate portions together and which prevents accidental separation thereof.

3,716,263
REFUSE COLLECTION DEVICE

Alfred C. Gatti, 2152 E. 18th St., Brooklyn, N.Y. 11219
Filed Feb. 9, 1972, Ser. No. 224,665
Int. Cl. A47f *13/06*
U.S. Cl. 294—19 R **7 Claims**



A pair of scoops are pivotally mounted upon supporting arms affixed to a vertically adjustable shaft and handle, the scoops being maintained in an open position by springs biasing the scoops against plungers. When the scoops are in contact with the ground or other surface from which refuse is to be removed, the handle is depressed, thereby urging the scoops to a closed position where they are maintained by means of the plungers which are then permitted to descend so as to obstruct retraction of the scoops to their open position. A bag may be disposed around the scoops during these operations so as to enclose the refuse sought to be removed, the bag thereafter being discardable or otherwise disposable as desired.

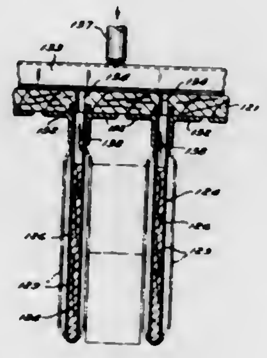
3,716,264
INFLATABLE GRIPPERS FOR BRICK MAKING MACHINES OR THE LIKE

Florentin J. Pearne, Whittier; Frank S. Pearne, San Gabriel, and Frederick G. Robson, Long Beach, all of Calif., assignors to Aircraft Mechanics, Inc., Los Angeles, Calif.

Division of Ser. No. 850,849, Aug. 18, 1969, Division of Ser. No. 478,913, Aug. 11, 1965, Pat. No. 3,478,397, and a continuation-in-part of Ser. No. 478,913, Aug. 11, 1965, Pat. No. 3,478,397. This application March 8, 1971, Ser. No. 122,005

Int. Cl. B66c *1/46*

U.S. Cl. 294—63 A **8 Claims**



An automated brick hacker is disclosed which includes an inverter stacker operable to position one elongated cut or uncut slug of unfired brick material on a subsequent cut or uncut slug. In one embodiment, an inverter is pivoted for movement between a position aligned with an off-bearing belt and an inverted position over the belt. A pusher operates to slide alternate slugs from the off-bearing belt onto the inverter. Vacuum means grip the slug while it is inverted and positioned over the subsequent slug on the off-bearing belt. In another embodiment, an inverter stacker is provided which is operable to grip lateral sides of a slug along its length and raise the slug for positioning on a subsequent slug with or without inversion. A pusher drivingly engages the rearward end of a cut slug for movement into the inverter and spaces adjacent slugs without creating spaces between bricks in the slug. A pneumatic gripper is provided to gently, but securely, grip a plurality of bricks for transfer from one location to another.

3,716,265
GRAB

Leendert van Hunksloot, Rotterdam, Netherlands, assignor to Nemag N.V., Rotterdam, Netherlands

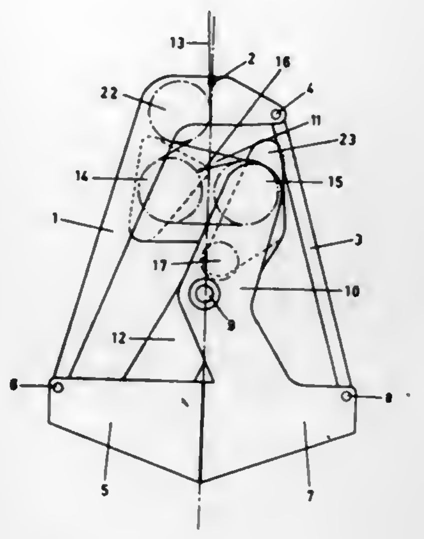
Continuation of application Ser. No. 640,635, May 23, 1967. This application Mar. 27, 1970, Ser. No. 20,877

Claims priority, application Netherlands, May 26, 1966, 6607301

Int. Cl. B66c *3/10*

U.S. Cl. 294—70 **1 Claim**

A grab having a carrier with two mutually pivoted containers. The side plates of the containers are elongated beyond their fulcrum and means are provided at their ends for leading the controlling cable or cables. The side plates are almost in a direct line with the closing edges of the grab containers and beyond the fulcrum are staggered so that they may pass each other. The ends of the side plates supporting the rollers for leading the controlling cable when in opened position of the grab are almost in the same horizontal plane as the pivot of the grab containers. The ends of the side plates of one of the grab containers supporting bypass rollers of the controlling cable form an angle of about 90° with respect to the remaining portion of the side plates.



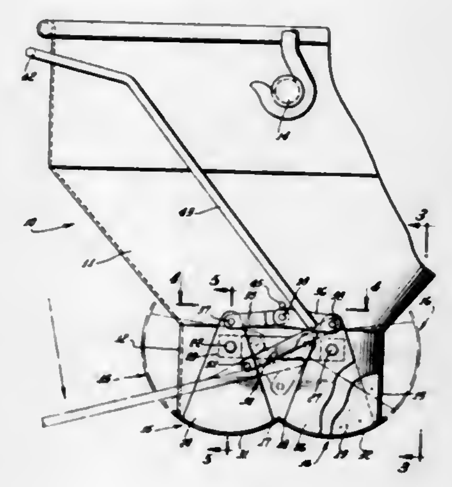
3,716,266
CLAM SHELL GATE ACTION

Leslie H. Garlinghouse, Pasadena, Calif., assignor to Garlinghouse Brothers, Los Angeles, Calif.

Filed Dec. 7, 1971, Ser. No. 205,511

Int. Cl. B66c *3/00;* **E21b** *33/132*

U.S. Cl. 294—71 **12 Claims**



In a concrete placing bucket at the bottom of which is a chute is a pair of clam shell gates pivotally mounted on the bucket so that they can be simultaneously swung outwardly to open the chute and release the contents of the bucket. To open the gates a handle is swung downwardly by hand and an actuator arm and synchronizer link mechanism multiplies the manual force to swing the gates open. Two actuator arms are pivotally attached together and when moved downwardly pull upper ends of the gates toward each other to swing lower ends of the gates away from each other. A synchronizer link attached to one gate above the pivot point and to the other gate below the pivot point forces the gates to move at approximately equal rates over approximately equal opening distances.

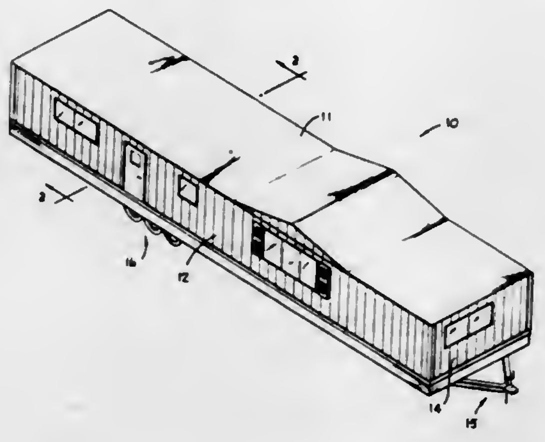
3,716,267
UNIFIED FLOOR-FRAME ASSEMBLY WITH SKIRT FOR A MOBILE BUILDING

Frederick H. Lindsay, Rt. 1, Dunkirk, Ind.

Filed Nov. 8, 1971, Ser. No. 196,597

Int. Cl. B60p *3/32*

U.S. Cl. 296—23 R **6 Claims**



A unified floor and frame assembly with a skirt for a mobile building. The floor and frame assembly has a pair of parallel I-beams which extend the length of the building being mounted atop a plurality of parallel beams extending the width of the building. A plurality of parallel members aligned with the lower beams are mounted atop the pair of beams and are supported by vertical legs. Floor sheets are mounted atop a plurality of ribs which extend the length of the building being recessed in the members. The lower beams form ledges which receive and support the building side walls. A wheeled carriage is removably connected to tubes mounted beneath the floor-frame assembly for transportation of the building. Skirts are fastened to the building side walls and extend to the bottom end of the unified floor-frame assembly.

3,716,268
LONGITUDINAL AND LATERAL RETAINER AND GUIDE ASSEMBLY FOR CONTAINERS ON A VEHICLE BED

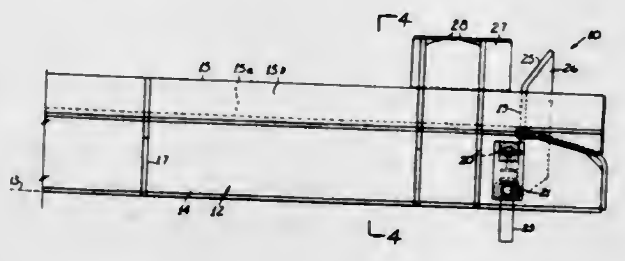
Kelly J. Arrey, Montreal, Quebec, Canada, assignor to Canadian National Railway Company, Montreal, Quebec, Canada

Filed March 23, 1971, Ser. No. 127,160

Claims priority, application Canada, Feb. 4, 1971, 104514

Int. Cl. B60p *7/10*

U.S. Cl. 296—35 A **1 Claim**



A bolster extending tranversely on a flat vehicle bed is provided at one side with an upstanding flange which engages the end of a shipping container resting on the bolster, so as to prevent movement of the container longitudinally and transversely of the bed. A vertical side plate on each end portion of the bolster projects upwardly to engage a side of the container and prevent movement thereof transversely of the bed. The side plate has an upwardly and outwardly slanting upper portion, and an upwardly and outwardly slanting end plate is secured to the bolster above the flange. The slanted upper portion of the side plate and the slanted end plate provide sloping guides for a container which is loaded from overhead onto the bolster.

3,716,269
SUNVISOR, ESPECIALLY FOR MOTOR DRIVEN VEHICLES

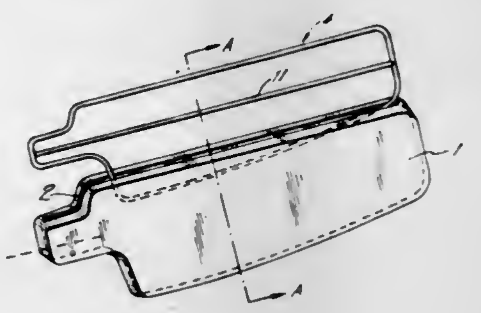
Gerhard Herr, Wuppertal-Elberfeld, and Willy O. Treber, Wuppertal-Vohwinkel, both of Germany, assignors to Gebr. Happich GmbH

Filed April 28, 1970, Ser. No. 32,607

Claims priority, application Germany, May 28, 1969, P 19 27 020.3

Int. Cl. B60j *3/00*

U.S. Cl. 296—97 H **4 Claims**



A padded sunvisor for motor vehicles is formed of two layers of material joined along all but one border to form a pocket into which is slipped a correspondingly shaped inner stiffening member, which may be formed of a strong wire frame. After insert of the stiffening member, the slit opening in the visor is closed to surround the stiffening member. Individual sunvisors may be cut from a long rectangular block of material with a stiffening member inserted into the pocket space of each section.

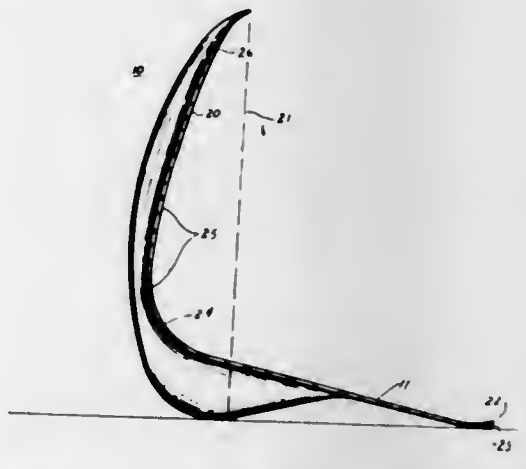
3,716,270
BACK SUPPORT

Richard B. Frazier, Burlington, Vt., assignor to Calcagni-Frazier-Zajchowski, Architects, Inc., Burlington, Vt.

Filed July 14, 1971, Ser. No. 162,410

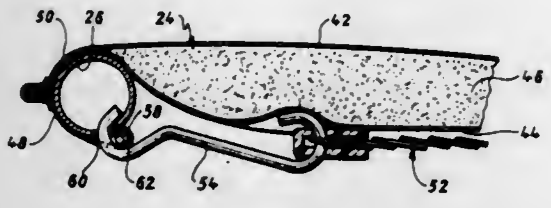
Int. Cl. A47c *4/02, 7/02;* **B60n** *1/06, 1/10*

U.S. Cl. 297—377 **1 Claim**



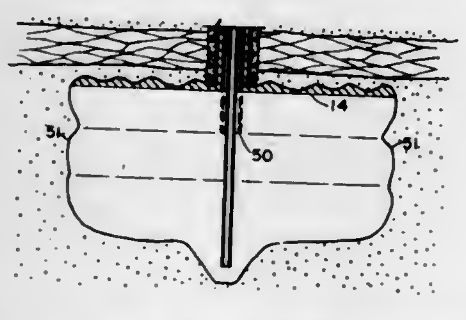
A back support, single piece, fiber reinforced plastic, or moulded high-impact un-reinforced plastic, molded to shape, to support the back of an individual, child, adolescent, or adult, the form being an upwardly extending back support portion integrally a part of a generally horizontal portion adapted to rest on the floor and engage the floor, the force of the individual's back pressing against the upwardly extending support, being transmitted to predetermined symmetrically placed areas of the horizontally outwardly extending base portion. The device is suitable for use as a back rest by an individual sitting on the floor, whether it be the bare floor or the floor with a small flat cushion.

3,716,271
FOLDING-FURNITURE PIECE
Rudolf Kurz, Bissingen, Germany, assignor to Firma Kurz GmbH, Bietigheim Wurtt., Germany
Filed Jan. 27, 1971, Ser. No. 110,207
Claims priority, application Germany, Feb. 6, 1970, G 70 04 114.4
Int. Cl. A47c *7/28*
U.S. Cl. 297—457 **8 Claims**



A chair or chaise has two or more frame sections which are articulated to each other and which each have transversely spaced lateral frame portions. A sheet material cover spans each frame section and has marginal portions which at least in part embrace the respective lateral frame portions, with springs spanning the frame sections at a side opposite that where the respective cover is located and engaging the marginal portions of the cover to pull the cover taut.

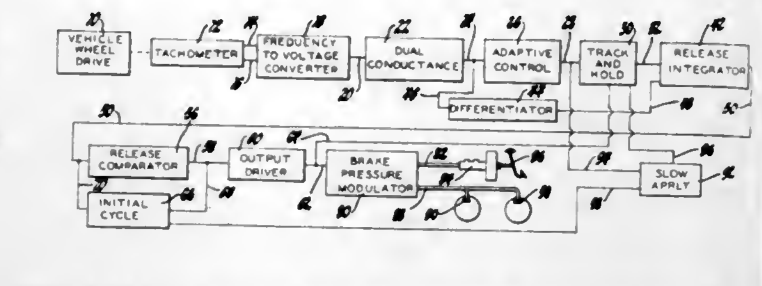
3,716,272
METHOD OF CREATING LARGE DIAMETER CYLINDRICAL CAVITIES BY SOLUTION MINING
J. Gilbert Davis, II, Ponca City, Okla., assignor to Continental Oil Company, Ponca City, Okla.
Filed May 24, 1971, Ser. No. 148,255
Int. Cl. E21b *43/28*
U.S. Cl. 299—5 **3 Claims**



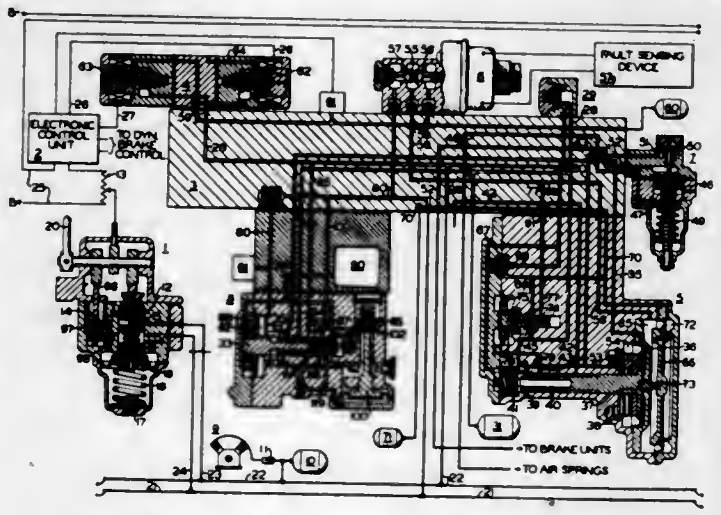
A method for forming a subterranean cavity including the steps of drilling and casing a hole to the depth desired for the roof of the cavity, then deepening the hole to a depth to about 4 feet below the floor level, positioning a dual string of wash pipe with the injection string at the desired floor level and the production string at the bottom of the hole, creating a horizontal hydraulic fracture at the floor level using fresh water and extending the fracture out a distance desired for the radius of the cavity, injecting a protective blanket over the roof of the cavity, and solution mining the cavity in incremental stages, maintaining the protective blanket for each incremental stage.

3,716,273
VARIABLE SENSITIVITY ANTI-LOCK BRAKE CONTROL
David G. Beyerlein, Flint, Mich., assignor to General Motors Corporation, Detroit, Mich.
Filed June 1, 1970, Ser. No. 42,304
Int. Cl. B60t *8/12*
U.S. Cl. 303—21 CG **4 Claims**

The control includes a reference signal with which braked wheel deceleration is compared for sensing incipient wheel lock-up and a circuit responsive to the rate of change of deceleration for changing the reference signal to make the control more or less sensitive to deceleration. The circuit is so arranged that the sensitivity is increased at a low rate of change of deceleration such as occurs during a gradual application of brake pressure on a low coefficient of friction surface.



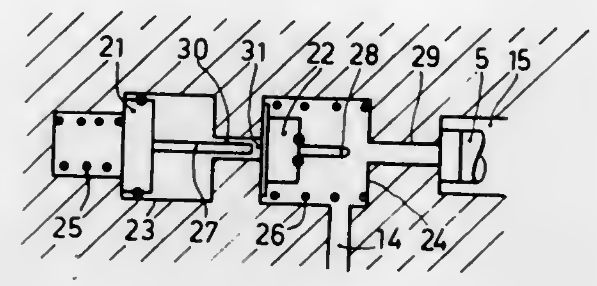
3,716,274
COMBINED ELECTRONIC AND FLUID PRESSURE BRAKE CONTROL APPARATUS
Jerome R. Pier, Export, Pa., assignor to Westinghouse Air Brake Company, Wilmerding, Pa.
Filed Sept. 28, 1971, Ser. No. 184,346
Int. Cl. B60t *15/18*
U.S. Cl. 303—20 **7 Claims**



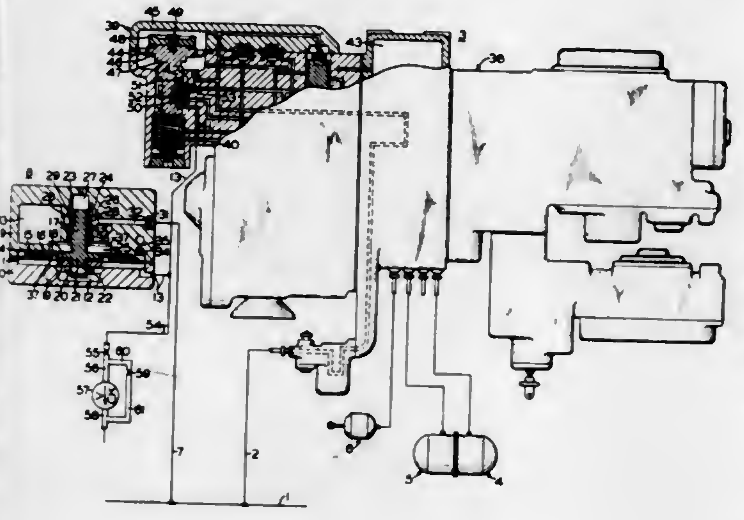
A rapid transit type railway brake control system in which an electronic control unit is employed to normally regulate electro-pneumatic control of the friction brakes in a manner to continuously supplement the effective dynamic brake sufficient to satisfy the brake demand input. Flow of electric current in a control wire (P-wire) to the electronic control unit is selectively varied to provide the desired braking in accordance with operation of a controller device which is adapted to concurrently vary brake pipe pressure proportional to the generated control wire current. A transfer valve under control of a fault sensing device which monitors the electronic control unit normally maintains a proportional brake control valve device operative under electro-pneumatic mode of control. In the event a failure or malfunction of the electronic control unit is detected by the fault sensing device, the transfer valve will operate to automatically switch the brake control valve to automatic-pneumatic mode of control under the influence of brake pipe fluid pressure.

3,716,275
ANTI-LOCK BRAKE SYSTEMS FOR WHEELED VEHICLES
Derek Robert Skoyles, East Grinstead, England, assignor to U.S. Philips Corp.
Filed March 5, 1971, Ser. No. 121,386
Claims priority, application Great Britain, March 18, 1970, 13,146/70
Int. Cl. B60t *8/00, 17/18*
U.S. Cl. 303—21 AF **4 Claims**

An anti-lock hydraulic brake system having a fluid pressure line connected to the anti-lock control valve. Actuation of the control valve causes displacement of fluid through the valve to relieve brake pressure. A fail-safe arrangement as provided for cutting off the flow when prolonged actuation of the control valve occurs.

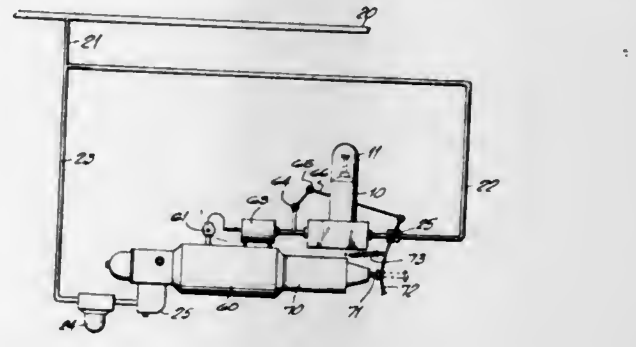


3,716,276
QUICK SERVICE VALVE DEVICE
Richard L. Wilson, Monroeville, and Daniel G. Scott, Apollo, both of Pa., assignors to Westinghouse Air Brake Company, Wilmerding, Pa.
Filed Oct. 27, 1971, Ser. No. 193,106
Int. Cl. B60t *17/04*
U.S. Cl. 303—82 **16 Claims**



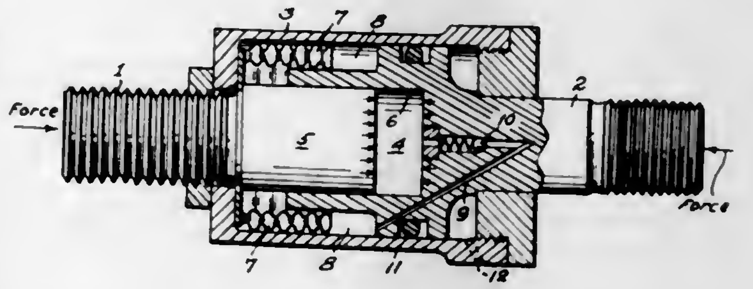
This invention relates to a continual quick service valve device operative sequentially with each successive brake pipe pressure reduction over the entire service application range of brake pipe pressure reductions to effect "quick service" transmission through a train brake pipe of a pressure reduction wave. Fluid under pressure heretofore released from the quick action chamber of a conventional brake control valve device to atmosphere upon effecting a service reduction of brake pipe pressure is supplied to one side of an abutment to cause it to open a quick service valve that establishes a communication between the train brake pipe and a quick service volume. This abutment also constitutes a snap-acting valve for controlling flow between the quick service volume and atmosphere and simultaneously effecting a change in its effective area. Consequently, so long as the one side of this abutment is subject to fluid under pressure released from the quick action chamber, it successively deflects in opposite directions to operate the quick service valve for controlling flow from the train brake pipe to the quick service volume and simultaneously, acting as a valve, repeatedly first cuts off flow from the quick service volume to atmosphere and thereafter releases to atmosphere the fluid under pressure supplied to this volume from the train brake pipe. Means are provided for constantly releasing to atmosphere at a restricted rate the fluid under pressure supplied to the one side of the abutment so that upon movement of the brake control valve device from its service to its lap position, the repeated operations of the continual quick service valve device are terminated. However, upon any subsequent movement of the brake control valve device from its lap position to its service position in response to a manually effected further reduction of brake pipe pressure, this continual quick service valve device will operate in the manner described above to repeatedly first vent fluid under pressure from the brake pipe to the quick service volume and thereafter release this fluid under pressure from this volume to atmosphere until the brake control valve device returns to its lap position.

3,716,277
AIR BRAKE RELEASE
Harvey Stephens, 1435 Michigan Street, Memphis, Tenn.
Filed Aug. 9, 1971, Ser. No. 169,912
Int. Cl. B60t *15/22*
U.S. Cl. 303—70 **4 Claims**



Apparatus for the release of railroad air brakes, which consists of a pressure sensitive control valve which supplies air to a piston to bleed the air brake reservoir, and thus release set brakes, together with valving sensitive to the position of the air brakes which controls the air supply to the said pressure sensitive control valve so that said valve is inoperative when brakes are in the released state.

3,716,278
LIQUID BEARING
George N. Depew, Reseda, Calif., assignor to The United States of America as represented by the Secretary of the Army
Filed March 25, 1971, Ser. No. 127,869
Int. Cl. F16c *17/06*
U.S. Cl. 308—9 **5 Claims**

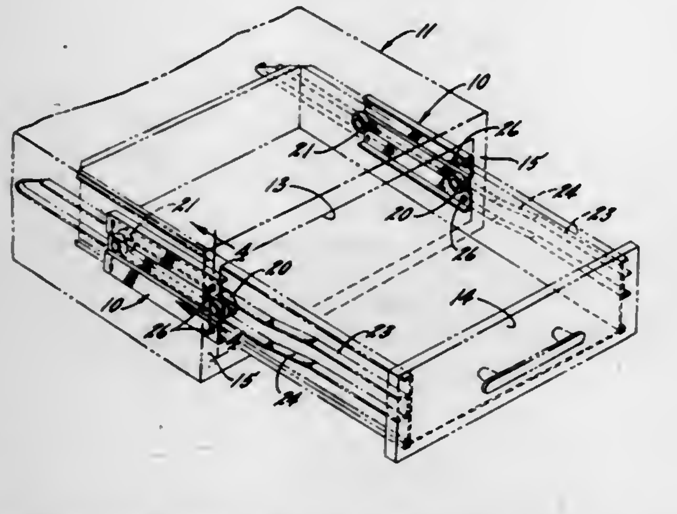


A liquid thrust bearing has provision for minimizing leakage, automatically returning leakage to a reservoir, and automatically restoring any lost fluid to the pressure/thrust area each time the thrust is removed.

3,716,279

UNIVERSAL ROLLER BRACKET ASSEMBLY FOR DRAWERS

Lloyd L. Anderson, and Richard L. Bildahl, both of Rockford, Ill., assignors to Amerock Corporation, Rockford, Ill.
Filed July 6, 1971, Ser. No. 159,727
Int. Cl. F16c *29/00*
U.S. Cl. 308—3.8 **6 Claims**

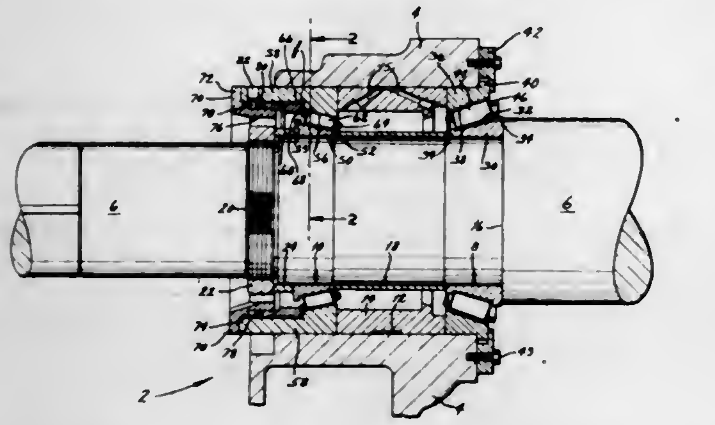


The assembly includes drawer guiding and supporting rollers journaled on a plate which may be turned edge-over-edge and used at either the left or right hand side of a cabinet. Circular screw-receiving holes are formed in one end portion of the plate and include protruding bosses which fit into accurately formed holes in a precision-made cabinet to help anchor the assembly in place. By turning the plate end-forend, elongated screw-receiving slots formed in the other end portion of the plate may be alined with approximately-located holes in a less expensive cabinet and may be used to enable attachment of the assembly to such a cabinet.

3,716,280

BEARING CONSTRUCTION WITH PRELOAD COMPENSATION

Robert Lee Leibensperger and Glen Ray Norris, Canton, Ohio, assignors to The Timken Company, Canton, Ohio
Filed Dec. 20, 1971, Ser. No. 210,042
Int. Cl. F16c *35/06*
U.S. Cl. 308—207 A **13 Claims**

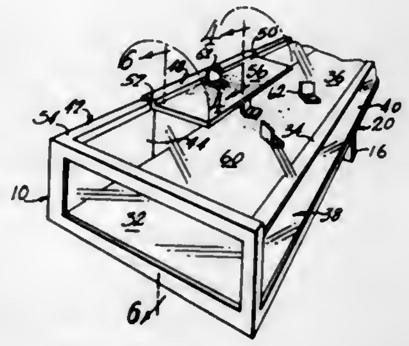


A bearing for supporting a rotatable spindle in a housing includes a cone encircling the spindle, a cup in the housing, and a plurality of tapered rollers positioned between and engaged with the cup and cone. A floating rib ring bears against the large diameter end faces of the rollers adjacent to the cup, and this rib ring is housed in a rib ring carrier. Connected with the carrier is rib positioning means for maintaining a substantially constant force on the rib ring so that the preload of the bearing does not vary from a selected set point as the bearing and the surrounding structure experienced differential thermal expansion. The positioning means may be adjusted to another set point while the spindle is rotating, in which case it imparts another substantially constant force to the rib ring and that force corresponds to the new set point.

3,716,281

SECURITY DISPLAY CASE

James M. Rudder, Jr., 2448 Cajun Drive NE., Marietta, Ga. 30060
Filed Sept. 23, 1971, Ser. No. 182,939
Int. Cl. A47f *3/00*
U.S. Cl. 312—114 **10 Claims**

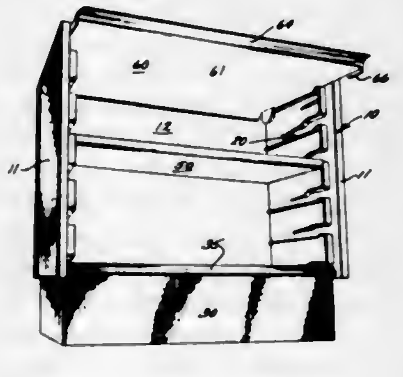


A portion of the back wall of a jewelry display case behind the counter is a swingably mounted wall panel so that expensive jewelry items such as rings, bracelets, and watches are placed on the surface of the swingable wall panel when it rests on top of the counter leaving a large exposed opening to the case behind the counter. The surface of the swingable wall panel may be covered with jewelry cloth or other covering to match the interior of the case. The swingable wall panel is normally coextensively a part of the back wall but is a separate frame made from the same material and has exactly the same frame mold as the rest of the back wall of the case so that it matches completely when in place but readily is swung from a vertical position in normal place to a horizontal position on top of the glass case. The swingable panel drops by gravity and locks in place by means of a latch.

3,716,282

DRAWER, TRAY-SHELF AND SUPPORTING STRUCTURES THEREFOR

Robert L. Propst, Ann Arbor, and James O. Kelley, Saline, both of Mich., assignors to Herman Miller, Inc., Zeeland, Mich.
Filed Oct. 12, 1970, Ser. No. 79,890
Int. Cl. A47b *88/16*
U.S. Cl. 312—322 **2 Claims**

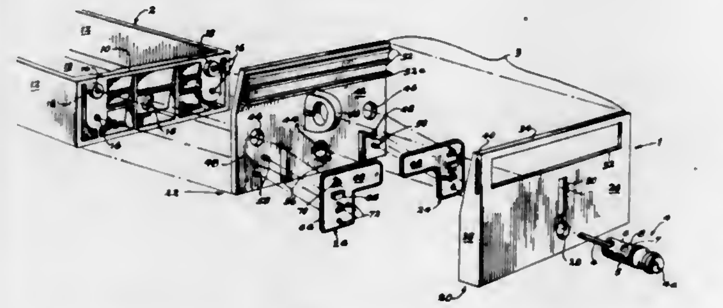


A mobile drawer supporting frame with a back and sides is molded of a temperature resistant, impact resistant plastic. Integrally molded drawer guides include drawer seating recesses which cooperate with drawer glides on molded plastic drawers to insure that the drawers are seated against accidental opening during movement of the frame. The molded plastic drawers are stackable, as are molded plastic shelf-trays which also can be supported in the drawer guides. The shelf-trays are invertible to provide either a shelf or a tray, and can be inserted either forwards or backwards in the guides to thereby increase their versatility.

3,716,283

DRAWER FRONT CONSTRUCTION

Carl H. Little, Jamestown, N.Y., assignor to Weber Knapp Company, Jamestown, N.Y.
Original application Nov. 13, 1970, Ser. No. 89,312. Divided and this application June 18, 1971, Ser. No. 165,852
Int. Cl. A47b *88/00*
U.S. Cl. 312—330 **2 Claims**

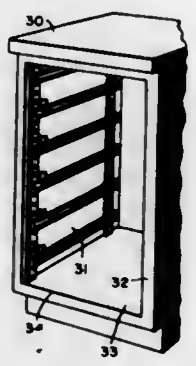


A two part plastic front construction for library card drawers or the like, wherein a rear half of the front carries a tray pull or handle for projection forwardly through an opening in a forward half of the front. The front is mounted on and force applied to the tray pull transferred to the card tray body by metal reinforcing brackets positioned between the halves prior to assembly thereof. The halves are provided with aligned openings to receive a card follower or holding rod mounting latch device retained therein by a guide-retainer formed integrally with and projecting rearwardly from the rear half.

3,716,284

VERTICALLY-ADJUSTABLE DRAWER SUSPENSION

James B. Vogt, 7811 Conservation Drive, Ada, Mich.
Filed May 17, 1971, Ser. No. 144,090
Int. Cl. A47b *88/10*
U.S. Cl. 312—339 **7 Claims**

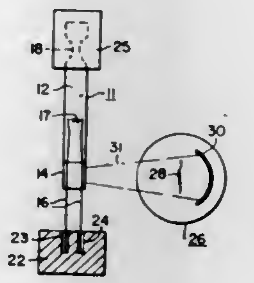


A track suspension for drawers and trays, the components being positioned vertically by apertured mounting strips installed at the four vertical corners of a cabinet space, together with brackets engageable at selected apertures in these strips. The rear brackets are engageable and disengageable in a direction other than tangential with respect to the front mounting strips, so that engagement of the front brackets locks the entire assembly in position.

3,716,285

METHOD OF MANUFACTURING SUBMINIATURE ELECTRIC LAMPS

Walter A. Boyce, Glen Ridge, N.J., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.
Division of Ser. No. 889,663, Dec. 31, 1969, Pat. No. 3,636,398. This application Aug. 18, 1971, Ser. No. 172,673
Int. Cl. H01j *9/38, 17/26*
U.S. Cl. 316—21 **6 Claims**

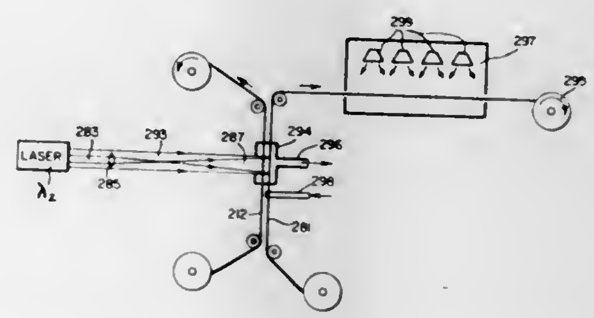


The lamp (which may be of the incandescent or photoflash type) has a composite envelope that is fabricated by sealing segments of light-transmitting and infrared-radiation absorbing glass tubing together in abutting relationship. The end of the infrared-radiation absorbing portion of the composite envelope is then hermetically sealed to the lead wires and the seal is formed by focusing a beam of infrared radiation onto the seal assembly. The envelope is evacuated, and filled with gas if desired, through its opposite end which is then tipped off. Oxidation of the lead wires is reduced to a minimum by forming the seal inside a chamber that is evacuated, or filled with an inert gas, and has walls which transmit infrared radiation. In the case of chamber-sealing, the free end of the light-transmitting portion of the envelope is sealed before the envelope-mount assembly is placed into the chamber so that the sealing and evacuation (or gas filling) operations are performed simultaneously.

3,716,286

HOLOGRAPHIC TELEVISION RECORD SYSTEM

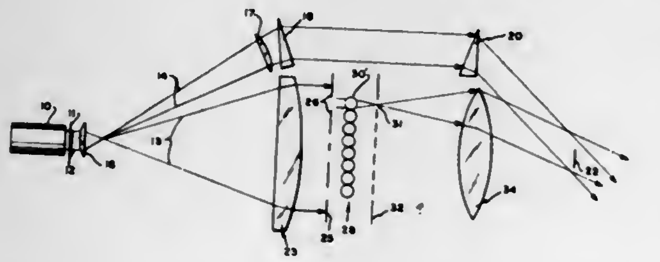
Daniel S. St. John, Hockessin, and Kenneth A. Haines, Middletown, both of Del., assignors to Holotron Corporation, Wilmington, Del.
Filed Dec. 11, 1969, Ser. No. 884,285
Int. Cl. G02b *27/00*
U.S. Cl. 350—3.5 **4 Claims**



A method and apparatus for constructing and replaying an optical holographic record containing a plurality of very small holograms, each of which contains information, independent of the other holograms. In the preferred embodiment described, each frame of an ordinary photographic movie is recorded as an individual hologram. The record is a narrow and elongated film with the holograms formed in a line along its length, each hologram touching those on either side thereof. A moving image is reconstructed by drawing the record at a uniform speed through an effectively continuous wave coherent light beam. A light sensitive detector for converting an image into a time varying electronic signal is positioned to receive reconstructed sequence of images and transform it into a signal acceptable to an ordinary television set for displaying the movie thereon. Each hologram is constructed by passing a beam of a coherent light through a movie frame onto a much smaller hologram aperture and by interfering this beam at a finite angle with a reference wavefront having a radius of curvature substantially equal to the effective distance between the movie and the hologram. Methods of adding color visual information as well as sound information are also disclosed. Such a holographic record is copied onto a photopolymerizable detector with ultraviolet coherent light.

3,716,287
FOURIER TRANSFORM HOLOGRAPHIC MEMORY WITH RANDOM PHASE SHIFTING PRODUCED BY RANDOM SIZE VARIATIONS IN A LENS ARRAY

Robert E. Brooks, Redondo Beach, Calif., assignor to TRW Inc., Redondo Beach, Calif.
Filed Oct. 4, 1971, Ser. No. 186,345
Int. Cl. G02b *27/00*
U.S. Cl. 350—3.5 **11 Claims**

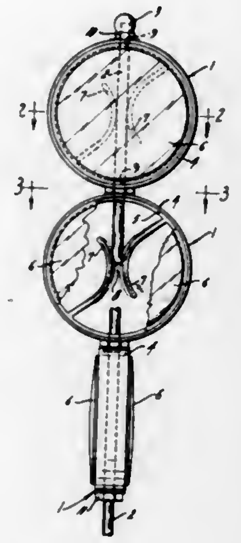


A holographic system for recording data, particularly digital data. The data is represented by an array of light modulators such, for example, as an opaque sheet having apertures therein which represent the digital data. The openings in the opaque array or light modulators are illuminated by coherent light; they are relatively large so that they are less subject to closure due to dirt, or damage due to scratches. The resulting light beams passing the apertures are focused by an array of optical elements, each into a focal point, which are much smaller than the apertures. The optical elements may consist of spherical lenses or the like. The array of lenses determines the location of the focal points which are the data points. Accordingly, alignment tolerances of the opaque aperture sheet are no longer critical. The phases of the light waves representing the data points may be averaged, for example, by the manufacturing tolerances of a lens array. Accordingly, the intensity of the subject beam at the hologram is made more uniform so that the light intensity is utilized more efficiently.

3,716,288
REFLECTOR FOR MARKING DRIVEWAYS AND THE LIKE

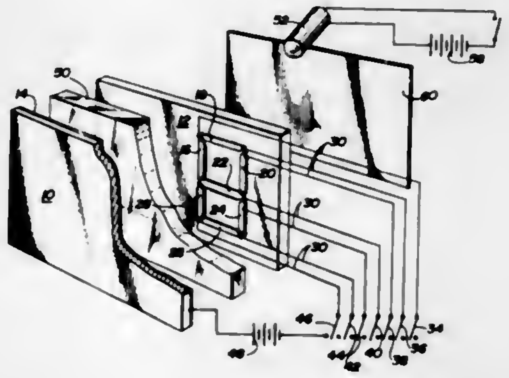
Arnold H. Kannenberg, Germantown, Wis., assignor to Lemco Plastics Inc., Milwaukee, Wis.
Filed May 27, 1971, Ser. No. 147,435
Int. Cl. G02b *5/12*
U.S. Cl. 350—97 **7 Claims**

The reflector for marking driveways and the like is adapted to be resiliently clamped to a rod which can be inserted into the ground. One or more reflectors can be supported on the rod at various angles and reflect the lights of passing cars to mark, for example, the entrance to a driveway. Each reflector is constructed of a circular molded plastic frame to hold the reflecting plastic and has internal resilient members projecting inwardly from the frame which cooperate to securely clamp the reflector to the supporting rod which passes through aligned holes in the frame and a passage between the springlike internal members. Each reflector at one end has an octagonally shaped embossment on the frame around one of the holes in the frame, and a second embossment around the aligned hole at the opposite side of the frame which has an octagonally shaped inset. Thus, the embossment of one reflector can be seated in the inset embossment of an adjacent reflector to locate a respective reflector at four different angular positions on the supporting rod relative to an adjacent reflector.



3,716,289
ELECTRO-OPTICAL DISPLAY DEVICES USING SMECTIC-NEMATIC LIQUID CRYSTAL MIXTURES

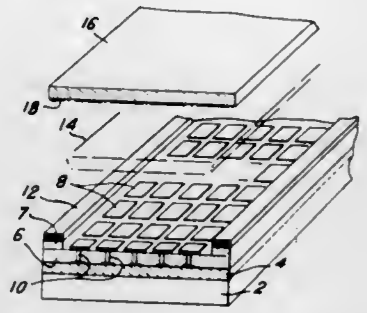
Linda T. Creagh, Argyle; Derick Jones, and Sun Lu, both of Dallas, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.
Filed Aug. 31, 1970, Ser. No. 68,280
Int. Cl. G02f *1/34*; **C09k** *3/00*
U.S. Cl. 350—160 LC **12 Claims**



A display device includes a layer of a smectic-nematic liquid crystal composition that is normally transparent to light. The composition is effective to scatter light in response to a voltage applied thereacross. The smetic-nematic compositions exhibit the mesomorphic state through a broad temperature range that preferably includes room temperature.

3,716,290
LIQUID-CRYSTAL DISPLAY DEVICE

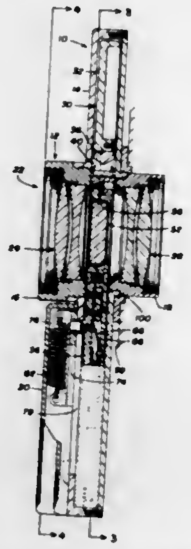
Joseph Borel, Echirolles, and Jacques Robert, Grenoble, France, assignors to Commissariat a l'Energie Atomique, Paris, France
Filed Oct. 18, 1971, Ser. No. 190,178
Int. Cl. G02f *1/16*
U.S. Cl. 350—160 LC **8 Claims**



An electrooptical display device comprising a film of liquid crystals between two systems of electrodes. One system comprises a plurality of integrated circuits forming a supporting layer on a substrate and a plurality of flat metallic electrodes deposited on the supporting layer, each electrode being connected electrically to one circuit. The other system comprises a transparent insulating plate provided on one face with a uniform coating of electrically conductive and semi-transparent material.

3,716,291
LENS SYSTEM WITH SELECTIVE IMAGE REVERSION

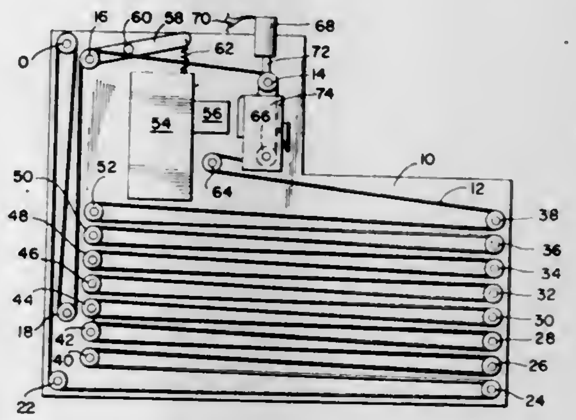
Henry A. Giesecke, Oklahoma City, Okla., assignor to Apromat, Incorporated, Oklahoma City, Okla.
Filed Aug. 3, 1971, Ser. No. 168,624
Int. Cl. G02b *17/02*
U.S. Cl. 350—203 **15 Claims**



A lens system with selective image reversion includes a symmetrical objective lens system which is fixedly supported in a housing. A generally imperforate frame is mounted in the center cross section of the housing for reciprocation along a line extending between the elements of the lens system and has a pair of slots formed in it which extend the width of the lens system. An image reversion system comprising first, second and third external reflective surfaces is mounted in one of the slots of the frame and a transparent member having an index of refraction matched to the optical characteristics of the image reversion system is mounted in the other slot. The frame also supports a plate mounted for rotation to position either an imperforate portion or an f:16 aperture or an f:22 aperture in alignment with the transparent member. Structure is provided for normally positioning the transparent member in alignment with the lens system and for reciprocating the frame to scan the image reversion system through the lens system and thereby form an inverted image.

3,716,292
FILM ADVANCING DEVICE

Larry K. Long, Tempe, Ariz., assignor to Advance Management Engineering & Research Co., Phoenix, Ariz.
Filed Nov. 16, 1970, Ser. No. 89,602
Int. Cl. G03b *1/48, 21/14*
U.S. Cl. 353—91 **8 Claims**

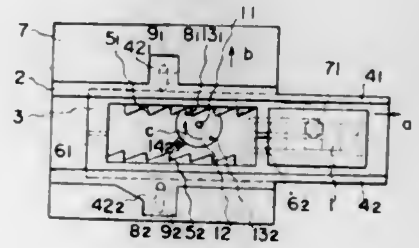


A film advancing device of the type used for advancing an endless film in single or multiple frame increments. The device includes a solenoid assembly and indexing plate which blanks out the film during its movement or drive and indexes the film in alignment with the projection lamp, as the desired frame is positioned.

The device is particularly adaptable to the programed advance of films, containing a plurality of questions which are projected for manual or computer answer by a student, medical patient, or the like.

3,716,293
FILM TRANSPORT DEVICE FOR A PROJECTOR

Naohiko Kitano; Akira Kamanaka; Mamoru Katsuragi; Tatsuo Kobayashi and Tadashi Iida, all of Osaka-fu, Japan., assignors to Minolta Camera Kabushiki Kaisha, Osaka-shi, Japan
Filed Oct. 19, 1970, Ser. No. 82,018
Int. Cl. G03b *23/00, 23/08*
U.S. Cl. 353—103 **8 Claims**



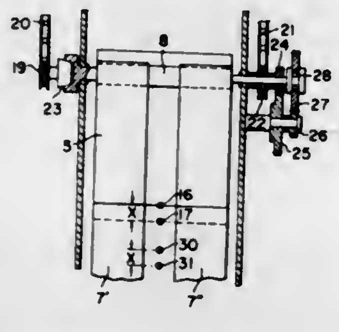
The present invention relates to a film transport device for a projector and more particularly relates to such a device so constructed that a plurality of original picture frames are arranged in two rows in the same plane on an original picture holding frame. By means of a driving device driven in one direction, said original picture holding frame is moved rectangularly so as to be delivered from one end of one of said two rows to the other end and at the extreme end thereof being moved in a perpendicular direction thereto. The frame is then delivered from one end of the other row to the other end in the opposite direction and at the extreme end thereof, being returned again to the perpendicular direction thereto. Thus, the original picture holding frame is rectangularly moved and thereby original picture frames are projected in turn.

3,716,294

ELECTROSTATIC QUICK COPYING APPARATUS

Wilhelm Josef Knechtel, Rodheim, and Detlef Schaffer, Wetzlar, Germany, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed July 8, 1970, Ser. No. 53,209
Claims priority, application Germany, July 10, 1969, P 19 35 025.5
Int. Cl. G03g *15/00*
U.S. Cl. 355—3 **11 Claims**



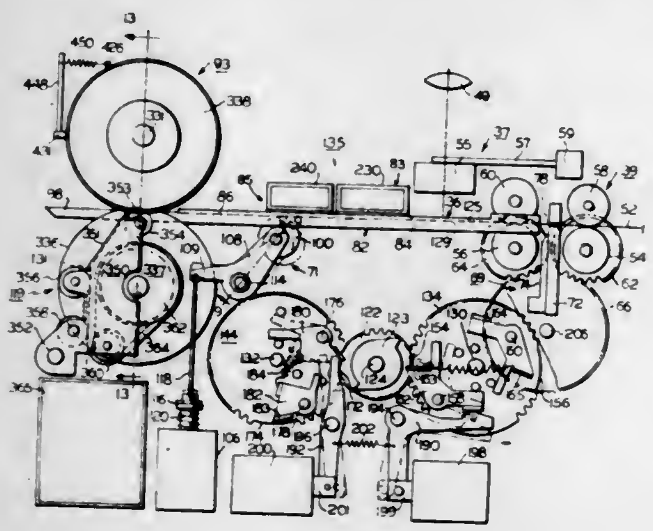
An electrostatic quick copying device includes a drive roller for transporting photosensitive paper and two drive means for driving the roller at different speeds, i.e. fast and slow speeds, by a free wheel and a clutch, respectively. At least a pair of switches is disposed in the path of the photosensitive paper for engaging and disengaging the clutch, whereby the photosensitive paper is slowly moved for a short time during exposure so as to enable the exposure to be accomplished by at least one xenon flash means.

3,716,295

ELECTROSTATIC MICRO COPYING APPARATUS INCLUDING FILM CUTTING, SLITTING, AND INSERTING MEANS FOR APERTURE CARDS

Yasutaka Nakajima; Isao Yamaguchi and Masaru Onoshi, all of Osaka-fu, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed March 12, 1971, Ser. No. 123,587
Int. Cl. G03g *15/00*
U.S. Cl. 355—3 **9 Claims**



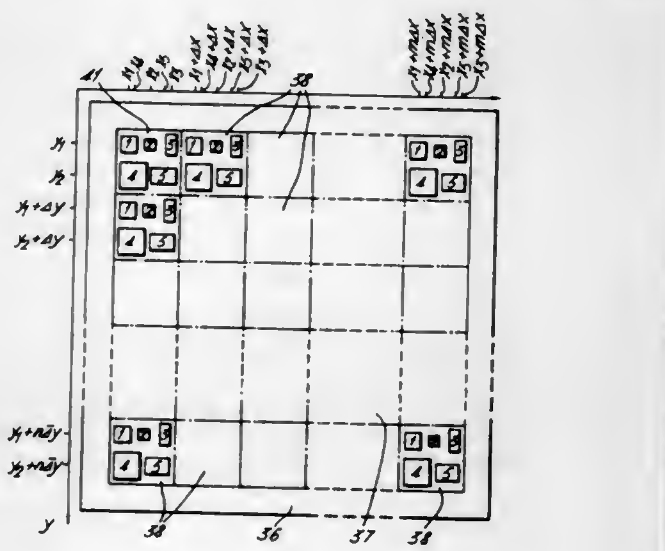
A photographic apparatus for producing a micro image of an original on an electrophotosensitive film by means of an electrophotographic method. The apparatus includes cutting means for cutting a length of film into film sections of a predetermined length, a supporting member for supporting and guiding said length of film and said film sections along a predetermined path, an aperture member having an aperture formed therein which defines the size of a frame on the film so as to leave two remaining portions at both longitudinal sides of the film, a charging means for charging electrostatically said frame, an exposure means for exposing the charged frame to a micro projected image of the original, a processing means for processing the exposed frame, an advancing means for advancing the film so that the film under driving engagement with only said two remaining portions of the film, a slitting means for separating said remaining portions from said film section after completion of the processing, and means for inserting the finished microfilm section into a pocket of an aperture card.

3,716,296

METHOD AND ELECTRONIC CIRCUIT ARRANGEMENT FOR PRODUCING PHOTOMASKS

Reinhard Springer; Kurt Drescher, and Eberhard Jahn, all of Dresden, Germany, assignors to Arbeitsstelle Fur Molekularelektronik, Dresden, Germany

Filed May 6, 1970, Ser. No. 34,961
Int. Cl. G03b *27/42*
U.S. Cl. 355—53 **6 Claims**



A method and electronic circuit arrangement for producing photomasks comprising repetitive patterns of any desired size regardless of the size of the image field of an optical projection system. According to the present method an orthogonal mask field is displaced to initial coordinates Xi, Yi relative to a fixed column and row coordinate system, a plurality of such mask fields, each having different repetitive patterns, are arranged on a photographic plate displaced relative to each other, such mask fields are then assembled into a complex pattern mask field. The present circuit arrangement comprises control signal generating means for controlling a tool such as an optical projection system as well as positioning means for said tool or for said photographic plate. The signal generating means include a spacing counter connected to preselector units adjustable for selecting said initial coordinates, said units being connected to logic circuit channels which identify the signals produced at the outputs of said preselector units to provide control signals for the optical projection system and for the positioning means.

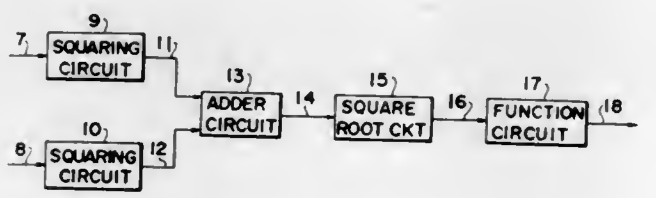
3,716,297

BRIGHTNESS COMPENSATING SYSTEM OF DISPLAY APPARATUS

Hajime Wakabayashi, Tokyo, Japan, assignor to Iwatsu Electric Company, Ltd., Tokyo, Japan

Filed Sept. 16, 1970, Ser. No. 72,599
Claims priority, application Japan, Sept. 26, 1969, 44/76438
Int. Cl. G03b *27/54*
U.S. Cl. 355—67 **4 Claims**

In a display apparatus, e.g., a cathode ray tube, in which the image displayed by the apparatus is processed, e.g., photographed by a camera, a function circuit is provided to generate a brightness compensation voltage determined by the characteristics of the lens of the instantaneous deflection of the cathode ray with the brightness compensation voltage is applied to the brightness adjuster associated with the deflection coils of the cathode ray tube.

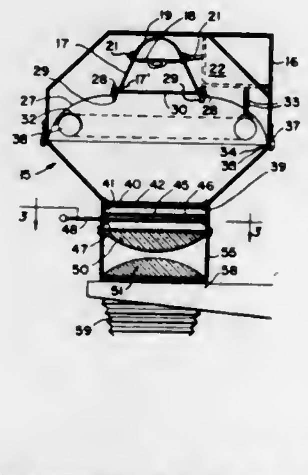


3,716,298

PHOTOGRAPHIC ENLARGER

Edward A. Reardon, 5183 Bohlig Rd., Los Angeles, Calif.

Filed July 14, 1970, Ser. No. 54,709
Int. Cl. G03b *27/76*
U.S. Cl. 355—71 **13 Claims**



A photographic enlarger having an electronic discharge flash tube as the light source for making the exposure, there is additionally provided an auxiliary light source for permitting focusing. Color value filters and light attenuating elements in the form of polarizing material discs are also provided.

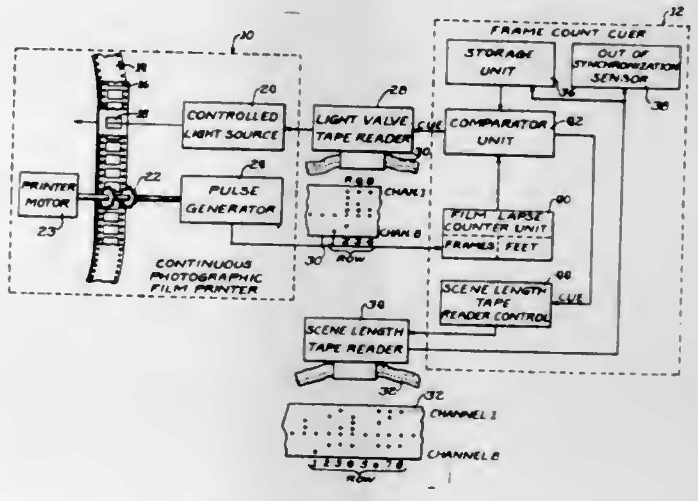
3,716,299

FRAME COUNT CUER FOR CONTINUOUS PHOTOGRAPHIC FILM PRINTER

Andrew Balint, Park Ridge, Ill., assignor to Bell & Howell Company, Chicago, Ill.

Filed Sept. 1, 1971, Ser. No. 176,933
Int. Cl. G03b *27/78*
U.S. Cl. 355—83 **16 Claims**

A frame count cuer for controlling the operation of a continuous photographic film printer. As the "preprint" film and overlaying "raw stock" are passed through the printer, a signal is generated corresponding to the quantity of film drawn across the exposure aperture. A counter is driven by the signal and provides a progressive integral footage and frame count of the amount of film passing through the printer. The information from a punched scene length tape is used to set a storage unit to the desired scene length and the setting of the storage unit is compared with the counter by a comparator. Upon coincidence, a cue signal is fed from the comparator to the printer light valves. The light valves are preset with information obtained from a punched paper tape in accordance with a predetermined preferred light level and hue for the scene to be printed.

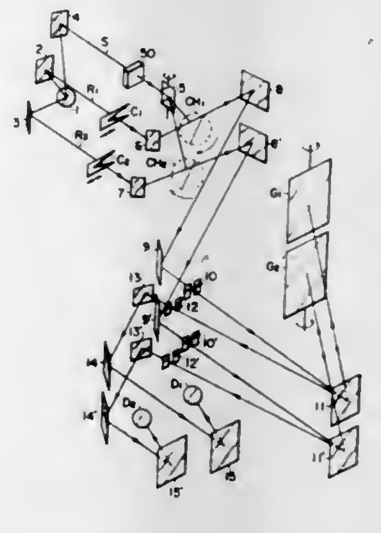


3,716,300

NULL BALANCE TRIPLE BEAM SPECTROPHOTOMETER

Koichi Matsumoto, and Makoto Ishikawa, both of Katsuta-shi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 16, 1971, Ser. No. 208,608
Int. Cl. G01j *3/08, 3/42*
U.S. Cl. 356—97 **9 Claims**

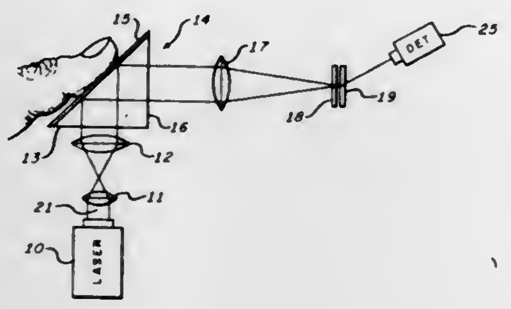


The beam modulating portion of a spectrophotometer has three beam paths, a first reference beam path, a second reference beam path, and a common sample beam path. The two reference beams are interrupted alternately by respective choppers which operate in synchronism and the sample beam is inserted into the respective interrupted periods of the two reference beams by a reflection mirror to provide two composite signals. The monochrometer portion of this spectrophotometer is a combination of two monochromators of the conventional type each receiving a respective composite signal.

3,716,301
FINGERPRINT IDENTIFICATION APPARATUS

Henry John Caulfield, Carlisle, and Dean Roger Perkins, Sudbury, both of Mass., assignors to Sperry Rand Corporation, New York, N.Y.

Filed March 17, 1971, Ser. No. 125,148
Int. Cl. G01b *9/08*
U.S. Cl. 356—165 **7 Claims**

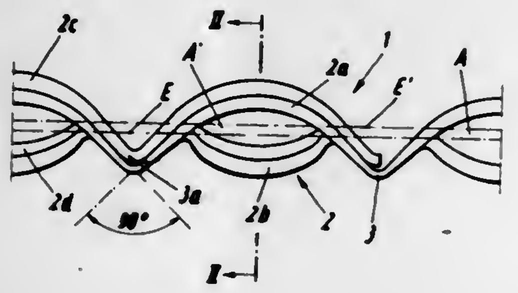


A coherent optical processor fingerprint identification apparatus in which identification is established by correlating an optical beam pattern representative of the finger to be identified with a prerecorded Fourier transform spatial filter of the fingerprint. Reliability of identification is improved by incorporating a mask in the processor so that the detector receives information primarily indicative of the correlation between certain features of the fingerprint and the spatial filter to the exclusion of other less significant features. Further improvement is achieved by means of dual detector affirmation-negation type signal processing techniques and, in the particular case of holographic filters various multiplexing techniques are also utilized for signal enhancement.

3,716,302
METHOD AND APPARATUS FOR BUILDING ROADS

Jean P. Bernold, CH-8880 Walenstadt, Switzerland, assignor to Hans Pfeiffer, a part interest

Division of Ser. No. 798,747, Feb. 12, 1969. This application Aug. 11, 1971, Ser. No. 170,771
Int. Cl. E01c *9/00*
U.S. Cl. 94—4 **7 Claims**

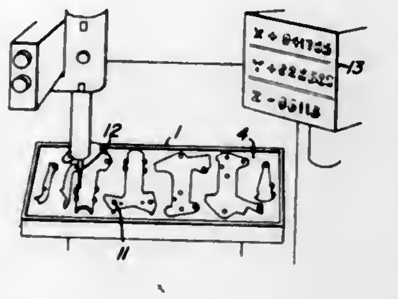


A method and apparatus for building roads including the steps of dipping special corrugated units into cold asphalt, arranging the dip coated units into a generally flat, planar continuous reinforcement, and pouring paving material over and through said reinforcement to establish a reinforced pavement.

3,716,303
EPOXY FIXTURING

Louis W. Rehberger, Baltimore, Md.; John C. Williams, Reston, Va., and John P. Demme, Joppatowne, Md., assignors to The United States of America as represented by the Secretary of the Army

Filed July 1, 1970, Ser. No. 51,460
Int. Cl. B23b *39/08*
U.S. Cl. 408—3 **2 Claims**

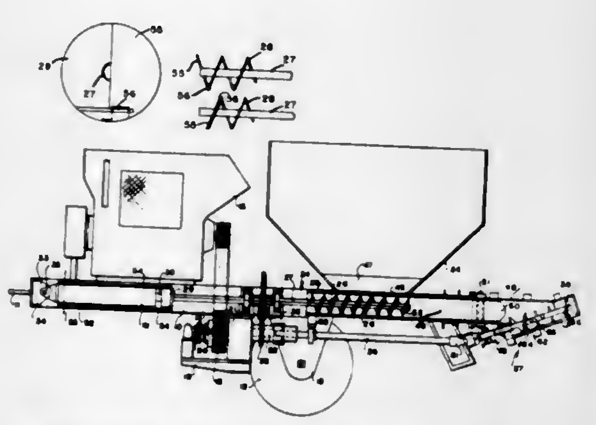


A system, means, and method for concurrently producing a plurality of different and irregular subcombinations by molding the subcombinations an an epoxy resin and numerical control machine processing the subcombinations.

3,716,304
CONCRETE PUMP

Manson Ivor Coles, Winnipeg, Manitoba, Canada, assignor to Mancole Company Limited, Winnipeg, Manitoba, Canada

Filed Sept. 14, 1970, Ser. No. 71,901
Int. Cl. F10b *3/00*
U.S. Cl. 415—72 **12 Claims**

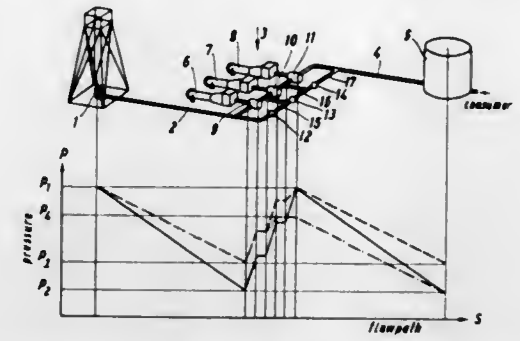


A pair of alternately reciprocal auger pumps fed by a common hopper and discharging concrete or the like into a common manifold. A clearance auger rotates considerably faster than the pump unit auger assemblies and clears the concrete from the manifold into the discharge conduit. Sections of the pump auger flights at the front ends thereof hinge to close off the ends when on the pumping stroke thus forming the auger flights into pistons.

3,716,305
GAS TURBINE POWER PLANT

Georg Oberlander, Bensberg-Frankenforst, Germany, assignor to Klockner-Humboldt-Deutz Aktiengesellschaft, Cologne-Deutz, Germany

Continuation of Ser. No. 622,730, March 13, 1967, abandoned. This application Aug. 20, 1970, Ser. No. 65,677
Claims priority, application Germany, March 15, 1966, K 58 727
Int. Cl. F04b *41/06*
U.S. Cl. 417—2 **1 Claim**

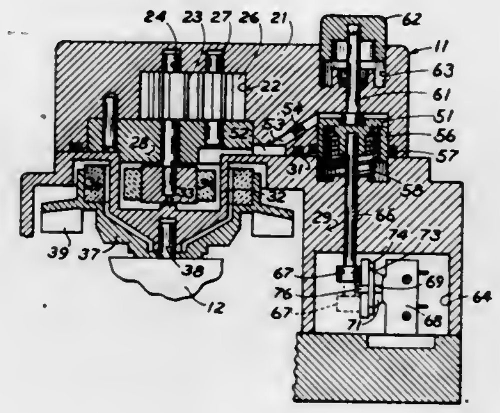


The present invention relates to an arrangement of controlling a compressor station for a gaseous medium in which the compressor station comprising turbine driven compressors is interposed between a source of a gaseous medium and a consumer. The compressors have associated therewith controllable bypass conduit means so that the gaseous medium coming from the said source can selectively be passed through said compressors in succession or can bypass at least some of said compressors.

3,716,306
GEAR PUMP CONSTRUCTION

Thomas B. Martin, Sr., Danville, and Dickey S. Londahl, Walnut Creek, both of Calif., assignors to Micropump Corporation, Concord, Calif.

Filed March 31, 1971, Ser. No. 129,872
Int. Cl. F04b *49/02*
U.S. Cl. 417—44 **5 Claims**



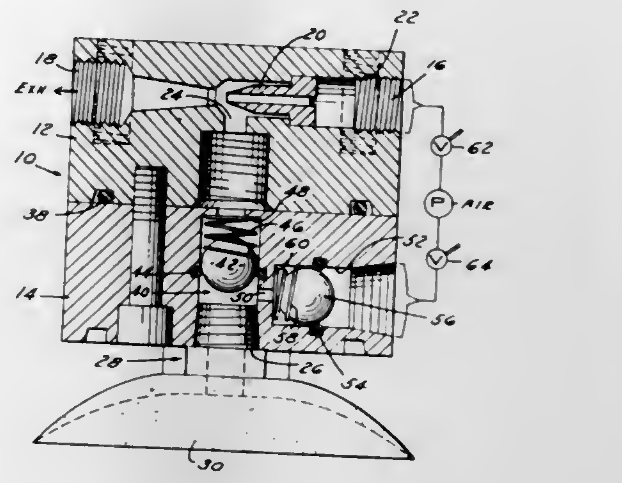
A motor-driven gear pump used to pump fluid from a reservoir to a dispensing spigot has a cylinder connected to the pump discharge having a spring biased piston. The piston rod has a knob engaging a normally open microswitch controlling the motor. When the motor is running and the pump delivering through the spigot, the piston is in intermediate position and the knob maintains the switch closed. When the spigot is closed, back pressure builds up in the cylinder, forcing the piston to overcome the spring and the knob to move out of contact with the switch, stopping the motor. If the reservoir is empty, the cylinder empties and the spring moves the piston so that the knob moves out of contact with the switch, again stopping the motor as a safety precaution. Check valves are installed in the inlet line and discharge line of the pump. A manually actuated button moves the piston against the force of the spring and thus primes the pump and also closes the switch to start the motor.

3,716,307
VENTURI HEAD FOR VACUUM SYSTEMS

Richard R. Hansen, Roseville, Mich., assignor to KMS Industries, Inc., Ann Arbor, Mich.

Filed Oct. 6, 1971, Ser. No. 186,861
Int. Cl. A47b *97/00;* **B66c** *1/04;* **A45d** *42/14*
U.S. Cl. 417—191 **4 Claims**

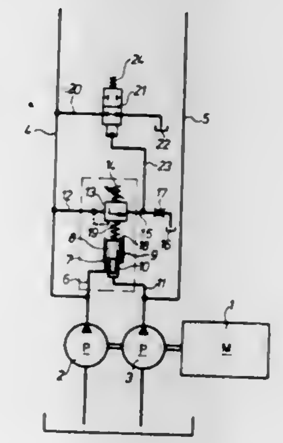
A venturi-head for a vacuum system utilized as a source of negative pressure for vacuum cups and the like which has incorporated therein a safety shut off valve to hold vacuum in the vent of a failure of actuating jet stream and requiring a pressure release available only when pressure source is furnishing required pressure.



3,716,308
HYDRAULIC SYSTEM

Walter Kobald, Stuttgart-Feuerbach, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

Filed Jan. 26, 1971, Ser. No. 109,813
Claims priority, application Germany, Jan. 28, 1970, P 20 03 740.5
Int. Cl. F04b *49/02, 49/08*
U.S. Cl. 417—286 **7 Claims**



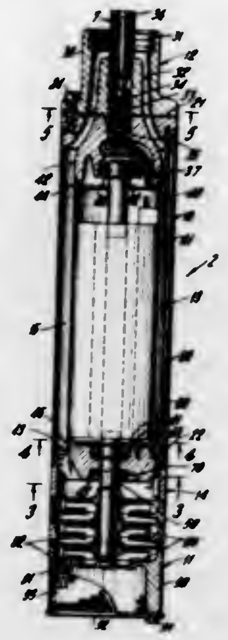
The user circuit for a pump having an output greater than the maximum output that can be accepted by the prime mover for the pump has a relief valve for shunting hydraulic fluid from the user circuit when the pressure within the circuit demands an output from the pump that exceeds the output available from the prime mover. The delivery side of the pump is connected to a piston that acts on the relief valve to open the latter in response to pressure within the user circuit.

3,716,309
SUBMERSIBLE MOTOR AND PUMP UNIT

Thomas O. Mitchell, Muskegon, Mich., assignor to Bennett Pump Incorporated, Muskegon, Mich.

Filed May 13, 1971, Ser. No. 143,053
Int. Cl. F04b *17/04*
U.S. Cl. 417—422 **5 Claims**

A motor and pump unit adapted for submerged operations in a body of liquid such as gasoline comprises a cylindrical tube having mounted therein a hermetically sealed motor which is operatively associated with a pump unit disposed at the lower end of the tube. The diameter of the motor is less than the inside diameter of the tube whereby fluid pumped by the pumping unit passes through the annular passageway defined between the motor and the tube, and is conveyed to the conventional piping system of a gasoline dispensing unit. The motor is contained in a fully sealed housing with a lip seal being provided about the drive shaft of the motor to prevent gasoline from entering the motor.



3,716,310

DIRECT DRIVE BALL PISTON COMPRESSOR

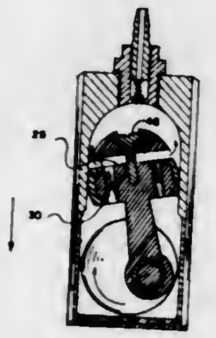
William Dieter Guenther, London, Ontario, Canada, assignor to Gun Web Limited, Province of Ontario, Canada

Filed Jan. 20, 1971, Ser. No. 107,932

Claims priority, application Canada, Mar. 9, 1970, 77,033

Int. Cl. F04b *21/04;* **F16j** *1/00*

U.S. Cl. 417—552 **6 Claims**



A compressor including an essentially spheroidal piston having a biased spheroidal crown member acting as a valve and mating with a cupola shaped cylinder head.

3,716,311

INDEPENDENT CONTROL MEANS FOR FLUID PRESSURE DEVICE

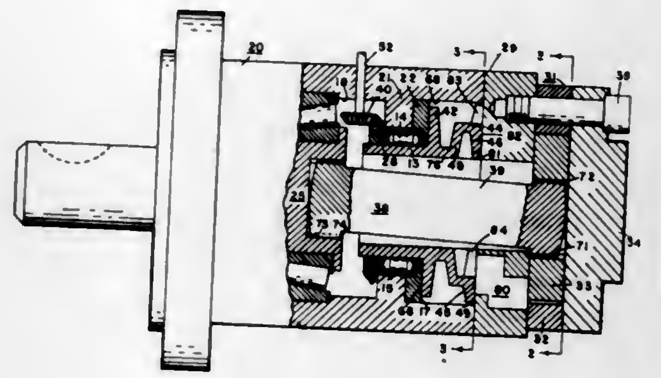
George V. Woodling, 22077 West Lake Road, Rocky River, Ohio

Filed July 11, 1968, Ser. No. 744,135

Int. Cl. F01c *1/10;* **F04c** *1/06*

U.S. Cl. 418—61 **10 Claims**

An independent control means to govern the operation of a fluid pressure device having a stator element and a rotor element constituting a stator-rotor mechanism, in which the stator element has a fixed axis and in which the rotor element has a movable axis with said rotor element having a rotational movement about its own axis and an orbital movement about the fixed axis. The entrance of fluid to the stator-rotor mechanism and the exit of fluid from the stator-rotor mechanism is governed by a rotary valve in the fluid pressure device.



The independent control means features an actuating means for rotating the rotary valve independently of the rotor element by which the rotary valve is usually driven. The independent control means also features a by-pass valve which, when operated, fluidly interconnects the inlet and outlet ports of the fluid pressure device, whereby the rotor element may be stopped instantly.

3,716,312

ROTORS FOR ROTARY PISTON ENGINES

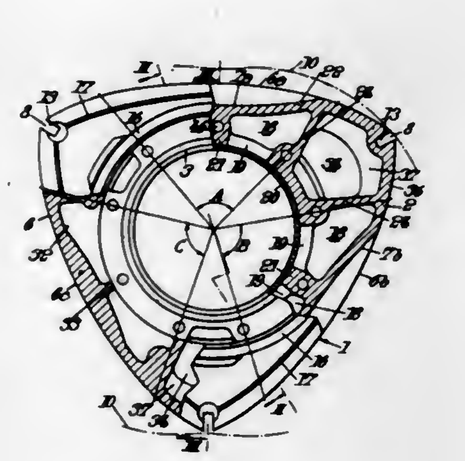
Jean Panhard, Paris, France, assignor to Societe de Constructions Mecaniques Panhard & Levassor, Paris, France

Filed Mar. 23, 1971, Ser. No. 127,305

Claims priority, application France, Mar. 24, 1970, 7010479

Int. Cl. F02b *55/04*

U.S. Cl. 418—94 **5 Claims**



The rotor is constituted by a body with a curvilinear triangular profile and rotates in a casing of a trochoidal shape. The curvilinear faces of the rotor have central recesses bounded by transverse crests parallel to the axis of the rotor shaft and by peripheral crests practically perpendicular to this axis. These recesses form variable volume combustion chambers with the engine casing being separated from one another by seals mounted along the transverse crests. The chambers are isolated radially by lateral segments on the sides of the rotor cooperating with the lateral surfaces of the casing. Between the bottoms of the recesses and the bore are closed cavities; below the crests are cavities communicating with the cooling circuit.

3,716,313

ROTARY PISTON INTERNAL COMBUSTION ENGINE

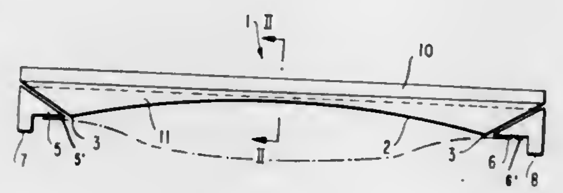
Heinz Lamm, Esslingen-St. Bernhardt, Germany, assignor to Daimler-Benz Aktiengesellschaft, Stuttgart-Untertuerkheim, Germany

Filed May 15, 1970, Ser. No. 37,676

Claims priority, application Germany, May 16, 1969, P 19 25 019.2

Int. Cl. F01c *19/02;* **F03c** *3/00;* **F04c** *27/00*

U.S. Cl. 418—121 **17 Claims**



A rotary piston internal combustion engine especially of trochoidal construction with a piston that is provided at its corners with sealing bars which, for purposes of increasing the adaptability to the running surface of the casing, is constructed flexible, particularly elastic in bending by a selective reduction of its height, primarily in its center part.

3,716,314

ROTARY MOTION DEVICE

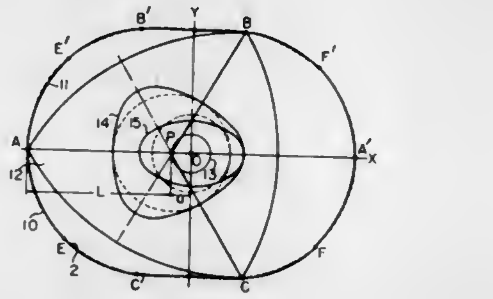
Koichi Takahashi, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Dec. 10, 1971, Ser. No. 206,695

Claims priority, application Japan, Dec. 16, 1970, 45/112,735

Int. Cl. F04f *3/00*

U.S. Cl. 418—150 **13 Claims**



Herein proposed is an improved rotary motion device such as a rotary engine using a usually three-lobed rotor which rotates about its center and revolves around a center of a contoured chamber in a center housing. The chamber has an internal contour generated from a two-linked curve which is made up of a pair of symmetrical component curves joined together through straight or nearly straight segments so that the lobes of the rotor is permitted to pass through the junction points without change in sign of the acceleration at the lobe portions of the rotor as is encountered in the prior art rotary motion devices using an epitrochoidally contoured chamber. This will contribute to improving the sealing between the lobes and the contacting surface of the center housing while providing wide selection of the gear configurations.

3,716,315

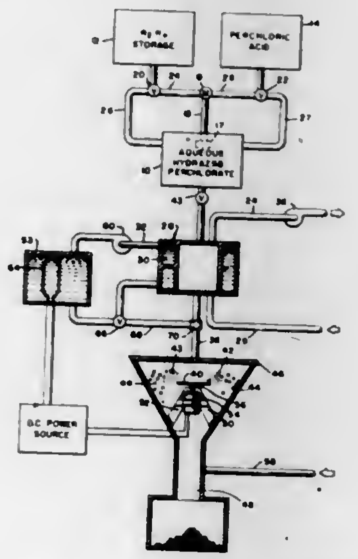
NOVEL APPARATUS FOR THE PRODUCTION OF ANHYDROUS SPHERICAL AMMONIUM PERCHLORATE USEFUL IN ROCKET PROPELLANTS

William M. King, Walnut, Calif., assignor to Aerojet-General Corporation, Azusa, Calif.

Division of Ser. No. 253,522, Jan. 21, 1963, Pat. No. 3,520,743. This application Oct. 19, 1965, Ser. No. 506,418

Int. Cl. B22d *23/08*

U.S. Cl. 425—8 **5 Claims**



A method for the continuous production of substantially spherical anhydrous hydrazine perchlorate pellets by contacting a stream of molten anhydrous hydrazine perchlorate with the face of a rapidly spinning disk contained within a cone patent. The spherical anhydrous ammonium perchlorate is utilized as the oxidizer in solid propellant compositions. Apparatus for the continual production of the substantially spherical anhydrous hydrazine perchlorate comprises tank means for containing hydrazine, tank means for containing aqueous perchloric acid, means for containing an aqueous solution of hydrazine perchlorate, means for conveying said hydrazine and said perchloric acid to the means for containing an aqueous solution of hydrazine perchlorate, means for controlling the pH of said aqueous solution within said means for containing aqueous hydrazine perchlorate, means for conveying said solution to an evaporator for concentrating said solution and means for conveying the molten hydrazine perchlorate formed in the evaporator to a disk contained within a cone whereby said hydrazine perchlorate can be formed into substantially anhydrous spheres before impinging the sides of said cone.

3,716,316

APPARATUS FOR THE APPLICATION OF A REFRACTORY LINING TO THE INSIDE WALL OF METALLURGICAL VESSELS, AS WELL AS A MOULDING UNIT TO BE UTILIZED IN COMBINATION THEREWITH

Cornelis Dekker, Ijmuiden; Pieter Karel Joustra, and Josephus Paro, both of Heemskerk, all of Netherlands, assignors to Koninklijke Nederlandsche Hoogovens en Staalfabrieken N.V., Ijmuiden, Netherlands

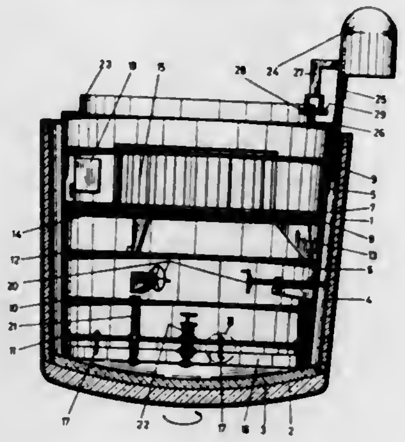
Filed June 14, 1971, Ser. No. 152,668

Claims priority, application Netherlands, June 12, 1970, 7008651

Int. Cl. F27d *1/16*

U.S. Cl. 425—13 **10 Claims**

The apparatus comprises a sand slinging device for applying refractory lining in granular form, a molding unit temporarily installed in and spaced from the vessel walls, and means for freeing the mold from the installed lining comprising vibration generators distributed around the inner periphery of the mold and hydraulic jacks, preferably removable, distributed about such periphery neat the bottom of the mold and expandable downwardly to raise the mold. A set of three jacks and a set of three vibrators are preferred, attached respectively to the lower and upper parts of a two-part mold. The preferred form also has manually operable jacks and centering spindles for the mold and at its bottom edges a cylindrical ring movable to sealingly engage the surface therebelow, an annular platform proximate to the top of the lower part of the mold, and vibration generators comprising eccentric masses rotatable about vertical axis in different directions of rotation.



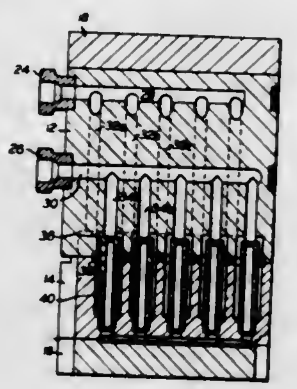
In the method, the lower part of the mold is positioned, raised free of the bottom of the vessel and centered and levelled by the manual jacks, with the ring resting on the vessel bottom; the platform and upper part of the mold are assembled on the lower part, the centering spindles are retracted; the refractory mass is slung into the space between the mold and the vessel walls; the hydraulic jacks are positioned at operative heights; the vibration generators and hydraulic jacks are operated and then stopped; the manual jacks are adjusted and the hydraulic jacks preferably removed and then the remaining mold parts. Concurrent and separate controls for the hydraulic jacks are preferably provided.

3,716,317

PACK FOR SPINNING HETEROFILAMENT FIBERS

Milton Guy Williams, Jr., and Henry Rausch, Jr., both of Charlotte, N.C., assignors to Fiber Industries, Inc., Charlotte, N.C.

Filed April 1, 1971, Ser. No. 130,370
Int. Cl. D01d *3/00, 1/10*
U.S. Cl. 425—198 **9 Claims**



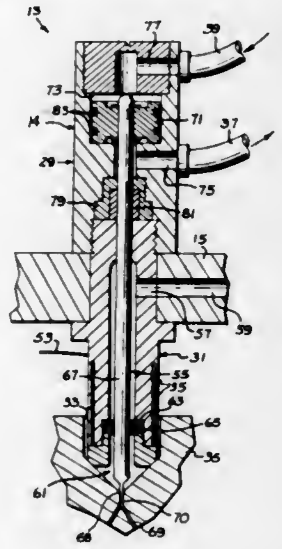
A spin pack is provided for producing heterofilaments from two polymer streams. Each stream is subdivided and the subdivisions filtered and delivered to a common header. The two headers are parallel and are defined between the upper face of a spinnerette and the adjacent members. Off each header and extending toward the other are a plurality of grooves, the grooves of one header alternating with those of the other and constituting pairs or couplets. Between each pair of grooves there are a plurality of channels of precise dimensions, e.g. length of at least about 0.075 inch, width of at least about 0.016 inch and depth of from about 0.005 to 0.030 inch, and a spinning orifice is located centrally of each channel. In this fashion each orifice gets the same amount of each polymer.

3,716,318

VALVING MEANS FOR INJECTION MOLDING APPARATUS

Carl L. Erik, Warren, and William J. Scott, Warminster, both of Pa., assignors to GTE Sylvania Incorporated, Secena Falls, N.Y.

Filed Feb. 4, 1971, Ser. No. 112,627
Int. Cl. B29f *1/04*
U.S. Cl. 425—245 **7 Claims**



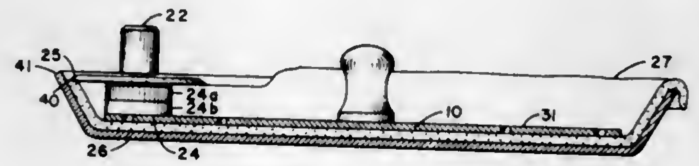
An improved valving means for an injection molding apparatus having first and second chambers located within a substantially cylindrically shaped body and separated by a restricting means. An elongated rod member, adapted to move within both chambers, has at one end a male tip which controls the amount of flow of molten material from the exit end of the first chamber. At the other end of the rod member is attached a piston, this piston moving within the second chamber as a result of altering fluid pressures exerted on both sides of the piston.

3,716,319

APPARATUS FOR FORMING THE CRUST OF A PIE

Harold E. Norman, Ponca City, Okla.

Filed April 20, 1970, Ser. No. 30,065
Int. Cl. A21c *11/10*
U.S. Cl. 425—293 **4 Claims**



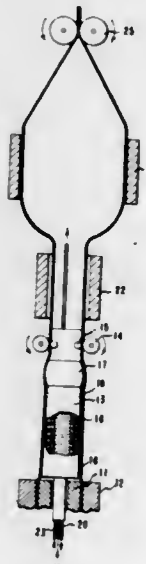
A method for forming the crust of a pie, particularly a pizza pie, by rolling the crust to a predetermined thickness, placing the rolled crust over a pie pan, pressing the crust to the bottom of the pie pan by a disc-shaped platen, forming the sides of the pie by placing a contoured forming tool against the top of the disc-shaped platen and rolling the preformed roller around the edge of the pie forcing the edge of the pie against the side of the pie pan. The pie is trimmed by having a second roller which contains a circular or disc knife. Thus the axis of the disc knife is parallel to the bottom of the pie pan and spaced a predetermined distance above the disc-shaped platen. The disc cutter is placed against the top of the platen in the same manner as the knife forming roller and rotated around the edge of the pie pan in a manner to trim the excess dough from the pie. The cut is made slightly below the top surface of the pan.

3,716,320

APPARATUS FOR PRODUCING FLAT FILM FROM THERMOPLASTIC MATERIAL

John B. Lyon, Buffalo, N.Y., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 234,398, Oct. 31, 1962, abandoned. This application Nov. 23, 1970, Ser. No. 92,223
Int. Cl. B29d *23/00*
U.S. Cl. 425—326 **3 Claims**



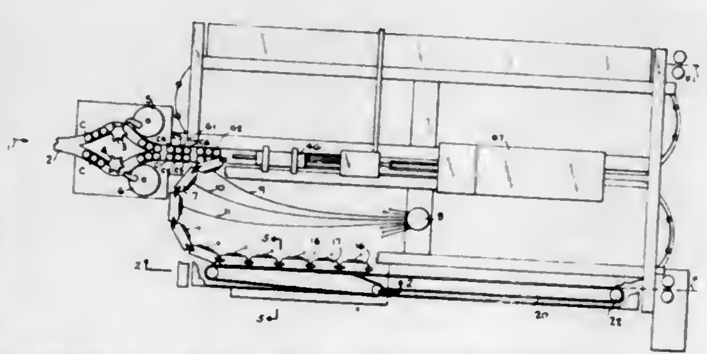
An apparatus for producing flat film from thermoplastic material wherein an expandable cylindrical collar in combination with a pressure relief valve is positioned between the expansion area and the quenching area. The collar prevents the expansion gas from leaking into the quenching and extruding area of the apparatus.

3,716,321

MECHANISM FOR LINING SHELLS

Rodney K. Calvert, Dunwoody, Ga., assignor to The Mead Corporation, Dayton, Ohio

Filed Sept. 15, 1970, Ser. No. 72,263
Int. Cl. B29c *17/02*
U.S. Cl. 425—383 **7 Claims**



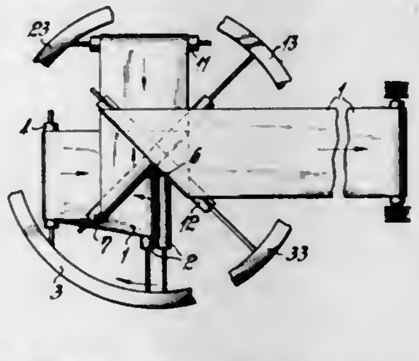
Mechanism and method for lining a series of pivotally interconnected shells each having bottom, side, and recessed end walls utilizes means for imparting movement to said shells along a predetermined path in end to end relation, means for moving a sheet of stretchable material alongside said series of shells in synchronism therewith, force applying means for urging said sheet of material into close frictional contact with the edges of the side walls of said shells, a pair of endless elements having their working reaches disposed alongside said shells and sheet and engagable with said sheet to urge portions thereof between the side walls of the shells into snug contact with the recessed ends of the shells, and vacuum means for drawing the sheet into flat face contacting relation with the bottom, sides and ends of the interior surfaces of said shells.

3,716,322

APPARATUS FOR FLATTENING AND TAKING AWAY BLOWN TUBING OF PLASTICS MATERIAL

Friedrich Kratzert, Rosenheim-Schlossberg, Germany, assignor to Windmoller & Holscher, Lengerich of Westphalia, Germany

Filed Sept. 22, 1970, Ser. No. 74,285
Claims priority, application Germany, Sept. 27, 1969, P 19 48 935.1
Int. Cl. B29c *17/00*
U.S. Cl. 425—392 **8 Claims**



The process serves to distribute any variations in thickness in the peripheral direction of the tubing, in conjunction with a process in which the tubing is blown and is either wound up or processed further in stationary devices. The plane in which the tubing is flattened is pivotally moved about the axis of the tubing reversingly in steps of at least approximately 360°. The flattened tubing is deflected about a deflecting member, which is reversingly moved in unison with the flattening plane and is laterally offset from the axis of rotation of the flattening plane and disposed in a plane that is at right angles to the flattening plane. The tubing is then moved about additional deflecting members, which are disposed in planes that are parallel to the plane which contains the first deflecting member and are also pivotally moved reversingly about the axis of rotation of the flattening plane. The angles through which the deflecting members are moved decrease as the distance from the flattening station increases. Successive deflecting members are alternatingly disclosed at least close to and more remote from the axis of rotation of the flattening plane. The tubing which has moved about the last deflecting member is moved in a constant direction in another plane, which is at right angles to the axis of rotation of the flattening plane.

3,716,323

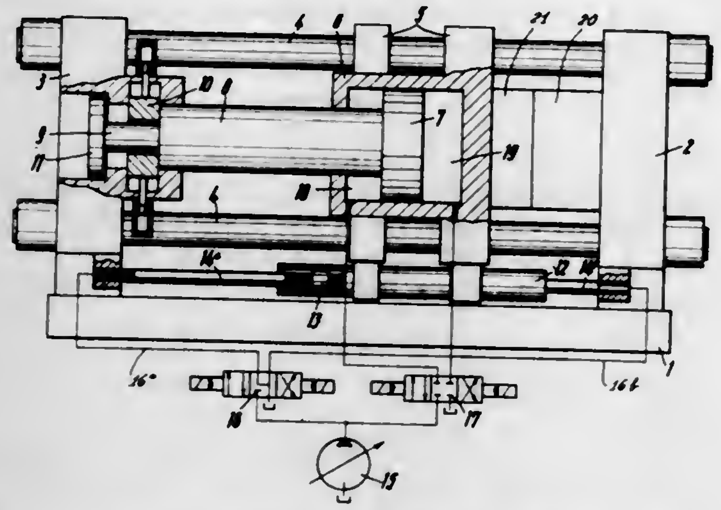
INJECTION MOLDING MACHINE

Gunter Classen, Monchengladbach, Germany, assignor to Mannesmann-Meer Aktiengesellschaft, Monchengladbach, Germany

Filed Dec. 14, 1971, Ser. No. 207,922
Int. Cl. B28b *3/26*
U.S. Cl. 425—450 **2 Claims**

An injection molding machine having a stationary support one mold half, and a movable carrier for the other second half.

The movable carrier runs on rods and has a cylinder chamber with a first piston from which extends a piston rod; lock means may hold the rod in a particular position when retracting the lock, rod and piston can be displaced; a hydraulic motor including a cylinder attached to the carrier underneath thereof, has a stationary piston with two tubular piston rods, serving as conduits to and from the motor cylinder; first hydraulic control means provide for selectively pressurizing the motor cylinder to obtain relative displacement thereof by action on the second piston, thereby displacing the carrier. Second hydraulic control means selectively pressurize the chamber in the carrier on one or the other side of the first piston in the chamber for displacement of the carrier relative to the piston when the lock means have locking position, and for closing the chamber so that incompressible pressure fluid therein couples the first piston to the carrier for common displacement upon operation of the hydraulic motor when the lock means are retracted.



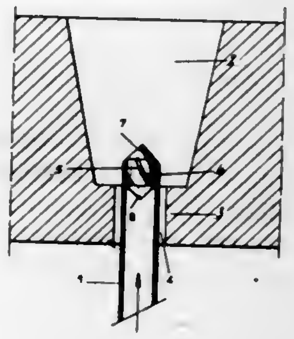
3,716,324
HIGH-INTENSITY BURNER FOR COMBUSTIBLE GAS

Marcel Maximilien Ponthoreau, and Claude Yves Marie Rozeu, both of 16 Cognac, Charente, France, assignors to Martell & Co., Cognac (Charente), France

Filed Jan. 6, 1971, Ser. No. 104,417

Int. Cl. F23k *5/00*

U.S. Cl. 431—185 **6 Claims**



A high intensity burner is provided in which the injector for the gas-air mixture extends into a combustion chamber through a hole in a wall of the chamber which provides an annular space between the injector and the wall so that a portion of the air required for combustion is introduced into the chamber through the space between the injector and the hole in the wall of the chamber. The device is especially useful for combustion chambers operated with fuel gases such as propane and butane.

CHEMICAL

ERRATUM

For Class 432—260 see:
Patent No. 3,716,223

3,716,325
DYEING COTTON OR REGENERATED CELLULOSE USING SULFUR DYES OXIDIZED WITH AQUEOUS SODIUM BROMITE SOLUTION

John Richard Aspland, Charlotte, N.C., assignor to Martin Marietta Corporation, New York, N.Y.

Filed Jan. 25, 1971, Ser. No. 109,593

Int. Cl. C09b *49/00;* **D06p** *1/30*

U.S. Cl. 8—37 **2 Claims**

Method for dyeing cotton or regenerated cellulose textile fibers with sulfur dyes, comprising the steps of applying at least one sulfur dye in reduced (leuco) form to said fibers and subsequently oxidizing said dye by contacting it with an oxidizing solution comprising water and sodium bromite and having pH 7–12.

3,716,326
PROCESS FOR PRINTING OF FABRICS CONSISTING OF SYNTHETIC FIBERS

Subodh Krishna Dutta; Krishnakant Girdharla Shah, and Jagdish Ishwarlal Setalvad, Ahmedabad, India, assignors to Ahmedabad Manufacturing & Calico Printing Co. Ltd., Ahmedabad, India

Filed March 4, 1970, Ser. No. 16,614

Int. Cl. D06p *3/54, 3/76*

U.S. Cl. 8—62 **4 Claims**

Process for the preparation of printed synthetic fabrics made of polyester and/or acrylic fibers which comprises firstly, in preparing the fabric from two groups of fibers, group (a) consisting of polyester and/or acrylic fibers and group (b) consisting of fibers which are soluble in mineral acids such as cotton and/or viscose and then printing the said fabric with such dyestuffs which are suitable only for synthetic fibers and finally removing by dissolving from the said printed fabric the bottom and/or viscose part, thereby obtaining printed fabric of polyester and/or acrylic fibers only.

3,716,327
POLYESTER FIBER DYED WITH MONOAZO COMPOUND CONTAINING AN ACYLAMIDOTETRAHYDROQUINOLINE GROUP

Max A. Weaver; James M. Straley, and Clarence A. Coates, Jr., all of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 812,411, April 1, 1969, Pat. No. 3,635,941. This application Sept. 23, 1971, Ser. No. 183,233

Int. Cl. D06p *1/18;* **C09d** *29/36*

U.S. Cl. 8—41 C **10 Claims**

A linear polyester textile fiber dyed with a water-insoluble azo compound having a 1-alkyl- or 1-cycloalkyl-7-acylamido-1,2,3,4-tetrahydroquinoline coupling component and certain substituted phenyl groups as the diazo component.

3,716,328
ANTHRAQUINONE DYED NYLON STABILIZED WITH BUTYLIDENE BIS (BUTYL CRESOL) AND POLYHYDROXYETHYL-OCTADECYLAMINES

Richard Eugene Mayer, Richmond, Va., assignor to Allied Chemical Corporation, New York, N.Y.

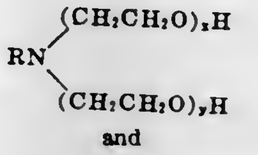
Division of Ser. No. 774,175, Nov. 7, 1968, abandoned. This application Sept. 9, 1971, Ser. No. 179,222

Int. Cl. D06p *5/02*

U.S. Cl. 8—165 **2 Claims**

The rate of fading of dyed textiles due to ozone action is substantially reduced through the incorporation therein of:

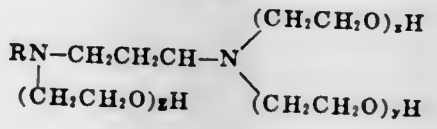
a. a compound chosen from the class of amines with ethyleneoxy substituents having the structural formulas:



$$RN\begin{cases}(CH_2CH_2O)_xH\\(CH_2CH_2O)_yH\end{cases}$$

(A)

and



$$\underset{(CH_2CH_2O)_zH}{RN}-CH_2CH_2CH-N\begin{cases}(CH_2CH_2O)_xH\\(CH_2CH_2O)_yH\end{cases}$$

(B)

wherein R is an alkyl or aralkyl radical with four to 25 carbon atoms, and x, y and z are integers such that $x + y$ is equal to or less than 10 in A compounds and $x + y + z$ is equal to or less than 10 in B compounds; and

b. a phenolic compound chosen from the group consisting of 4,4′-butylidene bis(6-tert-butyl-m-cresol), p-nonylphenol, 1,3,5 trimethyl-2,4,6-tris (3,5 di-tert-butyl-4-hydroxy benzyl) benzene, and 6-tert-butyl-m-cresol.

3,716,329
DYEING POLYACRYLONITRILE WITH BASIC DYESTUFF AND ALKOXYMETHYL QUATERNARY AMMONIUM COMPOUNDS

John Komninos, 19 Barnfield Court, Upper Saddle River, N.J.; Peter Klemchuk, 148 Upland Rd., Yorktown Heights, N.Y., and George Ham, 284 Pine Rd., Briarcliff Manor, N.Y.

Continuation-in-part of Ser. No. 786,904, Dec. 26, 1968, abandoned. This application Nov. 27, 1970, Ser. No. 93,479

Int. Cl. D06p *5/04, 5/06*

U.S. Cl. 8—169 **12 Claims**

Fibrous material consisting at least predominantly of polyacrylonitrile is dyed in an aqueous dyebath containing a basic dyestuff and up to about 10 percent by weight of at least one alkoxymethyl quaternary ammonium compound as a decomposable retarder. An illustrative example of such a retarder is n-tetradecyloxymethyltributylammonium chloride.

3,716,330
DYEING SYNTHETICS USING ROLLER COATED MOLTEN DYE COMPOSITIONS

Kazuo Kitamura, Otokuni-gun, Kyoto-fu; Fumiki Takabayashi, and Fumio Shibata, both of Ibaraki-shi, Osaka-fu, all of Japan, assignors to Teijin Limited, Osaka, Japan

Filed Sept. 29, 1970, Ser. No. 76,599

Claims priority, application Japan, Sept. 29, 1969, 44/77577; Dec. 17, 1969, 44/101418; Dec. 22, 1969, 44/103137; April 24, 1970, 45/35158; April 21, 1970, 45/34098; April 22, 1970, 45/34546

Int. Cl. C09b *67/00;* **D06p** *5/04*

U.S. Cl. 8—169 **7 Claims**

A process for dyeing fabrics of synthetics fibers which comprised preparing a molten dye composition composed of dyestuff and organic matrix compound which is solid at normal temperature and has compatibility with the dyestuff in molten state, coating the molten composition onto the fabric under the condition not permitting the dyeing of the fabric, then heat-treating the coated fabric to induce the dyeing, and finally removing the remaining coating layer by washing.

3,716,331

PROCESS FOR PRODUCING CARBON FIBERS HAVING A HIGH YOUNG¼S MODULUS OF ELASTICITY

Wesley A. Schalamon, Elyria, and Roger Bacon, Olmstead Falls, both of Ohio, assignors to Union Carbide Corporation, New York, N.Y.

Continuation of Ser. No. 610,789, Jan. 23, 1967, abandoned. This application April 10, 1970, Ser. No. 28,167

Int. Cl. C01b *31/07*

U.S. Cl. 423–447 **7 Claims**

Carbon fibers having a high Young's modulus are produced by a process which comprises longitudinally stressing partially carbonized cellulosic base fibers by means of an applied tensional force while concurrently subjecting them to a carbonizing treatment. The resultant stress carbonized fibers can then be subjected to a stress graphitizing treatment, if desired.

3,716,332

CARBONIZATION OF WOOL

Donald H. Leeds, Rolling Hills, Calif., assignor to Ducommun Incorporated

Filed July 27, 1970, Ser. No. 58,232

Int. Cl. C01b *31/07*

U.S. Cl. 423–447 **8 Claims**

A fibrous carbon product is produced by subjecting a body of wool fibers in a furnace to a reduced pressure to remove essentially all of the oxygen from the furnace and thereafter heating said body of wool fibers at a reduced pressure in the absence of any appreciable oxygen to a temperature of at least about 800°F at which carbonization will occur. An inert gas such as nitrogen is preferably passed over the body during carbonization to remove reaction products.

3,716,333

PROCESS OF AND APPARATUS FOR THERMOMETRIC ANALYSIS

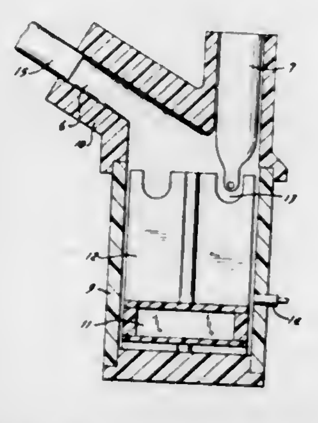
Gerd Peuschel, 3163 Sehnde, and Fritz Hagedorn, 3001 Bolzum ueber Han., both of Germany, assignors to Kali-Chemie A. G., Hannover, Germany

Filed Dec. 4, 1970, Ser. No. 95,153

Claims priority, application Germany, Dec. 9, 1969, P 19 61 633.2

Int. Cl. G01n *25/48*

U.S. Cl. 23—230 R **14 Claims**



Process and apparatus for thermometric analysis in which a pump supplies a test solution containing a component, the concentration of which is to be determined, and a reagent solution, adapted to react with the component, to a reaction vessel containing a stirrer and a temperature sensor. The solutions are fed at controlled, constant rates to the reaction vessel through tubing immersed in a constant temperature bath, and the reaction vessel, consisting of a material having a relatively low thermal conductivity, is also immersed in the bath. The temperature in the reaction vessel on mixing the solutions is noted and compared with calibration data.

3,716,334

DETERMINATION OF ELEMENTS IN ORGANIC COMPOUNDS

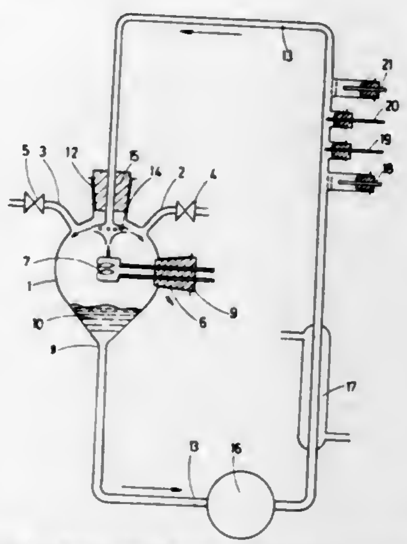
Michel Pont, Saint-Fons, France, assignor to Rhone-Poulenc S.A., Paris, France

Filed Feb. 12, 1971, Ser. No. 114,767

Claims priority, application France, Feb. 16, 1970, 7005445; Jan. 4, 1971, 7100030

Int. Cl. G01n *27/26, 31/06, 31/12*

U.S. Cl. 23—230 PC **8 Claims**



Apparatus for the rapid and automatic determination of elements such as halogen and sulphur in organic compounds comprises a closed vessel; means for introducing into said vessel and for supporting in said vessel a sample of said compound to be analyzed; means for filling said vessel with oxygen; means for causing combustion of said sample; means for causing circulation of an absorption liquid in a closed circuit including said vessel; means for determining and detecting said element to be analyzed in said absorption liquid; means for causing said absorption liquid to contact during the circulation thereof the inner surfaces of said vessel and said means for supporting said sample; and means for causing said circulation to cease when said determination is complete.

3,716,335

ASSAYING WITH CHANGE IN ELECTRON SPIN RESONANCE SPECTRUM BASED ON CHIRALITY

Edwin F. Ullman, Atherton, and Richard S. Schneider, Sunnyvale, both of Calif., assignors to Syva Corp., Palo Alto, Calif.

Filed May 3, 1971, Ser. No. 139,905

Int. Cl. G01n *27/78*

U.S. Cl. 23—230 R **15 Claims**

A method and compounds are provided for determining amounts of energy or chemical reagents in a fluid medium by introducing into the medium a sensor which is a stable nitroxide radical functionality bonded through a methylene group to a central atom bonded to a plurality of functionalities, at least one of which participates in a chemical change, which results in a change of asymmetry about the carbon atom bonded to the methylene group.

3,716,336

METHOD FOR DETERMINING PROCAINAMIDE LEVELS IN BLOOD OR URINE

Chandra Kant Parekh, North Brunswick, N.J., assignor to E. R. Squibb & Sons, Inc., New York, N.Y.

Filed June 28, 1971, Ser. No. 157,755

Int. Cl. G01n *33/16*

U.S. Cl. 23—230 B **6 Claims**

A qualitative and quantitative determination of procainamide blood levels may be obtained by contacting a sample of urine or denatured blood with dimethylcinnamaldehyde in the presence of an acid and comparing the resulting characteristic color with a reference standard.

3,716,337

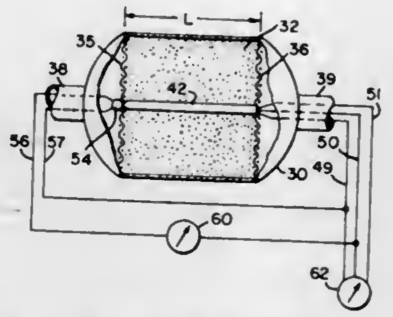
GAS MONITORING APPARATUS

William J. Jones, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed March 6, 1970, Ser. No. 17,194

Int. Cl. G01n *25/48, 27/02, 31/06*

U.S. Cl. 23—254 E **4 Claims**



A gas containing carbon dioxide is passed over a bed of carbon dioxide absorbent which contains an elongated temperature sensor which measures the peak temperature along its length and provides a temperature signal. A second sensor which measures the temperature of the gas prior to its reaction with the absorbent provides a second temperature signal. The signals are combined to get a resultant which is indicative of the carbon dioxide present in the gas.

3,716,338

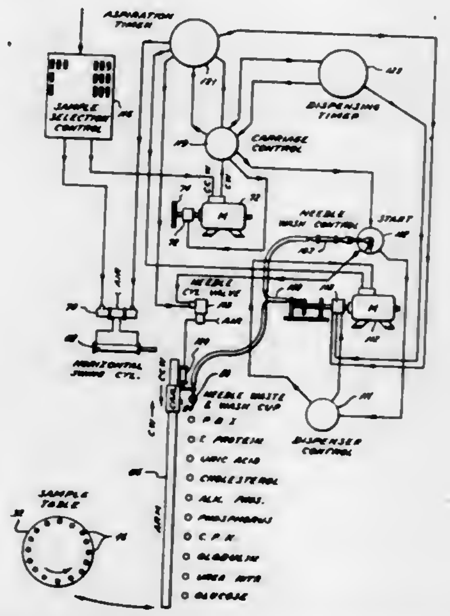
SAMPLE FLUID DISPENSING APPARATUS FOR CHEMICAL TESTING APPARATUS

John J. Moran, Houston, Tex., assignor to Hycel, Inc., Houston, Tex.

Original application June 14, 1968, Ser. No. 737,065, now Patent No. 3,622,279. Divided and this application June 21, 1971, Ser. No. 155,154

Int. Cl. G01n *1/18, 33/16*

U.S. Cl. 23—259 **7 Claims**



A sample pick up and dispensing apparatus for picking up samples to be tested from a sample container and discharging them into a plurality of testing containers. A water filled pick up and dispensing conduit actuated by a cylinder and piston assembly for providing accurate handling of the samples. An air interface piston and cylinder assembly connected to the conduit and cleaning means connected to the conduit for flushing water therethrough thereby preventing dilution of the sample and cross-contamination between different samples. Means for expelling a portion of the test sample back into the sample container prior to dispensing samples into the testing containers to insure constant delivery of the samples to the testing containers.

3,716,339

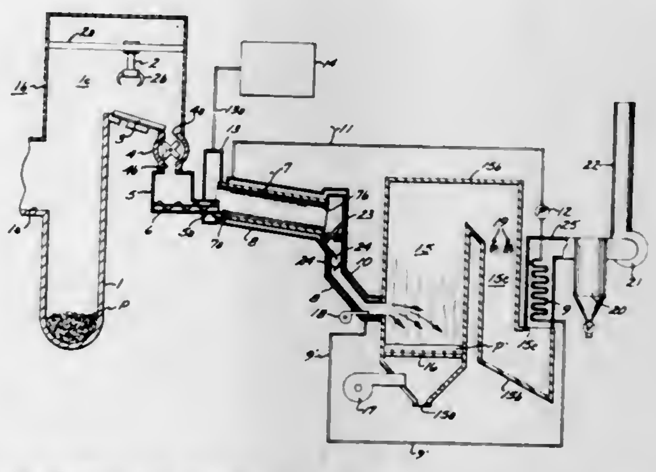
HYDROGEN CHLORIDE RECOVERY INCINERATOR FOR PLASTICS CONTAINING HYDROGEN AND CHLORINE

Masanobu Shigaki, Toyonaka-shi, Osaka; Shigehiro Kido, Itami-shi, and Yoshikazu Chiba, Yao-shi, Osaka, all of Japan, assignors to Takuma Kikan Mfg., Co., Osaka, Japan

Filed Dec. 14, 1970, Ser. No. 97,785

Int. Cl. F23g *7/00;* **C01b** *7/08*

U.S. Cl. 23—262 **4 Claims**



An apparatus for the disposal of scrap vinyl polymers containing chlorine and hydrogen. The apparatus includes a rotary kiln that is adapted to receive said scrap plastic and heat the same to a temperature at which the plastic partially decomposes, and the major portion of the chlorine escaping therefrom as hydrogen chloride gas, which gas together with any chlorine which results from the decomposition is recovered in a confined space for subsequent usage.

The partially decomposed scrap plastic is sequentially removed from the rotary kiln in a dried state and crushed. The crushed plastic is discharged by a blower onto a grate in a furnace where the scrap plastic is burned. The hot gases of combustion from the burning together with fines and dust arising from the burning operation are conducted through a passage to heat air that is subsequently used in the heating of the rotary kiln. The hot gàses of combustion, together with entrained solid materials, are discharged into a dust collector to remove the fines and dust therefrom. The gases after being freed of solid materials are subsequently discharged through a chimney to the ambient atmosphere. The gases discharged to the ambient atmosphere are substantially free of chlorine and hydrogen chloride gases.

3,716,340

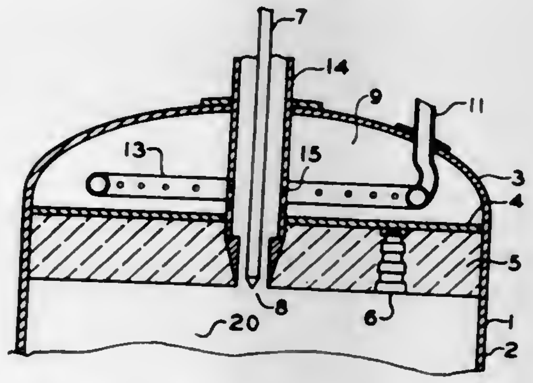
CARBON BLACK REACTOR

Charles R. Venable, Jr., Bartlesville, Okla., assignor to Phillips Petroleum Company

Filed Sept. 16, 1970, Ser. No. 72,637

Int. Cl. C09c *1/48*

U.S. Cl. 23—259.5 **3 Claims**



A carbon black reactor employing a support for a suspended arch, the support forming a section between itself and the head of the reactor into which the oxidizing gas is introduced to cool the support.

3,716,341
CRUCIBLE-FREE ZONE MELTING DEVICE HAVING AN ANGLED HEATING COIL

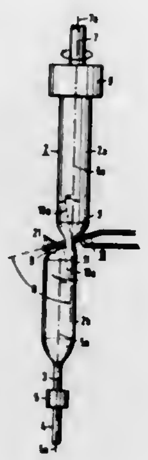
Otto Schmidt, Erlangen, Germany, and Siemens Aktiengesellschaft, 03, Berlin and Munich, Germany

Filed Nov. 30, 1970, Ser. No. 93,650

Claims priority, application Germany, Nov. 29, 1969, P 19 60 088.5

Int. Cl. B01j *17/10*

U.S. Cl. 23—273 SP **3 Claims**



Device for crucible-free zone melting a crystalline rod end-supported by holders of which one holder is rotatable about the longitudinal axis thereof includes a flat induction heating coil surrounding the longitudinal axis of the other holder for heating a molten zone formed in the crystalline rod, the induction heating coil having a plurality of windings disposed in a single plane, the plane extending at an acute angle defined by a normal to said plane of said windings and the longitudinal axes of both rod holders having a valve within the range of 0.5° to 3°.

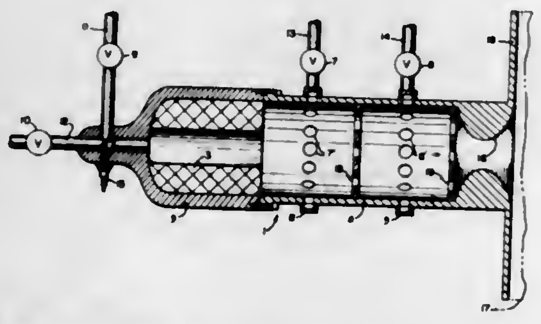
3,716,342
GENERATION OF CARBON DIOXIDE HAVING A POPULATION INVERSION

Donald R. Matthews, San Jose, and Allen L. Holzman, Palo Alto, Calif., assignors to United Aircraft Corporation, East Hartford, Conn.

Filed Feb. 25, 1969, Ser. No. 802,013

Int. Cl. B01j *7/00*

U.S. Cl. 23—281 **5 Claims**



Tetrahcyanoethylene is burned with a stoichiometric amount of oxygen to produce combustion products consisting essentially of high temperature carbon dioxide and nitrogen. These combustion products are mixed with additional nitrogen to reduce the temperature of the combustion products and to take advantage of the efficient energy transfer between excited nitrogen and carbon dioxide.

In addition, small amounts of hydrogen may also be burned to produce water which increases the rate of de-excitation of the lower vibrational levels of carbon dioxide molecules and thereby increase the efficiency of a lasing process. The hot gases so produced may then be expanded into and caused to flow continuously through a laser tube, whereby a continuous wave laser may be operated.

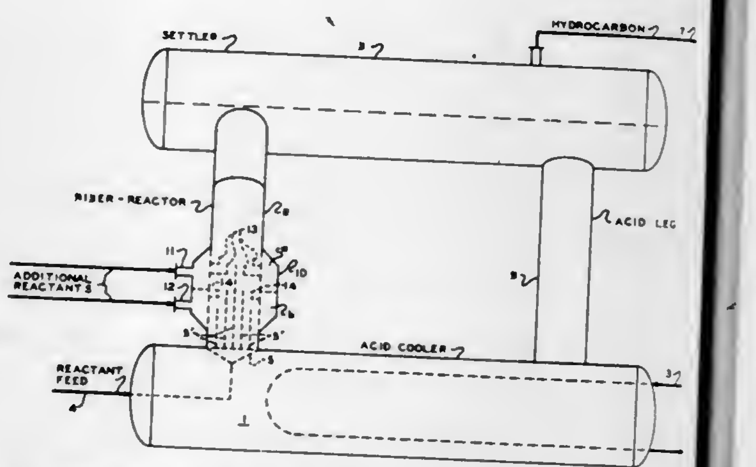
3,716,343
APPARATUS FOR INCREASING QUALITY AND QUANTITY OF PRODUCT FROM AN EXISTING CHEMICAL APPARATUS OPERATION

Charles C. Chapman, Bartlesville, Okla., assignor to Phillips Petroleum Company

Filed Nov. 2, 1970, Ser. No. 86,156

Int. Cl. B01j *9/08;* **C07c** *3/12, 3/54*

U.S. Cl. 23—285 **4 Claims**



An existing riser-reactor into which reactants are injected for reaction therein through a plurality of nozzles is modified to provide the same with additional nozzles and as desired the nozzles are arranged to inject the same or different reactants to portions of the riser-reactor which are separated each from the other so that optimum reaction can take place in each portion. In one form of the apparatus a chamber is constructed around an existing riser-reactor into which at the place surrounded by the chamber there have been inserted and fixed to its wall a plurality of nozzled pipes whereby to feed reactant from the chamber through the pipes and nozzles into the riser-reactor. As desired, the pipes can extend to provide nozzles for injection into the riser-reactor at various depths or levels therein. Also, by partitioning the chamber different reactants can be injected from the overall chamber to different portions of the riser-reactors. An apparatus as described can be originally constructed in toto rather than by modifying an existing riser-reactor.

3,716,344
INTERNAL COMBUSTION ENGINE EXHAUST CATALYTIC REACTOR

Dillion P. Ashburn, Ogden, Utah, assignor to New Products Corporation, Ogden, Utah

Filed Feb. 10, 1971, Ser. No. 114,175

Int. Cl. F01n *3/14;* **B01j** *9/04*

U.S. Cl. 23—288 F **11 Claims**

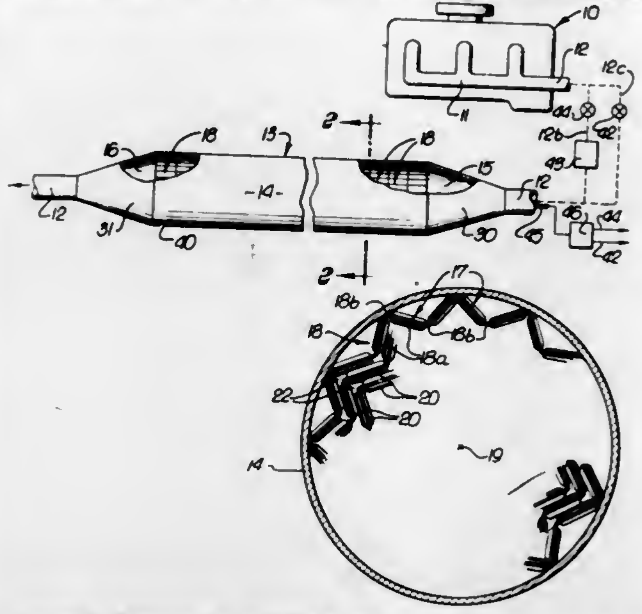
A catalytic reactor to be connected in series with ducting for hot gases containing CO_2 comprises:

a. a longitudinally elongated generally tubular case having lengthwise spaced entrance and exit ports, the entrance port to receive said gas at elevated temperature, and

b. multiple metallic fins extending generally longitudinally in the case and in closely packed relation to form multiple flow passages for said gas, the passages being spaced apart transversely of the case,

c. and the fin surface metal consisting of a copper catalys

which when contacted by the hot gas reduces the CO_2 content thereby to increase the oxygen content in the gas discharge from said exit port.



3,716,345
CZOCHRALSKI CRYSTALLIZATION OF GALLIUM ARSENIDE USING A BORON OXIDE SEALED DEVICE

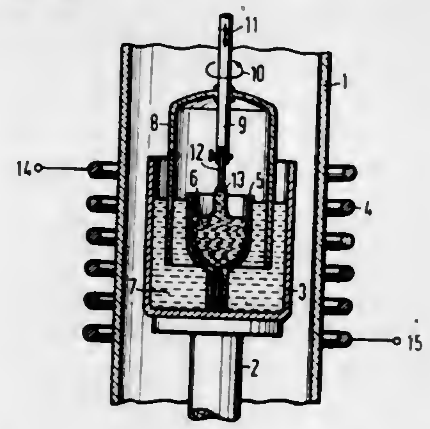
Josef Grabmaier, Unterhaching, Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed March 13, 1970, Ser. No. 19,289

Claims priority, application Germany, March 18, 1969, P 19 13 682.4

Int. Cl. B01j *17/18;* **C01g** *15/00*

U.S. Cl. 23—301 SP **2 Claims**



Method of producing according to Czochralski, monocrystals of semiconductive compounds easily decomposable at their melting point includes surrounding a crucible containing a melt of such semiconductive compound with a fluid medium extending to a level below the edge of the crucible, immersing a bell which is axially rotatable and vertically displaceable and which has a crystal seed axially suspended therewithin, into fluid medium so as to close off a volume above the surface of the molten compound, lowering the bell further into the fluid medium until the crystal seed is immersed in the melt, and thereafter raising the bell so as to pull the seed crystal and a monocrystalline rod of the semi-conductive compound out of the melt; and device for carrying out the method.

3,716,346
METHOD OF DISSOLVING LIQUEFIED CHLORINE IN AN AQUEOUS SOLVENT

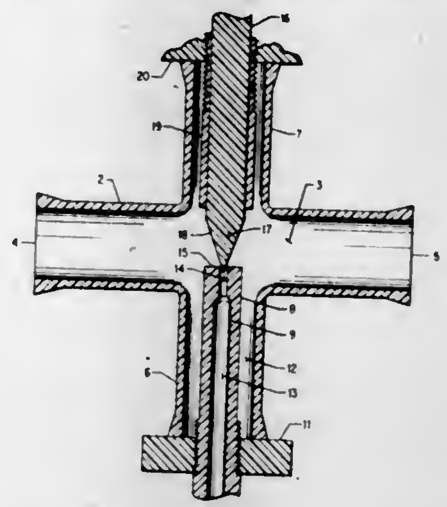
Udell T. Greene, Florham Park, N.J., assignor to Diamond Shamrock Corporation, Cleveland, Ohio

Division of Ser. No. 832,747, June 12, 1969. This application Sept. 21, 1970, Ser. No. 74,134

Int. Cl. B01d *11/00;* **B01f** *3/08;* **C01b** *7/02*

U.S. Cl. 23—312 R **1 Claim**

A single-seated valve assembly for introducing a controlled, non-surging flow of soluble liquefied gas directly into a stream of liquid solvent flowing through a conduit permits essentially full pressure on the liquefied gas to the region of incipient solution while suppressing vaporization of the gas. The valve body can be essentially cross-shaped with the valve passage forming a passage of the solvent conduit. The side passage into the valve passage for introducing the liquefied gas into the solvent terminates in a valve seat housing an orifice sealed by the end of a valve stem depending from across the valve passage.



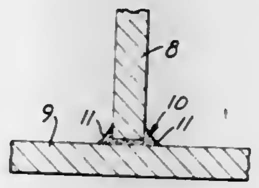
3,716,347
METAL PARTS JOINED WITH SINTERED POWDERED METAL

Theodore R. Bergstrom, Little Canada, and Philip D. Takkunen, Woodbury Township, Washington County, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Sept. 21, 1970, Ser. No. 73,891

Int. Cl. B22f *1/00*

U.S. Cl. 29—182.2 **17 Claims**



Metal parts are joined together with sintered powdered metal by applying a mixture of powdered metal and an organic heat-fugitive binder to the parts at the locus of the joint of to be formed therebetween, assembling the parts in their desired joined configuration, and heating the assembly to volatilize or burn-off the binder and sinter the powdered metal.

3,716,348
METHOD OF FORMING ABRASION-RESISTANT SELF-LUBRICATING COATING ON FERROUS METALS AND ALUMINUM AND RESULTING ARTICLES

Garry R. Perkins, 106 Lake Lane, Cary, Ill. 60013

No Drawing. Continuation-in-part of abandoned application Ser. No. 670,439, Sept. 25, 1967. This application June 1, 1970, Ser. No. 42,576

Int. Cl. B44d *1/16, 1/44*

U.S. Cl. 29—195 **8 Claims**

A low friction, abrasion resistant, hard surface, non-stick coating comprising nickel and fluorocarbon material, and method of application of such coating, furnishing coatings useful for friction surfaces such as cylinder and bearing applications, mold coatings, cooking utensils, and corrosion and abrasion resistant coatings for chemical process equipment and the like. The process may be carried out without pressurized, laminating, or other specialized apparatus.

3,716,349

METHOD FOR PRODUCING LASER GLASSES HAVING HIGH RESISTANCE TO INTERNAL DAMAGE AND THE PRODUCT PRODUCED THEREBY

Emil W. Deeg, Woodstock, Conn., and Elias Snitzer, Wellesley, and Arnold J. Simpson, Southbridge, Mass., assignors to American Optical Corporation, Southbridge, Mass.

No Drawing. Filed May 17, 1971, Ser. No. 144,238

Int. Cl. C03b *5/16*

U.S. Cl. 65—32 **7 Claims**

Laser glass which has high resistance to internal damage resulting from inclusions is produced by a method which includes the bubbling of either pure oxygen or an oxidizing oxygen-rich gas mixture through the melt during at least a portion of the stirring operations in order to maintain an oxidizing environment throughout the melt to prevent the reduction of any material in the melt to metallic or semiconductive states.

3,716,350

APPLYING UREA IN THE MOLTEN STATE TO CROPS

Saburo Hashimoto, Yorba Linda, Calif., assignor to Union Oil Company, Los Angeles, Calif.

Filed March 3, 1969, Ser. No. 803,980

Int. Cl. C05c *9/00;* **C07c** *127/00*

U.S. Cl. 71—28 **7 Claims**

Urea is distributed onto the area to be fertilized by dropping particles of molten urea into the atmosphere 20-500 feet over the area such that the molten urea solidifies into small prills before contacting the area to be fertilized.

3,716,351

ALGAECIDE COMPOSITION HAVING IMPROVED STABILITY

Donald H. Kunkel, Route No. 2 Box 9, Eagle, and Donald E. Seymour, 2608 East Newton Avenue, Milwaukee, both of Wis.

Filed April 28, 1970, Ser. No. 32,780

Int. Cl. A01n *11/04*

U.S. Cl. 71—67 **8 Claims**

An algaecide composition having improved stability comprising an aqueous solution containing a complex which is a reaction product of either a copper salt or a cobalt salt with an alkanolamine. The solution also contains an effective amount of an acetylenic diol and an alkali metal halogenate, such as sodium chlorate, which aid in preventing the complex from decomposing during extended periods of storage.

3,716,352

SINTERED DESULFURIZER FOR OFF-FURNACE USE

Hiroshi Ooi, and Hakaru Nakato, both of Chiba, Japan, assignors to Kawasaki Steel Corporation, Fukiai-ku, Kobe City, Japan

Filed Oct. 21, 1970, Ser. No. 82,717

Claims priority, application Japan, Oct. 24, 1969, 44/84663; Sept. 24, 1970, 44/83224; Sept. 24, 1970, 45/83223

Int. Cl. C21b *1/10, 3/02*

U.S. Cl. 75—58 **6 Claims**

A desulfurization composition for off-furnace use consisting of crushed particles of sintered material comprising 100 parts by weight of calcium oxide and 3 to 50 parts by weight, in total, of at least one compound selected from the group consisting of up to 30 parts by weight of calcium fluoride, sodium fluoride, magnesium fluoride, barium fluoride, and sodium silicofluoride, and up to 40 parts by weight, in terms of sodium carbonate, of sodium carbonate, sodium hydroxide, and sodium oxide.

3,716,353

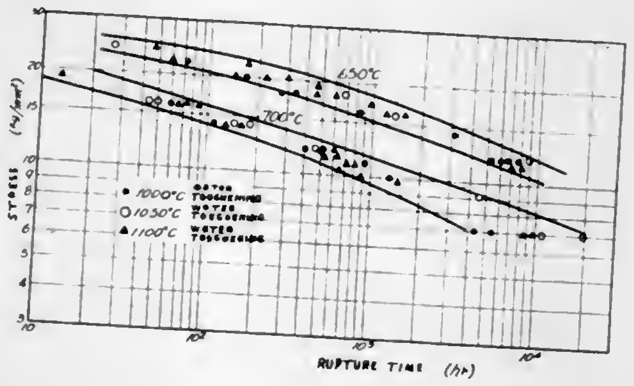
AUSTENITIC HEAT RESISTING STEEL

Tohru Mimino, No. 20-17, 1-chome, Minami, Meguro-ku, Tokyo; Kazuhisa Kinoshita, Totsuka-ku, Yokohama-shi, Kanagawa-ken; Ryohei Tanaka, Hodogaya-ku, Yokohama-shi, Kanagawa-ken, and Takayuki Shinoda, Toshima-ku, Tokyo, all of Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed March 10, 1970, Ser. No. 18,245

Int. Cl. C22c *39/20*

U.S. Cl. 75—128 G **2 Claims**



Cr–Ni system austenitic heat resisting steel having higher heat resistibility at elevated temperatures and for a longer time than common austenitic stainless steel by the multiplied effects of 0.03 to 0.30 C, Ti + Nb content and that the atomic ratio of Ti + Nb/C is within range of 0.05 to 1.0, 0.2 to 4.0% Mo and 0.04 to 0.15% N.

3,716,354

HIGH ALLOY STEEL

Orville W. Reen, Lower Burrell, Pa., assignor to Allegheny Ludlum Industries, Inc., Pittsburgh, Pa.

No Drawing. Filed Nov. 2, 1970, Ser. No. 86,358

Int. Cl. C22c *39/20, 39/50*

U.S. Cl. 75—128 W **5 Claims**

Described herein is a composition consisting essentially of, in weight percent, 16–25% chromium, 10–22% nickel, 4–10% molybdenum, up to 0.08% carbon, up to 2.0% manganese, up to 1.5% silicon and the balance essentially iron and steel making residuals.

3,716,355

ALUMINUM BASE ALLOY

Keith Gordon Wikle, Oak Harbor, Ohio, and Richard George O'Rourke, Fremont, both of Ohio, assignors to The Brush Beryllium Company, Cleveland, Ohio

Filed Sept. 30, 1971, Ser. No. 185,440

Int. Cl. C22c *21/02*

U.S. Cl. 75—142 **8 Claims**

There is provided an aluminum base alloy characterized by a substantial amount of silicon and nickel together with smaller amounts of copper and magnesium, and further characterized by the presence therein of beryllium and titanium, said alloy being useful in making molds where hardness and replication of fine detail is required. Latent within the as-cast alloy is developable hardness, fine grain structure, and freedom from microporosity obtained by submitting the alloy cast at from 1,000° to 1,100° F. to a further thermal history.

3,716,356

RHENIUM CONTAINING GOLD ALLOYS

Arthur Peter Burnett, Tariffville, Conn., assignor to The J. M. Ney Company, Bloomfield, Conn.

Continuation-in-part of Ser. No. 764,589, Oct. 2, 1968, abandoned, which is a continuation-in-part of Ser. No. 665,995, July 26, 1967, abandoned. This application Sept. 23, 1970, Ser. No. 74,825. The portion of the term of this patent subsequent to May 30, 1989, has been disclaimed.

Int. Cl. C22c *5/00*

U.S. Cl. 75—165 **8 Claims**

There is disclosed a novel and improved gold alloy containing at least about 5.5 per cent of palladium and about 0.03 to 1.0 per cent by weight of rhenium, and either or both of platinum and iron when the palladium content is less than 25.0 per cent.

3,716,357

PREPARATION OF THORIATED NICKEL-CHROMIUM ALLOY POWDER

David John Ivor Evans, North Edmonton, Alberta; David Alan Wayne Fustakian, Edmonton, Alberta; Leon Fredrick Norris, and Robert William Fraser, both of Fort Saskatchewan, Alberta, all of Canada, assignors to Sherritt Gordon Mines Limited, Toronto, Ontario, Canada

Filed April 3, 1969, Ser. No. 813,214

Int. Cl. C22c *1/10*

U.S. Cl. 75—0.5 BC **8 Claims**

Nickel-chromium alloy powder containing dispersed refractory oxide particles is produced by heating nickel powder particles containing physically inseparable sub-micron refractory oxide particles, a major portion of which are fixed in the surfaces of the nickel particles, in contact with a chromium source material, such as chromium powder or chromium oxide, in a flowing atmosphere of pure dry hydrogen at an elevated temperature and for a time sufficient to effect diffusion of chromium into the nickel particles and to reduce excess oxygen to an acceptable level.

3,716,358

COLLOID METALLURGY

Akira Oka, 71, 1-chome, Sugamo, Toshimu-ku, Tokyo, Japan

Continuation-in-part of Ser. Nos. 611,253, Jan. 24, 1967, abandoned, and Ser. No. 714,076, March 18, 1968. This application May 26, 1969, Ser. No. 827,997

Claims priority, application Japan, Jan. 25, 1966, 41/3885

Int. Cl. B22f *1/00*

U.S. Cl. 75—225 **14 Claims**

A process for producing non-porous full-density metal articles comprising forming a porous compact colloidal substantially pure metal particles having a maximum mean particle size of 0.2 micron, said metal being at least one metal selected from silver and the metals of groups IIIb, IVb, Vb, and VIII of the Periodic Table of the Elements, and then sintering said porous compact at a temperature substantially below the melting point of said metal and thereby forming a non-porous fully dense metal article within 10 minutes of initiation sintering, and maintaining said porous metal compact in a vacum or an inert atmosphere until said full-density metal article is formed.

3,716,359

CYCLIC RECORDING SYSTEM BY THE USE OF AN ELASTOMER IN AN ELECTRIC FIELD

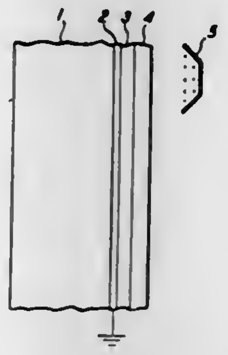
Nicholas K. Sheridon, Fairport, N.Y., assignor to Xerox Corporation, Rochester, N.Y.

Continuation of Ser. No. 23,649, March 30, 1970, abandoned. This application Dec. 28, 1970, Ser. No. 101,729

Int. Cl. G03g *13/22*

U.S. Cl. 96—1.1 **102 Claims**

The applications of elastomers to various imaging techniques are described which may be used for the cyclic recording, storage and subsequent erasure of optical information. Several embodiments of the invention are described, all of which form images by the elastic deformation of a thin elastomer layer. The pattern of the surface deformation, in general, follows the light distribution of the optical image being recorded. This image is formed on a photoconductive layer which is adjacent to, or integral with, the elastomer layer. An electric field is placed across the elastomer and the photoconductor layers, the field being modulated by the action of the image light on the conductivity of the photoconductor and provides the mechanical force necessary to deform the elastomer. Once the elastomer surface has deformed, it will in general remain deformed as long as the field across it is maintained; the image recorded, accordingly, being stored. Removing the electric field allows the elastomer to relax and the image is consequently erased. Reversing the field increases the rate at which the image is erased. A new image may now be formed, and the cycle started over again. Such an elastomer material is capable of a great many recording/storage/erasure cycles.



3,716,360

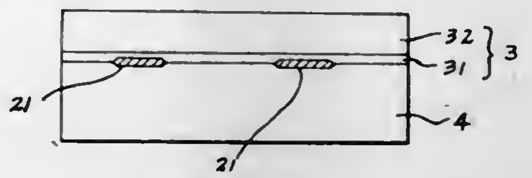
MOLTEN IMAGE TRANSFER IN ELECTROPHOTOGRAPHY

Osamu Fukushima, Hajime Miyatuka, and Satoru Honjo, Asaki-shi, Saitama, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Kanagawa, Japan

Filed Feb. 19, 1971, Ser. No. 116,964

Int. Cl. G03g *13/22*

U.S. Cl. 96—1.4 **7 Claims**



A process of transferring a toner image obtained by electrophoretic development comprising employing a liquid developer containing a thermoplastic resinous material which is included in the developed image, forming an image on an electrophotographic recording layer, bringing a heat-sensitive adhesive tape into an intimate contact with said image, heating the assembly so as to soften the resinous material included in the developed image but not to soften the heat-sensitive adhesive layer whereby the image is perfectly transferred to the adhesive tape, separating the tape from the recording layer and finally laminating the image-bearing tape onto a suitable support by softening the adhesive layer.

It should be noted that the recording layer does not melt nor soften at the temperature at which the developed image is softened and transferred.

3,716,361

PROCESS OF FORMING SILVER TRANSFER IMAGES

Robrecht Julius Thiers, Brasschaat; Josef Frans Willems, Wibijk, and Roger Alois Spriet, Edegem, all of Belgium, assignors to Gevaert-Agfa N.V., Mortsel, Germany

Filed Oct. 12, 1970, Ser. No. 80,151

Claims priority, application Great Britain, Oct. 27, 1969, 52,571/69

Int. Cl. G03c *5/54*

U.S. Cl. 96—29 R **12 Claims**

A process for the production of silver images according to the silver complex diffusion transfer process carried out in the presence of a hydroxylamine derivative developing agent and a (poly)amino(poly)carboxylic acid sequestering agent in acid form or in the form of a water-soluble salt is described. Better quality transfer images at substantially lower illumination levels are realized.

3,716,362

PROCESS FOR THE REMOVAL OF METALLIC SILVER FROM PHOTOGRAPHIC MATERIAL

Max Meier, Fribourg, Switzerland, assignor to Ciba-Geigy AG, Basle, Switzerland

Filed July 21, 1970, Ser. No. 56,945

Claims priority, application Switzerland, July 30, 1969, 11605/69

Int. Cl. G03c *7/00, 5/50, 5/32*

U.S. Cl. 96—60 R **49 Claims**

A process for removing metallic silver from photographic materials is provided, wherein any sparingly soluble silver salts present are not attacked. This process comprises treating the photographic material with an acid bath free from anions that form sparingly soluble silver salts and which bath contains an oxidant and a complexing agent. The oxidant has a standard redox potential of at most +0.8 Volts and the complexing agent has a silver complex stability constant of at most 10^9 (liter/mole)^2. This process is of special importance in carrying out the silver dye bleach negative-positive process. The main advantage of the process is the fact that it uses only a small number of bathes and no strong oxidants.

3,716,363

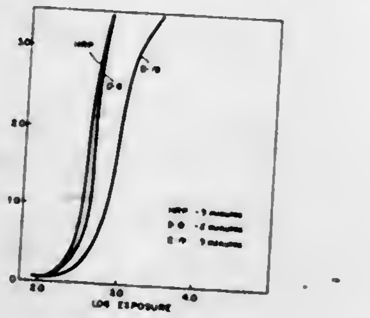
METHOD OF MAKING PHOTOMASKS OF THE TYPE USED IN THE FABRICATION OF MICRO-ELECTRONIC CIRCUITS

Paul A. Ruggerio, Auburn, Mass., assignor to GTE Laboratories Incorporated, Bayside, N.Y.

Filed Feb. 5, 1971, Ser. No. 112,940

Int. Cl. G03c *5/24, 5/26, 5/30*

U.S. Cl. 96—66 R **13 Claims**



A method of making photomasks containing lines of various widths for use in the fabrication of microelectronic circuits. The method utilizes a two-step development process to essentially eliminate the effects of optical diffraction and provide both thick and thin lines having a high degree of acutance, density and dimension control. The first development step utilizes a low-contrast developer to produce a nearly constant-density image over a wide exposure latitude. The second step employs a high-contrast developer which enhances the density in areas developed by the first step.

3,716,364

DIAZOTYPE MATERIALS

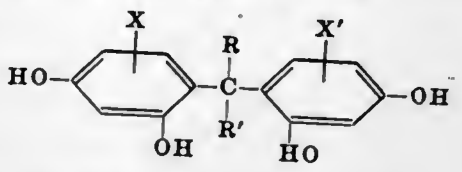
Joseph K. Gogola, Rolling Meadows, Ill., assignor to Addressograph-Multigraph Corporation, Mount Prospect, Ill.

Filed Sept. 2, 1970, Ser. No. 69,167

Int. Cl. G03c *1/58*

U.S. Cl. 96—75 **5 Claims**

Two-component diazotype sheet materials are described which form dense azo dye images and produce only slight bleeding and background coloration. The sheet material is coated with a conventional light-sensitive diazo compound and a coupling component of the formula



wherein R is lower alkyl or lower hydroxyalkyl, R′ is hydrogen or lower alkyl, and X and X′ are hydrogen, halogen, lower alkyl, lower alkoxyl, sulfo or nitro.

3,716,365

PROCESS FOR MAKING BREWERS' WORT

Martin F. Walmsley and John V. Cross, London, Ontario, Canada, assignors to John Labatt Limited, London, Ontario, Canada

Continuation-in-part of application Ser. No. 841,830, July 15, 1969. This application July 7, 1970, Ser. No. 52,999

Claims priority, application Great Britain, July 8, 1969, 34,409/69; July 21, 1969, 36,473/69, 36,474/69; July 23, 1969, 36,964/69

Int. Cl. C12c *7/00*

U.S. Cl. 99—51 **16 Claims**

This invention provides a process for manufacturing a brewers' wort in which an aqueous slurry of a raw starch-containing material is treated under defined temperature and time conditions with discrete amylase and protease enzymes employed at defined activity levels and amylase: protease ratios with respect to the starch-containing material. In this process, the mash bill contains no more than about 30% by weight malt, advantageously no more than about 20% by weight, so that the traditional reliance upon malt (a relatively expensive and complex material) is greatly lessened. Preferably, the mash bill includes up to about 60% by weight of a cereal adjunct, say liquefied corn grits. Preferred embodiments of this process are based on a mashing cycle with a proteolytic reaction at 40° to 55° C. for 30 to 120 minutes followed by a stepwise solubilisation and saccharification procedure involving heating at 64° C. to 68° C. for 35 to 60 minutes at 70° to 80° C.

The invention also includes an enzyme system of defined and standardized activity for use in the conversion of the starch-containing material, and a process for the manufacture of beer or like non-distilled alcoholic beverage.

3,716,366

BIS-PYRIDINIUM SALT AND A PHENYL BORANATE AS PHOTOSENSITIVE COMBINATION

Oskar Riester, Leverkusen, Germany, assignor to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed Feb. 1, 1971, Ser. No. 111,764

Claims priority, application Germany, Feb. 19, 1970, P 20 07 524.5

Int. Cl. G03c *1/00, 1/52*

U.S. Cl. 96—88 **4 Claims**

Dark colored images are obtained by imagewise exposure of light-sensitive layers containing bis-pyridinium compounds and organic boran compounds as explained below.

3,716,367

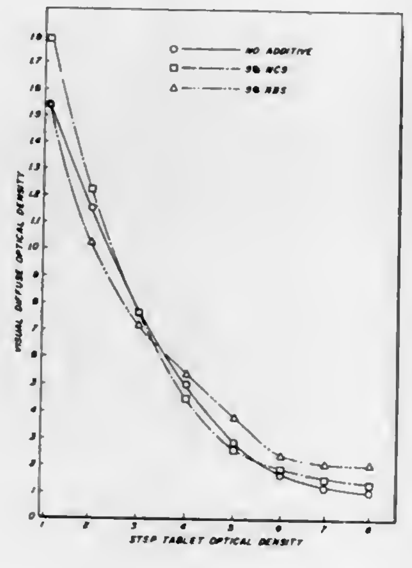
N-SUCCINIMIDE ADDITIVES FOR AZIDE IMAGING SYSTEMS

Hiel Ando, Stamford, Conn., assignor to American Cyanamid Company, Stamford, Conn.

Filed May 26, 1971, Ser. No. 147,111

Int. Cl. G03c *1/52, 1/72*

U.S. Cl. 96—91 N **6 Claims**



Dry photoimaging processes and compositions employing 1,8-diazidonaphthalene and certain N-substituted succinimide additives in a permeable film-forming plastic are disclosed.

3,716,368

PHOTOGRAPHIC, LIGHT-SENSITIVE MATERIAL CONTAINING A TRISAZO DYESTUFF

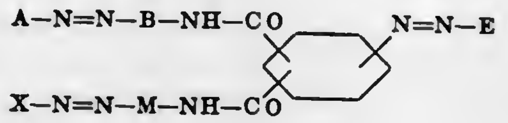
Alfred Froehlich, Marly-le-Grand; Bernhard Piller, Marly-le-Petit, and Hansrolf Loeffel, Berne, all of Switzerland, assignors to Ciba-Geigy AG, Basle, Switzerland

Continuation-in-part of Ser. No. 753,899, Aug. 20, 1968. This application Sept. 23, 1970, Ser. No. 74,860

Int. Cl. G03c *1/10*

U.S. Cl. 96—99 **17 Claims**

Photographic light-sensitive material, especially for the silver dyestuff bleaching process is provided. This material is characterized in that it contains on a support in at least one layer a trisazo dyestuff of the formula



wherein A, K, B and M each represents an aromatic or heterocyclic radical and E represents a radical derived from a coupling component. The dyestuff molecule moreover contains one or more groups conferring solubility in water and also may be present in the form of its metal complex compound. These trisazo dyestuffs absorb in the most diverse wave-length ranges. The trisazo dyestuffs are very fast to diffusion, have high color strength, are readily soluble and compatible with cations.

3,716,369

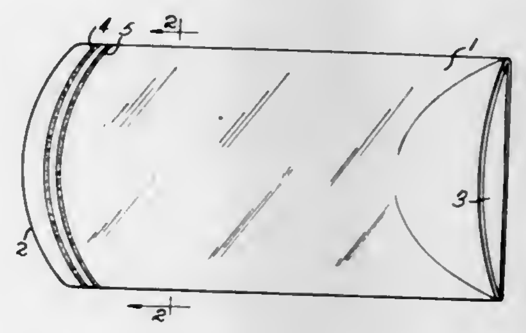
PROCESS FOR COOKING FOODS IN POLYALKYLENE TERAPHALATE FILM BAG

Sol J. Perlman, 150 West Ostend St., Baltimore, Md.

Continuation-in-part for Ser. No. 842,570, July 17, 1969, Pat. No. 3,578,239, which is a continuation-in-part of Ser. No. 630,961, April 14, 1967, Pat. No. 3,478,952. This application Aug. 5, 1970, Ser. No. 61, 049

Int. Cl. B65b *25/22*

U.S. Cl. 99—1 **9 Claims**



A process for cooking foods in polyalkylene terephthalate film bags is disclosed, wherein at least one side or bottom of such bags is formed by two distinct adhesive bands. The inner band is a thermoplastic adhesive which allows a measure of "-peelability" and "shock absorbability," whereas the outer adhesive band is a high strength thermosetting adhesive. During the cooking process the side of the bag having the adhesive bands will open to the atmosphere.

3,716,370

A METHOD OF HEATING A PACKAGE OF FOOD

Robert P. Bemiss, Hillsborough, Calif., assignor to Robolex, Inc.

Division of Ser. No. 844,494, July 24, 1969, Pat. No. 3,580,478. This application Feb. 24, 1971, Ser. No. 118,429

Int. Cl. B65b *29/08*

U.S. Cl. 99—1 **1 Claim**

The method provides for heating a food package by boiling wherein between the lid and the tray a liquid-tight mechanical connection is provided, plus a gas-tight meltable seal. In heating under water the seal melts and allows the escape of steam from the interior while the mechanical connection maintains the interior free of indrawn water.

3,716,371

SEPARATOR FOR NEGATIVELY PHOTOTACTIC HOUSEFLY LARVAE FROM CHICKEN HEN EXCRETA

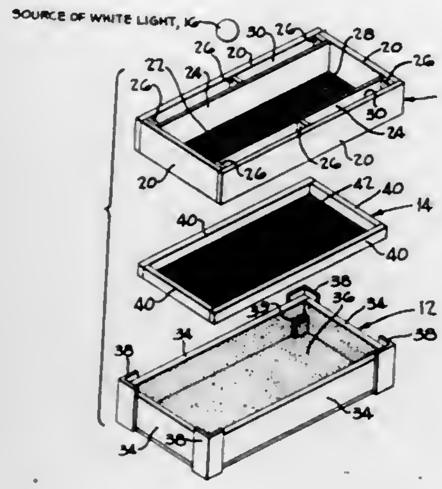
Corlette C. Calvert, Laurel, and Neal O. Morgan, Silver Spring, Md., and Richard D. Martin, Tucson, Ariz., assignors to the United States of America as represented by the Secretary of Agriculture

Filed Feb. 8, 1971, Ser. No. 113,470

Int. Cl. A23k *1/00*

U.S. Cl. 99—4 **3 Claims**

An apparatus for separating negatively phototactic housefly larvae from chicken hen excreta and collecting the larvae to allow them to pupate comprised of two compartments, an upper one having a screened floor and a lower one having a solid floor, a screened tray fitted into the lower compartment and a source of white light. Chicken hen excreta in the upper compartment is seeded with housefly eggs, the eggs are allowed to hatch and the larvae to tunnel and aerate the manure, thus deodorizing and reducing the moisture content of the manure by more than 50%. The larvae migrate out of the manure and pupate in the lower compartment. When dried and ground the pupae can be used as a protein source for growing chicks.



3,716,372
PROCESS FOR MANUFACTURE OF SOY CONCENTRATES, SOY ISOLATES AND RELATED PRODUCTS

Potito U. de Paolis, 144-D Camden Drive, Beverly Hills, Calif.
Continuation-in-part of Ser. No. 848,516, Aug. 8, 1969, abandoned. This application Nov. 16, 1970, Ser. No. 89,829
Int. Cl. A23j *1/14;* **A23l** *1/20*
U.S. Cl. 99—17 **10 Claims**

After destruction of the trypsin inhibitors in dehulled soy bean material (such as meal or flakes) as by boiling or near-boiling, in water, for a short period of time, the resulting solids are rendered almost 100 percent soluble or dispersible in water by introducing from about 0.1 ml. to about 2 ml. of a solution containing the enzyme catalase by weight, each ml. of solution containing 1000 Baker units of the enzyme catalase, to each 100 grams of starting soy bean material and not allowing any hydrogen peroxide to be introduced. The introduction of catalase into the soy bean material is found to produce a soy concentrate and soy isolate having almost 100 percent dispersibility and increased NSI solubility while having greatly improved flavor characteristics.

3,716,373
PROCESS FOR AGGLOMERATING INSTANT COFFEE

David Rhodes, 1 Heron Way, Broughton Park, and Derek Watridge, 22 Deep Dene Avenue, Dorking, both of England
Filed Nov. 20, 1970, Ser. No. 91,597
Int. Cl. A23f *1/08*
U.S. Cl. 99—71 **4 Claims**

An improved process for agglomerating soluble coffee powder has been discovered which produces agglomerates having a pleasing light color, good mechanical strength and a granular appearance. The coffee particles are compacted and form desired clusters on release from a feed box to the steam jets.

3,716,374
METHOD OF INCREASING SOLUBILITY OF FOOD ACIDULENTS

Esra Pitchon, Flushing, N.Y., assignor to General Foods Corporation, White Plains, N.Y.
No Drawing. Continuation-in-part of abandoned application Ser. No. 764,633, Oct. 2, 1968. This application July 12, 1971, Ser. No. 161,966
Int. Cl. A23l *1/00*
U.S. Cl. 99—78 **9 Claims**

Fumaric or adipic acid is partially coated with an aqueous mixture of larch gum and either propylene glycol or glycerol. The coated acid is impact milled to a particle size less than 25 microns and mixed with a hydroxycarboxylic acid such as citric acid. The mixture which can include granular sucrose is impact milled to form aggregates each having a particle size less than 25 microns and a moisture content of from about 1% to about 5%.

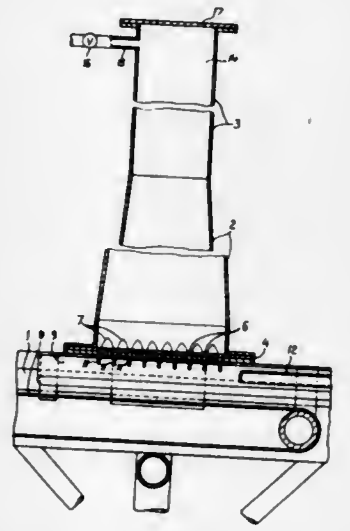
3,716,375
CONTINUOUS BREW FERMENTATION

Melburn B. Hancock, Richmond, Va., assignor to AMF Incorporated
Filed April 15, 1970, Ser. No. 28,582
Int. Cl. A21d *8/02*
U.S. Cl. 99—90 CB **18 Claims**

A method for the continuous production of a fermented brew for use in the preparation of dough for bakery products. A fermentable mixture is continuously introduced into a first fermentation chamber wherein, as the fermentation proceeds, the increments of the mixture introduced earlier will remain above the increments introduced later because of their lower relative density. As the increments attain a minimum density they are continuously transferred from the top of the first fermentation chamber into a second fermentation chamber in which, as fermentation proceeds further, the density of the increments increases so that the earlier introduced increments remain below those later introduced. The increments are removed continuously from the second chamber after their density has increased to a predetermined level.

3,716,376
METHOD AND APPARATUS FOR MAKING CHEESE

Reginald Thomas Clark, Staines, England, assignor to Alfa-Laval AB, Tumba, Sweden
Filed Nov. 12, 1969, Ser. No. 875,959
Claims priority, application Great Britain, Nov. 13, 1968, 53,924/68
Int. Cl. A23c *19/00;* **A01j** *25/12*
U.S. Cl. 99—115 **4 Claims**



Curds substantially freed from whey are fed into a vertical tower and extruded under pressure through a plurality of apertures in the base of the tower, and the curds are subjected to a lateral spreading action and to a lateral compressive action as they travel downwardly through the tower toward the extrusion apertures. The extruding pressure may be provided by applying pneumatic pressure to a head space in the tower, and the extruded curd may be cut into separate lengths by cutting means located below the tower base.

3,716,377
PREPARATION OF CHEESE

Arthur Bratland, Maudsvei 9, Heie, Notteroy, Norway
Filed Aug. 28, 1969, Ser. No. 853,940
Claims priority, application Norway, Sept. 3, 1968, 3410/68
Int. Cl. A23c *19/02*
U.S. Cl. 99—116 **5 Claims**

Cheese is made from an emulsion which contains a fat fraction including at least 25 percent non-milk fat, fat-free milk solids, butter serum and buttermilk.

3,716,378
PREPARATION OF FOODSTUFFS CONTAINING A HIGH CONTENT OF EMULSIFIED FAT

Arthur Bratland, Maudsvei 9, Heie, Notteroy, Norway
Continuation of Ser. No. 764,343, Oct. 1, 1968, abandoned. This application March 24, 1971, Ser. No. 127,787
Claims priority, application Norway, Oct. 2, 1967, 169,934; Sept. 6, 1968, 3464/68
Int. Cl. A23d *3/02*
U.S. Cl. 99—122 R **9 Claims**

A process for preparing foodstuffs such as cream substitutes, margarine and the like involving emulsifying fat and fat-poor milk constituents containing membrane substances that enclose the fat globules in milk.

3,716,379
PREPARATION OF BEEF AND CHICKEN FLAVORING AGENTS

Pierre Joseph van Pottelsberghe de la Potterie, Columbus, Ohio, assignor to Societe D'Assistance Technique pour Produits Nestle SA, Lausanne, Switzerland
Filed Oct. 6, 1970, Ser. No. 78,590
Int. Cl. A23l *1/26*
U.S. Cl. 99—140 N **12 Claims**

Meat flavoring agents are obtained by reacting a plant protein hydrolysate with thiamine and a mono or polysaccharide, the hydrolysate containing no cystine or cysteine.

3,716,380
BEEF FLAVOR

Pierre Joseph van Pottelsberghe de la Potterie, Columbus, Ohio, assignor to Societe D'Assistance Technique pour Produits Nestle SA, Lausanne, Switzerland
Filed Oct. 6, 1970, Ser. No. 78,591
Int. Cl. A23l *1/26*
U.S. Cl. 99—140 N **14 Claims**

A beef flavoring agent is obtained by reacting a protein hydrolysate, methionine and a saccharide, optionally in the presence of a carboxylic acid.

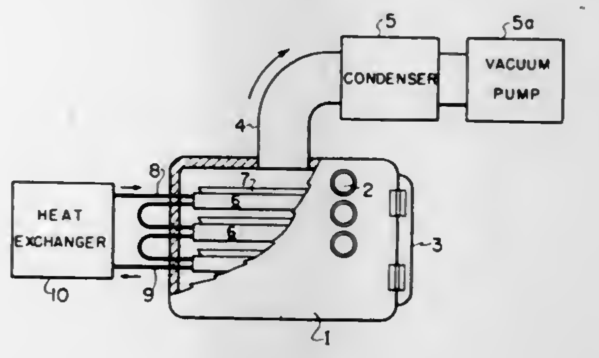
3,716,381
METHOD OF PRESERVING MEAT AND FISH WITH A GRANULAR SORBIC ACID FOOD PRESERVATIVE

Ryuzo Ueno, Nishinomiya; Tetsuya Miyazaki, Itami, and Shigeo Inamine, Nishinomiya, all of Japan, assignors to Ueno Pharmaceutical Co., Ltd., Higashi-ku, Osaka, Japan
Continuation-in-part of Ser. No. 714,454, March 20, 1968, abandoned. This application Aug. 14, 1970, Ser. No. 63,913
Claims priority, application Japan, March 27, 1967, 42/18677
Int. Cl. A23b *1/00, 3/00*
U.S. Cl. 99—157 **12 Claims**

A method of preserving meat and fish products subjected to heat treatment in a final finishing which comprises adding to the raw meat or fish a granular preservative comprising sorbic acid powder particles whose surface has been coated with a hardened oil, said preservative being prepared by the steps comprising melting a hardened oil having a melting temperature of 40°–90° C., adding to said melted hardened oil maintained at a temperature not exceeding 90° C., sorbic acid powder in an amount of 1/10 to ½ of the weight of said hardened oil, dispersing the sorbic acid powder uniformly in the melted hardened oil at said temperature, and thereafter cooling the melted mixture by spraying it.

3,716,382
SLUSH-DRYING OF LIQUID FOODS

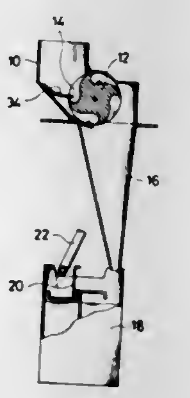
Santosh K. Chandrasekaran, Albany, and Cary Judson King III, Kensington, Calif., assignors to the United States of America as represented by the Secretary of Agriculture
Filed June 24, 1970, Ser. No. 49,410
Int. Cl. A23b *7/02*
U.S. Cl. 99—205 **1 Claim**



Liquid foods are dehydrated by subjecting them to a vacuum and to a temperature only low enough to freeze part of the water content to produce a slush. A high drying rate, coupled with good flavor retention is provided.

3,716,383
APPARATUS FOR THE PRODUCTION OF SNACK FOOD

Koji Yamamura, 10-11, 1-chome, Minemachi, Chofu, Tokyo, Japan
Filed Sept. 25, 1970, Ser. No. 75,476
Int. Cl. A47j *37/12;* **A23l** *1/10*
U.S. Cl. 99—353 **3 Claims**



The material of food is first supplied into a supply source and is then divided into a proper amount by a rotary feed drum having several recesses for a further intermittent feed of the material through a guide hopper into an oil tank serving as a fry pan provided at the bottom of the apparatus. The fried material is continuously taken up for the edible oil with an action of a rotary vane and is then blown away by a blower onto an oil strainer means for removing the residual oil and finally the resultant snack food is collected in a container.

3,716,384

COMPOSITIONS FOR SEALING LEAKS IN VESSELS

Amos R. Anderson, Adrian, Mich., assignor to Joseph J. Packo
Division of Ser. No. 7,210, Jan. 30, 1970, Pat. No. 3,634,560. This application May 12, 1971, Ser. No. 142,795
Int. Cl. C09k *3/10, 3/12*
U.S. Cl. 106—33 **4 Claims**

The invention relates to compositions for sealing leaks in pipes, conduits, gas lines, closed containers, tanks and the like. The interior of such equipment is first purged with a non-reactive dry gas, such as nitrogen, to remove any moisture and/or oxygen which may be present. Then the sealant composition is introduced into the interior of the equipment in a suitable inert gas vehicle under pressure. The sealant composition in the gas vehicle will escape from any leaks present in the equipment into the adjacent external environment such as the outer ambient atmosphere or adjacent soil in the case of pipelines buried in soil. The sealant reacts with oxygen and/or moisture to form at the situs of the leak a solid reaction product.

The sealant compositions comprise pyrophoric volatilizable alkyl aluminum etherates. Illustrative examples are trimethylaluminum dimethyletherate, trimethylaluminum diethyletherate, and triethylalumin diethyletherate. These and similar compounds may be used singly or in mixtures thereof. They may also be mixed with volatile organo-silane compounds in amounts ranging from about 1 to 99 percent by volume. Specific illustrative organo-silane compounds are trimethyl ethoxy silane, dimethyl diethoxy silane, and propyl trimethoxy silane.

3,716,385

OPTICAL GLASSES COMPRISING AlF_3 HAVING A VARYING PARTIAL DISPERSION

Willy Ritze, Mainz-Mombach, Germany, assignor to JENAer Glaswerk Schott & Gen., Mainz, Germany
Filed Apr. 6, 1970, Ser. No. 25,871
Claims priority, application Germany, Apr. 11, 1969, P 19 18 350.7
Int. Cl. C03c *3/00*
U.S. Cl. 106—47 Q **3 Claims**

Optical, fluorine-containing barium silicate or barium borosilicate glasses having a varying partial dispersion, characterized in that they consist essentially of:

	Wt. percent
SiO_2	15–45
B_2O_3	0–15
$SiO_2+B_2O_3$	30–47
BaO	25–56
BaF_2	0–10
$BaO+BaF_2$	35–56
AlF_3	3–18

3,716,386

PROCESS FOR DISPERSING FIBRE IN AN AQUEOUS MIX

Edward Kempster, Kings Langley, England, assignor to National Research Development, London, England
No Drawing. Filed Nov. 9, 1970, Ser. No. 88,201
Claims priority, application Great Britain, Nov. 12, 1969, 55,419/69
Int. Cl. C04b *7/02*
U.S. Cl. 106—90 **8 Claims**

A process for preparing a fibrous mix in which the fibre content of the mix is immersed in a solution of polyethylene oxide or methyl cellulose prior to its incorporation in the mix. Examples are described in which the basic constituent of the mix is cement or plaster and the fibres are glass fibres, steel wires, or nylon fibres.

3,716,387

CEMENT CLINKER PRODUCTION

Kenneth D. Simmons, New Canaan, Conn.; Henry W. Allen, Saverna Park, and Ronald F. Gebhardt, Randallstown, both of Md., and Hoke M. Garrett, Piedmont, Calif., assignors to Martin Marietta Corporation, New York N.Y.
Filed Dec. 16, 1970, Ser. No. 98,614
Int. Cl. C04b *7/28*
U.S. Cl. 106—100 **47 Claims**

Calcareous rock having an appreciable kerogen content, forming up to 75 percent of kerogen-bearing limestone deposits and previously unsuited for use in cement producing operations, is roasted at 800°–1,600°F, preferably at 1,000°–1,350F, in an oxidizing atmosphere to reduce the kerogen content to tolerable levels and render the roasted rock suitable as kiln feed material for cement production operations. The entire kerogen-containing limestone deposit can thereby be effectively utilized in such operations.

The quality of the roasted rock as kiln feed material is enhanced by the entrainment of impurities in the air stream used to cool the roasted rock, in the roaster effluent gases and in the heated gas stream used for drying of the rock prior to roasting. The effluent gases from the roaster and heated air from the cooling zone can be employed for the drying of additional quantities of rock. By carrying out the primary crushing of the rock so as to minimize the production of limestone fines, thus minimizing the amount of limestone material removed from the treated rock with the impurity-laden fines entrained in said gas streams, the quality of the treated rock may be further enhanced. With raw rock from interbedded deposits having thin bands of limestone separated by thin bands of shale, a single roll crusher can be used to minimize the production of limestone fines. Sulfur is removed from the roasted rock without release of sulfur-containing gases to the atmosphere, such removal being enhanced at temperature above 1,000°F. At such temperatures, the kerogen content of the roasted rock is reduced to from about 0.8 to 1.5 percent by weight of rock. In the effective utilization of limestone deposits having both high quality rock with tolerable amounts of hydrocarbons and said rock with appreciable kerogen hydrocarbon content, the high kerogen material, previously unused, can be employed for about 50 to 90 percent of the calcareous material used in cement clinker production, thereby avoiding premature depletion of the high quality rock and assuring effective utilization of the entire deposit.

3,716,388

COLORING COMPOSITIONS

Benito Lopez, Parsippany, and Saul S. Kornblum, Springfield, N.J., assignors to Sandoz-Wander, Inc., Hanover, N.J.
No Drawing. Continuation-in-part of abandoned application Ser. No. 748,593, July 30, 1968. This application Sept. 11, 1970, Ser. No. 71,428
Int. Cl. C08h *17/66;* **C08k** *1/24*
U.S. Cl. 106—289 **13 Claims**

A lake dye composition of a F.D. & C., D. & C. and External D. & C., or non-certified dye adsorbed on an insoluble fumed inorganic oxide substrate, e.g., titanium dioxide. It is useful for color coating pharmaceutical, cosmetic, food and other solid forms.

3,716,389

PIGMENT COMPOSITION AND ITS USE IN ELECTRODEPOSITION

Donald J. Voskuil, Muskego; John P. Knudtson, Milwaukee, and Myron J. Krupp, Grafton, all of Wis., assignors to PPG Industries, Inc., Pittsburgh, Pa.
Filed Feb. 2, 1971, Ser. No. 112,090
Int. Cl. C09c *3/00*
U.S. Cl. 106—309 **10 Claims**

When a mixture of dissimilar pigments are employed in an aqueous composition, for example, an electrodeposition bath, pigment separation is frequently noted. It has now been found that by preparing two aqueous pigment portions such as (A) a pigment, an anion-active agent, and a soluble silicate; and (B) a pigment, a cation-active agent, and a soluble metal salt capable of forming an insoluble silicate and then mixing (A) and (B), thereafter forming a convention pigment, this problem is reduced or eliminated. The pigments prepared in this manner may be used as pigments in electrodepositable compositions.

3,716,390

PHOTORESIST METHOD AND PRODUCTS PRODUCED THEREBY

Victor Charles Garbarini, Bethlehem, Pa., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.
No Drawing. Continuation-in-part of abandoned application Ser. No. 783,770, Dec. 13, 1968. This application May 27, 1970, Ser. No. 41,075
Int. Cl. B44d *1/02*
U.S. Cl. 117—34 **11 Claims**

The adherence of photoresist materials to many substrates is improved by use of a substrate primer of an ionic complexed compound capable of carrying an appropriate organo group for reaction with the photoresist, and capable of electrostatically migrating to the substrate for the formation of strong chemical bridges therewith.

3,716,391

PROCESS FOR GRAFT POLYMERIZATION ONTO ORGANIC MACROMOLECULAR MATERIALS

Kirokuro Hosoda, Yokohama-shi; Yoshio Kadowaki, Tokyo; Eisuke Oda, and Nobuo Hoshino, both of Yokohama-shi, all of Japan, assignors to The Furukawa Electric Company Limited, Chiyoda-ku, Yokyo, Japan
Filed Sept. 10, 1969, Ser. No. 856,643
Claims priority, application Japan, Sept. 14, 1968, 43/66276; Oct. 19, 1968, 43/76215
Int. Cl. B44d *1/092, 5/12*
U.S. Cl. 117—47 A **21 Claims**

A process for graft polymerization of monomers onto organic macromolecular solid materials which comprises activating a macromolecular shaped article having a specific surface area of less than 3800 cm^2/g with ozone under a condition of any point of the area defined by straight lines connecting p_1, c_1, c_{10}, p_{10} in the attached FIG. 1, and further bringing said ozone activated material into contact with one or more radical polymerizable monomers in the presence of one or more members selected from the group consisting of trimethylamine, propylamine, ethylenediamine, piperidine, piperazine, morpholine, ethanolamine, hydroxyethyl ethylenediamine, pyridine, formamide and dimethyl formamide.

3,716,392

COMPOSITIONS FOR AND METHODS OF IMPROVING ADHESION OF PLATED METAL ON PLASTIC SUBSTRATES

John J. Grunwald, New Haven, and Eugene D. D'Ottavio, Thomaston, both of Conn., assignors to MacDermid Incorporated, Waterbury, Conn.
Division of Ser. No. 645,901, June 14, 1967, Pat. No. 3,579,365. This application May 11, 1970, Ser. No. 48,713. The portion of the term of this patent subsequent to May 18, 1988, has been disclaimed.
Int. Cl. B01j *13/00;* **B44d ; G08h** *9/00*
U.S. Cl. 117—47 A **9 Claims**

A method of and composition for promoting adhesion between plated metal and a plastic substrate, in which the active agent is provided in finely divided dispersed or colloidal form in an aqueous emulsion. The active agents are any of a group of low molecular weight organic unsaturated compounds of the fatty acid type, and more especially of the group of naturally occurring products such as linseed, tall, tung and castor oils, turpentine and similar wood rosins. These, when dispersed in water to provide stable emulsions, are used as a pretreatment bath for plastic substrates, prior to plating of the substrate, in order to promote the formation of a stronger bond between the metal plate and substrate.

3,716,393

PROCESS FOR ANTISTATICALLY TREATING ARTICLES

Robert L. Baker and Edward Szlosberg, Greenville, S.C., assignors to Phillips Fibers Corporation, Bartlesville, Okla.
Filed Feb. 8, 1971, Ser. No. 113,618
Int. Cl. B44d *1/092*
U.S. Cl. 117—47 R **5 Claims**

A process for treating an electrically chargeable article with an anionic resist-agent and thereafter treating the article with a cationic agent to condition said article for lower accumulation of static charges of electricity thereon.

3,716,394

PROCESS OF METAL PLATING HYDROHALOGEN POLYMER SURFACE

Terry B. Waggoner, Overland Park, Kans., and Edgar J. Seyb, Jr., Oak Park, Mich., assignors to M&T Chemicals Inc., Greenwich, Conn.
Continuation-in-part of Ser. No. 574,954, Aug. 25, 1966, Pat. No. 3,639,153. This application March 9, 1971, Ser. No. 122,516
Int. Cl. B23b *15/08;* **C23c** *3/02*
U.S. Cl. 117—47 A **1 Claim**

This invention relates to a method of modifying a hydrohalogen polymer surface wherein said hydrohalogen polymer is selected from the group consisting of polyvinyl chloride, polyvinylidene chloride, and polyvinyl dichloride which comprises contacting the hydrohalogen polymer surface with an alkali metal alkoxide MOR wherein M is an alkali metal and R is an alkyl group at a temperature of 2° to 106° C for a time increment of 5 minutes to 300 minutes thereby forming an alkoxide-activated surface thereof; contacting said surface with an oxygen-containing oxidizing agent of sufficient strength to convert an olefinic double bond to the corresponding aldehyde or carboxyl group to form an oxygen-activated, alkoxide-activated surface; and electrolessly depositing onto said surface a metal deposit.

3,716,395

PROCESS OF PRODUCING PIGMENTED, A HARDENABLE RESIN CONTAINING PAPER SHEETS, AND PRODUCTS

Hans Bauer, Ulm-Wiblingen; Helmut Holzer, Neu-Ulm/Donau, both of Austria, and Gerhard Schmidt, Altheim ob Weithung, all of Germany, assignors to Sued-West-Chemie GmbH, Neu-Ulm/Donau, Germany
Filed Oct. 31, 1968, Ser. No. 772,400
Claims priority, application Germany Oct. 31, 1967, P 16 96 261.1
Int. Cl. B05c *9/04*
U.S. Cl. 117—68 **10 Claims**

A paper sheet is impregnated with a hardenable resin and a pigment and is coated with a mixture of a hardenable resin, a pigment, and a plasticizer. It may additionally be provided with a substratum layer of a hardenable resin on the surface opposite the coated surface. Such a paper sheet can be attached to a suitable base or carrier material by hot pressing. The paper sheet of this invention has the advantage over the heretofore used, simply coated paper sheet that the basis weight of the paper and the amount of impregnating resin can be reduced, that the paper, after pressing, has a higher degree of flexibility, that its craze and crack resistance is considerably improved, and that its hiding, masking, or covering power is superior to that of heretofore produced pigmented and resin coated paper sheets so that light color shades of the resulting laminated articles can be producéd in a simple and inexpensive manner. The preferred hardenable impregnating and coating resin in a melamine-urea-formaldehyde resin.

3,716,396

PROCESS FOR PRODUCING POLYESTERS OF IMPROVED RUBBER ADHESION AND PRODUCT

Kenji Shirano, and Toshihiko Yoshitake, both of Kurashiki, Japan, assignors to Kuraray Co., Ltd., Kurashiki, Japan

Filed April 15, 1971, Ser. No. 134,418

Int. Cl. B32b *25/08, 27/36*

U.S. Cl. 117—76 T **20 Claims**

Rubber adhesion properties of fibrous polyester materials are improved by a process which comprises applying a solution of an amine compound, such as polyethylene imine, to said fibrous material, subjecting the resulting fibrous material to heat treatment and then treating said fibrous material with an organic solvent solution of a polycarboxylic acid halide such as adipic acid dichloride.

3,716,397

TREATING MICROPOROUS MATERIAL

Frank Peter Civardi, 98 Kiwanis Drive, Wayne, N.J., and Hans-George Kuenstler, 149-32 12th Road, Whitestone, N.Y.

Filed Dec. 21, 1970, Ser. No. 100,290

Int. Cl. B44d *1/02*

U.S. Cl. 117—77 **18 Claims**

Microporous elastomeric sheet material, suitable for use in making shoe uppers, is pigmented throughout its thickness by impregnating it with a dilute aqueous pigmented latex, to deposit pigment within the micropores. Preferably the latex is anionic and the impregnated sheet is treated with acid; this produces a pigmented sheet of superior uniformity.

3,716,398

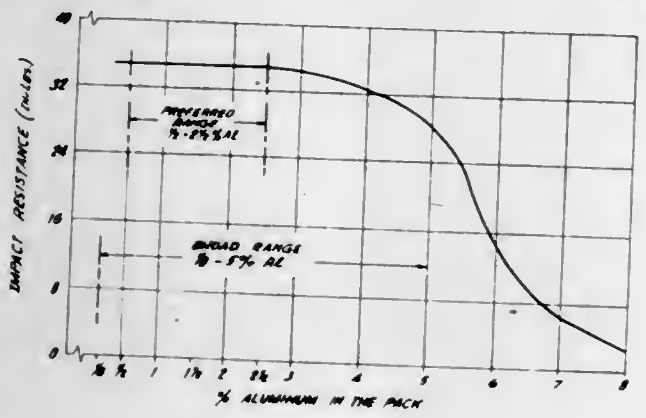
IMPACT RESISTANT COATINGS FOR NICKEL-BASE AND COBALT-BASE SUPERALLOYS AND THE LIKE

Richard J. Stueber, Suffern, N.Y., and Stanley J. Klach, Riverdale, N.J., assignors to Chromalloy American Corporation, Orangeburg, N.Y.

Filed Aug. 19, 1970, Ser. No. 65,147

Int. Cl. C23c *9/02*

U.S. Cl. 117—107.2 P **3 Claims**



In the production of impact and oxidation resistant nickel-base metal coatings on heat resistant superalloys by pack aluminizing in which nickel aluminide is formed to provide the protective coating, markedly improved ductile coatings are produced of high impact resistance by controlling the amount of aluminum in the pack which also contains about 5 to 40 percent by weight of chromium, the amount of aluminum not exceeding 3 percent by weight of the pack.

3,716,399

WATER-REPELLENT COMPOSITION FOR TREATING BUILDING MATERIALS

Siegfried Nitzsche; Ewald Pirson, and Michael Roth, all of Burghausen, Upper Bavaria, Germany, assignors to Wacker-Chemie G.m.b.H., Bavaria, Germany

Continuation-in-part of Ser. No. 772,854, Nov. 1, 1968, abandoned. This application Dec. 3, 1970, Ser. No. 94,981

Claims priority, application Germany, Nov. 3, 1967, W 45102

Int. Cl. C04b *41/28;* **C08g** *47/10*

U.S. Cl. 117—123 D **7 Claims**

A mixture of methylpolysiloxanes and polymethylmethacrylate or vinylchloride copolymers in organic solvent is employed to impart water-repellency to masonry and gypsum-based building materials, inter alia.

3,716,400

COATING PROCESS FOR METAL CONTAINERS

Joseph J. Tryzna, Evergreen Park, and George L. Becker, Chicago, Ill., assignors to Continental Can Company, Inc., New York, N.Y.

No Drawing. Original application Dec. 12, 1967, Ser. No. 689,789, now Patent No. 3,513,115. Divided and this application Mar. 5, 1970, Ser. No. 26,448

Int. Cl. B44d *1/36.* **C09d** *3/58*

U.S. Cl. 117—132 BE **2 Claims**

A process for coating a sheet metal substrate for metal food containers comprising applying to said metal substrate a dispersion in a volatile organic solvent of (1) an organosol film component composed of (a) a dispersion grade vinyl chloride homopolymer; (b) a solution grade vinyl chloride copolymer resin, and (c) a plasticizer; (2) an adhesion promoting component comprised of a methylol phenol ether and a low molecular weight epoxy resin; and (3) a heat stabilizing component of a triazine-aldehyde resin and an epoxidized triglyceride and drying and curing the coated substrate.

3,716,401

PROCESS RENDERING VINYL SURFACES SOIL RESISTANT

Robert Jay Axelrod, Claymont, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 12, 1971, Ser. No. 171,307

Int. Cl. B44d *5/00;* **B32b** *27/08*

U.S. Cl. 117—138.8 UA **6 Claims**

A process for rendering vinyl surfaces resistant to soiling and readily cleanable by application thereto of a polymeric surface coating comprising a vinyl polymer in a volatile solvent and from about 0.2 percent to about 0.7 percent by weight of carboxylic esters of 2-perfluoroalkylethanol having the formula $C_nF_{2n+1}CH_2CH_2OH$ wherein n is from 6 to 14.

3,716,402

FILM FORMING COMPOSITONS FROM POLYCARBOXYLIC ACIDS AND ADDUCTS OF POLYEPOXIDES AND AMINES

Darrell D. Hicks, Jeffersontown, Ky., assignor to Celanese Coatings Company, New York, N.Y.

Continuation-in-part of Ser. No. 806,727, March 12, 1969, abandoned. This application May 24, 1971, Ser. No. 146,494

Int. Cl. C09d *3/58;* **B44d** *1/36*

U.S. Cl. 117—161 LN **11 Claims**

A curable coating composition having utility when applied as a film to a substrate from an aqueous solution is prepared from a mixture of (1) the reaction product of a polyfunctional epoxide compound and a primary amine with (2) a polycarboxylic acid or acid anhydride and, in some cases (3) an aminoplast resin.

3,716,403

METHOD OF MAKING SEMI-CONDUCTIVE CATHODES

Leon Braun, Linden, N.J., assignor to Molecular Energy Corporation, Livingston, N.J.

Filed Oct. 20, 1969, Ser. No. 867,922

Int. Cl. H01j *9/00*

U.S. Cl. 117—201 **16 Claims**

The cathodes produced by the methods of this invention have relatively good conductivity and have a high proportion of energy productive materials and a significantly low proportion of non-energy productive materials. The method of producing such cathodes involves coating particles of metallic halides or oxides of copper, nickel, iron, silver or lead with a metallic sulfide and locating a plurality of the resulting coated particles so that substantially each coated particle of the plurality contacts at least one other coated particle of such plurality.

3,716,404

PROCESS FOR DOPING WITH IMPURITIES A GAS-PHASE-GROWN LAYER OF III-V COMPOUND SEMICONDUCTOR

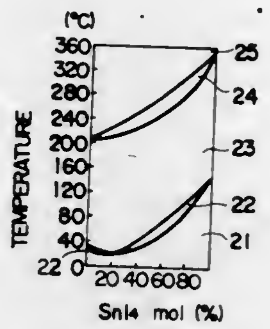
Motohisa Hirao, and Yutaka Takeda, both of Tokyo, Japan, assignors to Mitachi, Ltd., Tokyo, Japan

Filed Sept. 11, 1970, Ser. No. 71,474

Claims priority, application Japan, March 2, 1970, 45/17777; Sept. 12, 1969, 44/71995

Int. Cl. B44d *1/02;* **H01l** *7/36*

U.S. Cl. 117—201 **16 Claims**



A process for doping a semiconductor material with an impurity source of SnI_4, $SnBr_4$, GeI_4, $GeBr_4$, combinations thereof or a mixture of S and S_2Cl_2 by vaporizing the impurity source at a temperature of from 0° to 20°C. and then transferring the vapor with a carrier gas into contact with a semiconductor layer composed of a III–V compound in the course of its gas-phase growth. In this manner, it is possible to regulate the concentration of doping impurity, such as Sn, Ge or S, over a full range of lower concentrations (such as 10^{15}–10^{18} cm^{-3}) with semiconductor materials such as GaAs, GaP, GaPAs and InAs.

3,716,405

VAPOR TRANSPORT METHOD FOR GROWING CRYSTALS

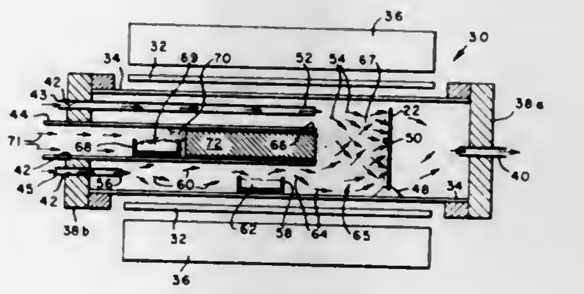
Mahn-Jick Lim, Lower Makefield Township, Bucks County, Pa., assignor to Western Electric Company Incorporated, New York, N.Y.

Filed Oct. 5, 1970, Ser. No. 78,445

Int. Cl. C23c *17/02*

U.S. Cl. 117—201 **44 Claims**

Single crystals of either III–V or II–VI compounds are deposited on a heated substrate using a heated liquified mass of the metallic constituent (Group III or II), a hydrogen compound of the Group V or VI element and wet hydrogen as source materials within an open reaction tube at an elevated temperature. In a preferred embodiment single crystal GaP is grown using heated liquid gallium (Ga), phosphine (PH_3) and wet hydrogen (H_2O and H_2) as source materials. The wet hydrogen is passed over the liquid gallium to generate a gallium sub-oxide (Ga_2O) stream while the temperature of the tube decomposes the phosphine to P_2 and H_2 in a stream. The P_2- and Ga_2O-containing streams are mixed but they reach the heated substrate whereat the single crystal gallium phosphide is grown. Thermodynamic analysis yields permissible ranges for the partial pressures of the P_2, the Ga_2O, and H_2O (from which are derived the inlet pressures of the PH_3 and the H_2O+H_2) and for the temperature of the liquid Ga and of the substrate. Uniform, large area single crystals (e.g., GaP) grown in this manner contain high amounts of electrically active dopants (e.g., oxygen) and are usable as efficient photo- and electro-luminescent devices.



3,716,406

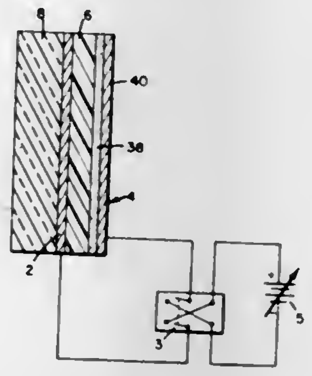
METHOD FOR MAKING A CADMIUM SULFIDE THIN FILM SUSTAINED CONDUCTIVITY DEVICE

Ronald F. Scholl, Malibu, and William P. Bleha, Jr., Santa Monica, Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed May 4, 1971, Ser. No. 140,086

Int. Cl. B44d *1/18*

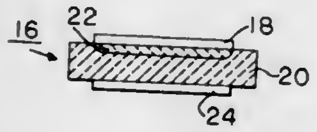
U.S. Cl. 117—217 **14 Claims**



A solid state electrical device which exhibits the property of having different and sustained states of electrical conductivity and method for making same is disclosed. More particularly, a method is disclosed for fabricating an improved solid state thin film electronic storage medium which can retain by conductivity modulation a high resolution image momentarily impressed thereupon by means of either optical or electron beam inputs for an extended period of time (several tens of seconds) provided that an applied electric field is maintained across the solid state element. This phenomenon is hereinafter referred to as "field sustained conductivity." Removal or reversal of the applied electrical field restores the solid state element to its normally insulating condition.

3,716,407
ELECTRICAL DEVICE HAVING OHMIC OR LOW LOSS CONTACTS

Manfred Kahn, Williamstown, Mass., assignor to Sprague Electric Company, North Adams, Mass.
Original application Sept. 23, 1969, Ser. No. 860,343. Divided and this application May 21, 1971, Ser. No. 145,948
Int. Cl. B44d *1/02;* **H01l** *3/00*
U.S. Cl. 117—224 **5 Claims**



An electrical device employs an inorganic substrate of the type having a highly electronegative element at least on the surface thereof. The substrate is selected from the group consisting of an insulator and a semi-conductor. In ohmic or low loss contact with said substrate is at least one electrode consisting essentially of a mixture of (1) a metal selected from a first group consisting of the platinum group metals, gold, silver and mixtures thereof and (2) a metal in in-situ oxidized form with at least some of the electronegative element of said substrate, said metal being at least one selected from a second group consisting of calcium, magnesium, barium, strontium, zinc, tin, vanadium, nickel, indium, titanium and chromium.

3,716,408
PROCESS FOR PREPARING A LACTULOSE POWDER

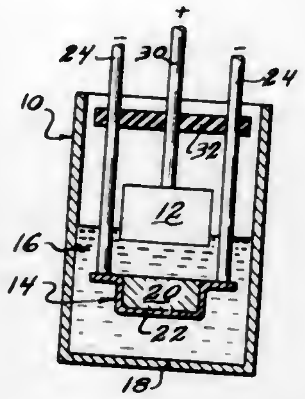
Taro Nagasawa; Takuji Kawashima, both of Tokyo; Koyoshi Suzuki, Taniyama, and Kouzo Kawase, Tokyo, all of Japan, assignors to Morinaga Milk Industry Co., Ltd., Tokyo, Japan
Filed Oct. 1, 1971, Ser. No. 185,885
Claims priority, application Japan, May 31, 1971, 46/37019
Int. Cl. C13k *9/00*
U.S. Cl. 127—46 R **1 Claim**

A lactulose powder containing above 55 percent of lactulose in solid content, is obtained by mixing an aqueous solution having a pH of less than 7.0 and which contains above 60 percent of lactulose in total solid content, with an aqueous solution having dissolved therein, about 0.3 percent, based on the weight of said lactulose, of konnayaku powder, and drying the resulting mixture.

3,716,409
CATHODES FOR SECONDARY ELECTROCHEMICAL POWER-PRODUCING CELLS

Elton J. Cairns, Downers Grove, Martin Kyle, Wheaton, and Hiroshi Shimotake, Hindsdale, all of Ill., assignors to the United States of America as represented by the United States Atomic Energy Commission
Filed Sept. 8, 1971, Ser. No. 178,577
Int. Cl. H01m *35/00*
U.S. Cl. 136—6 **22 Claims**

A secondary electrochemical power-producing cell including an anode containing lithium, an electrolyte containing lithium ions, and a cathode containing sulfur. The cathode comprises plates of a porous substrate material impregnated with sulfur alternating with layers, which may also comprise porous substrate plates, containing electrolyte. The cathode may further be encased in additional electrolyte-impregnated porous material. The cathode may also comprise a metal housing having an orifice at one end, a plate of porous substrate material impregnated with sulfur sealing the orifice, and a layer of electrolyte-impregnated porous substrate material mounted on the exterior surface of the sulfur-impregnated plate, liquid sulfur being located within the housing enclosure.



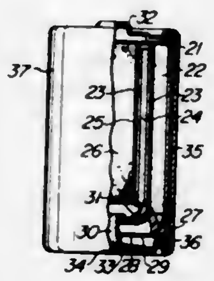
3,716,410
LITHIUM BATTERY ELECTROLYTE ADDITIVE AND METHOD OF IMPROVING DISCHARGE RATE

James N. Butler, Wayland, and David R. Cogley, Holliston, Mass., assignors to the United States of America as represented by the Secretary of the Air Force
No Drawing. Filed Sept. 27, 1971, Ser. No. 184,224
Int. Cl. H01m *11/00*
U.S. Cl. 136—6 **4 Claims**

A method for improving the discharge rate of lithium batteries by adding a small amount of a hexamethyl phosphoramide (hexamethyl-phosphoric triamide; Chemical Abstracts Registery No. 680–31–9) additive to the lithium perchlorate-propylene carbonate (carbonic acid, cyclic propylene ester; Chemical Abstracts Registry No. 108-32–7) electrolyte of the battery.

3,716,411
RECHARGEABLE ALKALINE MANGANESE CELL

Hiromichi Ogawa, Moriguchi, Tsukasa Ohira, Nara, Kaoru Murakami, Hirakata, and Takao Yokoyama, Neyagawa, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Jan. 29, 1971, Ser. No. 111,069
Claims priority, application Japan, Feb. 2, 1970, 45/9,111
Int. Cl. H01m *43/02*
U.S. Cl. 136—30 **3 Claims**



A rechargeable alkaline manganese cell wherein manganese dioxide is used as a positive electrode active material, zinc is used as a negative electrode active material and alkaline aqueous solution mainly composed of potassium hydroxide is used as an electrolyte and the discharge capacity of the negative electrode is controlled within such a range that the positive electrode can be reversed to non-discharge state by charging after discharging and said positive and negative electrodes face in their opposite sides through a mat-like separator of a given thickness therebetween.

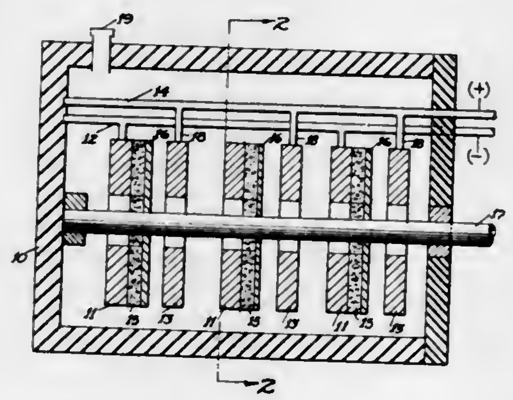
3,716,412
ELECTRIC STORAGE BATTERIES

Kenneth Peters, Walkden, England, assignor to Electric Power Storage Limited, Swinton, Manchester, England
No Drawing. Filed Feb. 19, 1971, Ser. No. 117,119
Int. Cl. H01m *9/00, 35/30*
U.S. Cl. 136—34 **6 Claims**

A lead acid battery having an improved acid electrolyte is disclosed. The electrolyte in the battery contains not more than 75 grams of amorphous silica (calculated as SiO_2) per litre of electrolyte whereby the resistance to shedding of active material from the positive electrode of the battery is enhanced.

3,716,413
RECHARGEABLE ELECTROCHEMICAL POWER SUPPLY

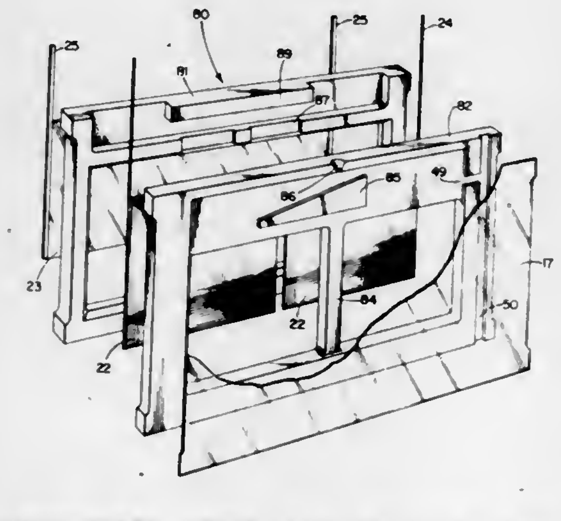
Steve Eisner, Schenectady, N.Y., assignor to Norton Company, Troy, N.Y.
Filed July 15, 1970, Ser. No. 54,887
Int. Cl. H01m *29/04, 31/02*
U.S. Cl. 136—86 A **10 Claims**



This invention relates to an improvement in zinc-air and other rechargeable electric storage cells whereby the zinc-electrode surface is mechanically activated allowing the cell to be recharged very rapidly without the growth of dendrites on the zinc plates.

3,716,414
100-WATT FUEL CELL

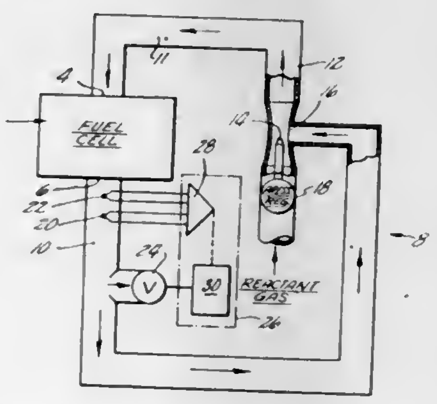
Max Goldberger, Wapping, Conn., assignor to Catalytic Technology Corporation, Manchester, Conn.
Filed Aug. 12, 1970, Ser. No. 63,070
Int. Cl. H01m *27/00*
U.S. Cl. 136—86 R **4 Claims**



A commercially useful and marketable fuel cell is described. The cell is capable of operating at ambient conditions of temperatures, pressure and the like for long periods of time. The complete cell includes one or more banks of individual cells, each cell including an anode, an air breathing catalytic cathode, and means for controlled feed of fuel and an aqueous electrolyte. The catalytic electrodes may be catalytic silver. A 100-watt commercial fuel cell is described.

3,716,415
FUEL CELL ELECTROLYTE CONCENTRATION CONTROL

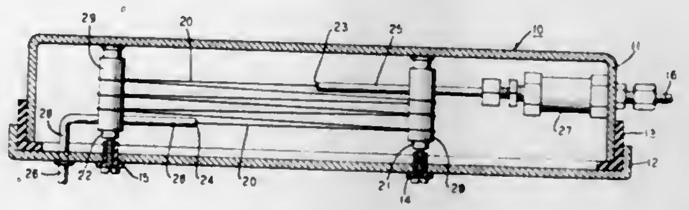
Richard N. Gagnon, Glastonbury; Carl V. Banic, Cromwell, and Albert P. Grasso, Vernon, all of Conn., assignors to United Aircraft Corporation, East Hartford, Conn.
Filed March 29, 1971, Ser. No. 128,775
Int. Cl. H01m *27/00*
U.S. Cl. 136—86 B **4 Claims**



A fuel cell electrolyte concentration control is provided by wet bulb and dry bulb temperature sensors disposed downstream of a fuel cell in a reactant gas recirculation conduit; excess electrolyte diluent removal means are provided and are controlled by control means as a function of the difference between the sensed dry bulb and wet bulb temperatures.

3,716,416
FUEL METERING DEVICE FOR FUEL CELL

Otto J. Adlhart, Newark, and Peter L. Terry, Madison, both of N.J., assignors to Engelhard Minerals & Chemicals Corporation
Filed May 20, 1971, Ser. No. 145,287
Int. Cl. H01m *27/00*
U.S. Cl. 136—86 B **4 Claims**

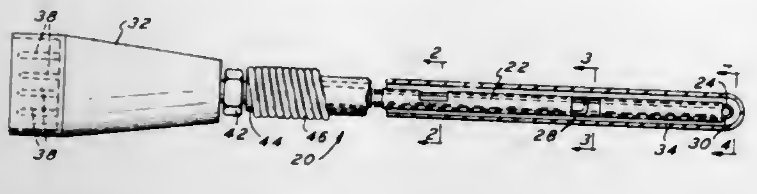


A fuel cell system designed for self-regulated power output at a predetermined level includes a capillary flow control device for throttling the fuel flow in response to the power output of the fuel cell.

3,716,417
PROFILE THERMOCOUPLE

Harry T. Evans, Philadelphia, Pa., assignor to Pyco, Inc., Penndel, Pa.
Filed Dec. 24, 1970, Ser. No. 101,220
Int. Cl. H01v *1/02*
U.S. Cl. 136—232 **3 Claims**

A profile thermocouple is provided for measuring temperature at a plurality of spaced points preferably in a diffusion furnace. The thermocouple includes a thermocouple lead of a first polarity and three thermocouple leads of a second polarity. Each of the leads of the second polarity are connected to the thermocouple lead of the first polarity at junctions which



are spaced along the length of the lead of the first polarity so that the junctions formed at the three points enable measurement of temperature at each of these positions.

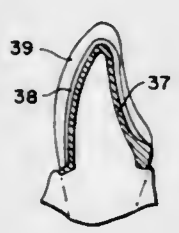
3,716,418
METHOD OF MAKING A CASTING HAVING AN OXIDIZED SURFACE LAYER INTENDED FOR USE AS A DENTAL RESTORATION

Jacob Kochavi, % Star Dental Laboratories, 718 El Camino, San Mateo, Calif. 94402

Filed Aug. 7, 1970, Ser. No. 61,917

Int. Cl. C23c *11/00*

U.S. Cl. 148—6.3 **1 Claim**



A restoration is made using an alloy of approximately 80% Ni–20% Cr employing conventional casting techniques heretofore used with precious metals. After the casting has been cleaned it is heated under vacuum commencing at 1400–1500° F. and increasing gradually to approximately 1950° F. The vacuum is released and the casting cooled—a grayish blue colored compound forming on the surface. Porosities and casting defects may be conveniently repaired using ceramic gold paste. The metal may be soldered, to other metal members, whether of the same alloy or gold or any other conventional metal. Porcelain is then applied, again using conventional techniques. The product is characterized by the very good bond of porcelain to metal, extreme dimensional accuracy and relatively low cost of metal.

3,716,419
PREPARATION OF ALUMINUM HAVING BLOCK TEXTURE

Francois Regis Boutin, rue de la Gare, 38-Virieu-sur-Bourbre, France

Filed Aug. 20, 1971, Ser. No. 173,698

Claims priority, application France, Nov. 16, 1970, 7040921

Int. Cl. C22f *1/04*

U.S. Cl. 148—11.5 A **5 Claims**

A process for the production of thin aluminum strips or sheets having a thickness less than 0.2 mm comprising the steps of hot rolling, cold rolling and recrystallization annealing wherein the aluminum strips or sheets are subjected to cold rolling, annealing and cold working between hot rolling and final recrystallization annealing.

3,716,420
HOT ROLLED STEEL SHEETS FOR EXTRA DEEP DRAWING

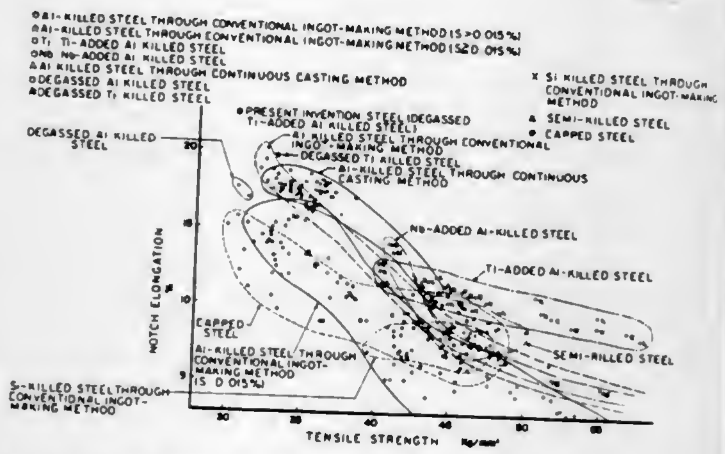
Kazuo Matsudo, Koichi Osawa, and Yoshisuke Ikegami, Fukuyama, Japan, assignors to Nippon Kokan Kabushiki Kaisha

Filed Nov. 8, 1971, Ser. No. 196,697

Claims priority, application Japan, Dec. 19, 1970, 45/113,660

Int. Cl. C21d *1/74, 9/48*

U.S. Cl. 148—12 **3 Claims**



A hot rolled steel sheet having extra deep drawing and press formability properties comparable to cold rolled steel sheets, wherein the steel is vacuum degassed and has a composition consisting essentially of: 0.001–0.020% carbon, less than 0.10% silicon, 0.10–0.60% manganese, less than 0.020% sulphur, 0.010–0.10% aluminum, 0.02–0.08% titanium, balance iron and incidental impurities and wherein $Ti/C<4$ and $Ti/S>2$. The steel sheets are hot rolled with a finishing temperature in the range 800–950° C. and coiled at a temperature in the range 650° C.–700° C.

3,716,421
COMPOSITIONS FOR IMPROVED SOLDERABILITY OF COPPER

John H. Burkhart, and Edward C. Slick, both of Warren, Pa., assignors to GTE Sylvania Incorporated

Filed March 19, 1971, Ser. No. 126,199

Int. Cl. C23f *7/00*

U.S. Cl. 148—6.14 R **3 Claims**

The solderability of copper and copper alloys is improved by applying a composition comprising certain triazole compounds, a carrier to impart a uniform coating on the material to be soldered and a solvent for the triazole and the carrier.

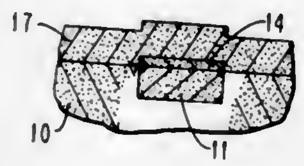
3,716,422
METHOD OF GROWING AN EPITAXIAL LAYER BY CONTROLLING AUTODOPING

David W. Ing, Poughkeepsie, and Hans B. Pogge, La Grangeville, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed March 30, 1970, Ser. No. 23,772

Int. Cl. H01l *7/36;* **C23c** *13/00*

U.S. Cl. 148—175 **5 Claims**



Autodoping from a diffused region in a substrate during growth of an epitaxial layer is prevented by growing a thin epitaxial layer over the entire surface of the substrate and then removing the epitaxial layer except for the portion over the diffused region. A second epitaxial layer is then grown over the surface of the substrate and the first epitaxial layer. The

first epitaxial layer caps the diffused region to prevent autodoping into the second epitaxial layer during growth thereof over the surface of the substrate not having the diffused region therein.

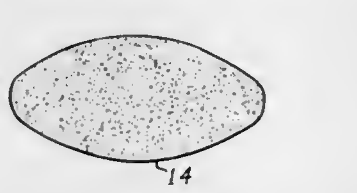
3,716,423
HOT-FORMED COPPER-BASE PRODUCT

Daniel B. Cofer, Carrollton, Ga., assignor to Southwire Company, Carollton, Ga.

Continuation-in-part of application Ser. No. 633,670, Apr. 18, 1967, which is a continuation-in-part of application Ser. No. 498,773, Oct. 20, 1965. This application is also a continuation-in-part of application Ser. No. 816,127, Apr. 14, 1969, which is a continuation of application Ser. No. 613,245, Feb. 1, 1967, which in turn is a division of application Ser. No. 390,666, Aug. 19, 1964, now Patent No. 3,317,994. This application Feb. 2, 1970, Ser. No. 7,779

Int. Cl. C22f *1/08*

U.S. Cl. 148—32 **1 Claim**



A hot-formed copper-base product in which the copper-base metal has copper oxide inclusions which are substantially uniformly dispersed and has a substantially uniform fine grain structure. In the form of a rod of tough pitch copper, the hot-formed copper-base product is superior to prior art hot-formed copper-base products for drawing into wire and for other uses. The hot-formed copper-base product is produced in the form of a rod of tough pitch copper by substantially completely solidifying a molten copper-base metal to obtain a cast metal and by hot-forming the cast metal into rod, the hot-forming being initiated while the cast metal is in substantially that condition in which it solidified and being of sufficient degree to substantially completely destroy the columnar dendritic structure of the cast metal.

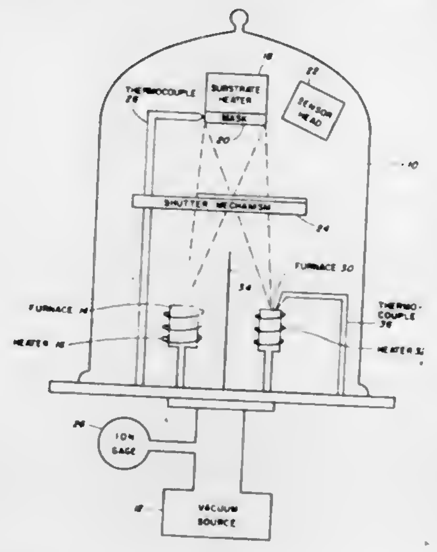
3,716,424
METHOD OF PREPARATION OF LEAD SULFIDE PN JUNCTION DIODES

Richard B. Schoolar, Silver Spring, Md., assignor to The United States of America as represented by the Secretary of the Navy

Filed April 2, 1970, Ser. No. 24,983

Int. Cl. H01l *7/00;* **B01j** *17/00;* **G03g** *5/02*

U.S. Cl. 148—175 **6 Claims**



Flat, uniform planar diodes of PbS are prepared by either (1) epitaxially growing an n-type layer onto a p-type layer by depositing one layer epitaxially onto the other in a vacuum of at least 5×10^{-6} Torr wherein the substrate is at a temperature between 200–350° C and the material to be deposited is at a temperature not lower than its sublimation point or (2) epitaxially growing a p-type layer on an n-type layer using the procedure described in (1) with the addition of vapors of a doping agent such as S, Se or Te, in the system. This method may also be applied to the closely related compounds $Pb_xSn_{1-x}Se$ and $Pb_xSn_{1-x}Te$ where x varies from 0 to 1 inclusive, hereinafter referred to as the lead-tin salt alloys.

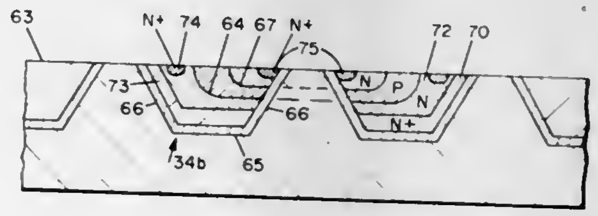
3,716,425
METHOD OF MAKING SEMICONDUCTOR DEVICES THROUGH OVERLAPPING DIFFUSIONS

Uryon S. Davidsohn, Scottsdale, Ariz., assignor to Motorola, Inc., Franklin Park, Ill.

Filed Aug. 24, 1970, Ser. No. 66,163

Int. Cl. H01l *7/00, 7/64, 11/00*

U.S. Cl. 148—175 **5 Claims**



An integrated device and/or circuit and the method for making such is disclosed employing a plurality of fully insulated islands having plane walls. Selected diffusion steps are made overlapping certain of the islands and certain of the other diffusion steps.

3,716,426
MIXTURE OF A RADIOACTIVE TRACER SUBSTANCE AND A PROPELLENT FOR MARKING DRILLING TOOLS FOR DEEP WELLS AND SIMILAR BOREHOLES

Herbert Becker, Frankfurt/Main, Germany, assignor to Farbwerke Hoechst Aktengesellschaft vormals Meister Lucius Bruning, Frankfurt/Main, Germany

Filed June 2, 1969, Ser. No. 829,808

Int. Cl. C06b *15/00*

U.S. Cl. 149—38 **2 Claims**

For the expulsion of radioactive indicators from tracer cavities in drilling tools for deep wells and similar boreholes propellants are used which do not react with the water of the circulating drilling fluid in stoichiometric proportions. The propellents consist of a mixture of aluminum powder and an alkali metal peroxide as the primer and an explosive as the gas-yielding component. Ammonium picrate may be used with special advantage as the gas-yielding component.

3,716,427
METHOD OF PRODUCING TARNISH RESISTANT COPPER AND COPPER ALLOYS AND PRODUCTS THEREOF

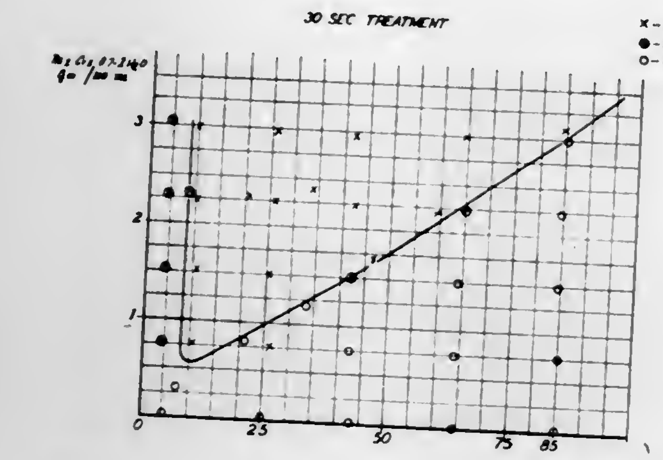
Elmer J. Caule, New Haven, Conn., assignor to Olin Corporation

Continuation-in-part of application Ser. No. 59,684, July 30, 1970, now Patent No. 3,677,828. This application Aug. 28, 1970, Ser. No. 67,943

Int. Cl. H05k *3/06*

U.S. Cl. 156—3 **14 Claims**

A method of producing a laminate having high bond strength and excellent resistance to acid undercutting comprising applying a phosphoric acid solution containing a dichromate to copper or its alloys, rinsing, drying, and adhesively laminating to a plastic film. The instant case also teaches a method of producing a high tarnish resistant copper and copper alloy by so treating, as well as a flexible



printed circuit characterized by high bond strength and the absence of acid undercutting.

3,716,428
METHOD OF ETCHING A METAL WHICH CAN BE PASSIVATED

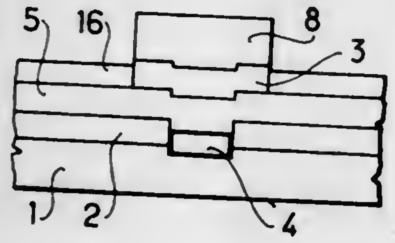
Claude Amouroux, Paris; Gerard Peres, Villepreux, and Pierre Valette, Lonjumeau, all of France, assignors to Compagnie Generale Electricite, Paris, France

Filed Feb. 9, 1971, Ser. No. 113,924

Claims priority, application France, Feb. 9, 1970, 7004491

Int. Cl. B44c *1/22*; **B44d** *1/18*; **H01l** *7/00*

U.S. Cl. 156—3 **5 Claims**



A process for etching a first metal which can be passivated, wherein a layer of a second metal which is more oxidizable than the first metal is deposited on the first metal, and the first metal and second metal layer are thereafter immersed in an acid solution.

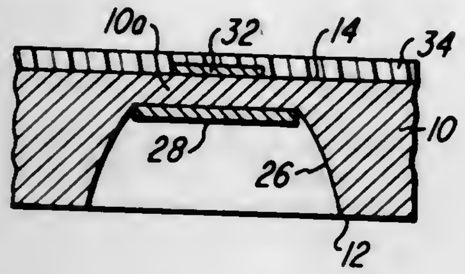
3,716,429
METHOD OF MAKING SEMICONDUCTOR DEVICES

Louis Sebastian Napoli, Hamilton Square, and John Joseph Hughes, Spotswood, both of N.J., assignors to RCA Corp.

Filed June 18, 1970, Ser. No. 47,425

Int. Cl. H01l *7/00*

U.S. Cl. 156—17 **9 Claims**



Semiconductor devices having thin bodies of a semiconductor material are made from a wafer of the semiconductor material which is thicker than the bodies of the devices. The thicker wafer is provided with spaced thinner portions of the desired area and thickness of the bodies of the devices to be formed by etching recesses in one surface of the wafer. The recesses are formed with flat bottoms which are of the desired area of the bodies of the devices. A masking layer is coated on the bottom of each of the recesses. The active region of each of the devices is formed at the other surface of the wafer over each of the recesses. The semiconductor material between the thin portions of the wafer is then removed by etching the wafer from the one surface of the wafer so as to separate the thin portions of the wafer to form the individual devices. During the last etching process the masking layers on the bottom of the recess protect the thin portions of the wafer from being etched.

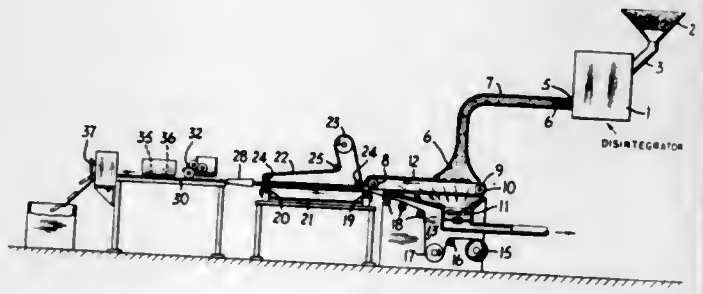
3,716,430
TAMPON AND PROCESS AND APPARATUS FOR MAKING THE SAME

Ingemar Croon, Alfredshem, and Nils Verner Blomqvist, Ornskoldsvik, both of Sweden, assignors to Mo och Domsjo Aktiebolag, Ornskoldsvik, Sweden

Division of Ser. No. 662,843, Aug. 15, 1967, Pat. No. 3,523,535, which is a continuation-in-part of Ser. No. 606,956, Jan. 3, 1967, abandoned. This application Oct. 15, 1969, Ser. No. 871,131

Int. Cl. A61f *13/20*

U.S. Cl. 156—62.4 **5 Claims**



A composite tampon is provided comprising an absorbent layer of cellulose pulp fibers, preferably cellulose fluff fibers, enclosed within a wrapper layer which can be a non-woven material, or a laminate between nonwoven material and cellulose pulp tissue.

Apparatus is also provided for preparing such tampons in a continuous manner from cellulose fluff fibers and the wrapper materials, folding or rolling the absorbent layer within the wrapper in the form of a continuous elongated tampon, and then cutting the column into lengths to form the tampon.

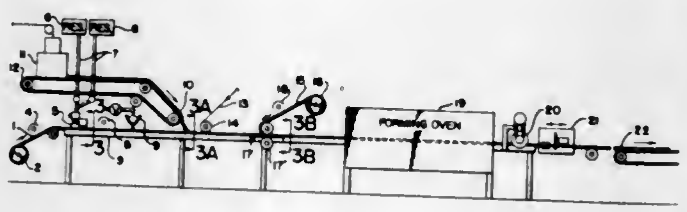
3,716,431
PROCESS FOR PREPARING STRIPED SHEET MATERIAL CONTINUOUSLY

John K. Townsend, Torrance, and Chester E. Sanford, Lomita, both of Calif., assignors to Vistron Corporation, Cleveland, Ohio

Continuation-in-part of Ser. No. 695,448, Jan. 3, 1968. This application May 14, 1970, Ser. No. 37,172

Int. Cl. B29j *5/00*

U.S. Cl. 156—62.4 **7 Claims**



A process and apparatus are provided for the continuous manufacture of novel, fiber-reinforced, thermoset plastic sheet material having longitudinal, substantially parallel colored or pigmented stripes as an integral part of the sheet material.

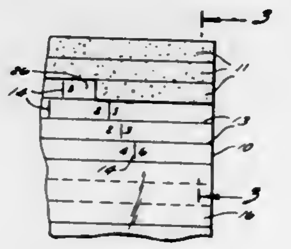
3,716,432
METHOD OF MAKING DECORATIVE ARTICLES EMPLOYING STRIPS OF FLEXIBLE MATERIAL

John R. Morrison, 350 E. 52nd St., New York, N.Y. 10022

Filed Mar. 3, 1971, Ser. No. 120,571

Int. Cl. B44d *5/06*

U.S. Cl. 156—63 **13 Claims**



A base is provided having a pressure-sensitive adhesive coating on its surface. A portion of a narrow strip of flexible material is applied to the base surface, the remainder of the strip being held away from the surface. A knife blade is pressed against the strip to sever the adhered portion from the remainder. The base may bear indicia to indicate where the strip is to be placed and cut, and the type (e.g. color) of strip to be used. These steps are repeated using other strips, each strip being contiguous with at least one strip preceding it. A visual characteristic, such as color, of some strips differs from that of others of the strips, so that together all the strips produce a composite decorative effect. At least some of the strips are aligned with one or more other strips and arranged end-to-end with the other strips, and at least some are arranged side-by-side and parallel to other strips. The base may be rigid or flexible.

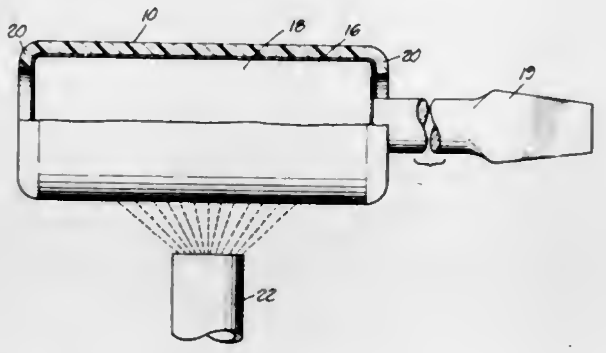
3,716,433
METHOD OF EQUIPPING A TOOL HANDLE OR HAND GRIP WITH A TOUGH ADHERENT PROTECTIVE LAYER WITH ENHANCED GRIPPING PROPERTIES

Walter A. Plummer, 3546 Crownridge Drive, Sherman Oaks, Calif.

Filed Sept. 18, 1970, Ser. No. 73,492

Int. Cl. B29c *27/10*

U.S. Cl. 156—85 **6 Claims**



A method of providing a tool handle or the like hand grip with a tough protective strong-gripping layer by shrinking and bonding a sleeve of heat-reactive thermoplastic material thereto.

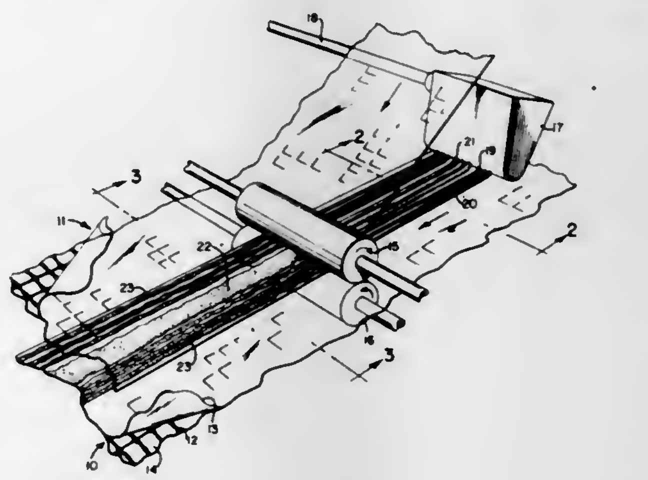
3,716,434
SEAL FOR PLASTIC SHEETING

Charles A. Cook, and David H. Campbell, both of Baton Rouge, La., assignors to Ethyl Corporation, New York, N.Y.

Division of Ser. No. 671,263, Sept. 28, 1967, Pat. No. 3,578,543. This application July 2, 1970, Ser. No. 60,972

Int. Cl. B65h *69/02*

U.S. Cl. 156—157 **3 Claims**



An overlap seal for joining together two edges of reinforced thermoplastic material. A plurality of strands or bands of hot melt adhesive are applied adjacent the edge of the one sheet of thermoplastic reinforced material and the edge of another sheet is positioned above the first sheet. The sheets are brought together and pressure is applied so that the heat contained in the hot melt adhesive causes a fusion of the two edges of thermoplastic to create a high strength bond. Some of the bands of thermoplastic material flow together to form a wide band with narrower bands on each side to provide an overlapped seal having increased strength.

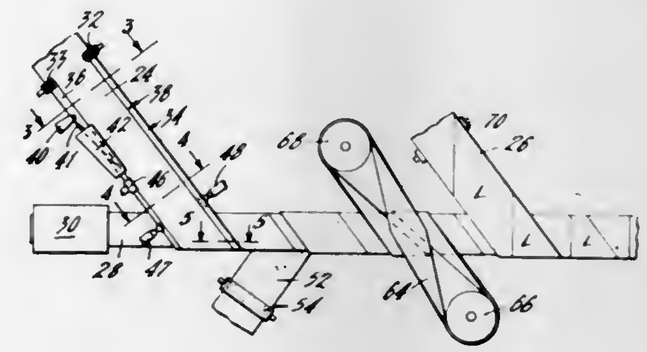
3,716,435
METHOD OF MAKING A CONTAINER BODY

Stephen F. Jensen, Bronx, N.Y., and William A. Meyer, South Salem, both of N.Y., assignors to American Can Company, New York, N.Y.

Division of Ser. No. 764,273, Oct. 1, 1968, Pat. No. 3,540,490. This application Nov. 16, 1970, Ser. No. 89,851

Int. Cl. B31c *3/04*

U.S. Cl. 156—195 **1 Claim**



A tubular, spirally wound multi-ply container body includes a body ply of fiber stock which has a liquidproof barrier layer prelaminated or otherwise preaffixed to one surface thereof. Material on the reverse side of both marginal edge portions of the resultant laminated ply is removed by a skiving operation, thereby reducing the thickness of the marginal edge portions. One of the thinned, skived, marginal edge portions is folded back on itself, and this folded edge portion is then helically wound in lapping relationship to the unfolded edge portion and bonded to it to form a sealed helical lap seam having a thickness substantially equal to that of the unskived portions of the ply.

3,716,436

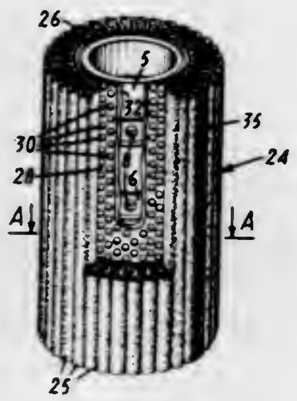
PROCESS FOR MAKING A BACK PRESSURE RESISTANT FILTER ELEMENT

David B. Pall, Roslyn Estates, and Tadas K. Jasaltis, Great Neck, both of N.Y., assignors to Pall Corporation, New York, N.Y.

Continuation-in-part of Ser. Nos. 544,788, June 2, 1966, abandoned, and Ser. No. , , Division of Ser. No. 607,478, Jan. 5, 1967, Pat. No. 3,570,675. This application March 16, 1970, Ser. No. 24,455

Int. Cl. B01d *25/04*; **B32b** *31/20*

U.S. Cl. 156—218 **9 Claims**



A corrugated cylindrical filter element is disposed about a central core. A perforated plastic bonding sheet is disposed between the core and the filter. The bonding sheet is bonded in situ to the inner tips of the corrugations only.

3,716,437

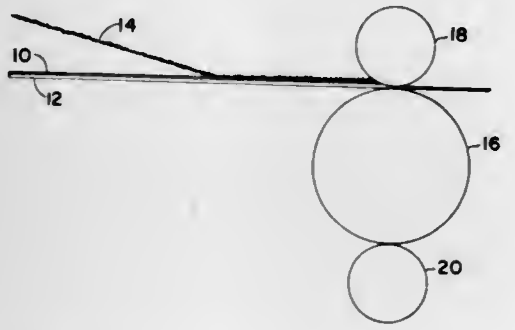
BASE FOR ADHESIVE TAPES

Nicholas S. Newman, 224 Chestnut Street, West Newton, Mass., and Donatas Satas, 99 Shenandoah Road, Warwick, R.I.

Division of Ser. No. 806,845, March 13, 1969, abandoned. This application Oct. 12, 1970, Ser. No. 33,134

Int. Cl. B32b *31/00*

U.S. Cl. 156—244 **4 Claims**



A base film suitable for adhesive tapes of enhanced tensile strength combined with high dielectric strength is made by selecting an extruded composite film comprising a superimposed films of different softening points, and then reinforcing the loweresoftening film with an unwoven and unspun array of textile-length fibers.

3,716,438

GROMMET SEALING APPARATUS AND METHOD

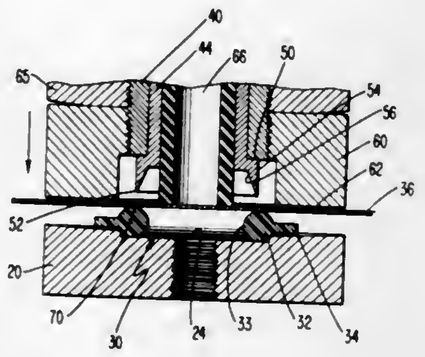
Henry H. Mackal, Fort Lauderdale, Fla., and George E. Lardner, Hawthorne, N.J., assignors to Halkey-Roberts Corporation, Paramus, N.J.

Filed Apr. 1, 1971, Ser. No. 130,170

Int. Cl. B32b *31/00*

U.S. Cl. 156—253 **18 Claims**

Method of and apparatus for sealing annular members such as flanged plastic grommets to plastic sheet material. The apparatus includes opposing dies which are mounted on conventional electronic sealing machines. A flanged grommet is held in a first one of the dies, and a sheet of plastic material is superimposed upon such die and the grommet held thereby. The other, second die, which is mounted for reciprocation toward and away from the first die, carries a hole punch which, acting with the body of the grommet, first punches a hole in the sheet material. The disc cut from the sheet is pushed out of the way by a yieldable member centrally carried by the second die. The sheet material is then electronically welded to the flange of the grommet, such flange preferably being simultaneously thinned and radially expanded.



3,716,439

METHOD OF MANUFACTURING CARDS

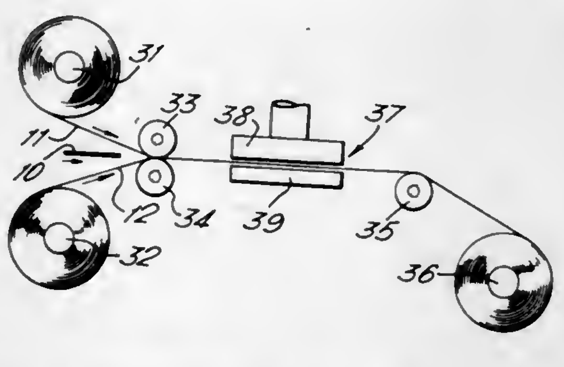
Sanetaka Maeda, Kyoto, Japan, assignor to Omron Tateisi Electronics Co., Kyota, Japan

Filed Dec. 10, 1970, Ser. No. 96,888

Claims priority, application Japan, Dec. 15, 1969, 44/101105

Int. Cl. B32b *31/18*; **C09j** *5/06*; **G09f** *3/02*

U.S. Cl. 156—269 **1 Claim**



A method of manufacturing credit cards and the like, wherein a card having necessary information visibly recorded therein is interposed between a pair of plastic films each having one surface coated with a layer of adhesive which is activated when heated, with the adhesive coated surface of each said film in contact with one surface of said card, and the card and films are passed between a pair of heated pressure rollers so as to form them into a unitary laminated construction.

3,716,440

METHOD OF MANUFACTURING A RESINOUS DECORATIVE LAMINATE HAVING A LUSTROUS PATTERN OF REALLY METALLIC SURFACE

Fumio Ando; Hideharu Kitahama, and Kazuhiro Sugiyama, all of Gifu-ken, Japan, assignors to Iirigawa Electric Industry Co., Ltd., Gifu-ken, Japan

Filed Dec. 29, 1970, Ser. No. 102,533

Claims priority, application Japan, Jan. 19, 1970, 45/4430

Int. Cl. B32b *29/00, 31/20*

U.S. Cl. 156—277 **3 Claims**

A novel resinous decorative laminate having a surface look of really metallic luster, such as that of gold or silver, is made by hot-pressing an assembly of laminated materials which consists of a sheet of paper pattern impregnated therethrough with a thermosetting resin and having a pattern printed thereon by the use of a printing ink containing a metal powder and a resinous vehicle, and several basic layer materials impregnated with a thermosetting resin. There is no ordinary overlay paper used in forming the decorative laminate.

3,716,441

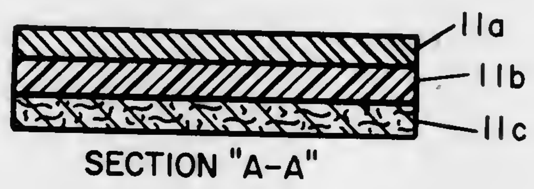
METHOD FOR PREPARING LAMINATED ARTICLE OF METALLIC, POLYMERIC AND WAX IMPREGNATED CELLULOSIC LAYERS

Ernest P. Black; Irl N. Duling, both of West Chester; John C. Merges, Jr., Glen Mills, and Alfred F. Talbot, Wallingford, all of Pa., assignors to Sun Oil Company, Philadelphia, Pa.

Filed Aug. 6, 1970, Ser. No. 61,718

Int. Cl. C05j *7/04*

U.S. Cl. 156—309 **9 Claims**



A tri-layer laminated article, having an outer wax impregnated cellulosic layer, a middle thermoplastic polymeric layer and an outer metallic layer, is easily prepared by applying a dispersion of solid polymer particles in molten wax to the surface of at least one of the outer layers and then placing the other outer layer adjacent to the dispersion. The application of heat and pressure to the resulting composite causes the cellulosic layer to be impregnated with wax and the polymer to form a molten middle layer. The latter upon cooling, solidifies resulting in the metallic layer firmly adhering to the solid polymeric layer which is firmly adhering to the wax impregnated cellulosic layer. The polymer used must be substantially insoluble in the molten wax at a temperature below the melting point of the polymer and have an adhesive capacity for both metallic and cellulosic materials. The resulting article has utility as a packaging material.

3,716,442

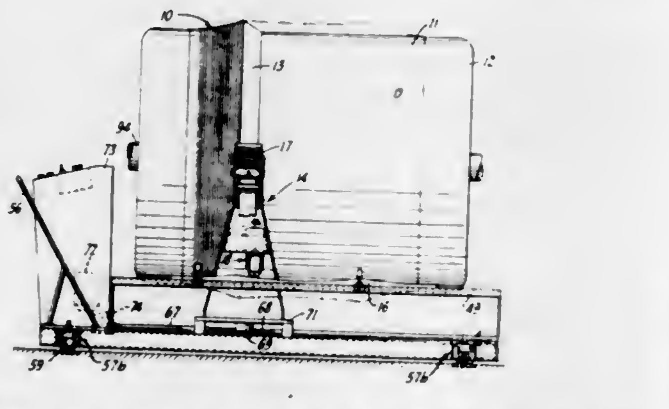
OFF-THE-ROAD TIRE BUILDING METHOD AND APPARATUS

Robert E. Hineline, Akron, Ohio, assignor to AMF Incorporated

Division of Ser. No. 656,283, July 26, 1967, Pat. No. 3,549,442. This application April 9, 1970, Ser. No. 31,445

Int. Cl. B29h *17/36*

U.S. Cl. 156—397 **11 Claims**



Apparatus for building tires, such as new off-the-road tires, on a drum arrangement whereby a strip of rubber is placed thereon as the drum continually rotates. The apparatus includes an application and sensing arm which guides the material onto the drum in a predetermined pattern in accordance with a straight line template. The application and sensing arm moves in a straight line across the surface of the building drum to build a tire contour in accordance with the template configuration. The apparatus is portable and may be removed from a building station when not required and thus used to serve a number of building stations.

3,716,443

CONTINUOUS ROD MAKING MACHINES

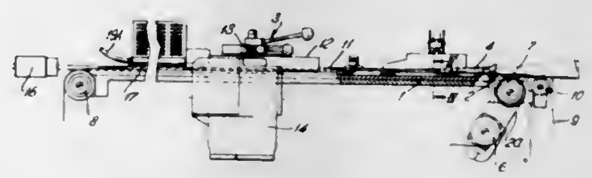
Edward George Preston, London, England, assignor to Molins Machine Company Limited, London, England

Filed Apr. 7, 1970, Ser. No. 26,298

Claims priority, application Great Britain, Apr. 10, 1969, 18,391/69

Int. Cl. B65h *17/32*; **D04h** *3/00*

U.S. Cl. 156—441 **16 Claims**



A continuous rod making machine, especially for making cigarette filter rods, has a heat exhanger after the heater to cool the adhesive. The heat exchanger uses air as a cooling medium and also to form an air bearing. There is also an air bearing between the garniture bed and tape.

3,716,444

APPARATUS FOR USE IN SPLICING TOGETHER THE ENDS OF TWO STRIPS

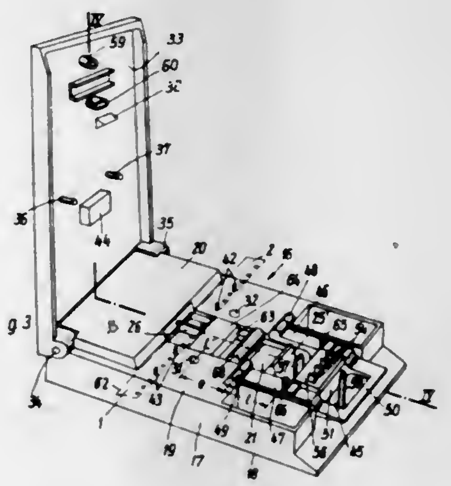
Rudolph Hanke, Monheim, Schwaben, Germany, assignor to Hamaphot Hama, K.G. Hanke & Thomas, Monheim, Schwaben, Germany

Filed Apr. 16, 1971, Ser. No. 134,638

Claims priority, application Germany, Sept. 3, 1970, P 20 43 674.2

Int. Cl. B31f *5/00*; **G03d** *15/04*

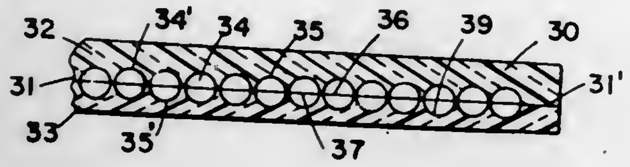
U.S. Cl. 156—505 **11 Claims**



Apparatus for splicing together the ends of two strips arranged end-to-end by means of an adhesive tab comprises a base whereon are provided holding means for holding the strips overlapped and in register with a cutting device mounted on a carriage sildable in the base, a swingable applicator for receiving the adhesive tab whilst its adhesive is protected by peelable backing strips, peeling it from the backing strips and applying half of said tab to one side of the adjacent ends of the two strips, and a mechanism for engaging the other half of the tab to fold it against the other side of said ends of the two strips, a lid being provided on the base; the arrangement is such that splicing is effected by positioning the backing strips of the tab, on retainer pegs, for engagement of the tab by the applicator, and locating the strips on the holding means, closing the lid to cause severance of said strips at their overlap and firm engagement of said backing strips with retainer pegs and to release said carriage for movement to an intermediate position upon opening of said lid, in which intermediate position said cutting device is withdrawn and a flat counter surface is in register with the strips to be joined, swinging said applicator from its tab-receiving position to a tab-applying position thereby to peel said tab from said backing strips and applying said half to said strips to be joined and also to initiate further movement of said carriage to operate said mechanism for engaging the other half of said tab to fold it against said other side of said two strips.

3,716,445
REFLEX REFLECTIVE SHEETING

Jerome H. Lemelson, 85 Rector Street, Metuchen, N.J.
Continuation of Ser. No. 744,911, July 15, 1968, abandoned, which is a continuation-in-part of Ser. No. 489,654, Sept. 23, 1965, Pat. No. 3,396,637, which is a continuation-in-part of Ser. No. 360,954, June 11, 1953, Pat. No. 3,220,871. This application June 24, 1970, Ser. No. 56,047
Int. Cl. B44f *1/02*
U.S. Cl. 161—2 **4 Claims**



New and improved structures in reflective sheeting are provided which may be produced automatically and continuously of a single material in substantially long lengths and areas larger than heretofore possible. In one form, the material of which the reflective sheeting is made comprises a flexible transparent polymer which has one or more surfaces of which sheeting has been embossed in a manner to reflect incident light striking the sheet back to the vicinity of the source.

3,716,446
PRIVACY CUBICLE CURTAIN CLOTH

William Bruce Dean, Cornelia, Ga., assignor to Johnson & Johnson
Filed Jan. 21, 1971, Ser. No. 108,634
Int. Cl. D03d *15/12*
U.S. Cl. 161—91 **4 Claims**

Privacy cubicle curtain cloth suitable for use in hospitals, nursing homes, sanitariums, and the like, capable of providing some measure of privacy between patients in adjacent beds comprising: a warp of saran ribbon or strip materials having a thickness of from about 1-½ mils to about 3 mils and a width of from about 20 mils to about 35 mils; and a frilling of polypropylene spun yarn having a yarn size of from about 8/1 to about 12/1, as calculated on the cotton count system, said privacy cubicle cloth being inherently fire retardant or flame resistant and self-extinguishing, relatively inert chemically in the presence of gases and liquids normally found in hospitals, commercially launderable, and having sufficiently light weight characteristics as to be easily handled and quickly drawn or pulled back in use, while still being opaque or translucent but not transparent to afford some measure of privacy to patients.

3,716,447
DELIGNIFICATION AND BLEACHING OF CELLULOSE PULP WITH OXYGEN AND ALKALI IN THE PRESENCE OF MAGNESIUM CHLORIDE INHIBITOR

Tin Aung, and William M. Boyle, Jr., both of Baton Rouge, La., assignors to The Dow Chemical Company, Midland, Mich.
Filed Dec. 15, 1969, Ser. No. 885,375
Int. Cl. D21c *9/12*
U.S. Cl. 162—65 **3 Claims**

Delignification and bleaching of cellulose pulp with oxygen and alkali by blending the cellulose pulp with an inhibiting quantity of magnesium chloride and then with alkali prior to heating with oxygen. The mixture of magnesium chloride and alkali precipitate finely divided and well dispersed magnesium hydroxide in situ within the cellulose pulp stabilizing the cellulose during the delignification process.

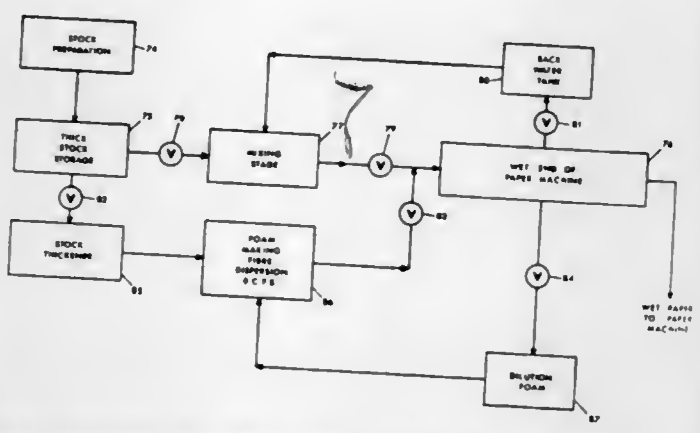
3,716,448
SINGLE STAGE DELIGNIFICATION AND BLEACHING OF CHEMICAL PULP WITH OXYGEN IN THE PRESENCE OF A PROTECTOR

Sunanda K. Roymoulik, Suffern, N.Y., assignor to International Paper Company, New York, N.Y.
Filed May 25, 1970, Ser. No. 40,429
Int. Cl. D21c *9/10*
U.S. Cl. 162—65 **8 Claims**

Delignification and bleaching of chemical pulp is achieved by treating the pulp in a single stage with oxygen at elevated temperature and pressure in the presence of a protector selected from the group consisting of $Na_2S_2O_4$ and Na_2S_x, where x is an integer from 1 to 4.

3,716,449
METHOD AND APPARATUS FOR FORMING A NON-WOVEN FIBROUS WEB FROM A FOAMED FIBER FURNISH

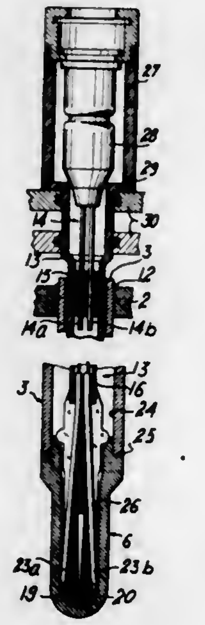
Albert Peter John Gatward, Beaconsfield, and Bronislaw Radvan, Flackwell Heath, both of England, assignors to Wiggins Teape Research & Development Limited, London, England
Continuation-in-part of Ser. No. 854,246, Aug. 29, 1969, abandoned, which is a continuation-in-part of Ser. No. 640,411, May 22, 1967, abandoned. This application Nov. 19, 1970, Ser. No. 91,104
Claims priority, application Great Britain, March 31, 1966, 24125/66
Int. Cl. D21d *3/00, 5/28*
U.S. Cl. 162—101 **22 Claims**



Improvements are afforded in method and apparatus for making non-woven fibrous webs including paper from a foamed aqueous furnish containing a surfactant in that the foam acquires and has imparted thereto physical characteristics as regards attainment of such a highly emulsified state that the bubbles are scarcely visible to the naked eye, as regards viscosity build-up of the foam to at least 22 seconds as measured with a Ford Cup Type B-4 and as regards the specific gravity being no greater than 0.35. Other improvements pertain to vortical mixing in the production of the foam, to combining the method and apparatus with conventional methods and apparatus and to handling the surfactant-containing water when in the foamed furnish and likewise as drained from the formed web.

3,716,450
DEVICE FOR REMOTE POSITIONING OF THERMOCOUPLES IN A NUCLEAR REACTOR

Noël Llons, Manosque, France, assignor to Commissariat a l'Energie Atomique, Paris, France
Filed Sept. 15, 1969, Ser. No. 857,791
Int. Cl. G21c *17/00*
U.S. Cl. 176—19 R **5 Claims**

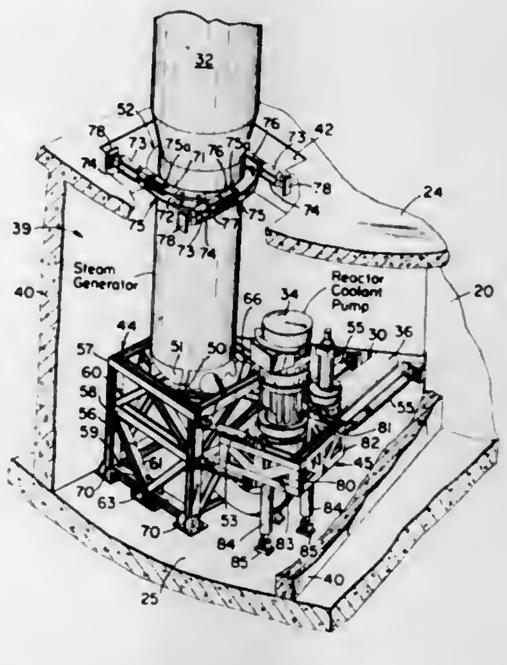


Remote positioning of thermocouples in proximity to the fuel assemblies of a nuclear reactor core is carried out by means of a device comprising an elongated cylindrical guide tube secured at one open extremity to the seal plug of the reactor vessel whilst the other extremity is closed by an end-piece which is mounted in proximity to the fuel assemblies and which has a smaller internal cross-sectional area than the guide tube. The device essentially comprises a flexible metallic positioning arm which is capable of sliding within the interior of the guide tube and at least one thermocouple cable mounted inside the positioning arm. That end of the cable which carries the sensitive element of the thermocouple is attached to the exterior of an elastic clamp which is secured to the positioning arm. The open end of the positioning arm is engaged within the guide tube until it penetrates in the end-piece, thereby closing the clamp and bringing the sensitive element into contact with the surface of the end-piece.

3,716,451
NUCLEAR REACTOR POWER PLANT STRUCTURAL SUPPORT SYSTEM

Alfred L. Van Sickel, East Weymouth; Errol S. Mitchell, Dorchester, and Gianfranco Rigamonti, Cambridge, all of Mass., assignors to Stone & Webster Engineering Corporation, Boston, Mass.
Filed Nov. 30, 1970, Ser. No. 93,687
Int. Cl. G21c *15/22, 21/00*
U.S. Cl. 176—65 **10 Claims**

A structural support system for the steam generators and reactor coolant circulating pumps of a nuclear power plant in which each steam generator is carried in a lower frame support mounted on linear slides and also is supported by an upper ring to which there is secured four equi-spaced hydraulic snubber assemblies mounted to the charging floor of the power plant at perpendicular directions to each other. Each reactor coolant pump is carried in a pivotally mounted frame support adjacent its associated steam generator. Hydraulic snubber assemblies extend between each steam generator and its associated reactor coolant pump and also between the reactor shield wall and each of the steam generators and reactor coolant pumps.



3,716,452
LYSIS OF YEAST CELL WALLS

Kunpei Kitamura; Tatsuhiko Kaneko; Yasushi Yamamoto, and Yoshiro Kuroiwa, all of Takasaki-shi, Japan, assignors to Kirin Beer Kabushiki Kaisha, a.k.a., Kirin Brewery Co., Ltd., Tokyo, Japan
Filed Sept. 17, 1970, Ser. No. 73,061
Int. Cl. C12d *13/10;* **A23j** *1/18*
U.S. Cl. 195—2 **16 Claims**

An enzyme which is capable of lysing yeast cell walls is produced by microorganisms belonging to Arthrobacter luteus nov. sp. The enzyme has a unique activity for lysing cell walls of yeast dead or alive and in any stage of growth.

3,716,453
METHOD OF PRODUCING L-HISTIDINE BY FERMENTATION

Shinji Okumura, Tokyo, Fumihiro Yoshinaga, Kanagawa-ken, and Koji Kubota and Hirotaka Kamijo, Tokyo, Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan
No Drawing. Filed June 10, 1970, Ser. No. 45,262
Claims priority, application Japan, June 25, 1969, 44/50,161
Int. Cl. C12b *1/00;* **C12d**
U.S. Cl. 195—29 **9 Claims**

Microorganisms of the genera Brevibacterium, Corynebacterium, and Arthrobacter are exposed to mutagenic chemical agents or to ionizing radiation, and the exposed organisms are screened for the presence of mutants capable of producing L-histidine by aerobic fermentation of conventional culture media. The best mutant strain so selected produces 4.3 g./l. L-histidine in the broth within 48 hours. The histidine is recovered in good yields by absorption from the broth on ion exchange resin.

3,716,454
PROCESS FOR THE PRODUCTION OF κ-AMINOBENZLPENICILLIN

Noriaki Kuwana, Nerima-ku, Tokyo; Tamio Kawamura, Bunkyo-ku, Yokyo, and Masayuki Fukumura, Hiratsuka-shi, Kanagawa, all of Japan, assignors to Eisai Kabushiki Kaisha, Bunkyo-Ku, Tokyo, Japan

Filed May 11, 1970, Ser. No. 36,482

Claims priority, application Japan, Sept. 2, 1969, 44/69075

Int. Cl. C12d *9/00*

U.S. Cl. 195—30 **8 Claims**

A process for the enzymatic production of D-(-)-α-aminobenzylpenicillin, i.e., Ampicillin, which is one of the semi-synthetic penicillins useful as an antibiotic, starting from 6-aminopenicillanic acid and a functional derivative of D-(-)-α-aminophenylacetic acid.

The process is conducted in an aqueous medium in the presence of a new microorganism named Flavobacterium EF 44–102 (ATCC No. 21429).

The said microorganism efficiently catalyzes the afore-mentioned enzymatic reaction to form ampicillin.

3,716,455
METHOD FOR PRODUCING ISOAMYLASE BY FERMENTATION

Seinosuke Ueda, Fukuoka-shi, Nobuya Nanri, Fukuoka-ken, and Motoyoshi Hongo, Fukuoka-shi, Japan, assignors to Hayashibara Co., Ltd., Okayama-shi, Japan

No Drawing. Continuation of application Ser. No. 667,345, Sept. 13, 1967. This application Aug. 1, 1968, Ser. No. 749,288

Claims priority, application Japan, Sept. 22, 1966, 41/62,328

Int. Cl. C12d *13/10*

U.S. Cl. 195—66 R **1 Claim**

Production of isoamylase by fermentation of a microorganism belonging to *Escherichia intermedia* in a culturing medium at 20°–40° C. and at pH 6–9. The isoamylase is an enzyme which decomposes the α-1,-6-linkage of starch.

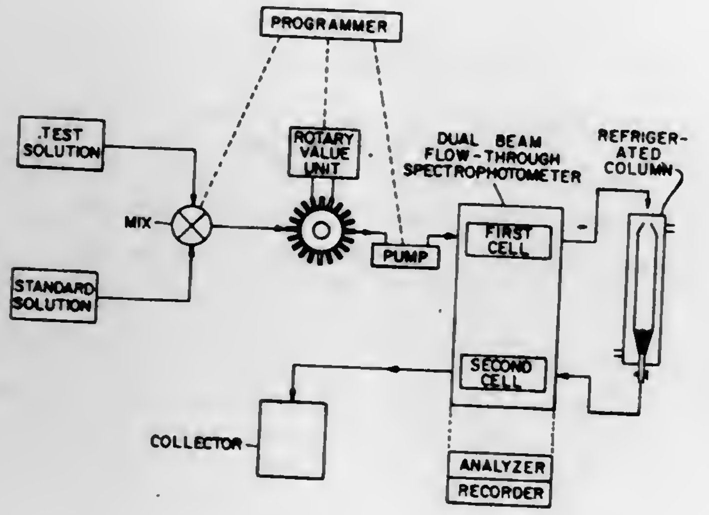
3,716,456
ANION MONITORING SYSTEM

Howard H. Weetall, Elmira, N.Y., assignor to Corning Glass Works

Filed May 14, 1971, Ser. No. 143,502

Int. Cl. C12k *1/04*

U.S. Cl. 195—103.5 R **25 Claims**



Continuous-flow monitoring system for determining the concentration of anions in an aqueous solution. The system is based on the inhibition by the anion of the enzymatic hydrolysis of an ester of the anion. Specific methods for determining the concentrations of inorganic phosphate and sulfate are disclosed.

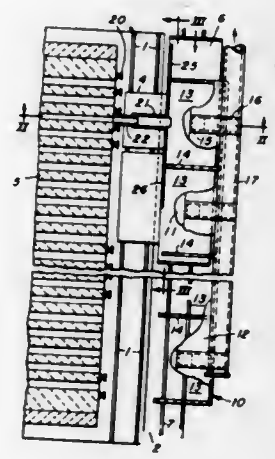
3,716,457
APPARATUS FOR PREVENTING AIR POLLUTION DURING COKE OVEN DISCHARGE

Erich F. Schon, Bochum - Weitmar, Germany, assignor to Dr. C. Otto & Comp. G.m.b.H., Bochuma, Germany

Filed Oct. 22, 1970, Ser. No. 83,111

Int. Cl. C10b *33/00*

U.S. Cl. 202—263 **8 Claims**



A tubular coke guide, supported by a carriage in front of a row of coke ovens, receives coke from each oven in succession and discharges it into a quencher car. This car is covered by a stationary housing extending throughout the length of the row of ovens. The housing has a roof and an outer wall extending therefrom down close to the outer side of the quencher car. The bottom and inner side of the housing are open and the inside of the housing is divided into cells by means of transverse upright partitions. The upper part of each cell is provided with a valved outlet connected to a suction line. Upright closure walls supported by the carriage extend from the outer end of the coke guide in opposite directions along the housing far enough to close the side of the cell beside them. The tops of these walls substantially engage the housing roof, and their bottoms are close to the inner side of the car. The cell into which the coke is being discharged therefore will have four side walls and a roof so that the smoke and dust produced in the cell will be drawn out through its outlet by means of the suction line.

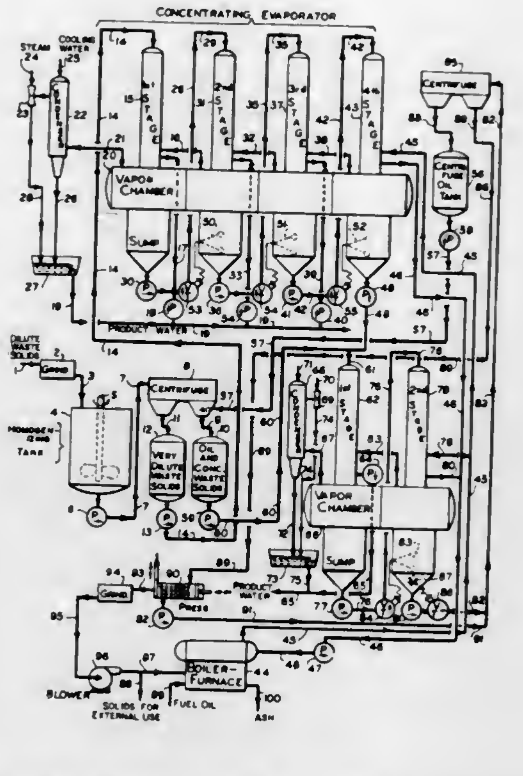
3,716,458
PROCESS AND APPARATUS FOR RECOVERING CLEAN WATER FROM DILUTE SOLUTIONS OF WASTE SOLIDS

Charles Greenfield, Murray Hill; Robert E. Casparian, Boonton, and Anthony J. Bonanno, Parsippany, all of N.J., assignors to Carver-Greenfield Corporation, Hanover, N.J.

Filed Sept. 18, 1970, Ser. No. 73,336

Int. Cl. B01d *3/00, 3/08, 3/02, 1/00;* **B01b ; A23c** *5/00*

U.S. Cl. 203—11 **13 Claims**



An improved process and apparatus for recovering clean water from dilute solutions of waste solids. A dilute stream of waste solids is concentrated by evaporation and the evaporated water is condensed and recovered. The waste solids in concentrated solution are mixed with oil and subject to further drying by evaporation. Again the evaporated water is condensed and recovered. If desired, the waste solids may be separated from the oil which may then be recycled.

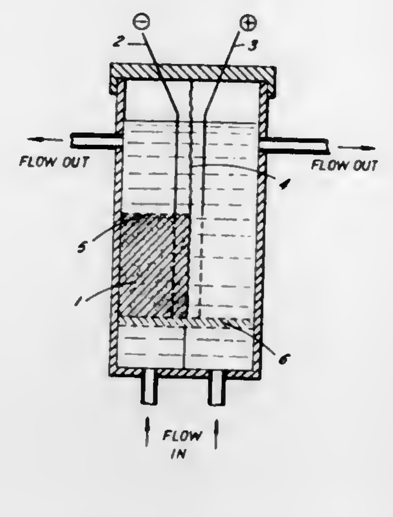
3,716,459
ELECTROCHEMICAL PROCESSES

David Stanley Salter, Horsham, and David Henry Smith, Guildford, England, assignors to Constructors John Brown Limited, London, England

Filed Oct. 16, 1969, Ser. No. 866,956

Int. Cl. B01k *3/00*

U.S. Cl. 204—1 R **11 Claims**



Electrochemical processes wherein at least one of the electrodes at which electron transfer occurs comprises a mass of discrete particles of particle size up to 2000μ which particles are comprised of a material selected from the group consisting of electrically conductive and partially electrically conductive materials, the mass of particles being supported on a fluid-permeable support and wherein a fluid is caused to flow upwards through the mass of particles in such a manner as to impart movement to the particles, the degree of upward movement of the particles in the fluid stream being limited by a particle-impermeable barrier positioned above the particle bed so that the volume occupied by the particles is less than the volume which the particles would occupy as a fluidised bed.

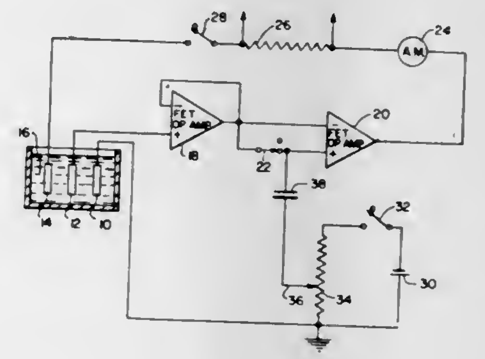
3,716,460
METHOD FOR DETERMINING CORROSION RATE AND METER THEREFOR

Aaron Weisstuch, Philadelphia, Charles E. Schell III, Levittown, and Paul C. Dryden, Philadelphia, Pa., assignors to Betz Laboratories, Inc., Trevose, Pa.

Filed June 21, 1971, Ser. No. 154,770

Int. Cl. G01n *27/26*

U.S. Cl. 204—1 T **13 Claims**



A three electrode corrosion rate meter including a potentiostat for providing a corrosion rate current wherein a capacitor is used to measure, store and program to the potentiostat the potential difference between the test and reference electrodes.

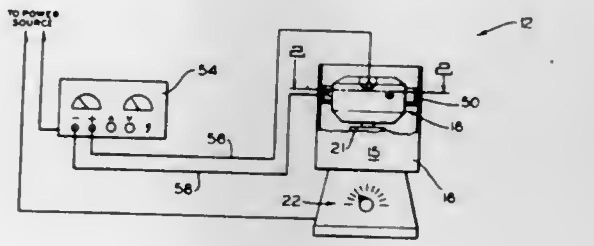
3,716,461
PROCESS FOR FORMING COMPOSITE MATERIAL BY ELECTRODEPOSITION UNDER THE INFLUENCE OF A CENTRIFUGAL FORCE FIELD

Iqbal Ahmad, Elnora, N.Y., assignor to The United States of America as represented by the Secretary of the Army

Filed May 13, 1969, Ser. No. 824,129

Int. Cl. C23b *5/48, 7/02, 5/68*

U.S. Cl. 204—16 **9 Claims**



An improvement in the techniques of forming composite material by electrodeposition whereby the electrolyte slurry containing the reinforcing whiskers or fibers is subjected to a centrifugal force field to press the whiskers or fibers against the cathode and form a permeable mat thereagainst for encapsulation by the deposited matrix metal. Thus, the percent by volume of the whiskers or fibers in the deposited composite material can be increased substantially above that which is possible by conventional electrodeposition technique.

3,716,462

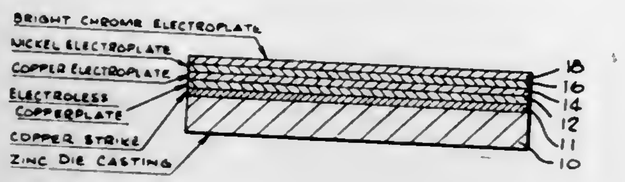
COPPER PLATING ON ZINC AND ITS ALLOYS

Darwin P. Jensen, 2565 Palos Verdes West, Palos Verdes Estates, Calif.

Filed Oct. 5, 1970, Ser. No. 77,828

Int. Cl. C23f *17/00;* **C23b** *5/20;* **C23c** *3/02*

U.S. Cl. 204—38 B **17 Claims**



Production of a uniform, continuous corrosion resistant bonded copper coating on a zinc or zinc alloy body, by a process which comprises contacting the zinc or zinc alloy body with an electroless copper plating composition or solution consisting essentially of a soluble copper salt, e.g., copper sulfate, a complexing agent, e.g., citric acid, and a reducing agent, e.g., sodium hypophosphite. The resulting zinc or zinc alloy body can then be contacted with a copper electroplating bath, and according to one embodiment the resulting copper plated zinc or zinc alloy body is then treated in a nickel electroplating solution, followed by treatment in a chromic acid electroplating solution, to provide a corrosion resistant bright attractive metal coating on the zinc or zinc alloy body. The above noted novel electroless copper plating composition, and the zinc or zinc alloy article coated with an electroless copper plating.

3,716,463

BRIGHT GOLD ALLOY ELECTROPLATING BATH AND PROCESS

Maurice Bick, South Orange, and Jean A. Lochet, Fords, N.J., assignors to Auric Corporation, Newark, N.J.

No Drawing. Filed Aug. 30, 1971, Ser. No. 176,334

Int. Cl. G01n *5/42, 5/46*

U.S. Cl. 204—43 **10 Claims**

An electroplating bath for effecting bright and relatively stress-free deposits of gold alloys. The bath is an aqueous solution of a soluble gold-alkali metal cyanide and a weak, stable, partially neutralized organic acid, together with quantities of cyclohexylamine and small amounts of soluble base metal salts or complexes to provide the desired alloy. A buffering agent for stabilizing the pH of the bath may also be incorporated into the bath.

3,716,464

METHOD FOR ELECTRODEPOSITING OF ALLOY FILM OF A GIVEN COMPOSITION FROM A GIVEN SOLUTION

Zlata Kovac, Pittsburgh, Pa., and Judith D. Olsen, Mount Kisco, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

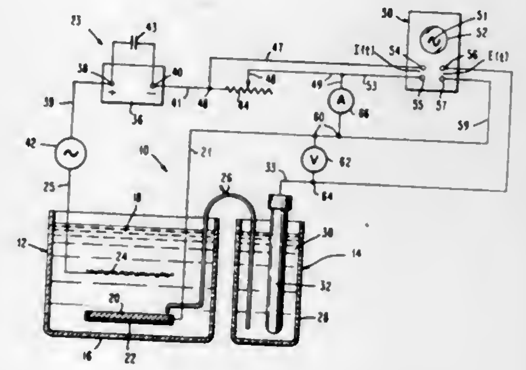
Filed Dec. 30, 1969, Ser. No. 889,106

Int. Cl. C23b *5/32*

U.S. Cl. 204—43 **8 Claims**

The effect of superimposing a sinusoidal alternating current on a direct current during electrodeposition of Ni—Fe alloys is disclosed in terms of the following factors: (a) maintaining the pH at the electrode equal to that of the bulk electrolyte; (b) ionic diffusion processes; and (c) chemical processes in solution prior to electrochemical reduction. The effect of frequency, amplitude and the rate of a-c current to d-c current on the composition of electrodeposited alloy are given for acid solutions of different pH and for alkaline solutions of metallic complexes with a variable concentration of complexing agent. It is shown that by proper choice of conditions, electrodeposited Fe—Ni alloys can be prepared with a desired uniform composition throughout their thickness.

In the practice of this disclosure, alternating current is superimposed on direct current to prevent the pH in the layer of solution adjacent to the electrode from increasing and thus influence the electrodeposition of iron group metals or alloys of any metals which readily form hydroxide. Formation of hydroxides is thus prevented and their inclusion into deposited film is precluded. Additionally, the a-c current beneficially affects the rate of deposition of a metal which is controlled by diffusion. There is no concentration gradient of composition across the thickness of a film of Ni-Fe deposited by practice of this disclosure. Illustratively, Ni and Fe plate out at the same rate for thickness of film approximately in the range of 300A. to 4,000A. By control of the density of the d-c current, and the amplitude and frequency of the a-c current, Ni-Fe film of any given composition approximately in the range of 6 to 60 percent Fe is electroplated from the same solution.



3,716,465

PROCESS FOR THE MANUFACTURE OF THIAZACYCLIC HYDROXY COMPOUNDS

Karl Heusler, Basel, Switzerland, and Robert Burns Woodward, Cambridge, Mass., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Nov. 23, 1970, Ser. No. 92,203

Claims priority, application Switzerland, Nov. 27, 1969, 17669/69

Int. Cl. B01j *1/10*

U.S. Cl. 204—158 R **11 Claims**

The invention concerns a process for the manufacture of 6-acylamino-3-hydroxy-2,2-dimethyl-penam compounds, useful as intermediates, which are obtained by irradiation of 6-acylamino-3-arylmethoxycarbonyl-amino-2,2-dimethylpenam compounds with simultaneous or subsequent treatment with water. Also included are the starting materials used in the above procedure.

3,716,466

THIOESTER CROSS-LINKING AGENTS

Edwin O. Hook, Marshfield, Mass., assignor to Moleculon Research Corporation, Cambridge, Mass.

No Drawing. Filed Dec. 22, 1969, Ser. No. 887,366

Int. Cl. C08f *1/24, 27/06*

U.S. Cl. 204—159.17 **12 Claims**

New thioester cross-linking monomers and methods of increasing cross-linking and oxidation resistance through their addition to various polymeric materials.

3,716,467

PROCESS FOR THE RADIATION INSOLUBILIZATION OF N-(VINYL) PHENYLACRYLAMIDE

Hiroyoshi Kamogawa, Kawasaki, Japan, assignor to Agency of Industrial Science and Technology, Tokyo, Japan

Division of Ser. No. 838,662, July 2, 1969, abandoned. This application March 15, 1972, Ser. No. 234,985

Claims priority, application Japan, July 5, 1968, 43/46865; July 5, 1968, 43/46866

Int. Cl. C08d *1/10;* **C08f** *1/16*

U.S. Cl. 204—159.18 **7 Claims**

A process for the insolubilization of N-(vinyl)phenylacrylamide polymers which comprises polymerizing or copolymerizing by cationic catalysts thereby producing soluble polymers, and irradiating the resulting soluble polymers with light in the presence of a light polymerization initiator thereby polymerizing the vinyl groups remaining in said soluble polymers and three-dimentional network structure polymers produced by the above mentioned process.

3,716,468

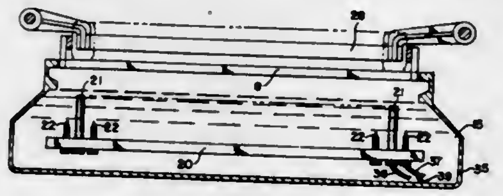
METHOD FOR ELECTRODEPOSITION OF CANS

Wayne T. Chiappe, Hinsdale, Ill., assignor to Continental Can Co., Inc., New York, N.Y.

Division of Ser. No. 829,411, June 2, 1969. This application April 9, 1971, Ser. No. 132,857

Int. Cl. C23b *13/00;* **B01k** *5/02*

U.S. Cl. 204—181 **10 Claims**



A method of depositing a coating onto a can body by electrolysis in which the can bodies are forced down between spaced electrodes and a current is sent between the spaced electrodes and another electrode located at a distance from the spaced electrodes. Electric potential is applied across from the can body to the other electrode and depositing of a coating takes place.

3,716,469

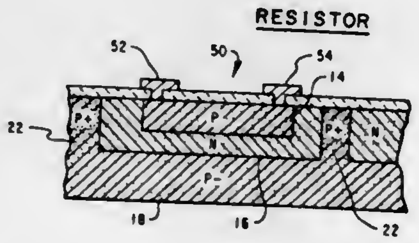
FABRICATION METHOD FOR MAKING AN ALUMINUM ALLOY HAVING A HIGH RESISTANCE TO ELECTROMIGRATION

Harshad J. Bhatt and James W. Tuttle, Wappingers Falls, N.Y., assignors to Cogar Corporation, Wappingers Falls, N.Y.

Original application Dec. 17, 1970, Ser. No. 99,036, now Patent No. 3,631,305. Divided and this application Oct. 1, 1971, Ser. No. 185,591

Int. Cl. C23c *15/00*

U.S. Cl. 204—192 **14 Claims**



This disclosure is directed to an improved semiconductor device, electrical conductor, thin film conductor, alloy and fabrication methods therefor. An aluminum-oxide-copper alloy conductor is disclosed which has a high resistance to electromigration and hence, a conductor lifetime greater by at least a factor of 10 than unalloyed aluminum conductors. Semiconductor devices utilizing this aluminum alloy in the thin film conductive stripes interconnecting different conductivity regions or devices located in the semiconductor substrate are significantly improved and more reliable.

3,716,470

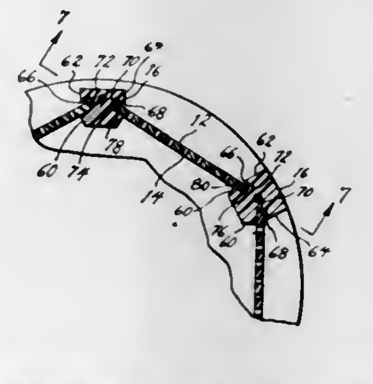
ELECTROPLATING BARREL CONSTRUCTED FROM TWO DISPARATE PLASTICS

Walter F. Noonan, Wallingford, Pa., assignor to Westlake Plastics Co., Lenni, Pa.

Filed June 8, 1971, Ser. No. 150,985

Int. Cl. C23b *5/78*

U.S. Cl. 204—213 **12 Claims**



A polyhedral rotatable electroplating barrel in which the axial ribs or struts and end heads are made of a thermoplastic resin whose deflection temperature as well as tensile and flexural strengths exceeds those of the thermoplastic resin used for the perforate panels with means interconnecting the ribs, heads and panels so that the panels are free to expand without buckling in all three dimensions into grooves in the ribs and heads.

3,716,471

ELECTRODE OF PETROLEUM COKE AND BROWN COAL CHAR

Geoffrey Victor Cullen, North Balwyn, John William Graham, Essendon, and Neil Graham Siviour, East Kew, Victoria, Australia, assignors to University of Melbourne, Victoria, Australia

No Drawing. Filed Sept. 9, 1970, Ser. No. 70,874

Int. Cl. B01r *3/08*

U.S. Cl. 204—294 **4 Claims**

A material for use in electrodes of the kind employed in electrolytic cells and comprising a mixture of petroleum coke and brown coal char.

3,716,472

CATHODE ATOMIZATION APPARATUS

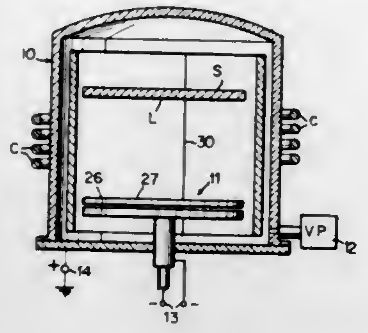
Helmold Kausche, Munich-Pasing, Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Continuation-in-part of Ser. No. 614,156, Feb. 6, 1967, abandoned. This application May 20, 1970, Ser. No. 39,121

Int. Cl. C23c *15/00*

U.S. Cl. 204—298 **5 Claims**

A cathode structure for use in a cathode sputtering apparatus for production of a homogeneous multi-component layer on a substrate. For example, the multi-component layer is a magneto striction free ferromagnetic Ni-Fe layer. The cathode is composed of individual components of the multi-component layer and each of the individual component surfaces is selectively varied to control the amount of that component sputtered during formation of the multi-component layer.



3,716,473

METHOD AND APPARATUS FOR COATING METAL WORKPIECES WITH WATER SOLUBLE OR COLLOIDAL COLORING MATTER EMULSIFIED IN WATER

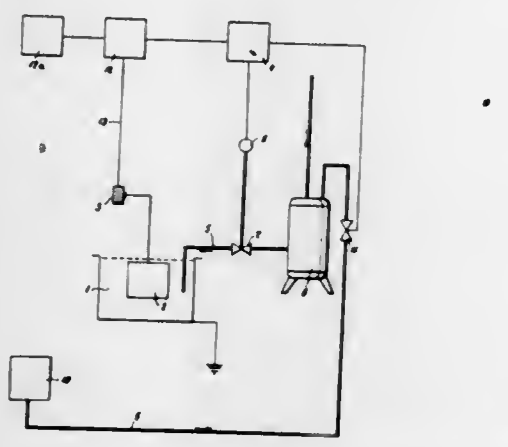
Jozsef Domokos, 67, Tancsics u., Budapest XIX; Gyorgy Benedek, 35 Ringlo u., Budapest XXII; Bela Kiss, 8, Mecset u., Budapest II; Laszlo Winkler, P.O. Box 36, Nap u., Budapest XVIII, and Zoltan Beller, P.O. Box 78/a, Nemetvologyi u., Budapest XII, all of Hungary

Division of Ser. No. 698,273, Jan. 16, 1968. This application June 21, 1971, Ser. No. 155,199

Claims priority, application Hungary, Jan. 20, 1967, DO-310

Int. Cl. B01k *5/02;* **C23b** *13/00*

U.S. Cl. 204—299 **2 Claims**



A method and apparatus for coating metal workpieces with coloring matter. The metal workpieces which are continuously coated, one after the other, are connected into an electrical circuit to form an anode thereof, and they are advanced sequentially through a solution which has either water soluble coloring matter or colloidal coloring matter emulsified in water. This solution is contained in a vessel which forms a cathode of the electrical circuit, and a coulometer-integrator-regulating means coacts with an anode bar which is connected to the workpiece for sensing a time impulse and a current-amount impulse. A supply means is provided for supplying the solution of coloring matter to the vessel, and a valve means coacts with this supply means for controlling the flow of coloring matter therefrom to the vessel, this valve means being actuated by an actuating means which is operatively connected with the coulometer-integrator-regulating means to be regulated thereby for maintaining constant the concentration of coloring matter in the solution in the cathode-forming vessel.

3,716,474

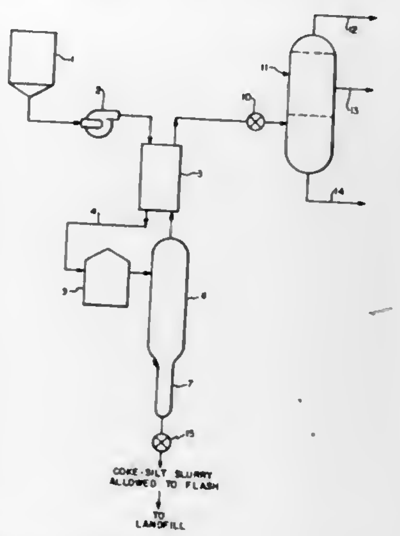
HIGH PRESSURE THERMAL TREATMENT OF WASTE OIL-CONTAINING SLUDGES

Howard V. Hess, Glenham, and Edward L. Cole, Fishkill, both of N.Y., assignors to Texaco Inc., New York, N.Y.

Filed Oct. 22, 1970, Ser. No. 83,057

Int. Cl. B01d *17/04;* **C02b** *1/02*

U.S. Cl. 208—13 **7 Claims**



Oil-water emulsion-type sludges, in particular refinery pit sludges are thermally treated at a temperature of at least 750° F under pressure of at least 3,000 psi to give a gas phase containing saturated hydrocarbons, suitable as fuel or cracking stock, a usable oil fraction, a water phase and a useful silt-coke phase.

3,716,475

HYDROTREATING CATALYST COMPRISING AN INTERSTRATIFIED CRYSTALLINE CLAY-TYPE ALUMINOSILICATE COMPONENT AND A CRYSTALLINE ZEOLITIC MOLECULAR SIEVE COMPONENT AND PROCESS USING SAID CATALYST

Sigmund M. Csicsery, Lafayette, and James R. Kittrell, Palos Verdes Estates, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Jan. 30, 1970, Ser. No. 7,179

Int. Cl. C10g *13/04;* **C01b** *33/28;* **B01j** *11/40*

U.S. Cl. 208—59 **20 Claims**

A catalyst comprising an interstratified synthetic crystalline aluminosilicate cracking component and a crystalline zeolitic molecular sieve component, which may be dispersed in a matrix comprising a siliceous gel, if desired one or both of said components being substantially in the ammonium or hydrogen form and substantially free of any catalytic metal or metals when dispersed in a matrix, and if desired one of said components being substantially in the ammonium or hydrogen form and substantially free of any catalytic metal or metals when not dispersed in a matrix, a hydrogenating component selected from platinum and compounds thereof and palladium and compounds thereof, a component selected from the metals cerium, manganese, zinc, and compounds of said metals, and processes using said catalyst.

3,716,476

EFFLUENT COOLING IN A HYDROCRACKING AND HYDRODESULFURIZING PROCESS

William R. Coons, Jr., Port Arthur; James H. Colvert, Houston, and Gerald V. Nelson, Port Arthur, all of Tex., assignors to Texaco Inc., New York, N.Y.

Filed Dec. 28, 1970, Ser. No. 102,251

Int. Cl. C10g *23/00*

U.S. Cl. 208—97 **6 Claims**

A residue-containing petroleum fraction, 50 percent boiling above 1,000°F, is hydrocracked and then hydrodesulfurized. During the onstream period, the conversion level of material boiling above 1,000°F is maintained substantially constant

while the sulfur content of the hydrocracked effluent increases. The sulphur content of a product fraction is maintained substantially constant by gradually increasing the hydrodesulfurization temperature. The effluent from the hydrocracking reaction is cooled by adding an aromatic-rich fraction and the cooled mixture is passed to the desulfurization reaction.

3,716,477

LOW PRESSURE REGENERATIVE REFORMING PROCESS

Robert L. Jacobson, Penole, and Robert D. Vanselow, Kensington, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 64,067, July 24, 1970, abandoned, which is a continuation of Ser. No. 740,566, June 27, 1968, abandoned. This application Oct. 6, 1970, Ser. No. 80,885The portion of the term of this patent subsequent to Jan. 26, 1988, has been disclaimed.

Int. Cl. C10g *35/08*

U.S. Cl. 208—139 **10 Claims**

A naphtha feed is reformed to high octane gasoline products at a pressure from 20 to 100 psig, a hydrogen or hydrocarbon mole ratio of less than 2 and a liquid hourly space velocity of 0.5 to 5, using a catalyst comprising platinum and rhenium supported on a porous inorganic oxide carrier. The reforming process is periodically discontinued to permit regeneration of the catalyst to restore substantially its initial activity.

3,716,478

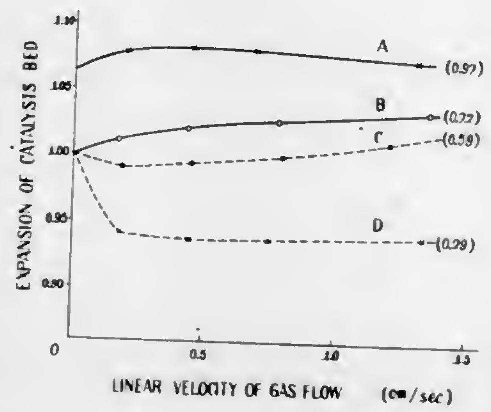
HYDROGENATION TREATMENT OF HYDROCARBON OIL

Yoshihide Kodera, Kanagawaken; Jun Kato, Meguro-ku, Tokyo; Kazuo Shimada, Kitaku, Tokyo; Morio Suzuki, Tsujido, Fujisawa-shi, Kanagawa-ken; Hidetaka Ohse, Soka-shi, Saitama-ken; Satoshi Ohshima, and Yasunori Kiriki, both of Meguro-ku, Tokyo, all of Japan, assignors to Agency of Industrial Science and Technology, Tokyo, Japan

Filed Feb. 10, 1970, Ser. No. 10,146

Int. Cl. C10g *23/10*

U.S. Cl. 208—152 **2 Claims**



Hydrogenation treatments of hydrocarbon oil is carried out in a catalyst-charged reaction vessel into the lower portion of which is fed a flow of a mixture of hydrocarbon oil and hydrogen or hydrogen-containing gas. The supply velocity of the mixture is adjusted so that catalyst particles in the catalyst layer do not fluidize. At the lower portion of the reaction vessel is provided an appropriate catalyst-withdrawing means by which deactivated catalyst particles are withdrawn during reaction.

3,716,479

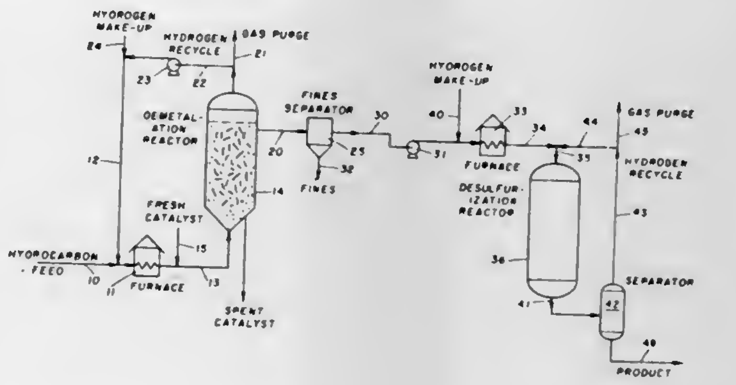
DEMETALATION OF HYDROCARBON CHARGE STOCKS

Paul B. Weisz, Yardley, and Anthony J. Silvestri, Morrisville, both of Pa., assignors to Mobil Oil Corporation

Filed Dec. 23, 1970, Ser. No. 100,931

Int. Cl. C10g *23/02*

U.S. Cl. 208—211 **23 Claims**



This specification discloses the demetalation of a hydrocarbon charge stock. The demetalation procedure involves contacting the hydrocarbon charge stock with hydrogen in the presence of, as a catalyst, a material derived from the naturally-occurring underwater deposit known as a manganese nodule. The manganese nodule may be employed without pretreatment or may be pretreated by sulfiding or by leaching to remove and recover one or more valuable metallic constituents. The manganese nodule catalyst, after it has become deactivated by use, may be processed to remove and recover one or more valuable metallic constituents.

3,716,480

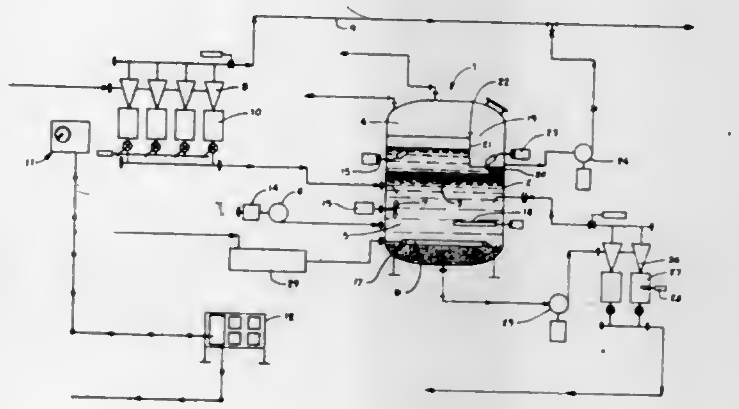
METHOD AND APPARATUS FOR CLEANING SOLIDS COATED WITH OIL

Bruce M. Finley and Paul G. Sturdivan, Oklahoma City, Okla., assignors to Demco Incorporated, Oklahoma City, Okla.

Filed June 21, 1971, Ser. No. 154,803

Int. Cl. B01d *17/02*

U.S. Cl. 210—22 **15 Claims**



A method and apparatus for cleaning solids coated with oil and removing oil therefrom is disclosed and includes a solids clarifier tank having a selected liquid therein and for receiving a portion of oil well production comprising a mixture of oil and solids coated with oil and having a baffle positioned therein to divide the clarifier tank into upper and lower chambers and a pump operative to inject a surfactant into the mixture of oil and solids coated with oil and the selected liquid which is mixed by agitation or mixing blades to disburse the surfactant throughout the mixture to effect rising of the oil which is removed from the upper chamber and settling of the solids which are removed from a lower portion of the lower chamber as a solids-liquid slurry which is separated into a solids portion to be discharged for disposal and a liquid portion which is returned to the clarifier tank.

3,716,481
THERMAL REGENERATION ION EXCHANGE PROCESS WITH TRIALLYLAMINE POLYMERS

Hendrik Adriaan Jacobus Battaerd, North Clayton, Victoria, Australia, assignor to ICI Australia Limited, Melbourne, Victoria, Australia

No Drawing. Continuation-in-part of application Ser. No. 882,496, Dec. 5, 1969. This application July 19, 1971, Ser. No. 164,148

Int. Cl. B01j *1/08;* **C02b** *1/16*

U.S. Cl. 210—32 **3 Claims**

Process for the demineralization of water by a mixed bed of weak acid and weak base type ion exchange resins in which the mixed bed is regenerated by eluting it with water or a saline solution at a temperature exceeding that employed during the adsorption stage. The process utilizes as the weak base resin at least one solid polymer comprising between 3 and 100 mole percent of triallylamine and a balance of at least one allylamine comer. The polymer used is prepared by exposing the allylic monomer or monomers to a total dose of from 3 to 20 megarads of high energy radiation at a temperature between −80° C. and +120° C.

3,716,482
ANION EXCHANGER WITH SPONGE STRUCTURE AND PROCESS OF USING SAME

Herbert Corte, Leverkusen, and Alfred Meyer, Cologne-Stammheim, both of Germany, assignors to Bayer Aktiengesellschaft

Division of Ser. No. 718,989, March 4, 1958, Pat. No. 3,637,535. This application Sept. 14, 1970, Ser. No. 72,198

Claims priority, application Germany, March 9, 1957, 2253239

Int. Cl. C02c *1/60*

U.S. Cl. 210—37 **8 Claims**

Organic impurities and inorganic anions are removed from an aqueous liquid by treating the liquid with a particulate anion exchange resin containing strongly basic groups and having a mean pore diameter of at least 100 Angstrom units.

3,716,483
PROCESS FOR REMOVING ORGANIC SUBSTANCES FROM WATER

Alfred Renner, Muenchenstein, Switzerland, assignor to Ciba-Geigy, Basel, Switzerland

Filed July 21, 1970, Ser. No. 56,955

Claims priority, application Switzerland, Aug. 1, 1969, 11754/69

Int. Cl. E02b *15/04*

U.S. Cl. 210—40 **3 Claims**

Process for removing dissolved, emulsified or suspended organic substances, for example fat, resin, oil or dyestuff, from water in which the contaminated water is brought into contact with a highly disperse, solid, water-insoluble organic polymer, for example melamine-formaldehyde resin or polyacrylonitrile of average molecular weight greater than 1,000 and a specific surface area greater than 5 m²/g, and the polymer charged with the contamination is separated from the water.

3,716,484
PROCESS FOR SUBSTANTIAL REMOVAL OF PHOSPHATES FROM WASTEWATERS

Patrick A. Lincoln, St. Louis, and Philip G. Delamater, Alma, both of Mich., assignors to Michigan Chemical Corporation, St. Louis, Mich.

Filed May 10, 1971, Ser. No. 142,032

Int. Cl. C02c *1/40*

U.S. Cl. 210—52 **3 Claims**

The invention is directed to a process for removing substantial amounts of soluble phosphates from wastewaters at primary treatment stages by means of chemical precipitation utilizing calcium chloride at a pH of 8–9.5, or a combination of calcium chloride and calcium hydroxide. An equivalent amount of calcia may be used in place of the calcium hydroxide.

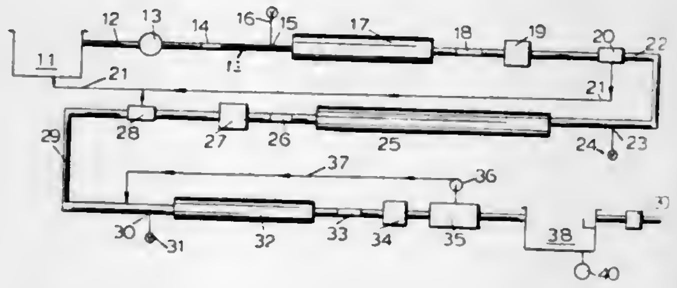
3,716,485
PROCESS AND APPARATUS FOR DESTROYING HEXAVALENT CHROMIUM IN SOLUTION

Richard G. Robertson, Parma Heights, Ohio, assignor to Ayteks International Corporation, Midina, Ohio

Filed Jan. 11, 1971, Ser. No. 105,163

Int. Cl. C02c *5/02*

U.S. Cl. 210—50 **14 Claims**



An apparatus and method for precipitating and/or destroying a chemical material comprising a source of material connected in series with an acidification unit, a reduction unit, and a pH adjustment unit and with detention chambers between each unit and a container to allow settling of the newly formed material. This apparatus provides a circuit through which the reaction takes place within engineered volumes of piping surrounding the unit.

3,716,486
BRINE DRILLING FLUID LUBRICANT AND PROCESS FOR DRILLING SUBTERRANEAN WELLS WITH SAME

Alphonse C. Perricone, Houston, Tex., assignor to Milchem Incorporated, Houston, Tex.

Filed Mar. 18, 1971, Ser. No. 125,509

Int. Cl. C10m *3/40*

U.S. Cl. 252—8.5 C **9 Claims**

Enhanced lubricating properties can be obtained in a brine drilling fluid by utilizing an alkaline water soluble solution of a mono- and di-hydrogen phosphate ester of a five mole ethylene oxide adduct of a C_{10} linear saturated alcohol in a solvent selected from the class consisting of monohydric alcohols, water, and mixtures thereof and a silicone defoamer.

3,716,487
PROCESS FOR THE REMOVAL OF SCALE

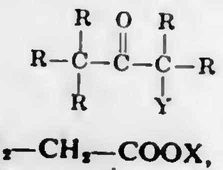
Herman A. Bruson, Woodridge, Conn., and Henry Gould, Houston, Tex., assignors to Milchem Incorporated, Houston, Tex.

Filed Sept. 23, 1971, Ser. No. 183,278

Int. Cl. C02b *5/06, 1/20*

U.S. Cl. 252—82 **26 Claims**

A process for the removal and inhibition of scale in aqueous environments utilizing a composition having the formula:



$$\begin{array}{ccccccc} & & R & & O & & R \\ & & | & & \| & & | \\ R- & & C & - & C & - & C & -R \\ & & | & & & & | \\ & & R & & & & Y \end{array}$$

wherein R is $-CH_2-CH_2-COOX$, X being a member selected from the class consisting of hydrogen, alkali metals, ammonium and substituted ammonium, and Y is selected from the class consisting of hydrogen and $-CH_2CH_2-COOX$, X being a member selected from the class consisting of hydrogen, alkali metals, ammonium and substituted ammonium.

3,716,488
TEXTILE FABRIC CLEANING COMPOSITIONS

Rodger E. Kolsky, West Paterson, and Vernon Lindsay Chase, Butler, N.J., assignors to J. P. Stevens & Co., Inc., New York, N.Y.

No Drawing. Continuation-in-part of abandoned application Ser. No. 69,948, Sept. 4, 1970. This application Aug. 11, 1971, Ser. No. 170,856

Int. Cl. C11d *1/38, 3/26*

U.S. Cl. 252—155 **8 Claims**

According to the present invention, a stable aqueous composition of matter is provided that inhibits soiling and cooperates with select detergents to produce superior shampooing and cleaning action on application to textile fabrics. The soil pick-up inhibiting effect of the formulation is attributable to an aqueous composition of matter comprising finely divided particulate clay from the smectite group; an "essentially" water-soluble polymer, substantially free of chromophores, that dries to a tack-free, non-sticky residue characterized by anionic properties or the capacity to form an association complex for the purpose of carrying an electrolytic charge in the composition; and in effective soil pick-up inhibiting amounts, a disperse polymer with a Tg of at least 15° C. that is non-filmforming at ambient temperatures. The detergents that effectively cooperate with the soil pick-up inhibitors are detergents characterized by anionic or non-ionic properties in an alkaline medium ranging in pH up to about 11.

3,716,489
SUPERSATURATED SOLID SOLUTIONS OF PHOTOCHROMIC MATERIALS IN EPOXIES

Darwin Fiske DeLapp, New Canaan, Conn., assignor to American Cyanamid Company, Stamford, Conn.

Filed Oct. 2, 1970, Ser. No. 77,731

Int. Cl. G02c *7/10;* **G02b** *5/28;* **F21v** *9/00*

U.S. Cl. 252—300 **9 Claims**

A fast-acting photochromic filter consists of (1) a solid optically transparent epoxy matrix of (2) essentially free from non-combined, that is molecular oxygen, and for storage stability protected from diffusion of atmospheric oxygen, in which is (3) dispersed, in solid solution, at least one light absorbing compound having a polynuclear conjugated aromatic ring structure.

As many photochromic materials have low solubility in a matrix, and a solid solution is desired, both the epoxide component of the epoxy resin and the photochromic material are dissolved in a volatile solvent such as benzene, or a halogenated or alkylated benzene, and the solvent evaporated, to form a supersaturated solution, to which hardener is added before crystallization occurs.

Edge sealing of the glass by a polyvinyl alcohol, layer or a metal seal, or hermetic glass seal maintains oxygen exclusion.

3,716,490
TREATMENT OF RADIOACTIVE LIQUIDS

Norbert L. C. Van de Voorde, Mol, Belgium, assignor to Belgonucleaire S.A., Brussels, Belgium

No Drawing. Continuation-in-part of application Ser. No. 782,728, Dec. 10, 1968. This application June 3, 1969, Ser. No. 830,130

Claims priority, application Great Britain, Dec. 11, 1967, 56,172/67

Int. Cl. G21g *19/42*

U.S. Cl. 252—301.1 W **15 Claims**

A method for decontamination of radioactive liquids and the products thereof, including contacting the radioactive liquid with an ion exchange material formed from a bituminous substance, such as asphalt, and thereafter compacting the ion exchange material, as by fusion and/or compression.

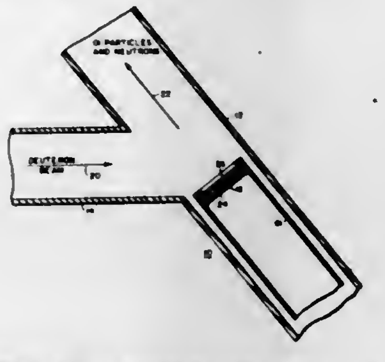
3,716,491
YTTRIUM-HYDROGEN ISOTOPE COMPOSITIONS FOR RADIOCHEMICAL REACTIONS

Lymperios N. Yannopoulos, 309 Edgewood Avenue, Apt. E, Pittsburgh, Pa.; Sven A. Jansson, 109 Glenfield Drive, and Earl A. Gulbransen, 63 Hathaway Court, both of Pittsburgh, Pa.

Filed July 9, 1969, Ser. No. 840,162

Int. Cl. C09k *3/00;* **G21g** *3/04*

U.S. Cl. 252—301.1 R **6 Claims**



Compositions for radiochemical reactions including yttrium deuterides and tritides and solutions of deuterium and tritium in yttrium alloys with titanium and/or zirconium.

3,716,492
BIODEGRADABLE COMPOSITION FOR DETECTING SURFACE DISCONTINUITIES

Bruce C. Graham, Arlington Heights, and Ilmars Z. Dukats, Park Ridge, both of Ill., assignors to Magnaflux Corporation, Chicago, Ill.

Filed April 1, 1971, Ser. No. 130,537

Int. Cl. C09k *1/02;* **G01n** *21/16*

U.S. Cl. 252—301.2 P **7 Claims**

A water washable, non-gelling colored liquid penetrant consisting essentially of a methyl ester of a fatty acid, a nonionic surfactant and a fluorescent dye, the methyl ester and the nonionic surfactant used being readily biodegradable and thereby rendering the penetrant as a whole non-polluting when subjected, without prior treatment, to the consuming action of microorganisms.

3,716,493
PROCESS FOR MAKING FINE SIZED LOW DENSITY SILICA

Ellsworth G. Acker, Baltimore, and Milton Edward Winyall, Ellicott City, Md., assignors to W. R. Grace & Co., New York, N.Y.

No Drawing. Continuation of abandoned application Ser. No. 731,266, May 22, 1968. This application Feb. 26, 1971, Ser. No. 119,407

Int. Cl. B01j *13/00;* **C01b** *33/16*

U.S. Cl. 252—317 **4 Claims**

A solution of alkali metal silicate is partially neutralized with about 6% sulfuric acid to about pH 10.6–10.9, stirred vigorously and completely neutralized with more sulfuric acid. After neutralization is complete, ammonia is added until a pH of greater than 7 is obtained. The thus formed slurry is then aged at about 80° C. for about 1 hour and filtered. The residue is washed with about 0.1% ammonium carbonate solution at about 80° C. and the thus washed solids are sized and dried. The resultant silica gel has a bulk density of about 0.03–0.10 g./cc., and a surface area of about 200–400 m.^{2}/g.

3,716,494

DYE PENETRANT REMOVER

Orlando G. Molina, Westminster, Calif., assignors to North Americana Rockwell Corp., and Air Products and Chemicals, Inc., Allentown, Pa., part interest to each

Continuation-in-part of Ser. No. 606,593, Jan. 3, 1967, abandoned. This application Feb. 25, 1971, Ser. No. 118,980
Int. Cl. G01n *21/16, 21/38*
U.S. Cl. 252—408 **4 Claims**

Viscous compositions of gel-like consistency are disclosed for removing excess dye penetrant from parts subjected to liquid dye penetrant inspection. The compositions comprise a cleaner, a carrier, and a viscosity increasing agent, and have a viscosity between 10 and 100 poises at 100 reciprocal seconds.

3,716,495

POLYMERIZATION INITIATOR COMPOSITION AND USE THEREOF

Henry L. Hsieh, Bartlesville, Okla., assignor to Phillips Petroleum Company

Filed Sept. 2, 1970, Ser. No. 69,123
Int. Cl. C08f *1/28, 3/06;* **C08d** *1/14*
U.S. Cl. 252—431 L **18 Claims**

An initiator composition, formed by mixing: (a) an organolithium compound and (b) a hydrocarbyl metal compound wherein the metal is selected from Group 2*a*, 2*b*, or 3*a* of the Periodic Table, is employed in the presence of a polar compound selected from ethers, thioethers, and tertiary amines in the preparation of homopolymers and copolymers of conjugated dienes and vinyl-substituted aromatic hydrocarbons.

3,716,496

CATALYST COMPOSITION FOR THE OXIDATION AND THE OXIDATIVE DEHYDROGENATION OF OLEFINS

Takachika Yoshino, Yokohama; Shigeru Saito, Tokyo, and Yutaka Sasaki, Yokohama, all of Japan, assignors to Nitto Chemical Industry Co., Ltd., Tokyo, Japan

Filed Sept. 2, 1970, Ser. No. 68,879
Claims priority, application Japan, Sept. 6, 1969, 44/70297
Int. Cl. B01j *11/74*
U.S. Cl. 252—439 **4 Claims**

This invention provides a catalyst composition for an oxidation reaction selected from the group consisting of ammoxidation of olefins to nitriles, oxidation of olefins to aldehydes and oxidative dehydrogenation of olefins (C_4-C_8) to diolefins.

The catalyst composition has the empirical formula:

$Fe_{10}\ Sb_{10-60}\ Me_{0.01-1}\ Te_{0.05-5}\ Q_{0.1-20}\ O_{40-177}$ wherein Me is V, Mo and W ; Q is Cu, Ag, Be, Mg, Ca, Sr, Ba, Zn, Cd, La, Ce and Al.

The catalyst composition exhibits not only an improved catalytic activity in the reaction but also it shows desirable physical properties particularly fitted for a fluidized-bed reaction.

3,716,497

MANUFACTURE OF CATALYSTS OF THE IRON MOLYBDATE TYPE FOR USE PARTICULARLY IN THE CATALYTIC OXIDATION OF ALCOHOLS TO ALDEHYDES

Philippe Courty, Nanterre, France, assignor to Institut Francais Du Petrole Des Carburants Et Lubrifiants, Rueil Malmaison, France

Filed Aug. 28, 1970, Ser. No. 68,000
Claims priority, application France, Sept. 8, 1969, 6930522
Int. Cl. B01j *11/22, 11/34*
U.S. Cl. 252—470 **14 Claims**

Manufacture of a molybdenum and iron containing catalyst in a four-stage process comprising reacting a solution containing molybdenum in an anionic form with a solution containing iron in a cationic form so as to obtain a precipitate, admixing said precipitate with an ammonium salt NH_4A,A being an anion, drying the resulting mixture at 40°–150°C and heating the dried product to 300°–500°C.

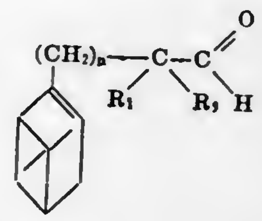
3,716,498

NOVEL FRAGRANCE COMPOSITIONS

John B. Hall, Rumson, N.J., assignor to International Flavors & Fragances Inc., New York, N.Y.

Division of Ser. No. 874,038, Nov. 4, 1969, Pat. No. 3,636,113. This application April 2, 1971, Ser. No. 130,821
Int. Cl. A61k *27/00*
U.S. Cl. 252—522 **5 Claims**

Novel fragrance compositions comprising aldehydes having the structure:



wherein R_1 is hydrogen or lower alkyl, R_2 is hydrogen or lower alkyl, and *n* is 1 or 2; lower alkyl acetals thereof, lower alkylene cyclic acetals thereof and mixtures thereof.

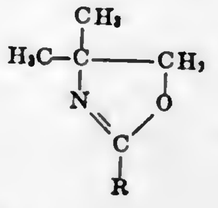
3,716,499

TERNARY FOAM CONTROL COMPOSITION AND BUILT ANIONIC DETERGENT COMPOSITION CONTAINING SAME

Jack Thomas Inamorato, Westfield, N.J., assignor to Colgate-Palmolive Co., New York, N.Y.

Continuation-in-part of Ser. No. 41,359, May 28, 1970. This application May 28, 1970, Ser. No. 41,601
Int. Cl. B01d *19/04;* **C11d** *3/065*
U.S. Cl. 252—524 **24 Claims**

A built anionic detergent composition having an inverse foam to temperature relationship is disclosed, as well as a ternary composition for accomplishing this relationship when added to a detergent system. The inverse foam to temperature relationship is provided by a synergistic mixture of a C_8–C_{22} fatty acid, a polyethoxylated mono higher fatty alkyl quaternary ammonium halide, nitrate or sulfate containing about 10 to 50 mols of ethylene oxide and an oxazoline having the formula:



where R is C_{15} to C_{21} alkyl.

3,716,500

TOBACCO SMOKE FILTER MATERIAL

Elmer Francis Litzinger, Louisville, Ky., assignor to Brown & Williamson Tobacco Corporation, Louisville, Ky.

No Drawing. Filed Sept. 25, 1970, Ser. No. 75,772
Int. Cl. A24d *1/06;* **C08g** *9/04*
U.S. Cl. 260—2.1 C **5 Claims**

An improved tobacco smoke filter material is formed from the porous, particulate salt of a weakly basic anion exchange resin, said salt being formed by the at least partial neutralization of the basic resin by a weak acid.

3,716,501

STABLE CARBONIUM ION RESINS AND METHOD OF PREPARATION

Joseph W. Rakshys, Jr., Framingham, Mass., assignor to The Dow Chemical Company, Midland, Mich.

Filed March 8, 1971, Ser. No. 122,239
Int. Cl. C08f *19/20*
U.S. Cl. 260—2.1 E **14 Claims**

Stable cross-linked carbonium ion resins having a plurality of triarylmethyl carbonium ion pendant groups are prepared by polymerizing a vinyl triaryl carbinol compound, alone or with a second monoolefinic monomer, and a poly-unsaturated monomer or by preparing a cross-linked polymer containing p-bromo or p-iodo styrene pendant groups, lithiating the polymer and reacting with an aromatic ketone and converting the triaryl carbinol to a carbonium ion. The cross-linked carbonium ion resins are useful as ion exchange resins for organic solvent systems.

3,716,502

ELASTOMERIC THERMOPLASTIC POLYESTER POLYURETHANE COMPOSITIONS STABILIZED AGAINST HYDROLYSIS

Frederic Christian Loew, Ridgewood, N.J., assignor to Inmont Corporation, New York, N.Y.

Filed Nov. 27, 1970, Ser. No. 93,409
Int. Cl. C08g *51/56, 51/60, 53/08*
U.S. Cl. 260—2.5 AY **17 Claims**

Addition of small amounts of acidic silica to improve hydrolytic stability of polyurethanes.

3,716,503

STABILIZED SURGICAL ADHESIVE

John Johnston, Michigan City, Ind., assignor to Scholl, Inc., Chicago, Ill.

Filed Oct. 19, 1970, Ser. No. 82,110
Int. Cl. C08d *9/12;* **C08c** *9/18*
U.S. Cl. 260—3 **4 Claims**

Adhesive mass for surgical tape including a rubbery elastomer, zinc resinate, a filler or reinforcing agent and preferably a neutral resin.

3,716,504

PAPER COATING COMPOSITIONS AND PRODUCTS FORMED THEREFROM

Martin K. Lindemann, Somerville, and Rocco P. Volpe, Newark, N.J., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

No Drawing. Filed Mar. 31, 1965, Ser. No. 444,388
Int. Cl. C08f *45/24;* **D21h** *3/44*
U.S. Cl. 260—8 **15 Claims**

A coating composition effective to deposit upon a fibrous web, such as paper or paperboard, a glossy, bright coating having desirable "pick" characteristics comprises an aqueous synthetic polymer latex and a mineral filler, the latex containing dispersed vinyl acetate-ethylene copolymer of 5 to 40%, preferably more than 15%, ethylene content, and characterized by an intrinsic viscosity of 1 to 2.5 deciliters per gram as measured in benzene at 30° C., the dispersed copolymer having a particle size of 0.1μ to 0.25μ, the latex preferably having a solids content of 35 to 70% of copolymer and 100 parts of filler preferably being present per 5 to 25 parts of latex solids.

3,716,505

PROCESS FOR SUSPENSION POLYMERIZATION

Keitaro Ohe; Daijiro Nishio; Shigeru Sadamtsu, and Hiroyuki Kaneko, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed May 22, 1970, Ser. No. 40,482
Claims priority, application Japan, May 23, 1969, 44/40057
Int. Cl. C08f *1/11*
U.S. Cl. 260—17 A **8 Claims**

A process for suspension polymerization of vinyl monomers in an aqueous liquid medium wherein an inorganic compound difficultly soluble in the liquid medium and a resinous substance, having a solubility parameter value of from 7.8 to 16.1 and being soluble in the vinyl monomers are kneaded in advance with the vinyl monomers, and the kneaded mixture is then suspended in the liquid medium to polymerize the vinyl monomers.

3,716,506

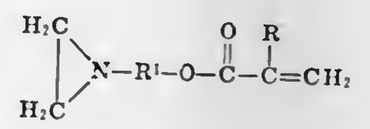
PROCESS FOR PREPARING AZIRIDINYL ALKYLACRYLATE OR METHACRYLATE GRAFT COPOLYMERS

John A. Simms, Wilmington, Del., and Aloysius N. Walus, Flint, Mich., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 22, 1970, Ser. No. 100,793. The portion of the term of this patent subsequent to March 21, 1989, has been disclaimed.
Int. Cl. C08f *45/34, 45/36*
U.S. Cl. 260—22 CB **12 Claims**

The novel process for preparing a graft copolymer having a backbone segment and side chain segments comprises:

1. preparing a prepolymer which forms a side chain segment of the graft copolymer that contains at least one reactive group;
2. reacting the prepolymer and aziridinyl compound of the formula



wherein R^1 is an alkylene group having 1–8 carbon atoms and R is —H or —CH_3;

3. polymerizing the prepolymer with other ethylenically unsaturated monomer units to form that graft copolymer.

These graft copolymers are particularly useful in forming coating compositions which may be in the form of aqueous dispersions, organosols or lacquers and these compositions form useful finishes for trucks, automobiles, airplanes, appliances such as refrigerators, stoves, washing machines, and the like and can be used as primers and/or sealer compositions.

3,716,507
HYDROXYPROPYLMETHYLCELLULOSE AS A PROTECTIVE COLLOID IN VINYL MONOMER POLYMERIZATION

Ronald L. Glomski, and George K. Greminger, Jr., both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed March 2, 1971, Ser. No. 120,324
Int. Cl. C08f *1/11, 1/13*
U.S. Cl. 260—17 R **4 Claims**

An improvement in the process for preparing vinyl polymers in aqueous suspension, said improvement comprising the use of hydroxypropylmethylcellulose having a methoxyl degree of substitution of from 0.4 to 1.3 and a hydroxypropyl molar substitution of from 0.2 to 1.4 and a total substitution of at least 1.0 combined degree of methoxyl substitution and degree of hydroxypropyl molar substitution as the protective colloid in the water-phase of an oil-in-water suspension system.

3,716,508
AIR-DRIED COATINGS COMPOSITIONS COMPRISING POLYESTER RESINS AND A SATURATED ALIPHATIC ALDEHYDE

Sheldon N. Lewis, Willow Grove, and George A. Frank, Fort Washington, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Filed July 9, 1971, Ser. No. 161,317
Int. Cl. C09d *3/64, 3/66*
U.S. Cl. 260—22 A **10 Claims**

In accordance with the invention, new air-drying compositions for coating, impregnating, etc. have been discovered which are based on the reaction of fumaric esters with mono-, di- or polyaldehydes. The reaction involved is fast and cures rapidly with complete consumption of at least one of the reactants so that coatings and the like made from these compositions set quickly to a hard condition and do not overcure to an embrittled condition on ageing.

3,716,509
METHOD FOR AGGLOMERATING AND STABILIZING RUBBERY POLYMER LATICES

Alva F. Harris, Wilbraham, Mass., assignor to Monsanto Company, St. Louis, Mo.

No Drawing. Continuation-in-part of abandoned application Ser. No. 84,137, Oct. 26, 1970. This application Jan. 12, 1972, Ser. No. 217,267
Int. Cl. C08f *47/02*
U.S. Cl. 260—23.7 A **19 Claims**

There is disclosed a process for agglomerating latices of a rubbery polymer to provide larger particles. Contact is effected between a cationic exchange resin and an aqueous latex of a polymer which contains an organic acid salt emulsifying agent for the latex and sulfate and/or phosphate radicals chemically bonded to the polymer particles. The admixture is maintained in contact for a period sufficient to remove a substantial amount of the emulsifying agent cation to produce agglomeration of the particles, which are cohesive under the conditions of operation. Thereafter, the latex and exchange resin are separated and the latex is stabilized, such as by addition of a reagent furnishing a cation capable of regenerating the emulsifying agent. The process produces agglomeration with a minimum amount of coagulation, and it is especially well suited to use on a continuous basis.

3,716,510
SEALANT COMPOSITION

Steven G. Belak, Claymont, Del., and Lewis W. Hall, Jr., Chadds Ford, Pa., assignors to Standard Oil Company, Chicago, Ill.

No Drawing. Filed Jan. 2, 1968, Ser. No. 694,835
Int. Cl. C08f *45/52*
U.S. Cl. 260—28.5 AS **3 Claims**

A sealant composition suitable for heat sealing electrical conduits yet does not form a permanent bond without heat sealing, is made from about 65 to 85 weight percent of atactic polypropylene or atactic propylene-ethylene copolymer, 5 to 15 weight percent of carbon black, 5 to 10 weight percent of asphalt and 5 to 20 weight percent of petroleum mineral oil.

3,716,511
COATING COMPOSITION OF AN AQUEOUS DISPERSION OF COPOLYMERIC VINYLIDENE CHLORIDE

Vernon Charles Haskell, Richmond, Va., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 8, 1970, Ser. No. 96,293
Int. Cl. C08f *29/14, 45/44*
U.S. Cl. 260—29.6 RB **7 Claims**

A coating composition comprising a dispersion of copolymer of vinylidene chloride wherein the copolymer is of between about 60 parts and about 95 parts by weight of vinylidene chloride in a dispersion medium of alcohol and a nitrogenous base; and a process for coating film structures of organic thermoplastic polymeric material characterized by applying the coating composition to a film structure and thereafter drying the coated film structure.

3,716,512
FOUNDRY MOLD COMPOSITION

Silvio Vargiu; Silvestro Pezzoli, both of Milan, and Pierluigi Abruzzi, Bergamo, all of Italy, assignors to Societa' Italiana Resine S.p.A., Milan, Italy

Filed Nov. 5, 1971, Ser. No. 196,208
Claims priority, application Italy, Nov. 12, 1970, 31628 A/70

Int. Cl. C08g *51/24*
U.S. Cl. 260—29.3 **8 Claims**

A foundry mold composition containing sand and a binder comprising a phenol-formaldehyde-urea-furfuryl alcohol resin with 5 parts or more ethylene glycol to every 100 parts of resin.

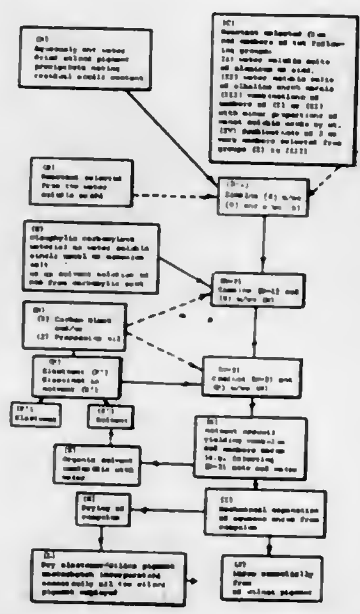
3,716,513
SILICA PIGMENTS AND ELASTOMER-SILICA PIGMENT MASTERBATCHES AND PRODUCTION PROCESSES RELATING THERETO

Oliver W. Burke, Jr., Fort Lauderdale, Fla. (1510 SW. 13th Court, Pompano Beach, Fla. 33061)

Continuation-in-part of abandoned application Ser. No. 798,215, Sept. 16, 1968, which is a division of application Ser. No. 611,250, Jan. 24, 1967, now Patent No. 3,523,096, which is a continuation-in-part of applications Ser. No. 458,420 and Ser. No. 458,379, both May 24, 1969, both now abandoned, and Ser. No. 479,806, Aug. 16, 1965, now Patent No. 3,401,017. This application July 16, 1970, Ser. No. 55,462

Int. Cl. C08c *11/10;* **C08k** *1/08*
U.S. Cl. 260—33.6 AO **14 Claims**

Curbing of silica pigment losses and the promotion of uniformity of product in the preparation of an elastomer-silica pigment masterbatch are effected (a) by combining (1) an aqueously wet hydrated silica pigment precipitate which has a bound alkali content, which has been prepared by precipitation from an aqueous alkali metal silicate solution, and which has been continuously maintained in an aqueously wet state without having been dried therefrom after its precipitation, with (2) a quantity of oleophilic carboxylate material and (3) with selected coagulant for the carboxylate; (4) combining the resulting treated wet silica pigment with a solvent dispersion of the elastomer, with or without (5) carbon black and/or processing oil, and (b) removing the solvent and aqueous phase and recovering the resulting combination as a masterbatch essentially without loss of silica pigment. A dispersible alkaline silica pigment composition and process for its production are also provided.



3,716,514
POLYAMIDE-IMIDE COMPOSITIONS CONTAINING GUANIDINE SALTS OF WEAK ACIDS AS BONDING AGENTS

Edwin F. Morello, Whiting, Ind., assignor to Standard Oil Company, Chicago, Ill.

Filed March 1, 1971, Ser. No. 119,874
Int. Cl. C08g *51/34*
U.S. Cl. 260—33.4 P **3 Claims**

The adhesion of an amide-imide polymeric coating on a magnet wire is substantially improved by the addition of guanidine or guanidine salts of weak acids in the initial coating composition.

3,716,515
PROCESS OF MAKING SHELF-STABLE MIXTURES OF THIOL, OXIDIZER AND ACCELERATOR PRECURSOR

Gerhard Wilhelm, Viernheim, Lothar Hockenberger, Ludwigshafen, and Manfred Soyka, Lampertheim, Germany, assignors to Rutgerswerke Aktiengesellschaft, Frankfurt am Main, Germany

No Drawing. Filed June 14, 1971, Ser. No. 152,965
Claims priority, application Germany, Feb. 19, 1971, P 21 07 971.0
Int. Cl. C08g *51/04*
U.S. Cl. 260—37 R **6 Claims**

Mixtures based on liquid monomeric, oligomeric, or polymeric compounds having one or more terminal mercapto groups, containing as hardening agents peroxides of zinc or cadmium and, if desired, fillers, plasticizers and similar additives, are prepared by adding to said mixtures reaction products of Grignard compounds corresponding to the formula RMgX, wherein R stands for a lower alkyl or a phenyl-group and X stands for a halogen, with nitriles or amines, which react with the atmospheric moisture to form compounds which release and accelerate the oxidation reaction.

3,716,516
FLAME RETARDANT COMPOSITIONS OF MATTER

Robert A. Dombro, Ten UOP Plaza, Algonquin & Mt. Prospect Roads, Des Plaines, Ill.

Continuation-in-part of Ser. No. 772,045, Oct. 30, 1968, Pat. No. 3,661,937, which is a continuation-in-part of Ser. No. 408,673, Nov. 3, 1964, Pat. No. 3,452,083. This application Nov. 8, 1971, Ser. No. 196,774
Int. Cl. C08f *45/100;* **C08g** *51/100*
U.S. Cl. 260—45.8 A **11 Claims**

Novel flame retardant compositions of matter comprising admixture of a polymeric compound and a halo-substituted dihydroxypolyhalomethanonaphthalenedicarboxylic acid or anhydride thereof as exemplified by an admixture of polypropylene and 1,4-dihydroxy-5,6,7,8,9,9-hexachloro-1,2,3,4,4*a*,5,8,8*ad*-octahydro-5,8-methano-2,3-naphthaneledicarboxylic acid.

3,716,517
SILOXANE POLYMERS FOR SOIL-REPELLENT AND SOIL-RELEASE TEXTILE FINISHES

Allen G. Pittman, El Cerrito, and William L. Wasley, Berkeley, Calif. (both % Western Regional Research Laboratory, Berkeley, Calif. 94710)

No Drawing. Application June 28, 1971, Ser. No. 157,759, which is a division of application Ser. No. 38,899, May 19, 1970, now Patent No. 3,639,156. Divided and this application Mar. 2, 1972, Ser. No. 231,412

Int. Cl. C08f *11/04*
U.S. Cl. 260—46.5 Y **2 Claims**

Fluorocarbon silanes are copolymerized with silanes which contain two or more alkyleneoxy groups. The copolymers are useful for application to fibrous materials to provide both soil repellency and soil releasability.

3,716,518
SILOXANE POLYMERS FOR SOIL-REPELLENT AND SOIL-RELEASE TEXTILE FINISHES

Allen G. Pittman, El Cerrito, and William L. Wasley, Berkeley, Calif., assignors to the United States of America as represented by the Secretary of Agriculture

No Drawing. Application June 28, 1971, Ser. No. 157,759, which is a division of application Ser. No. 38,899, May 19, 1970, now Patent No. 3,639,156. Divided and this application Mar. 2, 1972, Ser. No. 231,411

Int. Cl. C08f *11/04*
U.S. Cl. 260—46.5 Y **3 Claims**

Fluorocarbon silanes are copolymerized with silanes which contain two or more alkyleneoxy groups. The copolymers are useful for application to fibrous materials to provide both soil repellency and soil releasability.

3,716,519
METHOD FOR PRODUCING A POLYAMIDEIMIDE AND PRODUCT OF SAID METHOD

Naoya Yoda; Masaru Kurihara, both of Otsu; Noriaki Dokoshi, Kusatsu; Chiaki Tanaka, and Masaomi Eguchi, both of Otsu, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed Aug. 7, 1970, Ser. No. 61,914
Claims priority, application Japan, Aug. 11, 1969, 44/62868; Sept. 24, 1969, 44/75261
Int. Cl. C08g *20/32*
U.S. Cl. 260—47 CB **6 Claims**

Polyamideimides are prepared by reacting a bis (tricarboxylic acid anhydride) anhydride with a primary diamine or an aminocarboxylic acid, and polymerizing the resulting oligomer composition with a diisocyanate.

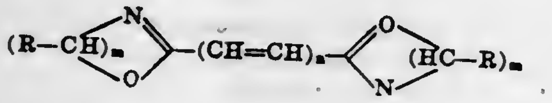
3,716,520
COMPOSITION OF AN EPOXY RESIN AND 2,2-ALKYLENE BIS-2-OXAZOLINE AS CURING AGENT

Donald A. Tomalia, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 833,765, June 16, 1969. This application Jan. 28, 1971, Ser. No. 110,752

Int. Cl. C08g *30/14*

U.S. Cl. 260—47 EN **1 Claim**



$m = 2$ or 3
$n = 1 - 3$
$R = H$ or alkyl C_{1-4}

useful as latent curing agents in polyepoxides to produce epoxy resins; to homopolymerize, or to copolymerize with dithiols; to homopolymerize or copolymerize ethylenically, or any combination of these:

3,716,521
ETHERIFIED OR ESTERIFIED PHENOLIC RESIN FIBERS AND PRODUCTION THEREOF

James Economy, Eggertsville; Francis J. Frechette, Tonawanda, and Luis C. Wohrer, Lewiston, all of N.Y., assignors to The Carborundum Company, Niagara Falls, N.Y.

Filed March 31, 1971, Ser. No. 130,017

Int. Cl. C08g *5/18*

U.S. Cl. 260—59 **24 Claims**

Infusible cured phenolic resin fibers are reacted with a suitable reagent to block at least about 50 percent of the phenolic hydroxyl groups of the cured resin by esterification or etherification, whereby infusible cured phenolic resin fibers are obtained which have improved oxidation resistance and colorfastness and which are white.

3,716,522
AMIDE ACETAL INITIATED CHLORAL POLYMERIZATION PROCESS

Roe C. Blume, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Nov. 12, 1970, Ser. No. 89,135

Int. Cl. C08g *1/18, 3/00*

U.S. Cl. 260—64 **22 Claims**

Disclosed herein is a process for making chloral homopolymers, and copolymers with, for instance, isocyanates and ketenes, at temperatures between about 0° and 60° C. employing amide acetal initiators, and for making composites thereof with ethylenically unsaturated free-radical catalyzed polymers. The polymers are useful, inter alia, in building-product applications.

3,716,523
LOW CONCENTRATION STANNOUS CARBOXYLATE CATALYSIS OF POLYESTERIFICATION

William H. Cook, Bloomfield Hills, Mich., assignor to Basf Wyandotte Corporation, Wyandotte, Mich.

Filed Oct. 21, 1970, Ser. No. 82,848

Int. Cl. C08g *17/003*

U.S. Cl. 260—75 M **8 Claims**

A method is provided for making a polyester having an acid number of less than 1 which involves heating a polyhydric alcohol and a polycarboxylic acid in the absence of a catalyst until an acid number of 30 or less is obtained and then continuing the esterification in the presence of a stannous salt of a carboxylic acid until the acid number is near zero.

3,716,524
T-BUTYL ALCOHOL/WATER COSOLVENT EMULSION COPOLYMERIZATION OF A MONOMERIC SYSTEM COMPRISING METHYL METHACRYLATE AND BICYCLIC METHACRYLATE

Harry J. Cenci, Warminster, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Filed Jan. 6, 1971, Ser. No. 104,519

Int. Cl. C08f *15/16*

U.S. Cl. 260—78.5 **10 Claims**

A mixture comprising a bicyclic methacrylate, methyl methacrylate, up to 10 percent by weight of ethyl acrylate, an aqueous medium containing an organic solvent that is substantially inert, such as t-butyl alcohol, is polymerized in emulsion to give a product which contains a low level of coagulum and of residual monomer.

3,716,525
WATER-SOLUBLE SULFUR DYESTUFFS

Friedrich Engelhardt; Christian Heid, both of Frankfurt am Main-Fechenheim; Willi Gunzert, Frankfurt am Main; Erwin Krusche, and Artur Meyer, both of Frankfurt am Main-Fechenhaim, all of Germany, assignors to Cassella Farbwerke Mainkur Aktiengesellschaft, Frankfurt am Main-Fechenheim, Germany

Filed Dec. 15, 1969, Ser. No. 885,322

Claims priority, application Germany, Dec. 17, 1968, P 18 15 133.2

Int. Cl. C09b *49/12*

U.S. Cl. 260—128 **5 Claims**

Water-soluble dyestuffs having an affinity for fibers and being capable to dyeing in the absence of reducing agents obtained by reacting water-insoluble sulfur dyestuffs, reduction products thereof or their thiosulfuric acid derivatives with alkylenimines and substituted derivatives thereof.

3,716,526
REFINING OF HEMICELLULOSES

Richard G. Schweiger, Muscatine, Iowa, assignor to Grain Processing Corporation, Muscatine, Iowa

Filed Oct. 19, 1971, Ser. No. 190,656

Int. Cl. C08b *19/00, 29/08*

U.S. Cl. 260—212 **3 Claims**

Purification of crude hemicellulose by extracting with an aqueous organic acid.

3,716,527
PROCESS FOR PRODUCING FORMALDEHYDE-TREATED STARCH FREE OF UNREACTED OR FREE FORMALDEHYDE

Edwin L. Speakman, Clinton, Iowa, assignor to Standard Brands Incorporated, New York, N.Y.

Filed Oct. 22, 1971, Ser. No. 191,816

Int. Cl. C08b *19/01*

U.S. Cl. 260—233.3 A **9 Claims**

The invention is directed to a process for producing a formaldehyde-treated starch. A material which provides ammonium or amine groups is provided in a slurry of formaldehyde-treated starch containing free or unreacted formaldehyde at a pH of above about 6.5. The material combines with the free or unreacted formaldehyde and thus reduces vaporization of the formaldehyde.

3,716,528
DERIVATIVES OF IBOGAMINE, IBOGAINE AND IBOGALINE LACTAMS

Wataru Nagata, Nishinomiya, and Shoichi Hirai, Ibaraki, Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

No Drawing. Original application May 28, 1968, Ser. No. 732,520, now Patent No. 3,663,940. Divided and this application Oct. 14, 1970, Ser. No. 80,806

Claims priority, application Japan, June 3, 1967, 42/35,647; Feb. 7, 1968, 43/7,620

Int. Cl. C07d *43/38*

U.S. Cl. 260—239.3 P **10 Claims**

Lactams of ibogamine, ibogaine and ibogaline compounds, such as 4-desethyl-18-p-toluensulfonyloxyibogamine lactam, are provided, which are useful as intermediates in preparing isoquinuclidine alkaloids useful as medicaments.

3,716,529
NOVEL C-16,17 SPIRO-ORTHOESTER STEROIDS AND PREPARATION

Jack Ackrell, Mountain View; John A. Edwards, Los Altos, and John H. Fried, Palo Alto, all of Calif., assignors to Syntex Corporation, Panama, Panama

Filed May 14, 1970, Ser. No. 37,292

Int. Cl. C07c *173/00*

U.S. Cl. 260—239.55 D **23 Claims**

C-16,17 spiro-orthoesters and method of preparation involving reacting a 16,17-dihydroxy steroid with an O-alkyl alkanoic acid lactonium tetrafluoroborate in the presence of a base. The novel spiro-orthoesters are useful anti-inflammatory agents.

3,716,530
HALOGENATION OF STEROIDS

Alan Martin Krubiner, Montville, and Eugene Paul Oliveto, Glen Ridge, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Aug. 10, 1971, Ser. No. 170,639

Int. Cl. C07c *173/00, 169/08*

U.S. Cl. 260—239.55 C **13 Claims**

A process for converting 17α-vinyl-17β-hydroxy steroids to 17-(2-haloethylidene)-steroids known intermediates for antifungal and progestational agents, by treating the 17α-vinyl-17β-hydroxy steroids with vanadium tetrahalide.

3,716,531
5-NITRO-FURFURYLIDENE ANTIMICROBIC AGENTS

Rudolf Albrecht; Eberhard Schroder, both of Berlin, Germany, and Mahmoud Muftic, Cornavin-Geneve, Switzerland, assignors to Schering AG, Berlin and Bergkamen, Germany, by said Albrecht and Schroder

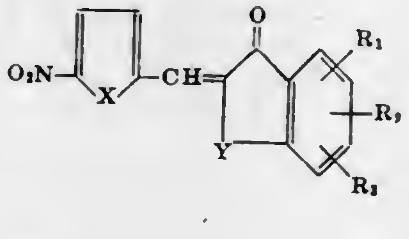
Filed Oct. 31, 1968, Ser. No. 804,333

Claims priority, application Germany, Nov. 14, 1967, Sch 41572

Int. Cl. C07d *5/30*

U.S. Cl. 260—240 A **13 Claims**

For combating and preventing infections caused by a variety of microbes such as bacteria and *Trichomonas vaginalis*, new compounds of the formula



wherein

X is O, S or NH;

Y is O; S; —CH$_2$—O—; —S—CH$_2$—; —CH$_2$—S—; —O—CH$_2$—; —SO—; —SO—CH$_2$—; —CH$_2$—SO—; —CH$_2$—$_2$—; —SO$_2$—CH$_2$— or —CA$_2$—, A being H, methyl, ethyl or phenyl; and

R$_1$, R$_2$ and R$_3$ each represents alkyl, hydroxy, hydroxyalkyl, alkoxy, alkoxyalkyl, alkoxyalkoxy, mono- or dialkylaminoalkyl, dialkylaminoalkoxy, amino, acylamino, mono- or dialkylamino, alkylsulfonylamino, acyloxy, alkylsulfonyloxy, benzyloxy groups wherein each alkyl, alkoxy or acyl residue is not more than five carbon atoms and acyl is derived from a carboxylic acid; halogen; or hydrogen with the provision that when Y represents —CH$_2$—$_1$, R$_2$, and R$_3$ is other than hydrogen.

3,716,532
PROCESS FOR PREPARING CRYSTALLINE FORMS OF 4,4½-BIS[(4-ANILINO-6-MORPHOLINO-1,3,5-TRIAZIN-2-YL)-AMINO]-STILBENE-2,2½-DISULFONIC ACID

Christopher Tscharner, Neumattenweg 9, Benken-Baselland, Switzerland; Maurice Schwarz, 15 Appletree Lane, and Richard Pichler, 11 Westfield Rd., both of Warwick, R.I.

Filed April 13, 1970, Ser. No. 27,587

Int. Cl. C07d *55/22*

U.S. Cl. 260—240.1 **3 Claims**

Novel crystalline 4,4′-bis[(4-anilino-6-morpholino-1,3,5-triazin-2-yl)-amino]-stilbene-2,2′-disulfonic acid is provided by a procedure involving treating cyanuric chloride with 4,4′-diaminostilbene-2,2′-disulfonic acid, reacting the product thus obtained, without isolation, with aniline followed by reacting the resulting product, without isolation, with morpholine and precipitating the product thus obtained by treatment with an acid.

The new crystalline 4,4′-bis[(4-anilino-6-morpholino-1,3,5-triazin-2-yl)-amino]-stilbene-2,2′-disulfonic acid is incorporated in detergents, soaps or other laundry products and imparts to the aforesaid and similar materials, unexpected and surprising superior over-all performance properties.

3,716,533
N-DEFORMYLATION OF 3-HALOMETHYL-7β-FORMAMIDOCEPHALOSPORIN-1-OXIDES

David Cedric Humber, Greenford, England, assignor to Glaxo Laboratories Limited, Greenford, England

No Drawing. Filed Aug. 21, 1970, Ser. No. 66,125

Claims priority, application Great Britain, July 10, 1970, 33,697/70

Int. Cl. C07d *99/24*

U.S. Cl. 260—243 C **8 Claims**

A process for the preparation of 7β-aminocephem-4-carboxylic acids and derivatives thereof comprises N-deformylating a 7β-formamidocephem-4-carboxylic acid or derivative thereof with a Lewis acid in a lower alkane diol under substantially anhydrous conditions.

3,716,534
THIADIAZOLES[3,4-D]-PYRIDAZINES

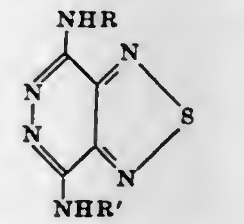
James Bernard Sleja, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed April 13, 1971, Ser. No. 133,722

Int. Cl. C07d *51/04*

U.S. Cl. 260—250 A **6 Claims**

Thiadiazolo[3,4-d]Pyridazines of the formula



are colored compounds useful as color screens, dye intermediates and pigments.

3,716,535

TRIMERIZATION OF ISOCYANATES

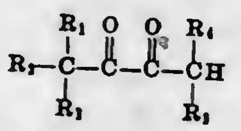
Kenneth H. Markiewitz, Wilmington, Del., assignor to ICI America Inc.

No Drawing. Filed Feb. 27, 1968, Ser. No. 708,484

Int. Cl. C07d *55/38*

U.S. Cl. 260—248 NS **9 Claims**

Aromatic isocyanates are trimerized with a catalyst system which comprises a mixture of at least one tertiary amine and at least one co-catalyst selected from the group consisting of benzoyl peroxide and compounds having the formula



$$R_2-\underset{R_3}{\overset{R_1}{C}}-\overset{O}{\overset{\|}{C}}-\overset{O}{\overset{\|}{C}}-\underset{R_5}{\overset{R_4}{C}}H$$

wherein R_1 and R_4 are independently selected from the group consisting of hydrogen, alkyl groups having from 1 to 4 carbon atoms, and aryl groups, R_2, R_3, and R_5 are independently selected from the group consisting of hydrogen and alkyl groups having from 1 to 4 carbon atoms, and the total number of carbon atoms in the alkyl group is from 1 to 10. The reaction is divided into two stages. The first stage is an initiation period during which substantially no polymerization occurs. The second stage is the rapid trimerization of the isocyanate.

3,716,536

METHOD OF PREPARING BENZOGUANAMINES

Peter Herman Gund, Hightstown, and Gerald Berkelhammer, Princeton, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed Sept. 17, 1971, Ser. No. 181,631

Int. Cl. C07d *55/20*

U.S. Cl. 260—249.9 **7 Claims**

A process for the preparation of benzo and substituted benzoguanamines, is described.

These compounds are useful as intermediates in the preparation of thermosetting resins, pharmaceuticals and the like.

3,716,537

CERTAIN THENOYL DERIVATIVES OF BENZENSULFONYLAMINOPYRIMIDINES

Ruth Heerdt, Mannheim-Fendenheim; Manfred Hubner, Ludwigshafen/Rhine; Felix Helmut Schmidt, Mannheim-Seckenheim, and Rudi Weyer, Frankfurt/M.-Unterliederbach, all of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Germany

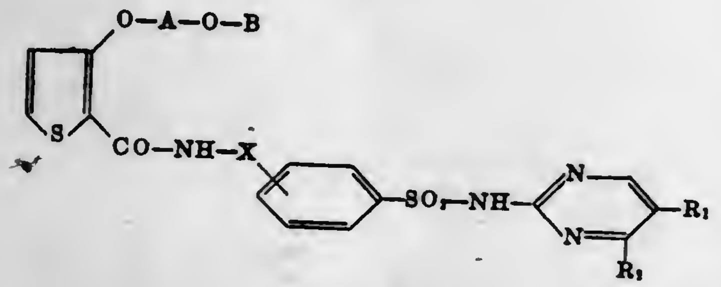
Filed June 1, 1970, Ser. No. 42,512

Claims priority, application Germany, June 7, 1969, P 19 29 232.5

Int. Cl. C07d *51/42*

U.S. Cl. 260—256.5 R **9 Claims**

Certain novel sulfonylaminopyrimidines having the general formula



wherein A is a lower alkylene radical, B is a lower alkyl radical, X is a straight or branched-chain lower alkylene radical, R_1 is a straight or branched-chain alkyl, cycloalkyl, cycloalkylalkyl, aryl, e.g., phenyl or naphthyl, aralkyl, e.g., benzyl or naphthyl-ethyl, alkoxy, cycloalkoxy, alkoxyalkyl, alkoxyalkoxy or alkylmercapto radical and R_2 is a hydrogen atom or a lower alkyl radical and wherein R_1 and R_2 can, together, also form an alkylene ring of three to five methylene radicals, as well as the physiologically compatible salts thereof, have strong blood sugar reducing activity.

3,716,538

AMINOMETHYLPHENYLBICYCLONONENOLS

Robert Norman Schut, Edwardsburg, Mich., assignor to Miles Laboratories, Inc., Elkhart, Ind.

Filed Sept. 9, 1970, Ser. No. 70,884

Int. Cl. C07d *51/70*

U.S. Cl. 260—268 BC **4 Claims**

Certain aminomethyl-9-phenylbicyclo[3.3.1]-non-3-en-9-ols and acid addition salts thereof as well as methods for their preparation are disclosed. These compounds exhibit analgesic and tranquilizer activity.

3,716,539

1(2-DIBENZOFURYL)4-PIPERAZINO BUTANOLS

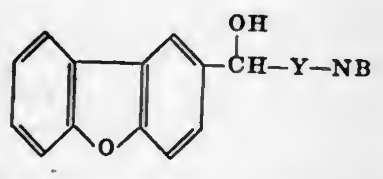
Harvey B. Hopps, West Allis, Wis.; Dennis Jackman, University, Miss., and John H. Biel, Lake Bluff, Ill., assignors to Aldrich Chemical Company, Inc., Milwaukee, Wis.

Continuation-in-part of Ser. No. 693,765, Dec. 27, 1967, abandoned, which is a continuation-in-part of Ser. No. 605,995, Dec. 30, 1966, abandoned, which is a continuation-in-part of Ser. No. 462,066, June 7, 1965, abandoned. This application May 19, 1971, Ser. No. 145,069

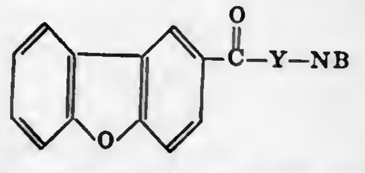
Int. Cl. C07d *51/70*

U.S. Cl. 260—268 TR **8 Claims**

Compounds of the formula



which possess hypotensive activity and are useful for treating hypertension in mammals and compounds of the formula



which are useful as intermediates in the preparation of the foregoing hypotensive agents and also in some cases exhibit hypotensive, sedative and muscle relaxant activity and processes for the preparation of the foregoing compounds. In the foregoing formulas, NB is a primary or secondary amino radical and Y is (lower)alkylene.

3,716,540

HEXACHLOROPENTADIENE ADDUCTS OF UNSATURATED PIPERAZINE AMIDES

Robert R. Mod; Frank C. Magne, and Evald L. Skau, all of New Orleans, La., assignors to The United States of America as represented by the Secretary of Agriculture

Continuation of Ser. No. 878,922, Nov. 21, 1969, Pat. No. 3,663,582. This application Dec. 16, 1971, Ser. No. 208,953

Int. Cl. C07d *51/70*

U.S. Cl. 260—268 C **2 Claims**

This invention relates to certain new nitrogen-containing compounds, more particularly to N-substituted and N,N-disubstituted piperazine amides, the acyl moieties of which are the acyl moieties of the hexachlorocyclopentadiene adducts of either 9-octadecenoic or 10-undecenoic acids.

The compounds which are the subject of this invention are characterized by the fact that as growth inhibitors they are effective against a variety of bacteria, yeasts, and molds, some of which are pathogenic. They are also useful as plasticizers.

3,716,541

SUBSTITUTED DERIVATIVES OF 10,11-DIHYDRO-5,10-(IMINOMETHANO)-5H-DIBENZO, CYCLOHEPTENES AND PREPARATION THEREOF

Thomas A. Dobson, Dollard-des-Ormeaux, Montreal, Quebec, and Martin A. Davis, Montreal, Quebec, Canada, assignors to Ayerst, McKenna and Harrison Limited, Ville St. Laurent, Quebec, Canada

Filed July 23, 1970, Ser. No. 57,792. The portion of the term of this patent subsequent to Aug. 3, 1988, has been disclaimed.

Int. Cl. C07l *39/00*

U.S. Cl. 260—286 R **21 Claims**

There are disclosed herein 11-oxo-, 11-hydroxy-, 11-acyloxy-, 11-alkoxy-, and 11-(substituted amino)- derivatives of 10,11-dihydro-5,10-(iminomethano)-5H-dibenzo-[*a,d*] cycloheptene, and their corresponding 12-alkyl-, 12-alkenyl-, 12-cycloalkyl-, 12-aralkyl-, 12-dialkylamino-alkyl-, 13-alkyl-, 13-aralkyl- and 13-aryl- derivatives. The compounds are useful central nervous system depressants and methods for their preparation and use are given.

3,716,542

PROCESS FOR THE PREPARATION OF ISOCARBOSTYRILS

Rene Lenaers, Brussels; Ernest H. de Ruiter, Beersel, and Jan J. Vandewalle, Mortsel, all of Belgium, assignors to Union Carbide Corporation, New York, N.Y.

Filed Dec. 23, 1970, Ser. No. 101,146

Int. Cl. C07d *35/30*

U.S. Cl. 260—289 R **10 Claims**

Isocarbostyrils are conveniently prepared in high yields and in a high degree of purity by contacting an isoquinoline with an anhydrous, liquid melt mixture of potassium hydroxide and sodium hydroxide.

The anhydrous, melt mixture is prepared by reacting potassium hydroxide with an amount of sodium oxide sufficient to consume all the water present and then heating the mixture to its melting point. Thereafter the isoquinoline is added and upon completion of the reaction, water is introduced to hydrolyze the potassium isocarbostyril salt. Isocarbostyrils are useful as intermediates in the production of dyes, pharmaceuticals, antioxidants, and surfactants.

3,716,543

C_{10}–C_{13} HYDROCARBYL SUBSTITUTED PYRIDINE COMPOUNDS

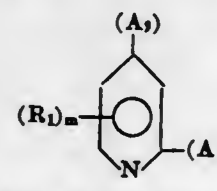
John B. Hall, Rumson, N.J., assignor to International Flavors and Fragrances Inc., New York, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 854,787, Sept. 2, 1969. This application July 28, 1970, Ser. No. 59,027

Int. Cl. C07d *31/20*

U.S. Cl. 260—290 V **9 Claims**

Novel nitrogen heterocyclic compounds defined by the structure:



wherein R_1 represents C_1–C_3 lower alkyl and *m* is an integer ranging from zero up to 2; wherein one of A_1 or A_2 is a moiety selected from the group consisting of cyclododecen - 3 - yl-methyl, 2-pinen-10-yl-methyl, 4,8-dimethyl - 3,7 - nonadienyl, 3-methyl - 6 - i-propyl-2-cyclohexenyl-methyl, and 1,4,8-trimethyl - 3,7 - nonadien-1-yl; and the other of A_1 or A_2 is R_1 or hydrogen.

3,716,544

CERTAIN 6,11-DIHYDRO-11-(3-ALPHA-TROPANYLOXY)-DIBENZO[B,E]THIEPINE-5-OXIDES AND THE CORRESPONDING DIOXIDES AND DERIVATIVES THEREOF

Fulvio Gadient, Birsfelden, Switzerland, assignor to Sandoz Ltd., Basle, Switzerland

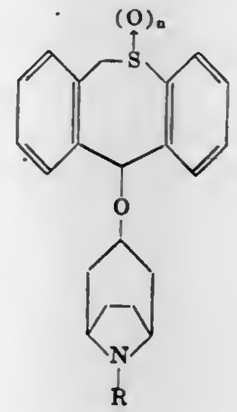
Filed July 13, 1971, Ser. No. 162,290

Claims priority, application Switzerland, July 15, 1970, 10735/70; July 15, 1970, 10736/70; July 15, 1970, 10737/70; July 15, 1970, 10738/70

Int. Cl. C07d *43/06*

U.S. Cl. 260—292 **5 Claims**

The invention concerns new dibenzothiepines of the formula:



wherein R is alkyl of one to four carbon atoms and *n* is 1 or 2, or

R is alkyl of two to four carbon atoms and *n* is 0,
and pharmaceutically acceptable acid addition salts thereof. The compounds are useful in the prophylaxis and treatment of gastric ulcers.

3,716,545

OXIDATIVE CONVERSION INCLUDING DEHYDROGENATION

Dennis L. Ripley, Bartlesville, Okla., assignor to Phillips Petroleum Company

Continuation of Ser. No. 769,428, Oct. 21, 1968, abandoned, which is a continuation-in-part of Ser. No. 693,186, Dec. 26, 1967, abandoned. This application Jan. 16, 1970, Ser. No. 4,470

Int. Cl. C07c *5/18*

U.S. Cl. 260—290 V **16 Claims**

Oxidative conversion of olefins and/or diolefins including the dehydrogenation of organic compounds is carried out with an iron-phosphorus-oxygen catalyst wherein the amount of phosphorus is greater than the stoichiometric amount required to react with all of the iron in the catalyst and form monophosphate ions (PO_4^{-3}). The activity of the phosphorus-containing catalyst can be maintained by continuous or intermittent addition of phosphorus containing compounds.

3,716,546

PRODUCTION OF BIPYRIDYLIUM SALTS AND RELATED COMPOUNDS

John Edward Colchester, Runcorn, England, assignor to Imperial Chemical Industries Limited, London, England

Continuation of Ser. No. 811,249, March 27, 1969, abandoned. This application March 1, 1971, Ser. No. 119,893

Int. Cl. C07d *31/42, 31/44*

U.S. Cl. 260—295 AM **4 Claims**

A process for the production of 1,1′-disubstituted-4,4′-bipyridylium salts which comprises reacting the corresponding 1,1′-disubstituted-1,1′,4,4′-tetrahydro-4,4′-bipyridyl with a free radical compound.

3,716,547
PROCESS FOR THE PREPARATION OF A POLY(VINYL ACETATE-DIALKYL MALEAEE-ACRYLIC ACID) TEXTILE SIZES

Albert E. Corey, East Longmeadow; Donald D. Donermeyer; Joel Fantl, both of Springfield, and Charles R. Williams, Longmeadow, all of Mass., assignors to Monsanto Company, St. Louis, Mo.

Filed Dec. 16, 1970, Ser. No. 98,914
Int. Cl. C08f *1/13*; **D06c** *27/00*
U.S. Cl. 260—29.6 TA **17 Claims**

Disclosed herein is a process for the preparation of a poly(vinyl acetate-dialkyl maleate-acrylic acid) textile size which comprises (1) interpolymerizing the monomers at a temperature of from 40° to 60°C. to form a latex using a surfactant system comprising a phosphate ester of an alkyl phenolethylene oxide condensate wherein the alkyl group contains seven to 11 carbon atoms; and (2) dissolving the resulting latex in a basic aqueous medium to form the size.

3,716,548
2-(CHLOROPYRIDYLAMINO)-1-PYRROLINES

Fred M. Hershenson, Morton Grove, Ill., assignor to G. D. Searle & Co., Chicago, Ill.

Filed April 30, 1971, Ser. No. 139,175
Int. Cl. C07d *31/42*
U.S. Cl. 260—296 R **1 Claim**

1-Pyrrolines having a chloropyridylamino substituent at the 2-position are described herein. The compounds involved are useful as anti-hypertensive agents. To prepare the present compounds, 2-pyrrolidinone is reacted with phosphorus oxychloride and the resulting product is then reacted with an aminopyridine.

3,716,549
PYRIDINE-BIS-(HYDROXYARYL ETHERS) AND DERIVATIVES THEREOF

Gerhard Darsow, and Hermann Schnell, both of Krefeld-Verdingen, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed June 29, 1970, Ser. No. 51,018
Claims priority, application Germany, July 10, 1969, P 19 34 889.1
Int. Cl. C07d *31/30*
U.S. Cl. 260—297 R **3 Claims**

Title products are described which are useful intermediates for the production of synthetic resins such as saturated and unsaturated polyester resins, polycarbonates and epoxy resins and which are prepared by reacting 2,6-dichloropyridine with a dialkali phenolate in the molar ratio of approximately 1:2 in the presence of a polar organic solvent at about 60° to about 180°C and acidifying the reaction mixture.

3,716,550
PROCESS FOR THE PREPARATION OF VINYLTETRAZOLE

William H. Gilligan, Washington, D.C.; Chilton H. McDonnell, Indian Head, and Orlando Jones, Pisgah, both of Md., assignors to The United States of America as represented by the Secretary of the Navy

Filed Oct. 29, 1969, Ser. No. 872,432
Int. Cl. C07d *55/56*
U.S. Cl. 260—308 D **16 Claims**

Improved processes for the preparation of 1-and 2- alkyl-5-vinyltetrazoles which involve the reaction of an ammonium azide and a β-dialkylaminopropionitrile in a water solvent and alkylating the product thereof under a carefully maintained pH.

3,716,551
DEUTERATED L-AMINO ACID MIXTURE

Irving Putter, Martinsville, N.J., assignor to Merck & Co., Inc., Rahway, N.J.

No Drawing. Filed July 17, 1969, Ser. No. 842,715
Int. Cl. C07d *49/36*
U.S. Cl. 260—309 **8 Claims**

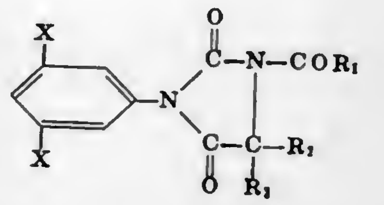
A mixture of naturally occurring L-amino acids in deuterated form and a method for the preparation of such a mixture which consists in treating deuterated algae with acid to afford a protein residue which is then hydrolyzed, concentrated, filtered, adsorbed upon a suitable ion exchange resin and recovered by conventional means.

3,716,552
N⅛-ALKANOYL-N⅛⅛-DIHALOPHENYL IMIDAZOLIDINEDIONES

Akira Fujinami, Ashiya; Toshiaki Ozaki, Toyonaka; Keiichiro Akiba, Ikeda; Sigeo Yamamoto, Toyonaka; Katsuji Nodera, Nishinomiya; Katsutoshi Tanaka, Takarazuka; Nobuyuki Kameda, Takarazuka, and Tadashi Ooishi, Takarazuka, all of Japan, assignors to Sumitomo Chemical Company, Ltd., Osaka, Japan

Filed Oct. 5, 1970, Ser. No. 78,263
Claims priority, application Japan, Oct. 9, 1969, 44/80887
Int. Cl. C07d *49/34*
U.S. Cl. 260—309.5 **10 Claims**

Novel 3-(3′,5′-dihalogenophenyl)-1-acylimidazolidine-2,4-diones of the formula,



wherein X is a halogen atom, R_1 is a lower alkyl group, a lower alkenyl group, or a halogenated lower alkyl group having one to three halogen atoms, and R_2 and R_2 are individually a hydrogen atom or a lower alkyl group. The novel imidazolidinediones have high microbicidal activities on various fungi and bacteria and are non-toxic to mammals and plants. The imidazolidinediones are prepared by reacting a corresponding 1-unsubstituted 3-(3′,5′-dihalogenophenyl) imidazolidine-2,4-dione derivative with a corresponding acylating agent.

3,716,553
1,3-DIAZASPIRO [4,4]NON-7-ENE-2,4-DIONE

Harvey E. Alburn, West Chester, and Horace Fletcher, III, Montgomery, both of Pa., assignors to American Home Products Corporation, New York, N.Y.

Division of Ser. No. 777,506, Nov. 20, 1968, Pat. No. 3,594,413. This application Sept. 4, 1970, Ser. No. 69,911
Int. Cl. C07d *49/32*
U.S. Cl. 260—309.5 **1 Claim**

This invention is concerned with the preparation of cyclopentene-1,1-dicarboxamides; 1,3-diazaspiro [4,4] nonene-2,4-dionen; 1-aminocyclopentene-1-carboxylic acids; 1-(N-alkylamino)cyclopentene-1-carboxylic acids; and 3-oxa-1-azaspiro [4,4] nonene-2,4-diones which are intermediates in the preparation of 6-(1-aminocyclopentene-1-carboxamido)penicillanic acids which are useful antibacterial agents.

3,716,554
N-(CHLOROPHENOXYACETYL)ETHYLENE UREA HERBICIDES

Edwin D. Little, Convent Station, N.J., and Clarence A. Hirsch, Indianapolis, Ind., assignors to Allied Chemical Corporation, New York, N.Y.

Division of Ser. No. 825,986, May 19, 1969, Pat. No. 3,639,115. This application May 17, 1971, Ser. No. 144,400
Int. Cl. C07d *49/30*
U.S. Cl. 260—309.7 **2 Claims**

N-(Chlorophenoxyacetyl)ethylene ureas are prepared by reacting ethylene urea with a chlorophenoxyacetyl chloride. The products are useful herbicides.

3,716,555
NEW 5-NITROFURYL DERIVATIVES

Graham Arton Howarth, Wilmslow, and James Gainer, Tyldesley, both of England, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Oct. 27, 1970, Ser. No. 84,512
Claims priority, application Great Britain, Sept. 9, 1970, 43,056/70
Int. Cl. C07d *49/18*
U.S. Cl. 260—310 R **5 Claims**

Compounds of the class of 4-cyano-5-alkoxymethylenamino-3-(5-nitro-2-furyl)-pyrazole have antimicrobial properties and are active ingredients in pharmaceutical compositions and animal feedstuff compositions; an illustrative example is 4-cyano-5-ethoxymethylenamino-1-methyl-3-(5-nitro-2-furyl)-pyrazole.

3,716,556
1,3,2-OXAZABORINIDES AND METHOD FOR PREPARING THE SAME

Thurairajah Padmanathan, Highland Park, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 732,045, May 27, 1968, Pat. No. 3,621,023. This application April 19, 1971, Ser. No. 135,385
Int. Cl. C02d *27/54*
U.S. Cl. 260—326.3 **2 Claims**

Condensed difluoro or diacetoxy 1,3,2-oxazaborinides are prepared by treating (a) a condensation product of a naphthostyril with an active ketomethylene compound, such as barbituric acid or its N,N-dialkyl derivatives, an indandione, an oxindole or a pyrazolone, (b) a condensation product of an o-hydroxybenzaldehyde with an aromatic amine, or (c) an ortho-(benz-azol-2yl)-naphthol or phenol, the azole being oxazole, thiazole or imidazole, with either (1) boron trifluoride dissolved in ether, or (2) orthoboric acid, benzeneboronic acid or esters thereof, in acetic acid in the presence of acetic anhydride, at reflux. The difluoro and diacetoxy-1,3,2-oxazaborinides are characterized by affinity for polyesters when applied by disperse dyeing methods and fluoresce on the fiber. Similar effects are obtained on nylon and acetate and to some extent on modified polyacrylonitrile.

3,716,557
1,2-EPITHIO-3-(-CYANOETHOXY)PROPANE

Heinz Uelzmann, Cuyahoga Falls, Ohio, assignor to The General Tire & Rubber Company

Continuation-in-part of Ser. No. 806,777, Feb. 28, 1969. This application March 30, 1970, Ser. No. 24,001
Int. Cl. C07d *59/00, 1/00*
U.S. Cl. 260—327 E **1 Claim**

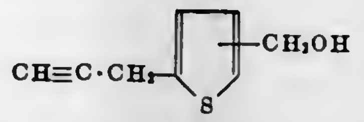
Compounds having terminal oxirane groups are formed by reaction of glycidol, under base-catalyzed conditions, with vinyl-type compounds, e.g., acrylonitrile, acrylic esters, vinyl ketones, vinyl sulfones and the like. The resulting products can be converted to terminal thiirane group compounds by reaction with thiocyanates. The compounds are useful as comonomers in production of copolymers and as cure accelerators for epoxy-amine resinous compositions.

3,716,558
5-PROPARGYL THENYL ALCOHOLS

Nobushige Itaya, Minoo-shi, and Toshio Mizutani, Hirakata-shi, both of Japan, assignors to Sumitomo Chemical Company Ltd., Osaka, Japan

Filed April 23, 1970, Ser. No. 31,368
Claims priority, application Japan, May 14, 1969, 44/37203
Int. Cl. C07d *63/12*
U.S. Cl. 260—332.3 R **1 Claim**

5-Propargyl thenyl alcohol having the formula,



which may be useful as an intermediate for the production of pyrethroidal insecticides such as 5-propargyl-thenyl chrysanthemates.

3,716,559
4-METHYLEN-2-OXA-3-KETO ANDROSTANES AND 4-METHYL-Δ⁴ DERIVATIVES THEREOF

Robert J. Chorvat, Arlington Heights, and Raphael Pappo, Skokie, Ill., assignors to G. D. Searle & Co., Chicago, Ill.

No Drawing. Filed July 13, 1971, Ser. No. 162,294
Int. Cl. C07d *7/18*
U.S. Cl. 260—343.2 S **6 Claims**

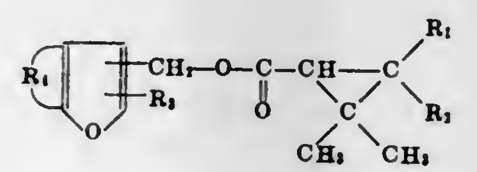
The reaction of 2-oxa-3-keto androstanes with formaldehyde affords the corresponding 4-methylene derivatives, which are rearranged by treatment with palladium catalyst to afford the corresponding 4-methyl-Δ^4 derivatives. Both the 4-methylene and 4-methyl-Δ^4 compounds are pharmacologically active as is evidenced by their anabolic and androgenic properties.

3,716,560
4,5-TETRAMETHYLENE FURFURYL AND 4,5-TETRAMETHYLENE-3-FURYLMETHYL CHRYSANTHEMATES

Nobushige Taya, Minoo; Toshio Mizutani, Hirakata; Shigeyoshi Kitamura; Yositosi Okuno, both of Toyonaka, and Keimei Fujimoto, Kobe, all of Japan, assignors to Sumitomo Chemical Company, Ltd., Osaka, Japan

Filed March 26, 1970, Ser. No. 22,995
Int. Cl. C07d *5/36*
U.S. Cl. 260—346.2 R **5 Claims**

Cyclopropanecarboxylic acid esters represented by the formula,



wherein R_1 represents hydrogen or methyl; R_2 represents methyl, 2-methyl-1-propenyl or 2-methoxy-carbonyl-1-propenyl when R_1 is hydrogen and R_2 represents methyl when R_1 is methyl; R_2 represents hydrogen or methyl; and R_4 represents a lower alkylene radical containing or not containing oxygen or sulfur atom in its carbon chain, the alkylene having up to four carbon atoms, which may be useful as insecticides having high insecticidal effects and low toxicity to mammals.

3,716,561
SELECTIVE ALLYLIC OXIDATION PROCESS

David Andrews, Upper Montclair, and Gabriel Saucy, Essex Fells, N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

No Drawing. Original application Apr. 21, 1969, Ser. No. 818,142. Divided and this application Apr. 30, 1971, Ser. No. 139,188

Int. Cl. C07d *7/04*

U.S. Cl. 260—345.9 **2 Claims**

Multi-step processes for the preparation of tricyclic intermediates useful in the total synthesis of steroids are described. A first process step involves treatment of a dihydroxy, divinyl compound with both manganese dioxide and an amine to produce a Mannich base intermediate. The resulting Mannich base intermediate may be reduced catalytically and then coupled with a cyclic dione to yield a tricyclic keto diene. This compound can be reduced to yield a tricyclic hydroxy compound useful as an intermediate in the total synthesis of steroidal compounds having known valuable pharmacological properties. Alternatively, it is possible to directly couple the Mannich base with the cyclic diketo compound followed by reduction and catalytic hydrogenation to yield the tricyclic hydroxy compound.

3,716,562
PROCESS FOR PREPARING OLEFIN OXIDES

Gianfranco Pregaglia; Giorgio Montorsi; Giuseppe Caprara, all of Milan, and Giuseppe Messina, Alghero, all of Italy, assignors to Montecatini Edison S.p.A., Milan, Italy

Filed June 10, 1971, Ser. No. 151,979

Claims priority, application Italy, June 12, 1970, 25901 A/70

Int. Cl. C07d *1/06*

U.S. Cl. 260—348.5 V **10 Claims**

Olefin oxides are prepared with greatly improved yield in the liquid phase reaction of olefins, aldehydes, the carbonyl group of which is bound to tertiary or secondary carbon atom, by conducting the process in two stages. In the first stage the gas containing oxygen is reacted in the liquid phase with the olefin and aldehyde at a temperature of 0°–120° C., wherein the olefin/aldehyde molar ratio is between 50 : 1 and 1 : 1, until at least 35 percent conversion of the aldehyde. In the second stage in which the oxygen feed is preferably interrupted, the reaction is continued at a temperature of 50°– 150° C. in the presence of a catalyst selected from the group consisting of compounds of molybdenum, titanium, tungsten, vanadium and combinations thereof.

3,716,563
PREPARATION OF EPOXIDE COMPOUNDS BY EPOXIDIZING OLEFINS WITH PREFORMED ORGANOPEROXYBORON COMPOUNDS

Jean-Claude Brunie and Noël Crenne, Lyon, France, assignors to Rhone-Poulenc S.A., Paris, France

No Drawing. Filed May 27, 1966, Ser. No. 553,283

Claims priority, application France, June 1, 1965, 19,139

The portion of the term of the patent subsequent to Jan. 2, 1990, has been disclaimed

Int. Cl. C07d *1/08*

U.S. Cl. 260—348.5 L **3 Claims**

Epoxidized compounds are manufactured by oxidizing olefinic compounds with triorganoperoxyboranes as epoxidizing agent.

3,716,564
AZA ALIPHATIC ESTERS

Virginia L. Spain, Mountain View, and John D. Diekman, Menlo Park, both of Calif., assignors to Zoecon Corporation, Palo Alto, Calif.

Filed May 13, 1971, Ser. No. 143,183

Int. Cl. C08h *17/36*

U.S. Cl. 260—404 **11 Claims**

Novel aza α, β-unsaturated aliphatic esters prepared by the reaction of an aliphatic nitrile with a di-unsaturated aliphatic ester in the presence of mercuric nitrate followed by reduction with sodium borohydride useful for the control of insects.

3,716,565
3,4-ALLENIC FATTY ACID ESTERS

Clive A. Henrick and John B. Siddall, Palo Alto, Calif., assignors to Zoecon Corporation, Palo Alto, Calif.

No Drawing. Filed Feb. 1, 1971, Ser. No. 111,768

Int. Cl. C07c *69/52, 103/56, 33/04*

U.S. Cl. 260—410.9 R **13 Claims**

Preparation of di-unsaturated and tri-unsaturated aliphatic esters and amides by reaction of alkynyl alcohol with orthoester or amide ketal to prepare allenic ester or amide and rearrangement of allene, useful for insect control.

3,716,566
METHOD OF DECOMPOSITION AND/OR WET INCINERATION OF ORGANIC MATERIAL, ESPECIALLY BIOLOGICAL SUBSTANCES

Bruno Otto Sansoni, Lohhof-Sud, and Wolfgang Karl Heinrich Kracke, Munich, Germany, assignors to Gesellschaft fur Strahlenforschung m.b.H., Neuherberg, Germany

No Drawing. Filed June 18, 1969, Ser. No. 834,526

Claims priority, application Germany, July 2, 1968, P 17 73 750.7

Int. Cl. C09f *5/00*

U.S. Cl. 260—412.8 **11 Claims**

A method of decomposition and/or wet incineration of organic substances such as meat, fish, flour, bone, vegetables, milk powder, cellulose, ion exchange resins or the like. The substances are decomposed in aqueous suspension by subjecting them to attack of the radicals $\cdot OH$ or $\cdot HO_2$.

3,716,567
SIMULTANEOUS PRODUCTION OF ALCOHOLATES AND TRIVALENT TITANIUM COMPLEXES OF BETA-DIKETONES

Erich Termin, Laufenburg, and Gerhard Hauck, Troisdorf-Sieglar, both of Germany, assignors to Dynamit Nobel AG, Troisdorf, Germany

Filed Sept. 8, 1970, Ser. No. 70,580

Claims priority, application Germany, Sept. 6, 1969, P 19 45 303.3

Int. Cl. C07f *7/28*

U.S. Cl. 260—429.5 **9 Claims**

Tetravalent titanium alcoholate-beta diketone complexes, e.g. titanium isopropylate-triacetylacetonate, are reacted with an alkali metal amalgam in a non-polar solvent to reduce the titanium to trivalent state, forming, for example, titanium triacetylacetonate and sodium isopropylate. The sodium isopropylate is a crystalline precipitate which can be removed by filtration; the amalgam can be decanted off and reused, as in alkali metal chloride electrolysis, to restore its alkali metal content so as to be ready for re-cycling.

3,716,568
REACTION PRODUCTS OF DIOCTYLTIN OXIDE AND DIOCTYLTIN MONOHYDRIC ALIPHATIC SATURATED ALCOHOL THIOGLYCOLATE ESTERS AND PROCESS

Lawrence R. Brecker, Brooklyn, and Otto S. Kauder, Jamaica, both of N.Y., assignors to Argus Chemical Corporation, Brooklyn, N.Y.

Division of Ser. No. 788,915, Jan. 3, 1969, Pat. No. 3,591,549. This application Sept. 1, 1970, Ser. No. 68,802

Int. Cl. C07f *7/22*

U.S. Cl. 260—429.7 **9 Claims**

Dioctyltin oxide-dioctyltin monohydric aliphatic saturated alcohol thioglycolate ester reaction products are provided, which are particularly useful as stabilizers for polyvinyl chloride resins.

3,716,569
SILICON-CONTAINING AMINOMETHYL PHOSPHONATES

Derek Redmore, Ballwin, and Frederick T. Welge, Webster Groves, Mo., assignors to Petrolite Corporation, Wilmington, Del.

No Drawing. Filed Oct. 12, 1970, Ser. No. 80,124

Int. Cl. C07f *7/02, 7/04*

U.S. Cl. 260—448.8 N **5 Claims**

Silicon-containing aminomethyl, or substituted aminomethyl, phosphonic acids and derivatives thereof. The silicon atom is silicone functional (i.e. has a —SiO— group) and is also attached to an alkyleneamino group which may have one or more amino groups (i.e. an alkyleneamine group having at least one N—H group) capable of reacting with a carbonyl compound (i.e. aldehyde or ketone) and phosphorous acid, or a derivative thereof, to form aminomethyl phosphonic acid. All, or less than all, of the N—H groups may be converted to aminomethyl phosphonic acids. The silicon-aminomethyl phosphonic acids may be monomeric, polymeric, or copolymeric. They are useful, for example, as corrosion inhibitors, scale inhibitors, water clarifiers and for other uses.

3,716,570
NOVEL HYDROGEN CONTAINING FLUOROALKYL HYPOCHLORITES AND PROCESS FOR THE PREPARATION THEREOF

Douglas Eugene Gould, Dover; Lowell Ray Anderson, Parsippany; David Edward Young, Denville, and William Burke Fox, Morris Township, Morris County, all of N.J., assignors to Allied Chemical Corporation, New York, N.Y.

Filed June 5, 1969, Ser. No. 830,864

Int. Cl. C07c *71/00*

U.S. Cl. 260—453 R **13 Claims**

Hydrogen containing fluoroalkyl hypochlorites of the formula:

$$R_3COCl$$

wherein each R may be hydrogen, lower alkyl, aryl and fluoroalkyl with the proviso that at least one R substituent is fluoroalkyl and one R substituent contains at least one hydrogen atom. The alkyl and fluoroalkyl moieties may contain the same or a different number of carbon atoms and each may contain up to six carbon (lower alkyl), in a straight, or branched chain structure and when R contains six carbon atoms, it may represent an alicyclic moiety. These novel hydrogen containing fluoroalkyl hypochlorites can be prepared by reacting the corresponding alcohols with chlorine monofluoride (ClF) in the absence of a catalyst. These compounds are useful as polymerization initiators, chlorinating agents, bleaching agents, and are valuable intermediates for the syntheses of other useful compounds.

3,716,571
OLIGOCARBONATE ACRYLATES AND A PROCESS FOR PRODUCING THE SAME

Alfred Anisimovich Berlin; Tamara Yakovlevna Kefeli; Natalia Lvovna Marshavina, all of Moscow; Grigory Mikhailovich Strongin, Dzerzhinsk; Nikolai Vladimirovich Kara-Giaur, Dzerzhinsk; Boris Ivanovich Kolomazov, Dzerzhinsk; Alexei Vasilievich Efimov, Dzerzhinsk; Aglaida Nikolaevna Bodrova, Dzerzhinsk, and Judif Markovna Altshuler, Dzerzhinsk, all of U.S.S.R., assignors to Institut Khimicheskoi Fiziki an SSSR, Moscow, U.S.S.R.

Filed July 2, 1969, Ser. No. 838,648

Int. Cl. C07c *69/54;* **C08g** *17/10, 17/13*

U.S. Cl. 260—463 **5 Claims**

A novel class of polymerizable oligomers -oligocarbonate-acrylates and a process for producing the same by reacting monoesters of alkylene glycols and acids of the acrylic series with bischloroformates of glycols or bisphenols or with oligomeric compounds containing terminal bischloroformate groups.

Said unsaturated oligoesters may be used in compositions of contact binding fiberglass plastics, colorless film-forming materials, electroinsulating compositions, adhesives. Besides, they may be used for producing heat-resistant protecting glass of improved strength, optical components, injection molding plastics and other polymer materials.

3,716,572
ARYL CARBONATES OF POLYOLS

Donald R. Moore, Rutherford, N.J., and Giuliana C. Tesoro, Dobbs Ferry, N.Y., assignors to J. P. Stevens & Co., Inc., New York, N.Y.

No Drawing. Original application July 6, 1966, Ser. No. 563,064, now Patent No. 3,542,841. Divided and this application July 14, 1970, Ser. No. 62,733

Int. Cl. C07c *69/00;* **C08g** *22/04;* **D06m** *15/60*

U.S. Cl. 260—463 **2 Claims**

This invention concerns novel aliphatic polyaryl carbonates useful as intermediates and as crosslinking agents for polyamines and polyimines.

3,716,573
PREPARATION OF AMINO ACID DERIVATIVES

Seemon H. Pives, Murray Hill, N.J., assignor to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 774,213, Nov. 7, 1968, Pat. No. 3,676,453. This application June 5, 1970, Ser. No. 57,395

Int. Cl. C07c *103/30*

U.S. Cl. 260—471 A **8 Claims**

Amino acid derivatives are prepared by reacting a 2,4 or 4 substituted-4H-oxazol-5-one with a carboxylic acid halide to form a novel oxazole product which rearranges on heating to the azlactone which is also novel. The rearranged product is reacted with ammonia, an alcohol, a mercaptan or amines to form the corresponding amino acid derivatives which are useful as pharmaceutical intermediates.

3,716,574
PURE CRYSTALLINE PLICATIC ACID TETRAHYDRATE AND THE METHYL ESTER THEREOF

John Howard and Terence D. McIntosh, Vancouver, British Columbia, Canada, assignors to Rayonier Incorporated, New York, N.Y.

No Drawing. Filed Dec. 1, 1967, Ser. No. 687,092

The portion of the term of the patent subsequent to Feb. 22, 1989, has been disclaimed

Int. Cl. C07c *65/14, 69/76*

U.S. Cl. 260—473 F **2 Claims**

Pure crystalline plicatic acid tetrahydrate that is stable to heat and light up to its melting point of 176° C. is prepared from substantially pure methyl plicatate. The pure methyl plicatate, which is itself a new composition of matter conveniently prepared from an aqueous extract of red cedar heartwood, is saponified with an aqueous solution of alkali metal hydroxide at an elevated temperature under substantially non-oxidative conditions. The resulting alkali metal plicatate solution is then acidified with a slight excess of a mineral acid such as hydrochloric or sulfuric acid, and the acidified solution is cooled, and if desired seeded, whereupon pure crystalline plicatic acid tetrahydrate precipitates in yields as high as 80 or 90 percent of theoretical.

3,716,575
PURIFICATION OF BIS(2-HYDROXYETHYL)TEREPHTHALATE

Ray N. Finch; John P. Mireur, and Hollye Fouts, all of Corpus Christi, Tex., assignors to Celanese Corporation, New York, N.Y.

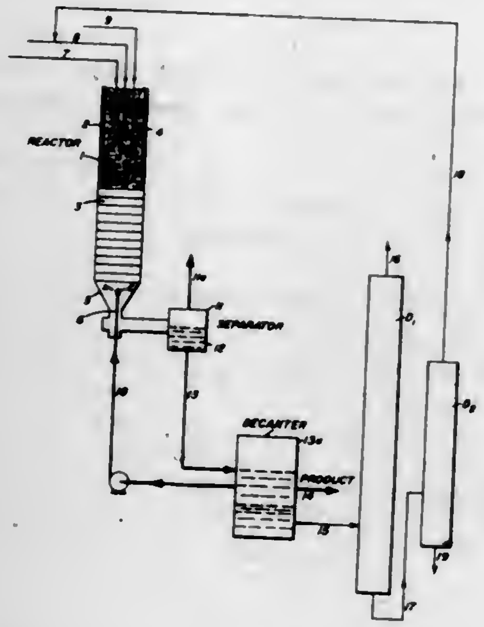
Continuation of Ser. No. 713,273, March 8, 1968, abandoned. This application Feb. 16, 1971, Ser. No. 115,859
Int. Cl. C07c *69/82*
U.S. Cl. 260—475 PR **6 Claims**

A process for the removal of color forming impurities, such as aldehydes and nitrogen compounds, from bis(2-hydroxyethyl terephthalate by treatment with mixtures of an alkali metal sulfite and an alkali metal bisulfite.

3,716,576
OXIDATIVE DEHYDROGENATION PROCESS FOR PREPARING UNSATURATED ORGANIC COMPOUNDS

Alden E. Blood, and Herschel T. Vinyard, both of P. O. Box 2068, Longview, Tex.

Continuation-in-part of Ser. No. 550,518, May 16, 1966, abandoned. This application July 22, 1969, Ser. No. 847,789
Int. Cl. C07c *69/52;* **B01d** *3/00*
U.S. Cl. 260—486 D **7 Claims**



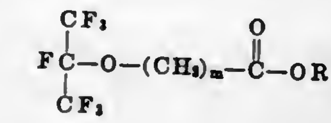
A process for obtaining salt-free aqueous hydrogen iodide from the crude reaction mixture resulting from the oxidative dehydrogenation of organic compounds in the presence of an iodine-containing material. The process comprises separating the organic product from the crude reaction mixture and distilling in two stages the aqueous layer containing hydrogen iodide to obtain an aqueous composition consisting essentially of hydrogen iodide. The aqueous hydrogen iodide composition is recycled to the reaction zone. The process is particularly useful in those oxidative dehydrogenation processes wherein hydrogen iodide hydrate is employed as a catalyst.

3,716,577
PREPARATION OF FLUORINATED ESTERS

Allen G. Pittman, El Cerrito, and William L. Wasley, Berkeley both of Calif., assignors to The United States of America as represented by the Secretary of Agriculture

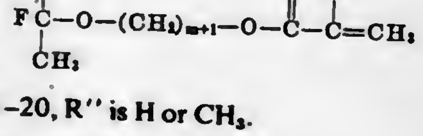
Division of Ser. No. 841,616, July 14, 1969, Pat. No. 3,674,820, which is a division of Ser. No. 703,199, Nov. 22, 1967, Pat. No. 3,527,742, which is a division of Ser. No. 477,331, Aug. 4, 1965, Pat. No. 3,424,785.
Filed July 30, 1971, Ser. No. 167,812
Int. Cl. C07c *69/54*
U.S. Cl. 260—486 H **4 Claims**

Fluorinated ketones are converted into acrylic esters, using the following typical plan: Hexafluoroacetone is reacted with an alkali metal fluoride, and the resulting intermediate is reacted with an omega-halo-aliphatic carboxylic acid ester, yielding an ester of the structure



$$F\overset{CF_3}{\underset{CF_3}{C}}-O-(CH_2)_m-\overset{O}{\overset{\|}{C}}-OR'$$

wherein *m* is 1–20, R′ is a hydrocarbon group. This ester is reduced to produce an alcohol which is reacted with acryloyl (or methacryloyl) chloride, yielding the product



$$F\overset{CF_3}{\underset{CH_3}{C}}-O-(CH_2)_{m+1}-O-\overset{O}{\overset{\|}{C}}-\overset{R''}{\overset{|}{C}}=CH_2$$

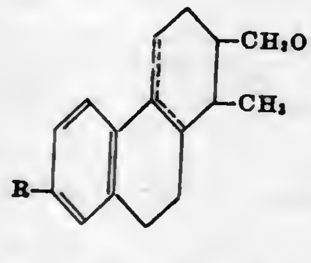
wherein *m* is 1–20, R″ is H or CH_3.

3,716,578
HEXAHYDROPHENANTHRENE DERIVATIVES

Poul Johnk, Vaerloese, Denmark, assignor to Novo Terapeutisk Laboratorium A/S, Copenhagen, Denmark

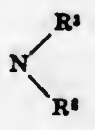
Filed March 18, 1970, Ser. No. 20,819
Claims priority, application Great Britain, April 3, 1969, 17,637/69
Int. Cl. C07c *69/02*
U.S. Cl. 260—488 CD **3 Claims**

Novel hexahydrophenanthrene derivatives of the general formula



(I)

in which R is hydrogen or OR^1; R^1 is hydrogen, benzyl, lower alkyl or cycloalkyl; R^2 is hydrogen, lower alkyl, cycloalkyl, cycloalkyl containing a hetero atom, or OCR^3; R^3 is hydrogen, lower alkyl or CH_2SO_2X; X is chlorine, OR^4,



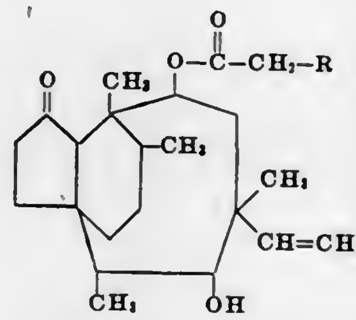
or OMe; R^4 is hydrogen or lower alkyl; R^5 and R^6 are hydrogen or lower alkyl, or R^5 and R^6 together with the attached N-atom form a heterocyclic ring; and Me is an alkali metal or an earth alkali metal atom, useful anti-fertility compositions for oral administration, as well as processes for their production.

3,716,579
ESTER DERIVATIVES OF PLEUROMUTILIN

Franz Knauseder, and Ernst Brandl, both of Tirol, Austria, assignors to Biochemie Gesellschaft m.b.H., Vienna, Austria

Filed July 20, 1970, Ser. No. 56,752
Claims priority, application Austria, July 21, 1969, A 7004/69
Int. Cl. C07c *69/16;* **C12d** *9/22*
U.S. Cl. 260—488 B **2 Claims**

The invention concerns new pleuromutilin derivatives of the formula:



wherein R is $CH_3-(CH_2)_7-CH=CH-(CH_2)_7-COO-$, $CH_3-(CH_2)_4-CH=CH-CH_2-CH=CH-(CH_2)_7-COO-$, $CH_3-(CH_2)_5-CH=CH-(CH_2)_7-COO-$, or hydrogen.

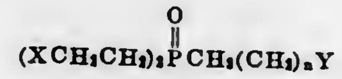
The derivatives are useful animal feed additives, and also find application in veterinary medicine.

3,716,580
FUNCTIONAL TERTIARY PHOSPHINE OXIDES

Ludwig Maier, Kilchberg/Zurich, Switzerland, assignor to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 883,291, Dec. 8, 1969, abandoned. This application Dec. 3, 1970, Ser. No. 94,965
Claims priority, application Switzerland, Dec. 17, 1968, 19115/68; Aug. 28, 1969, 13191/69; Dec. 11, 1969, 18556/69
Int. Cl. C07f *9/02*
U.S. Cl. 260—488 J **13 Claims**

Tertiary phosphine oxides of the formula



$$(XCH_2CH_2)_2\overset{O}{\overset{\|}{P}}CH_2(CH_2)_nY$$

in which X is selected from the group consisting of hydroxyl, chlorine, bromine or an RO, RS or RC(O)O— group, wherein R is a hydrocarbon group, Y signifies hydroxyl, chlorine or bromine if *n* is O, or Y is defined as X if *n* is 1, and *n* is 0 or 1, and a novel process for preparing such phosphine oxides. Tertiary phosphine oxides, exemplified by tris-(2-hydroxyethyl)-phosphine oxide, bis-(2-chloroethyl)-chloromethylphosphine oxide and bis-(2-decanoxyethyl)-chloromethylphosphine oxide are useful as flameproofing agents and plasticizers.

3,716,581
PROCESS FOR PREPARING OLEFIN ESTERS

Benedetto Calcagno, and Marcello Ghirga, both of Milan, Italy, assignors to Societa Italiana Resine S.p.A., Milan, Italy

Filed April 22, 1968, Ser. No. 723,255
Claims priority, application Italy, April 29, 1967, 15535 A/67
Int. Cl. C07c *67/04*
U.S. Cl. 260—497 A **13 Claims**

A process for preparing unsatured esters from olefines and carboxylic acids is provided, in which the catalytic salts are regenerated by chlorine treatment and returned to the reaction.

3,716,582
SULFOPHENYLINDAN DICARBOXYLIC ACID AND DERIVATIVES THEREOF

Max H. Keck, Cuyahoga Falls, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 794,415, Jan. 27, 1969, Pat. No. 3,554,975. This application Aug. 6, 1970, Ser. No. 61,787
Int. Cl. C07c *143/52*
U.S. Cl. 200—507 R **3 Claims**

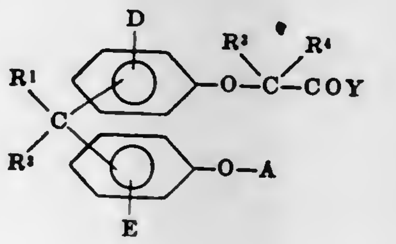
The invention relates to sulfophenylindan dicarboxylic acids, salts and esters thereof and to polyester resins containing units of these materials. The polyester resins have improved dye receptivity.

3,716,583
PHENOXY CARBOXYLIC ACID DERIVATIVE

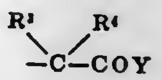
Yasushi Nakamura, Ibaragi; Kunio Agatsuma; Yoshihiro Tanaka, both of Takarazuka, and Shunji Aono, Toyonaka, all of Japan, assignors to Sumitomo Chemical Company, Ltd., Osaka, Japan

Filed April 7, 1970, Ser. No. 26,412
Claims priority, application Japan, April 16, 1969, 44/29905; April 16, 1969, 44/29907; May 2, 1969, 44/34166; May 2, 1969, 44/34167; Oct. 3, 1969, 44/80041; Oct. 3, 1969, 44/80042; Dec. 19, 1969, 44/102809; Dec. 23, 1969, 44/104194
Int. Cl. C07c *69/76*
U.S. Cl. 260—520 **7 Claims**

Novel anti-atherosclerosis agents having the formula,



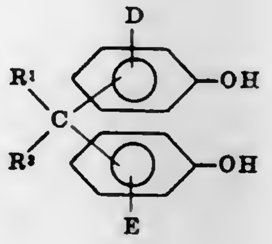
wherein typical examples of R^1 and R^2 are hydrogen, C_1—C_8 alkyl, phenyl, benzyl and phenethyl, or R^1 and R^2 may form cycloalkylidene together with a carbon atom bonded therewith; R^3 and R^4 each is hydrogen or C_1—C_4 alkyl; Y is hydroxyl, C_1—C_4 alkoxy, phenoxy or an amine residue; A is hydrogen or a group of the formula,



$$-\overset{R^3\quad R^4}{C}-COY$$

wherein R^3, R^4 and Y have the same meanings as defined above; and D and E each is hydrogen or halogen.

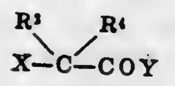
These compounds are produced, for example, by reacting a bisphenolic compound of the formula,



with chloroform and a ketone compound of the formula,

$$R^3-CO-R^4$$

in the presence of an alkali. Alternatively, they are produced by reacting the bisphenolic compound with α-halogeno- or α-hydroxycarboxylic acid derivative of the formula,



$$X-\overset{R^3\quad R^4}{C}-COY$$

wherein R^1, R^2, R^3, R^4, D, E and Y have the same meanings as defined above; and X is halogen or hydroxyl.

3,716,584

PROCESS FOR THE PURIFICATION OF LACTIC ACID

Gerard Chaintron, Rhone, France, assignor to Rhone-Poulenc S.A., Paris, France

Filed May 21, 1970, Ser. No. 39,567

Claims priority, application France, May 23, 1969, 6916915

Int. Cl. C07c *59/08*

U.S. Cl. 260—535 R **7 Claims**

This invention provides a process for purifying lactic acid obtained by hydrolysis of the intermediate products produced by the oxidation of propylene with nitric acid and/or nitrogen peroxide, with removal of some, at least, of the nitric acid, by treating the lactic acid with hydrogen in the presence of a hydrogenation catalyst.

3,716,585

ALKOXY TRIFLUOROMETHYLANILINE COMPOUNDS

Philip L. Strong; Don L. Hunter, both of Anaheim, and Cecil W. LeFevre, Tustin, all of Calif., assignors to United States Borax & Chemical Corporation, Los Angeles, Calif.

Filed Aug. 5, 1970, Ser. No. 61,449

Int. Cl. C07c *91/42, 87/58*

U.S. Cl. 260—574 **6 Claims**

N-alkyl substituted 5-alkoxy-2-nitro-4-trifluoromethylanilines and their thio analogues. The compounds are useful as herbicides and can be formulated with conventional herbicide carriers.

3,716,586

NEW 2-HYDROXY-3,5-DI-(TERT. BUTYL)-BENZOPHENONES

Kurt Hofer, Munchenstein/BL, and Rudolf Kessler, Reinach/BL, both of Switzerland, assignors to Sandoz Ltd. (also known as Sandoz AG), Basle, Switzerland

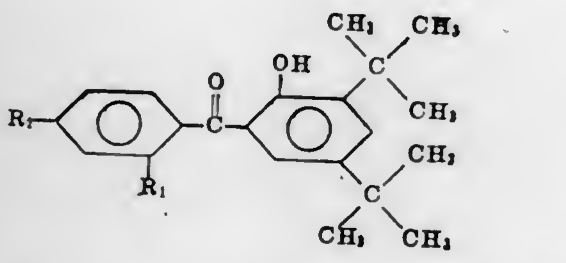
Filed July 16, 1970, Ser. No. 55,604

Claims priority, application Switzerland, July 25, 1969, 11367/69

Int. Cl. C07c *49/82*

U.S. Cl. 260—591 **7 Claims**

New 2-Hydroxy-3,5-di-(tert. butyl)-benzophenones of Formula



(I)

wherein R_1 stands for hydrogen or lower alkyl and R_2 for hydrogen or alkyl or for phenyl, phenoxy or phenylmercapto which may be substituted by alkyl, chlorine or bromine are prepared by a Friedel-Crafts condensation reaction and are useful as ultraviolet absorbers.

3,716,587

N-(PHENYL OR BENZYL)-N,N¼-BIS-(1-AMINO-2,2,2-TRICHLORO)-ETHYL)ALKYLENIAMINES

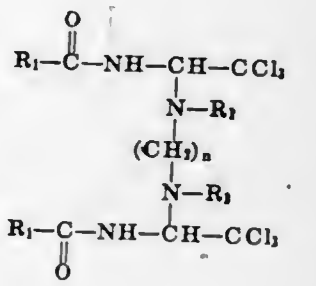
Walter Ost; Klaus Thomas, Dietrich Jerchel, all of Ingelheim/Rhine and Karl-Richard Appel, Biberach-Rissegg, all of Germany, assignors to C. H. Boehringer Sohn, Ingelheim/Rhine, Germany

Continuation-in-part of Ser. No. 793,187, Jan. 22, 1969, Pat. No. 3,595,916. This application March 25, 1971, Ser. No. 128,168

Int. Cl. C07c *103/30*

U.S. Cl. 260—562 P **20 Claims**

Compounds of the formula



wherein

R_1 is hydrogen, alkyl of one to four carbon atoms or trichloromethyl,

R_2 is phenyl, benzyl, chlorophenyl, dichlorophenyl, chlorobenzyl, dichlorobenzyl, bromophenyl or dibromophenyl,

R_3 is hydrogen, phenyl, benzyl or dichlorophenyl, bromophenyl or dibromophenyl, and

n is 1, 2 or 3;

the compounds are useful as fungicides.

3,716,588

MERCAPTO-METHYL SULPHIDES

Christian Esclamadon, Billere, Yves Labat, Pau, and Jean-Baptiste Signouret, Billere, France, assignors to Societe Anonyme dite: Societe Nationale des Petroles d'Aquitaine, Tour Aquitaine, Courbevoie, France

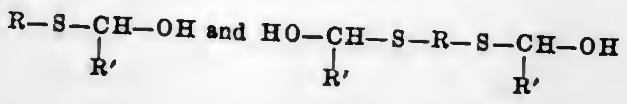
No Drawing. Filed Jan. 28, 1970, Ser. No. 6,587

Claims priority, application France, Jan. 31, 1969, 6902062

Int. Cl. C07c *149/10*

U.S. Cl. 260—609 R **8 Claims**

A process for the preparation of mercapto-methyl sulphides, the sulphide functions of which are in the α-position relatively to the terminal thiol functions, comprises causing a mercaptan RSH or a dimercaptan HS—R—SH to react with an aldehyde R'CHO, and sulphurising with H_2S the herimercaptal or dihemimercaptal



$$R-S-\underset{R'}{CH}-OH \text{ and } HO-\underset{R'}{CH}-S-R-S-\underset{R'}{CH}-OH$$

compound thus obtained, wherein R is a hydrocarbon group having from 1 to 12 carbon atoms; it can be an alkyl, cycloalkyl or aryl group, which may comprise thioether or ether groups or any other functional group which does not react with H_2S; R' can be hydrogen, a saturated or unsaturated alkyl radical, a saturated or unsaturated cycloalkyl radical or an aryl radical.

New mercapto-methyl sulphides are thus obtained.

The invention includes processes for plasticising sulphur with these new thiols, and, as new industrial products, plastic sulphur compositions.

3,716,589

PROCESS FOR THE SYNTHESIS OF 2,6-DIMETHYLPHENOLS

Takeshi Kotanigawa, Mitsuyoshi Yamamoto, and Katsuyoshi Shimokawa, Sapporo, Japan, assignors to Agency of Industrial Science & Technology, Tokyo, Japan

No Drawing. Filed Nov. 19, 1969, Ser. No. 878,263

Claims priority, application Japan, Nov. 27, 1968, 43/87,569

Int. Cl. C07c *37/16*

U.S. Cl. 260—621 R **6 Claims**

A process is disclosed for methylating the ortho-position of phenols by reacting a mixed gas of phenols and methyl alcohol in the presence of a composite catalyst. The composite catalyst is a ferrite having the formula MFe_2O_4 where M is zinc, magnesium, calcium, barium, cobalt, nickel, chromium, manganese, cadmium, copper, silver, copper-zinc, magnesium-zinc, and silver-zinc.

3,716,590

PROCESS FOR PREPARING THE P,P-DINITROBIBENZYL

Dr. Eng. Adrian Caraculacu; Eng. Alla Petrus, both of Iasi, and Eng. Mircea Laba, Ploiesti, all of Romania, assignors to Institutul De Chimie Macromolecular Petre Poni-Iasi, Iasi, Romania

Filed March 24, 1971, Ser. No. 127,815

Int. Cl. C07c *79/10;* **B01j** *1/12*

U.S. Cl. 260—645 **6 Claims**

p,p'-dinitrobibenzyl is produced by oxidizing p-nitrotoluene alone or in admixture with o-nitrotoluene in a pulsed column with air or oxygen in the presence of alcoholic alkali.

3,716,591

OLEFIN HALOGENATION

Donnie G. Brady, Bartlesville, Okla., assignor to Phillips Petroleum Company

No Drawing. Filed Mar. 13, 1969, Ser. No. 807,067

Int. Cl. C07c *17/02, 19/02, 23/00*

U.S. Cl. 260—648 R **10 Claims**

Halogenated olefinic compounds are formed by reacting an olefinic compound with a halogen in the presence of a non-polar diluent, a Lewis acid, and only a complex forming amount of a polar organic compound, the halogenated product being useful as a flame retardant in polyolefins.

3,716,592

PROCESS FOR THE PREPARATION OF ALKYL, PERFLUOROALKYL AND ARYL IODIDES

Leonard S. Silbert, Philadelphia, Pa., assignor to the United States of America as represented by the Secretary of Agriculture

No Drawing. Original application Mar. 23, 1970, Ser. No. 24,923, now Patent No. 3,652,682. Divided and this application Nov. 12, 1971, Ser. No. 198,444

Int. Cl. C07c *25/04*

U.S. Cl. 260—650 R **1 Claim**

High yields of alkyl, perfluoroalkyl and aryl iodides are prepared directly from their corresponding carboxylic acids by reaction in solution with iodine and aroyl peroxide or t-butylperoxy isopropyl carbonate. The reaction is conducted at a temperature of about 110–125° C. for about two to three hours in solvents such as 1,3-dichloropropane, 1,3-dibromopropane and 1,1,2,2-tetrachlorodifluorethane. Solvents such as 1,2-dichloroethane and carbon tetrachloride can be used as solvents but they require longer reaction times.

3,716,593

HYDROGEN FLUORIDE RECOVERY METHOD

Tom Hutson, Jr., and Cecil O. Carter, both of Bartlesville, Okla., assignors to Phillips Petroleum Company

Filed June 22, 1970, Ser. No. 48,342

Int. Cl. C07c *17/08*

U.S. Cl. 260—653.6 **6 Claims**

A hydrogen fluoride and acid soluble oil mixture is contacted with water, the oil separated therefrom, then reacted with an olefin and the resultant organic fluorides are recovered.

3,716,594

PROCESS FOR THE PRODUCTION OF LIVING OLIGOMER

Yutaka Hoshino; Koshiro Matsukawa; Akira Nadaka, and Kazuo Uno, all of Niigata, Japan, assignors to Nippon Soda Co., Ltd., Tokyo, Japan

Filed March 25, 1970, Ser. No. 22,489

Claims priority, application Japan, April 1, 1969, 44/24412

Int. Cl. C07f *1/04*

U.S. Cl. 260—665 R **4 Claims**

In the process for producing alkali metal dianion complex dimer (disodiooctadiene) and metal dianion complex oligomer which is an initiator for living polymerization by reaction between fine particles of sodium metal and 1, 3-butadiene, cohesion of sodium metal particle is avoidable by maintaining the ratio of ME/LE of 2.0 to 0 wherein ME is the molar quantity of metallic sodium (unreacted sodium metal); LE is the equivalent quantity of carbanion complex terminal of disodiooctadiene (sodium corresponding to cation attached to butadiene) and the resulting initiator gives living polymer having narrow polymerization degree and a coincident average polymerization degree with the expected value calculated from the molar ratio of the sodium metal to butadiene.

3,716,595

POLYSUBSTITUTED DIHYDROPYRENES

Luther A. R. Hall, Woodcliff Lake, N.J., John A. Gurney, Tarrytown, N.Y., and Harris B. Renfroe, Montvale, N.J., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

No Drawing. Application Apr. 7, 1967, Ser. No. 635,287, which is a continuation-in-part of abandoned application Ser. No. 499,064, Oct. 20, 1965. Divided and this application Oct. 16, 1970, Ser. No. 81,606

Int. Cl. C07c *13/62*

U.S. Cl. 260—666 PY **1 Claim**

Photochromic 1,3,6,8-tetra(lower)alkyl-15,16-dimethyl-15,16-dihydropyrenes, 15,16-methylene-15,16-dihydropyrenes, 15,16-methylene-15,16-dihydropyrenes and 1,3,6,8-tetra(lower)alkyl - 15,16 - methylene-15,16-dihydropyrenes substituted in one or both of the 2- and 7-positions benzoyl, alkanoyl, alkanoyloxy, cyano, nitro, alkyl, α-hydroxyalkyl, α-acyloxyalkyl, α-isonitrosoalkyl, or acylamido groups are prepared via substitution of the parent hydrocarbon. A typical embodiment is 2-acetamido-7-nitro-1,3,6,8,15,16-hexamethyl-15,16-dihydropyrene.

3,716,596

ALKYLATION AND DEALKYLATION OF AROMATICS IN THE PRESENCE OF CRYSTALLINE ALUMINOSILICATES

Emmerson Bowes, Media, Pa., assignor to Mobil Oil Corporation

Filed April 18, 1968, Ser. No. 722,206

Int. Cl. C07c *3/52*

U.S. Cl. 260—671 C **4 Claims**

A process for alkylating or dealkylating a compound capable of alkylation or dealkylation by contacting it in a reaction zone maintained under conditions effective for accomplishing said alkylation or dealkylation with a catalyst comprising a crystalline zeolite characterized by a unique X-ray diffraction pattern or products of thermal treatment of the zeolite. The zeolite can be further defined by reference to the following formula expressed in terms of mole ratios of oxides:

$$M_{2/n}O:J_2O_3:3\text{–}20ZO_2:0\text{–}20H_2O$$

wherein M is a cation, J is aluminum or gallium and Z is silicon or germanium and *n* is the valence of M.

3,716,597
PROCESS FOR ALKYLATING AROMATIC HYDROCARBONS

Roy T. Mitsche, Island Lake, and Edward Michalko, Lombard, both of Ill., assignors to Universal Oil Products Company, Des Plaines, Ill.

Continuation-in-part of Ser. No. 20,024, March 16, 1970, Pat. No. 3,677,973. This application Dec. 28, 1970, Ser. No. 102,058

Int. Cl. C07c *3/52*

U.S. Cl. 260—671 C **11 Claims**

A process for alkylating alkylatable aromatic hydrocarbons using a catalyst comprising a zeolite with a mordenite crystal structure containing alumina fixed in combination therewith.

3,716,598
HARDENABLE EPOXY RESIN COMPOSITIONS

Mark Markovitz, Schenectady, N.Y., assignor to General Electric Company

Filed Oct. 28, 1971, Ser. No. 193,550

Int. Cl. C08g *45/08*

U.S. Cl. 260—831 **6 Claims**

The cure rate of 1,2-epoxy resins containing more than one epoxy group per molecule can be controlled over a wide range of times by a catalytic hardener comprising from 0.05 to 10 percent based on the weight of the epoxy resin of a bis(triorganotin) oxide and from 0.1 to 15 percent by weight of the epoxy resin of a phenolic accelerator.

3,716,599
ACRYLIC FLUOROCARBON COATING COMPOSITIONS

Joseph A. Vasta, Woodbury, N.J., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Continuation-in-part of application Ser. No. 77,310, Oct. 1, 1970. This application Oct. 20, 1971, Ser. No. 191,056

Int. Cl. C08g *41/04*

U.S. Cl. 260—859 **11 Claims**

Converting coating compositions containing polyvinyl fluoride or polyvinylidene fluoride and a cross-linkable amino acrylic polymer and a blocked isocyanate.

3,716,600
N-ACYL DERIVATIVES OF PHOSPHOROAMIDOTHIOATES

Philip S. Magee, San Rafael, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 810,383, March 25, 1969, abandoned. This application Feb. 24, 1970, Ser. No. 13,846

Int. Cl. C07f *9/24;* **A01n** *9/36*

U.S. Cl. 260—959 **12 Claims**

N-acyl derivatives of O-alkyl-S-aliphatic hydrocarbyl phosphoroamidothioates and S-alkyl-S-aliphatic hydrocarbyl phosphoroamidothioates. These compounds are insecticidal.

3,716,601
POLY(ETHER ESTERS) OF PHTHALIC ACID SALTS AND DI(HALOALKYL) ETHERS AS DYE RECEPTIVE AGENTS

Donnie G. Brady; Harold R. Deck; Faber B. Jones, all of Bartlesville, Okla., and John H. Underwood, Charlotte, N.C., assignors to Phillips Petroleum Company

Filed June 16, 1971, Ser. No. 153,866

Int. Cl. C08g *39/10;* **D06p** *3/00*

U.S. Cl. 260—873 **6 Claims**

Poly(ether esters) are prepared by reacting a phthalic acid salt with a di(haloalkyl)ether in a polar solvent using a phosphonium salt catalyst. The resulting poly(ether esters) are useful in olefin polymers to improve dye receptivity.

3,716,602
HEAT RESISTANT ELASTOMER COMPOSITIONS

Ichiro Iwami, Tsutomu Matsunaga, Sakae Inouye, Makoto Fujimori, Noriyuki Hayashi, Norio Wada, Ken Yoneyama, and Hideaki Inaba, Tokyo, Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

No Drawing. Filed Dec. 12, 1969, Ser. No. 884,748

Claims priority, application Japan, Dec. 17, 1968, 43/92,046

Int. Cl. C08c *11/60;* **C08d** *5/04;* **C08f** *15/40*

U.S. Cl. 260—889 **4 Claims**

Heat resistant elastomer compositions are obtained by adding to a cross-linkable elastomer composition containing at least 5% by weight of an elastomer containing an active halogen in the molecule, phenothiazine or the derivatives thereof.

3,716,603
TRIS(3,5-DIHYDROCARBYL-4-HYDROXY PHENYL)PHOSPHATES

Bernard R. Meltsner, Royal Oak, Mich., assignor to Ethyl Corporation, New York, N.Y.

No Drawing. Filed Nov. 1, 1965, Ser. No. 505,982

Int. Cl. C07f *9/12;* **C08k** *1/60;* **C10l** *1/26*

U.S. Cl. 260—953 **7 Claims**

Organic material is stabilized by the addition of a tris-(3,5 - dihydrocarbyl-4-hydroxyphenyl)phosphate, either alone or in combination with a dialkylthiodialkanoate.

This invention relates to new 3,5-dihydrocarbyl-4-hydroxyphenyl phosphates and their use as antioxidants.

Most organic materials undergo degradation in the presence of oxygen. This degradation is accelerated at increased temperatures. Frequently, high temperatures are encountered during the processing of these materials in manufacturing operations and thus some form of stabilizer is required for many materials, even during the manufacturing stage. Other materials are not subject to extremes in temperature during manufacture, but even these undergo degradation on aging.

3,716,604
METHOD FOR BONDING SOLID PROPELLANTS TO ROCKET MOTOR CASING

Henry C. Dehm, Salt Lake City, Utah, assignor to Hercules Incorporated, Wilmington, Del.

Filed May 2, 1967, Ser. No. 637,037

Int. Cl. C06b *21/02*

U.S. Cl. 264—3 R **4 Claims**

The reliability of propellant-case bond adhesion is improved by chemically bonding the propellant binder to the insulator of the rocket motor casing during the propellant cure cycle. Bonding is effected by treating a surface of an uncured elastomeric insulator with a polyfunctional material such as unsaturated alcohols, acids, amines, or isocyanates, curing the insulator, placing uncured propellant against the treated surface, and then curing the propellant in place. Excellent adhesion of nitrocellulose-containing propellants to butadiene-styrene type insulators is demonstrated using undecylenic alcohol as the surface treating material.

3,716,605
PRECIPITATION PROCESSES FOR METAL-CONTAINING MATERIALS

John Herbert Grimes, Basingstoke, and William Dress, Newbury, both of England, assignors to United Kingdom Atomic Energy Authority, London, England

Filed Jan. 26, 1970, Ser. No. 5,964

Claims priority, application Great Britain, Jan. 31, 1969, 5,500/69

Int. Cl. B01j *13/00;* **C01g** *57/00;* **G21c** *21/00*

U.S. Cl. 264—0.5 **14 Claims**

To a solution of a soluble salt of the relevant material or metals, e.g., iron, thorium, uranium, or aluminum, is added a polymeric organic compound, eg a polysaccharide such as dextran or carob gum, which renders the solution viscous and forms a complex with the metallic ions. The viscous solution is formed into a suitable physical configuration, eg drops, and contacted with a gaseous reagent to precipitate the metal or metals as insoluble compounds, eg iron can be precipitated by contacting with ammonia gas. The gaseous reagent employed moves relative to the viscous solution in said form of a suitable physical configuration. The organic compound may be driven off by heating and the precipitate reduced to metal if desired.

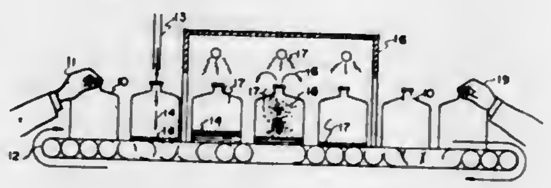
3,716,606
METHOD OF STABILIZING THERMO-PLASTIC CONTAINERS

Patrick Seymour Bazett, London, Ontario, Canada, assignor to Kemp Products Limited, Ontario, Canada

Filed July 15, 1970, Ser. No. 55,001

Int. Cl. B29d *23/00*

U.S. Cl. 264—25 **7 Claims**



Thermoplastic containers, particularly polyethylene, can be stabilized with desired or required control limit on volume and shape, such that they are capable of being used at temperature ranges in excess of 110°F. without appreciable or significant loss of shape or capacity. This is achieved by placing a small amount of liquid such as water within the bottle and subjecting the bottle to a microwave radiant energy field such that the liquid (water) absorbs the radiant energy and boils off into steam. The vapor generated would appear to be converted (after all water has evaporated) into superheated vapor which scours the interior of the bottle causing it to shrink and to stabilize such that under subsequent elevated heat environments (service temperatures) it is essentially stable in volume and shape.

3,716,607
HEAT TREATMENT OF MOLTEN CARBONACEOUS MATERIAL PRIOR TO ITS CONVERSION TO CARBON FIBERS AND OTHER SHAPES

Sugio Otani, Hishi-machi, Japan, assignor to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo-to, Japan

Filed July 7, 1970, Ser. No. 51,817

Claims priority, application Japan, Nov. 1, 1963, 38/58932; Sept. 1, 1964, 39/49772

Int. Cl. C01b *31/07;* **D06m** *11/12, 11/04*

U.S. Cl. 264—29 **8 Claims**

A method is provided for the production of carbon shaped articles in the form of filaments, yarns, ribbons, films, sheets, tubes and the like. The shaped articles resulting from the process are likewise provided. The method comprises the steps of

a. heating a natural or synthetic organic substance, such as polyvinyl chloride, polyacrylonitrile, petroleum pitch, coal pitch and others, in the presence of an inert gas to a temperature in the range of about 300° to 500° C., which temperature is below the carbonization temperature of such substance,
b. bringing the temperature of the substance to a temperature below the carbonization temperature in an inert atmosphere and forming the substance into a desired shape,
c. contacting the shaped article with an oxidizing gas, and
d. subjecting the article to carbonization by heating in an inert atmosphere at a temperature substantially above 500° C.

The shaped articles are useful for a wide range of uses, as for example, thermal insulation materials, carbon electrodes, and the like.

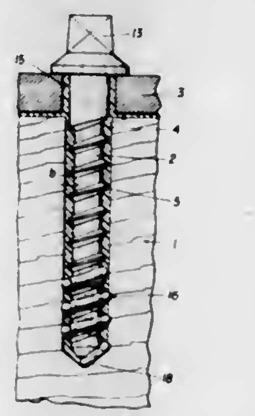
3,716,608
METHOD FOR RESTORING RAILWAY TIES

Gunter Neumann, 106 Theresienfeld, Austria, assignor to Gunter Neumann Terrasan-Erzeugnisse, Theresienfeld, Austria

Filed Feb. 12, 1971, Ser. No. 114,838

Int. Cl. B32b *35/00;* **E01b** *31/24. 31/26*

U.S. Cl. 264—36 **9 Claims**



Railway ties are restored while remaining in the railway bed and without removing the rails nor the bed plates which support the rails. After removing the spikes, the holes in the ties are bored-out by a drill passing smoothly through the spike holes in the bed plates. Metallic inserts, either a rod bent into a double U-shape or shaped into a helix are then placed in the bored-out holes and a filling of a hardening synthetic resin plastic is poured into the holes. The bed plates are raised somewhat from the ties and supported each by at least two spacing strips to form a narrow gap between the lower face of the bed plates and the top faces of the ties and then spikes are driven into the resin-filled holes, whereby the hardening synthetic resin plastic displaced by the spikes fills the gap between the bed plates and the railway ties.

3,716,609
PROCESS FOR PREPARING MOLDED STRUCTURE FROM POLYPHENYLENE SULFIDE RESIN AND FILLER

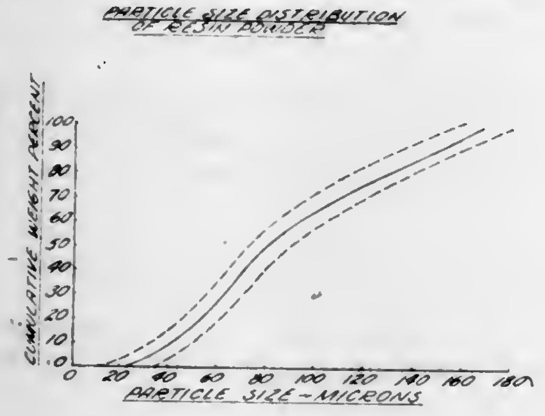
John C. Trocciola, Glastonbury, Warren L. Luoma, Wethersfield, Richard C. Nickols, Jr., South Windsor, and Roger C. Emanuelson, Glastonbury, Conn., assignors to United Aircraft Corporation, East Hartford, Conn.

Filed Oct. 5, 1970, Ser. No. 77,928

Int. Cl. B22f *3/14;* **B29c** *25/00;* **C08g** *25/00*

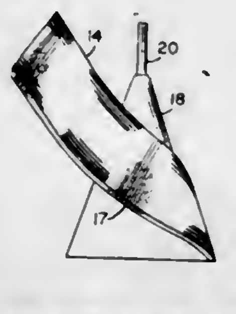
U.S. Cl. 264—111 **5 Claims**

A novel molded structure of polyphenylene sulfide resin and a filler is produced according to a process wherein the resin/filler mixture is precured by heating the mixture to a temperature below the melting temperature of the resin prior to molding; the mold is preheated to a temperature of about 600 to 700° F. and the charge of resin/filler mixture is preheated to a temperature below the melting temperature of the resin; the molding pressure of about 3000 p.s.i. is applied to the mold before the resin has time to encapsulate the filler; after cooling the mold while maintaining the pressure, the molded structure is removed from the mold.



3,716,610
METHOD OF MAKING IMPROVED NOSE CAPS FOR MISSILES AND ROCKETS

Max Goldstein, Columbus, Ohio, assignor to The United States of America as represented by the Secretary of the Army
Filed April 14, 1971, Ser. No. 133,921
Int. Cl. B29d *3/02*; **B32b** *1/10, 31/18*
U.S. Cl. 264—152 **5 Claims**



A method of making missile nose caps for extremely high temperature performance is disclosed. The method utilizes a typical material such as reinforcement fibers of silica or glass fiber tape inpregnated with a phenolic resin to form a panel. The panel which provides the proper orientation of the reinforcement fibers from a shingle angle to a perpendicular angle is shaped to a preform. The preform is placed in a mold and molded to a final shape and dimension required for the nose cap. If a rosette or rod tip is required, the tip is molded integrally with the nose cap.

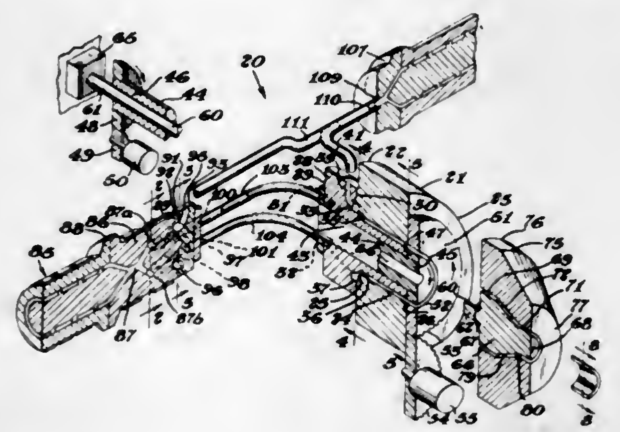
3,716,611
METHOD FOR PRODUCING HIGH TENACITY NYLON-66 FILAMENTS

Richard D. Chapman, Pensacola, Fla., assignor to Monsanto Company, St. Louis, Mo.
Continuation-in-part of Ser. No. 753,877, Aug. 20, 1968, abandoned. This application Nov. 4, 1970, Ser. No. 87,004
Int. Cl. B29c *17/02, 25/00*
U.S. Cl. 264—290 N **1 Claim**

Synthetic filaments having a tenacity of at least 10 grams per denier are produced by storing same for at least 1 day after molecular orientation thereof under high tensile stress and in an area of low relative humidity. The yarn is made preferably from high viscosity nylon-66 polymer. In practice the drawn yarn is wound on a core at 1.0 to 1.8 gpd, stored for 1 to 10 days in air at 15°–40°C and 10–40 percent relative humidity, and then rewound under a tension of 0.12 to 1.0 gpd. Moisture on yarn during storing is 1.1 to 2.3 percent.

3,716,612
METHOD FOR THE FORMATION OF COMPOSITE PLASTIC BODIES

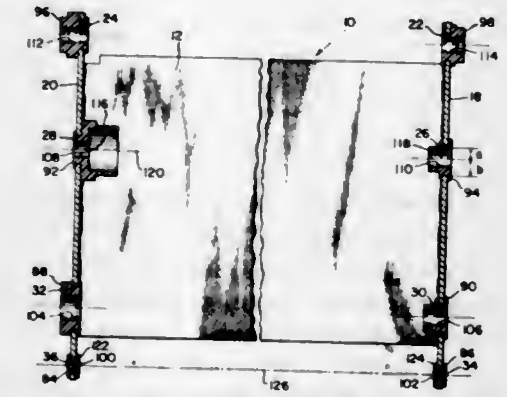
Walter J. Schrenk, Bay City; Kenneth J. Cleereman, Midland; Douglas S. Chisholm, Midland, and Turner Alfrey, Jr., Midland, all of Mich., assignors to The Dow Chemical Company, Midland, Mich.
Continuation-in-part of Ser. No. 636,480, May 5, 1967, abandoned. This application Jan. 6, 1970, Ser. No. 987
Int. Cl. B29f *1/12, 3/10, 3/12*
U.S. Cl. 264—241 **8 Claims**



A method is described for making articles of plastic materials; for example, plastic bottles, from a composite of synthetic thermoplastics. Two or more such resinous materials, which have distinct polymeric and physical characteristics, are combined in a way such that they are present in the article in separate phases possessing an apparent plurality of generally commensurately and spirally extending layers of the said resinous materials and in a manner adapted to take full advantage of the resulting combination of properties.

3,716,613
METHOD OF PROVIDING AXIALLY ALIGNED MOLDED PARTS IN NON-ALIGNED APERTURED WALLS OF A PREFORMED MEMBER

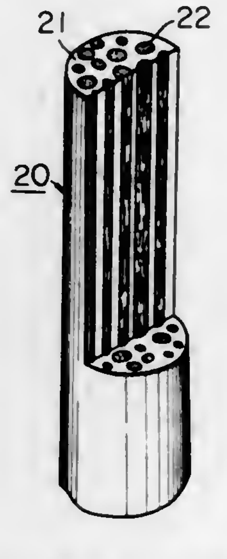
William J. Lux, Holland, Pa., assignor to Honeywell Inc., Minneapolis, Minn.
Filed Oct. 29, 1970, Ser. No. 84,983
Int. Cl. B29f *1/00*
U.S. Cl. 264—254 **6 Claims**



Method of manufacturing is presented which provides axially aligned finished molded parts, such as bushings and/or protuberances in non-aligned apertured wall portions of a preformed member, such as in the non-aligned opposing walls of a U-shaped chart-drive frame.

3,716,614
PROCESS OF MANUFACTURING COLLAGEN FIBER-LIKE SYNTHETIC SUPERFINE FILAMENT BUNDLES

Miyoshi Okamoto, Takatsuki-shi, Osaka; Shunji Mizuguchi, and Koji Watanabe, both of Otsu-shi, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan
Filed May 4, 1970, Ser. No. 34,458
Claims priority, application Japan, May 12, 1969, 44/35780
Int. Cl. B29c *25/00*
U.S. Cl. 264—344 **10 Claims**



Collagen fiber-like synthetic superfine filament bundles are prepared through a process in which an "islands-in-a-sea" type composite filament is formed from a sea constituent polymeric material and an island constituent polymeric composition consisting of at least two polymers different from each other, at least one of which has a content of 7 to 93 percent based on the composition, the sea constituent is removed for obtaining a bundle of island constituent superfine filaments and then at least one polymer in the resultant superfine filaments is removed in order to obtain the collagen fiber-like synthetic superfine filament bundles.

ERRATUM

For Class 423—49 see:
Patent No. 3,715,764

3,716,615
PROCESS FOR THE PRODUCTION OF CUPROUS OXIDE

Donald J. Bauer; Philip R. Haskett, and Roald E. Lindstrom, all of Reno, Nev., assignors to The United States of America as represented by the Secretary of the Interior
Filed Aug. 24, 1971, Ser. No. 174,541
Int. Cl. C01g *3/02*; **C22b** *3/00*
U.S. Cl. 423—35 **11 Claims**

Cu_2O is precipitated from a copper chelate solution by the addition of alkaline material and a reductant. The stability constant of the chelate must be more than 5.

3,716,616
PROCESS FOR DECONTAMINATION OF NEUTRON-IRRADIATED BERYLLIUM

Kuang-Hui Lin, Oak Ridge, Tenn., assignor to The United States of America as represented by the United States Atomic Energy Commission
Filed Feb. 24, 1971, Ser. No. 118,494
Int. Cl. C01f *3/00*
U.S. Cl. 423—134 **2 Claims**

A process for treating neutron-irradiated beryllium containing cobalt-60 is provided which comprises reacting the beryllium with molten stannous chloride under conditions which will produce beryllium chloride and subsequently distilling the beryllium chloride to recover a decontaminated beryllium chloride distillate.

3,716,617
PROCESS FOR PRODUCING ALUMINA

Tsurumi Oku, Niihama, Akio Suzuki, Kobe, and Nobuyoshi Tawara and Kenji Niwa, Niihama, Japan, assignors to Sumitomo Chemical Co., Ltd., Osaka, Japan
Filed Apr. 13, 1970, Ser. No. 27,475
Claims priority, application Japan, Apr. 17, 1969, 44/30,037
Int. Cl. C01f *7/06*
U.S. Cl. 423—121 **11 Claims**

Improved process for producing alumina according to the Bayer process wherein the digestion residue is separated from the sodium aluminate solution, resulting from the digestion of an alumina-containing ore, by using a synthetic organic high molecular weight flocculant and conducting the separation only when at least 5% by weight of reactive silica remains in the digestion residue. With this process, soda concentrations higher than 70 g./l. may be utilized for digestion.

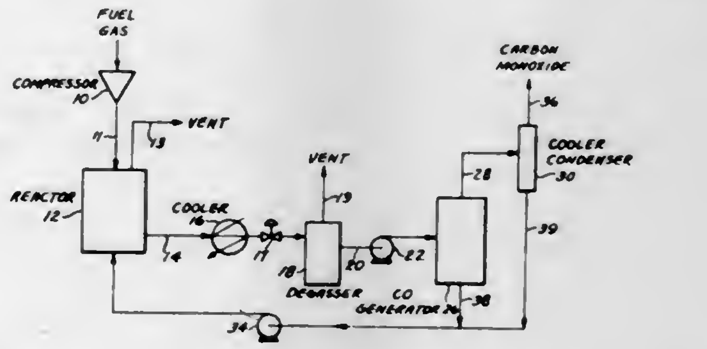
3,716,618
SEPARATION OF COBALT FROM NICKEL AND COBALT BEARING AMMONIACAL SOLUTIONS

Donald Robert Weir, and Russell Peter Kofluk, both of Fort Saskatchewan, Alberta, Canada, assignors to Sherritt Gordon Mines Limited, Toronto, Ontario, Canada
Filed March 24, 1971, Ser. No. 127,677
Int. Cl. C01g *51/00, 53/00*
U.S. Cl. 423—143 **7 Claims**

A process for extracting a nickel product having a predetermined nickel to cobalt ratio and a mixed nickel-cobalt sulphide product having a low nickel to cobalt ratio from reduced nickel and cobalt bearing lateritic and garnieritic ores. The reduced ores are leached in one or more stages under oxidizing conditions in an aqueous ammoniacal ammonium carbonate solution. Solution from the leaching operation is treated in a multi-stage cobalt removal operation in which excess sulphidizing agent is added to one stage to effect extraction of a large quantity of cobalt from solution as a mixed nickel-cobalt sulphide precipitate. The amount of sulphidizing agent added to another stage is restricted to produce a mixed nickel-cobalt sulphide precipitate with a low Ni:Co weight ratio. The mixed sulphide precipitate is removed from each stage solution and a portion is recycled to the solution from which it was removed.

3,716,619
PROCESS FOR RECOVERING CARBON MONOXIDE FROM FUEL GAS

James B. Lynn, Bethlehem, and Alan H. Singleton, Emmaus, both of Pa., assignors to Bethlehem Steel Corporation
Filed March 19, 1971, Ser. No. 125,974
Int. Cl. C01b *31/18*; **C07c** *69/06*
U.S. Cl. 423—247 **6 Claims**



Carbon monoxide is recovered from a fuel gas by compressing a fuel gas containing carbon monoxide and by reacting the carbon monoxide with a lower alkyl alcohol to form alkyl formate. The formate is separated from the fuel gas, and the carbon monoxide is regenerated by decomposition of the formate.

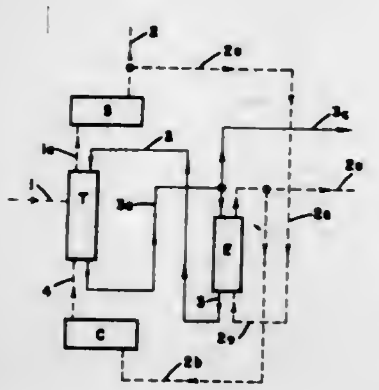
3,716,620
PROCESS FOR REMOVING TRACES OF HYDROGEN SULFIDE AND MERCAPTANS FROM GASES

Andre Deschamps, Chatou; Sigismond Franckowiak, Montesson, and Philippe Renault, Noisy le Roi, all of France, assignors to Institut Francais Du Petrole Des Carburants Et Lubrificants, Rueil Malmaison (Hauts de Seine), France
Filed Oct. 27, 1970, Ser. No. 84,497
Claims priority, application France, Nov. 4, 1969, 6937967
Int. Cl. B01d *53/16*
U.S. Cl. 423—228 **16 Claims**

A process for purifying a gas containing hydrogen sulfide or a mercaptan, wherein said gas is contacted with a solution of iodine in an organic solvent, said organic solvent also containing an amine.

3,716,621
DEUTERIUM-HYDROGEN MONOTHERMAL EXCHANGE

Howard Keith Rae, Deep River, Ontario, Canada, assignor to Atomic Energy of Canada Limited, Ottawa, Ontario, Canada
Filed April 3, 1970, Ser. No. 25,497
Claims priority, application Canada, April 8, 1969, 047,998
Int. Cl. C01c *1/00;* **C07c** *87/06, 87/14*
U.S. Cl. 23—193 **2 Claims**

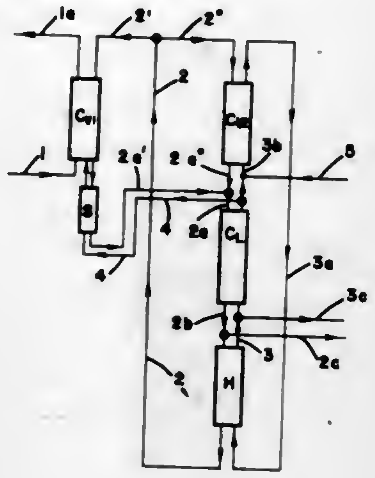


A monothermal exchange process of extracting deuterium from ammonia synthesis gas includes passing the gas through an exchange liquid stream consisting of a liquid amine having up to five carbon atoms per molecule to cause deuterium to be transferred from the synthesis gas to the exchange liquid and removing a stream of exchange liquid enriched in deuterium therefrom.

3,716,622
EXTRACTION OF DEUTERIUM FROM AMMONIA SYNTHESIS GAS

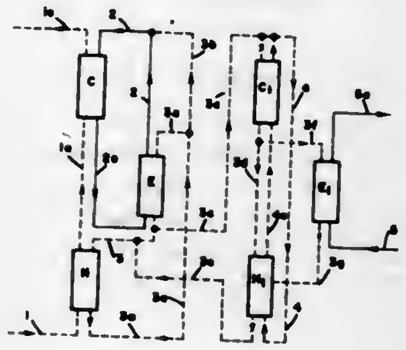
Howard K. Rae, Deep River, Ontario, Canada, assignor to Atomic Energy of Canada Limited, Ottawa, Ontario, Canada
Filed April 3, 1970, Ser. No. 25,316
Claims priority, application Canada, April 8, 1969, 047999
Int. Cl. C01b *4/00, 4/06*
U.S. Cl. 23—210 **6 Claims**

In the extraction of deuterium from a mixture of nitrogen and hydrogen commercially prepared for subsequent synthesis to ammonia, the synthesis gas is passed through a first cold region in deuterium exchanging relationship with an exchange liquid, said exchange liquid being selected from the group consisting of ammonia, an amine, a mixture of ammonia and an amine and a mixture of amines, and a stream of hydrogen gas is circulated through a second cold region and a hot region in deuterium exchanging relationship with the exchange liquid. Thus the synthesis gas is not passed through the second cold region or the hot region, and these regions do not therefore have to be capable of accommodating so large a flow as the first cold region.



3,716,623
EXTRACTION OF DEUTERIUM FROM HYDROGEN GAS USING AMINES IN A BITHERMAL PROCESS

Allan R. Bancroft, Deep River, Ontario, Canada, assignor to Atomic Energy of Canada Limited, Ottawa, Ontario, Canada
Filed Apr. 3, 1970, Ser. No. 25,317
Claims priority, application Canada, Apr. 8, 1969, 47,993/69
Int. Cl. C01c *1/00, 87/127;* **C01b** *1/00*
U.S. Cl. 423—248 **12 Claims**



In the extraction of deuterium from hydrogen in a bithermal process for the production of heavy water, a stream containing a first liquid amine with up to five carbon atoms per molecule is used as the exchange liquid in one of the exchange regions, and stream containing a second liquid amine with up to five carbon atoms per molecule or ammonia is used as the exchange liquid in the other exchange region, and deuterium exchange between the two exchange liquid streams is caused to occur under conditions such that countercurrent contact is possible, for example such that one of the exchange liquid exists substantially as a vapour and a portion of the first or second exchange liquid enriched in deuterium is separated after exchange between the two liquids. The amine may be primary aliphatic monoamine or diamines.

3,716,624
NITRONIUM PERCHLORATE STABILIZED BY BF_3

John A. Brown, Berkeley Heights, N.J., assignor to Esso Research and Engineering Company
No Drawing. Filed Dec. 24, 1964, Ser. No. 421,753
Int. Cl. C01b *11/18*
U.S. Cl. 423—274 **4 Claims**

1. Nitronium perchlorate stabilized by the presence of an effective stabilizing amount of BF_3.

3,716,625
PROCESS FOR THE PRODUCTION OF NITRIC ACID WITH A CONCENTRATION OF OVER 70 PERCENT BY WEIGHT

Gerhard Oberste-Berghaus, 1 Berlin 39, and Claus-Dieter Karau, 1 Berlin 41, both of Germany, assignors to Bamag Verfahrenstechnik GmbH, Butzbach/Hesson and Berlin, Germany
Filed Feb. 26, 1970, Ser. No. 17,997
Claims priority, application Germany, Feb. 28, 1969, P 19 11 200.6; Jan. 16, 1970, P 20 02 791.2
Int. Cl. C01b *21/40*
U.S. Cl. 23—161 **17 Claims**

Process of preparing nitric acid (having a concentration of over 70 percent by weight) by catalytically oxidizing ammonia with air to form NO_2, absorbing the NO_2 in water or aqueous nitric acid, increasing the partial pressure of the NO_2 partly by compression and partly by passage through the absorption stage, washing out the residual NO_2 with 60–70 percent nitric acid and recycling the same into the absorption stage, and blowing out the NO_2 through the nitrous gas products of the ammonia oxidation in a degasification stage arranged ahead of the absorption stage.

3,716,626
SEPARATION OF METAL CARBONYL CATALYSTS FROM OXO REACTION MIXTURES

Wilhelm Kniese, Limburgerhof, Hans Juergen Nienburg, Ludwigshafen, Walter Himmele, Walldorf, and Werner Aquila, Ludwigshafen, Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany
No Drawing. Filed Oct. 15, 1970, Ser. No. 81,169
Claims priority, application Germany, Oct. 29, 1969, P 19 54 315.8
Int. Cl. C01g *51/02, 55/00;* **B01d** *15/04*
U.S. Cl. 423—418 **6 Claims**

An improved process for the separation of metal carbonyl catalysts capable of forming carbonylate anions from oxo reaction mixtures by means of ion exchangers by treating the crude oxo reaction mixture with a basic ion exchanger at a temperature of 0° to 120° C. and pressures ranging from 5 to 700 atmospheres.

3,716,627
PROCESS FOR THE PREPARATION OF VANADIUM CARBIDE

Servaas Middelhoek, Arnhem, Netherlands, assignor to N.V. Hollandse Metallurgische Industrie Billiton, Arnhem, Netherlands
No Drawing. Filed Sept. 9, 1970, Ser. No. 70,886
Claims priority, application Netherlands, Sept. 9, 1969, 6913684
Int. Cl. C01b *31/30;* **C22c** *29/00*
U.S. Cl. 423—440 **13 Claims**

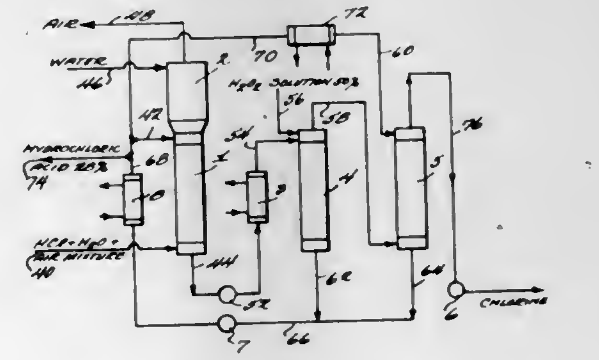
A process for the preparation of vanadium carbide from an oxidic, vanadium-containing material which comprises contacting the material at high temperature with a gas containing at least 60 volume percent thereof of at least one low molecular weight hydrocarbon in an amount not exceeding twice the stoichiometric amount. The CO and hydrogen produced as by-products can be used to furnish the heat energy required.

ERRATUM

For Class 423—447 see:
Patents Nos. 3,716,331 and 3,716,332

3,716,628
PROCESS FOR THE PRODUCTION OF CHLORINE

Hans Klebe, Alfred Meffert, and Ludwig Lange, Rheinfelden, Baden, Gerhard Fratzer, Ludwigshafen (Rhine), and Franz-Ludwig Dahm, Beuggen, Germany, assignors to Deutsche, Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt am Main, Germany
Filed Nov. 24, 1970, Ser. No. 92,370
Claims priority, application Germany, Dec. 20, 1969, P 19 63 946.4
Int. Cl. C01b *7/04*
U.S. Cl. 423—507 **21 Claims**



Chlorine is produced from hydrogen chloride containing gas by converting the hydrogen chloride to a 20 to 40 weight percent aqueous solution and reacting the solution with hydrogen peroxide to form chlorine.

3,716,629
PROCESS FOR PREPARING POTASSIUM PEROXYDISULFATE

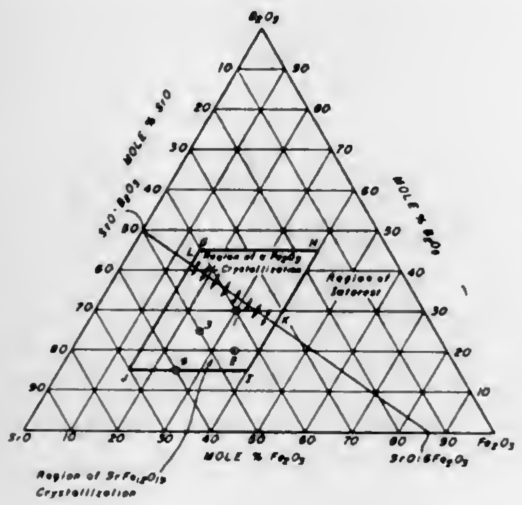
Russell Alan Miller, Cheektowaga, N.Y., assignor to FMC Corporation, New York, N.Y.
Filed Sept. 10, 1970, Ser. No. 71,271
Int. Cl. C01b *15/08*
U.S. Cl. 423—513 **4 Claims**

An improvement in a method for preparing potassium peroxydisulfate which comprises adding sodium hydroxide to the potassium peroxydisulfate-potassium sulfate-water mother liquor resulting from the reaction of ammonium peroxydisulfate and potassium sulfate, said addition increasing the sulfate solubility in the mother liquor and substantially reducing the sulfate contamination of the peroxydisulfate product.

3,716,630
HARD MAGNETIC FERRITES

Brian Thomas Shirk, St. Marys, Pa., assignor to Stackpole Carbon Company, St. Marys, Pa.
Continuation-in-part of application Ser. No. 829,579, June 2, 1969, which is a continuation-in-part of application Ser. No. 812,158, Apr. 1, 1969. This application July 2, 1970, Ser. No. 51,880
The portion of the term of the patent subsequent to Dec. 28, 1988, has been disclaimed
Int. Cl. C01f *11/00;* **C01g** *49/00*
U.S. Cl. 423—594 **1 Claim**

Hard magnetic ferrites of the formula $MO.6Fe_2O_3$ where M is barium, strontium or lead, are made by providing a molten borate composition containing the metal oxide and ferric oxide in amounts corresponding to the desired ferrite, cooling the melt below the liquidus either so rapidly as to convert the melt to a glass which upon appropriate heat treatment undergoes nucleation and crystallization of the ferrite, or at a rate such that devitrification and ferrite crystallization occurs during cooling. Both procedures result in a borate-rich matrix containing the crystallized ferrite which can be easily recovered separately from other matrix substances by, for example, magnetic separation or dissolution of the borate matrix material in a weak acid.



3,716,631
USE OF RADIOACTIVE COMPOUNDS TO DETERMINE FAT ABSORPTION

Jan Frederik Steggerda, Emmasingel, Eindhoven, and Ary Cornelis Houtman, Van Houtenlaan, Weesp, both of Netherlands, assignors to U.S. Philips Corporation, New Corporation, N.Y.

Filed Feb. 24, 1969, Ser. No. 801,771

Claims priority, application Netherlands, Feb. 23, 1968, 6802651

Int. Cl. A61k *27/04*

U.S. Cl. 424—1 **5 Claims**

Use of radioactive labeled phenylsubstituted fatty acids to determine disturbances in fat metabolism in animals, the degree of disturbance being determined by measurement of a radioactive degradation product excreted in the urine.

3,716,632
TEST COMPOSITION AND METHOD FOR THE IN VITRO DETERMINATION OF THYROID FUNCTION

Marshall Lloyd Fader, and James Edward Christner, both of Elkhart, Ind., assignors to Miles Laboratories, Inc., Elkhart, Ill.

Filed April 27, 1970, Ser. No. 32,396

Int. Cl. A61k *27/04*

U.S. Cl. 424—1 **16 Claims**

The thyroid hormone content of blood serum can be readily determined by using an in vitro radioactive thyroid function test system containing a "protein error" pH indicator such as bromcresol purple. Such a "protein error" indicator provides color and detects the presence of the test sample, inhibits the formation of free iodide and decreases the adsorption of radioactive tagged thyroid substance to the walls of the container enclosing same.

3,716,633
VINYL ACETATE-CROTONIC ACID-UNSATURATED ESTER OR ETHER POLYMERS IN HAIR LACQUERS AND SETTING LOTIONS

Andre Viout and Regine Pasero, Paris, France, assignor to Societe Anonyme dite: l'Oreal, Paris, France

No Drawing. Continuation-in-part of applications Ser. No. 530,395, Feb. 8, 1964, and Ser. No. 655,770, July 25, 1967. This application July 25, 1968, Ser. No. 747,470

Claims priority, application France, Mar. 3, 1965, 7,787; Jan. 27, 1966, 47,441; Aug. 3, 1966, 71,998; Luxembourg, July 28, 1967, 54202

The portion of the term of the patent subsequent to May 18, 1988, has been disclaimed

Int. Cl. A61k *7/00*

U.S. Cl. 424—47 **3 Claims**

Copolymers of (a) vinyl acetate, (b) crotonic acid and (c) unsaturated esters or ethers in cosmetic hair treating compositions.

3,716,634
INSECT VIRUS COMPOSITIONS AND PROCESS

Frank E. Wells, Kansas City, Mo., assignor to McLaughlin Gormley King Company, Minneapolis, Minn.

Filed Oct. 19, 1970, Ser. No. 82,083

Int. Cl. C12r *7/00*

U.S. Cl. 424—93 **7 Claims**

Insect polyhedrosis and granulosis virus particles are liberated from their inclusion bodies and then complexed and precipitated from an aqueous dispersion with a basic protein having an isoelectric point above about pH 8.0 to provide a virus concentrate. The resulting precipitate may be dispersed in an oil to provide a stabilized viral insecticide.

3,716,635
ANTIFUNGAL ANTIBIOTIC OBTAINED FROM BASIDIOMYCETE OUDEMANSIELLA MUCIDA AND PROCESS OF MAKING THE SAME

Vladimir Musilek, Prague, Czechoslovakia, assignor to Ceskoslovenska Akademie Ved, Prague, Czechoslovakia

Continuation-in-part of applications Ser. No. 600,046, Dec. 8, 1966, and Ser. No. 698,353, Jan. 16, 1968. This application Aug. 4, 1970, Ser. No. 60,903

Claims priority, application Czechoslovakia, Dec. 17, 1965, 7,592/65

Int. Cl. A61k *21/00;* **C12b** *1/00;* **C12d** *9/00*

U.S. Cl. 424—122 **11 Claims**

Antifungal antibiotic obtained by fermentation of a culture of basidiomycete *Oudemansiella mucida* (Schrad. ex. Fr.) Höhn. The antibiotic has the empirical formula $C_{16}H_{18}O_3$, the molecular weight of 258 and a melting point between 51 and 53° C.

3,716,636
ACETIC ACID ANHYDRIDE AS A STABILIZER FOR N-METHYL-N-FORMYL AMIDE OF O,O-DIMETHYL DITHIOPHOSPHORYL ACETIC ACID

Hans Helfenberger, Reinach, Basel-Land, Switzerland, assignor to Sandoz Ltd. (also known as Sandoz AG), Basel, Switzerland

No Drawing. Continuation-in-part of application Ser. No. 767,496, Oct. 14, 1968, which is a continuation-in-part of application Ser. No. 678,450, Oct. 26, 1967, which in turn is a continuation of application Ser. No. 416,596, Dec. 7, 1964, all now abandoned. This application June 25, 1970, Ser. No. 49,942

Claims priority, application Switzerland, Dec. 13, 1963, 15,299/63

Int. Cl. A01n *9/36*

U.S. Cl. 424—211 **12 Claims**

The invention provides liquid anhydrous pesticidal concentrates containing the N-methyl-N-formyl amide of O,O-dimethyldithophosphoryl acetic acid stabilised with an acid anhydride e.g. acetic anhydride.

3,716,637
PHARMACEUTICAL PREPARATIONS

Georg Anner and Jaroslav Kalvoda, Basel, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

No Drawing. Filed Sept. 30, 1970, Ser. No. 77,002

Int. Cl. A61k *17/00*

U.S. Cl. 424—243 **7 Claims**

A pharmaceutical preparation containing as active substance 3,20-dioxo-6α-methyl-17α-acetoxy-19-nor-Δ^4-pregnene.

3,716,638
6α-METHYL-19-NOR-PROGESTERONE AND A PROCESS OF ITS MANUFACTURE

Georg Anner and Jaroslav Kalvoda, Basel, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

No Drawing. Filed Oct. 6, 1970, Ser. No. 78,581

Claims priority, application Switzerland, Oct. 10, 1969, 15,272/69

Int. Cl. A61k *17/00*

U.S. Cl. 424—243 **1 Claim**

The present invention provides the new 3,20-dioxo-6α-methyl-17α-caproyloxy-19-nor-Δ^4-pregnene.

It may be used as gestagen and for fertility control.

3,716,639
ANOREXIGENIC TETRAHYDROBENZAZEPINES

Karl Hoegerle, Basel, and Ernst Habicht, Oberwil, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 751,381, Aug. 9, 1968, abandoned, which is a continuation-in-part of Ser. No. 705,627, Feb. 15, 1968, abandoned. This application March 11, 1970, Ser. No. 23,523

Int. Cl. A61u *27/00*

U.S. Cl. 424—244 **6 Claims**

7-chloro-2,3,4,5-tetrahydro-1H-3-benzazepines and pharmaceutically acceptable acid addition salts thereof are prepared; therapeutical compositions containing said compounds and methods for producing an anorexigenic effect in a mammal are provided.

3,716,640
10-OXO-10,11-DIHYDRO-5H-DIBENZ[B,F]AZEPINE-5-CARBOXAMIDE IN THE TREATING OF EPILEPSY

Walter Schindler, Riehen, Basel, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 16,552, March 4, 1970, Pat. No. 3,642,775. This application Sept. 20, 1971, Ser. No. 182,213

Claims priority, application Switzerland, March 10, 1969, 3583/69

Int. Cl. A61k *27/00*

U.S. Cl. 424—244 **2 Claims**

10-Oxo-10, 11-dihydro-5H-dibenz[b,f]azepine-5-carboxamide has a depressant effect on the central nervous system; the compound is the active ingredient of pharmaceutical compositions and is useful for the treatment of psychosomatic disturbances, of epilepsy and of trigeminal neuralgia.

3,716,641
COCCIDIOSTAT COMPOSITIONS AND METHODS USING AMINOBENZONITRILES

Philip P. Actor, Phoenixville; Roger C. Parish, King of Prussia, and Vassilios J. Theodorides, West Chester, all of Pa., assignors to Smith Kline & French Laboratories, Philadelphia, Pa.

Filed July 30, 1970, Ser. No. 59,733

Int. Cl. A61k *27/00*

U.S. Cl. 424—251 **24 Claims**

p-Aminobenzonitriles are active ingredients for compositions and methods useful for the treatment or prevention of various protozoal infections in animals, especially coccidiosis in poultry. Combinations of p-aminobenzonitriles with other aminopyrimidine anti-protozoal agents such as pyrimethamine give a potentiated activity against *Eimeria tenella*. A particularly active chemical ingredient is p-dimethylaminobenzonitrile and its acid addition salts.

3,716,642
ANTI-INFLAMMATORY, ANTALGIC AND ANTI-PYRETIC MEDICAMENT, ON A PYRIDOXINE FLUFENAMATE BASIS

Raymond Francois Jacques Sarbach; Demetre Yavordios, both of Chatillon-sur-Chaloronne; Le Hao Dong, Montpellier; Jacques Mizoule, Chatillon-sur-Chaloronne, and Charles Ricci, Lyon, all of France, assignors to Institut De Recherche Scientifigue (I.R.S.), Chatillon-sur-Chalorrone, France

Continuation of Ser. No. 58,147, July 24, 1970, Pat. No. 3,627,774. This application Dec. 7, 1971, Ser. No. 205,758

Claims priority, application France, July 24, 1969, 6925288

Int. Cl. A61u *27/00*

U.S. Cl. 424—263 **9 Claims**

An anti-inflammatory, antalgic and anti-pyretic medicament contains pyridoxine flufenamte and an excipient to which may be added several compatible constituents such as vitamin B_1.

3,716,643
ANTIMICROBIALLY ACTIVE SUBSTANCES AND THEIR PRODUCTION

Toshihiko Kawano, No. 10-9, Shinomiya Kawahara-cho, Yamashina, Higashiyama-ku, Kyoto; Takashi Yamaoka, No. 12, Hishishibukawa-cho, 3-chome, Kusatsu; Keiichi Maruo, No. 2-B6-104, Takanodai 1-chome, Suita-shi, Osaka, and Yasuhisa Furutaka, No. 1-25, Sho 1-chome, Ibaraki-shi, Osaka, all of Japan

Filed May 1, 1970, Ser. No. 33,598

Int. Cl. A01n *9/12*

U.S. Cl. 424—286 **20 Claims**

Process for preparing antimicrobially active substances which comprises reacting alkylenebis(dithiocarbamic acid) in a salt form with a water-soluble divalent copper salt in the presence of a halogen ion under the condition that more than one molar amount of divalent copper ion to one molar amount of alkylenebis(dithiocarbamate) salt is present in the reaction system and, if desired, under the oxidative condition; optionally followed by subjecting the resulting product to oxidation. The obtained substances are advantageous in showing a stronger antimicrobial activity against a wide variety of phytopathogenic fungi and bacteria than known cupric alkylenebis(dithiocarbamate) does.

3,716,644
HYPOLIPIDEMIC AGENTS

Henry John Albers and Stephen Joseph Riggi, Suffern, N.Y., Frederick Louis Bach, Montvale, N.J., and Elliott Cohen, Pearl River, N.Y., assignors to American Cyanamid Company, Stamford, Conn.

No Drawing. Filed July 15, 1971, Ser. No. 163,083

Int. Cl. A61k *27/00*

U.S. Cl. 424—308 **5 Claims**

A method for the lowering of serum lipids in mammals by the administration of meta and para alkoxybenzoic acids, esters and pharmaceutically acceptable salts of said benzoic acids and dimethylaminoethyl esters, wherein the alkoxy group comprises from 12 to 20 carbon atoms; and pharmaceutical compositions thereof.

3,716,645
STABILIZED TRANS-DIETHYL-STILBESTEROL COMPOSITIONS

Werner R. Boehme, Glen Ellyn, and George Vuht, Chicago, both of Ill., assignors to Dawes Laboratories, Inc., Chicago, Ill.

Filed Jan. 19, 1970, Ser. No. 4,081
Int. Cl. A61k *27/00*
U.S. Cl. 424—346 **19 Claims**

A composition of matter containing trans-diethylstilbestrol and from about 0.1 to about 50 percent by weight of a nontoxic acireductone based on the weight of said trans-diethylstilbestrol.

3,716,646
BACTERICIDAL COMPOSITION AND METHODS EMPLOYING METHYLENE-2,2'-BIS(4-CHLOROTHYMOL)

Lucien Nouvel, 91 Avenue des Ternes, Paris, France

No Drawing. Filed Mar. 23, 1966, Ser. No. 536,664

Claims priority, application France, Mar. 24, 1965, 10,468

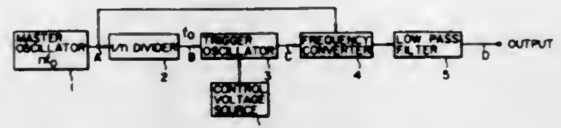
Int. Cl. A61k *27/00*
U.S. Cl. 424—347 **11 Claims**

Methylene-2,2'-bis(4-chlorothymol) is employed as a medicinal against gram positive bacteria.

ELECTRICAL

3,716,647
MUSICAL SOUND GENERATING SYSTEM WITH BURST SIGNALS

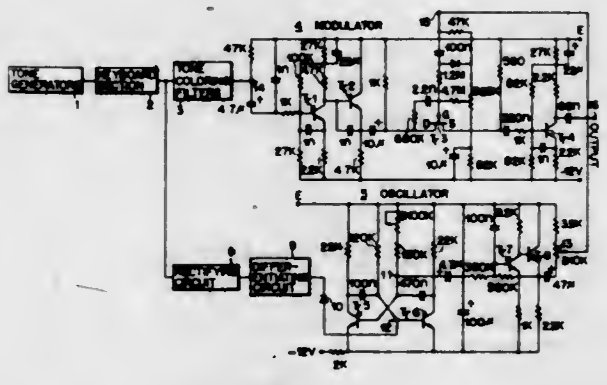
Akio Kameoka, Kawasaki, and Shinichi Nakamura, Yokohama, Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan
Filed Dec. 8, 1971, Ser. No. 205,866
Claims priority, application Japan, Dec. 10, 1970, 45/109,183; Dec. 11, 1970, 45/109,719
Int. Cl. G10h *3/00*
U.S. Cl. 84—1.11 **11 Claims**



A musical sound generating system for an electronic musical instrument which comprises a master oscillator for producing a signal having a frequency which is integral multiples of a fundamental frequency defining the pitch of a musical sound to be synthesized. The master oscillator output frequency is divided by a frequency divider to obtain a signal of the fundamental frequency. The divider output triggers an oscillator to cause oscillation which is continued during a desired length of time within the period of the fundamental frequency. The trigger oscillator operates at a frequency deviated from the master oscillator frequency by a desired formant frequency associated with the musical sound to be synthesized. The outputs of the master and trigger oscillators are coupled to a frequency converter or amplitude modulator to produce a signal of the formant frequency or difference frequency between master and trigger output frequencies. The output of the frequency converter is then coupled to a low pass filter to produce at the output thereof a burst signal having the instantaneous frequency of the formant frequency. The frequency spectrum envelope of the burst signal has a maximum value at the formant frequency.

3,716,648
ELECTRONIC MUSICAL INSTRUMENTS PROVIDED WITH A CIRCUIT FOR GENERATING A TREMOLO EFFECT

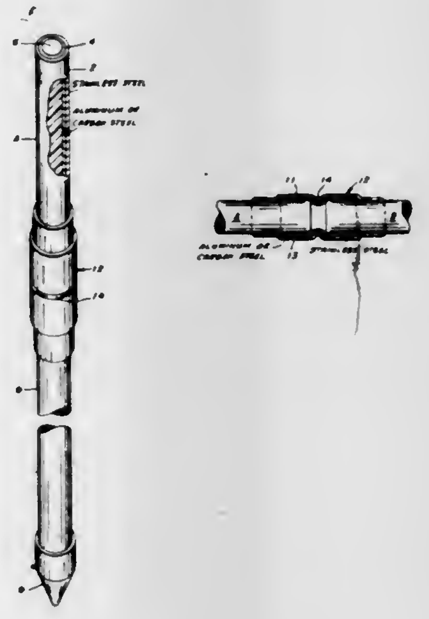
Akihisa Takeyama, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu-shi, Shizuoka-ken, Japan
Filed Oct. 22, 1971, Ser. No. 191,649
Claims priority, application Japan, Oct. 26, 1970, 45/106,303
Int. Cl. G10h *1/04*
U.S. Cl. 84—1.25 **6 Claims**



Part of tone signals selectively drawn out of tone generators by operation of a keyboard section is subjected to rectification and differentiation to obtain a trigger signal when the tone signals rise. The trigger signal is supplied to the base of either of first and second transistors jointly constituting an astable multivibrator to trigger it to draw out modulating signals which rise simultaneously with musical tone signals. The modulating signals modulate the musical tone signals in amplitude to obtain a distinct tremolo effect.

3,716,649
GROUNDING ROD AND COUPLER THEREFOR

George A. Smith, Waterbury; Harrison Stevens, Wallingford; Robert R. Walker, Wallingford, and Gilbert D. Boyd, Wallingford, all of Conn., assignors to Allegheny Ludlum Industries, INc., Pittsburgh, Pa.
Filed March 16, 1971, Ser. No. 124,788
Int. Cl. H01r *3/06*
U.S. Cl. 174—7 **21 Claims**

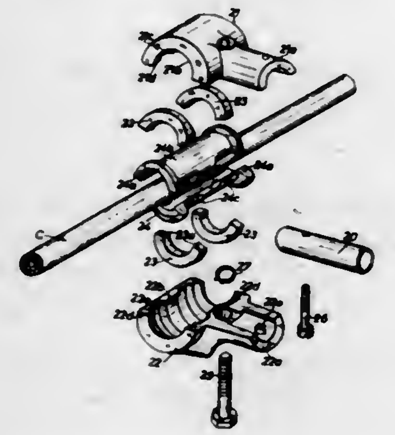


Described herein is an electrical grounding rod comprising a thin-walled tube of a corrosion resistant steel, a conductor tube of aluminum or other suitable electrically conductive material to provide a low resistance path to ground and a core of a plastic-type filler within the inner tube, the core being sufficiently rigid to provide structural support to the thin-walled tube yet resistant enough to allow some bending of the rod to circumvent obstructions encountered in driving the rod into the ground. A driving point is provided to fit over one end of the rod to isolate the aluminum from the earth and to facilitate driving the rod into the ground. In an alternative embodiment an additional steel tube is provided within the conductor tube to form a three-wall or "sandwich" composite.

3,716,650
CLAMP WITH RESILIENT GRIPPING UNIT FOR USE WITH OVERHEAD CONDUCTOR SPACERS AND A SPACER INCLUDING THE SAME

Robert de Mecquenem, Chateau de la Roare, Roche la Moliere, France
Filed May 28, 1971, Ser. No. 147,793
Claims priority, application France, May 29, 1970, 7018891
Int. Cl. H02g *7/12, 7/14*
U.S. Cl. 174—42 **8 Claims**

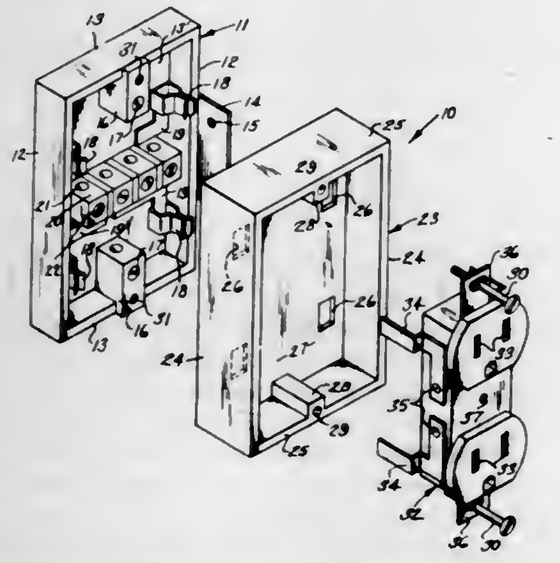
A spacer for overhead conductors is disclosed. The spacer comprises a unit for resiliently gripping directly about the conductor, the unit being constituted essentially by a pair of jaws adapted to be encircled about the conductor and connected one to another by clamping means. Pads of flexible and resilient material are arranged onto half-sheaths made of metal which directly encircles the conductor.



The jaws are provided with recesses having an eccentric bottom surface which differs from the external surface of the pads whereby the pads are engaged in a compression effect when they are inserted therein, and the jaws are brought together by one or more clamping means.

3,716,651
MINIMUM WIRE BOX AND DEVICE ADAPTERS

Ardwin Werner, R.F.D. 3, Batesville, Ind. 47006
Filed July 14, 1971, Ser. No. 162,537
Int. Cl. H02g *3/18*
U.S. Cl. 174—53 **1 Claim**

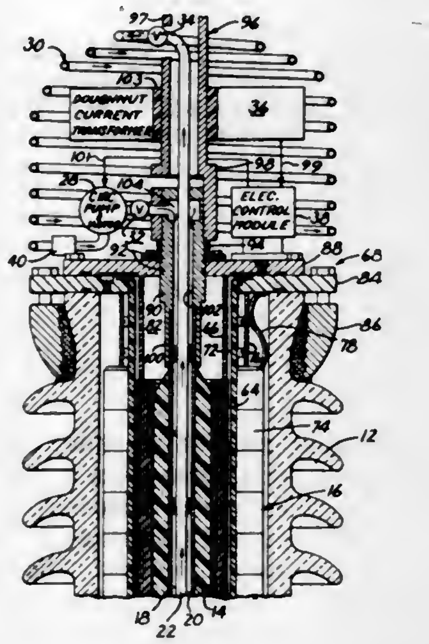


A plug receiving and switch adaptable device. This device is primarily for the purpose of eliminating the excess wire normally required to make electrical connections to switches, receptacles and the like, and includes a rectangular base with spring clip means received within openings of the outer box shell which receives the plug receptacle or other unit.

3,716,652
SYSTEM FOR DYNAMICALLY COOLING A HIGH VOLTAGE CABLE TERMINATION

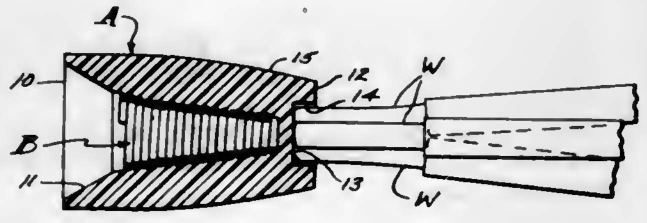
George E. Lusk, Downers Grove, and James H. Nicholas, Flossmoor, both of Ill., assignors to G & W Electric Specialty Company, Blue Island, Ill.
Filed April 18, 1972, Ser. No. 245,211
Int. Cl. H01b *7/28*
U.S. Cl. 174—15 R **19 Claims**

A dynamically cooled high voltage cable termination with a pothead, and a hollow core conductor cable, employs a circulating insulating liquid dielectric through a closed loop system having flow passages within the cable conductor core and a heat exchanger external to the pothead structure. The heat exchanger and other associated components may be disposed at the normally high voltage end of the pothead. The current carrying capacity of the cable within the pothead is thereby effectively increased, together with the energy transferring capabilities of the cable system with which it is associated, without degradation of the dielectric characteristics of the cable termination.



3,716,653
WIRE SPLICE GAUGE AND CONNECTOR

Charles T. Willmarth, 1245 S. Beverly Glen Blvd., Los Angeles, Calif.
Filed Dec. 13, 1971, Ser. No. 207,194
Int. Cl. H01r *5/00*
U.S. Cl. 174—87 **6 Claims**

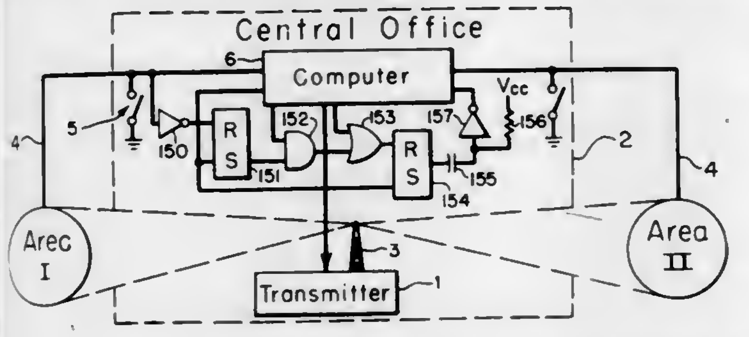


A wire splicing connector that longitudinally aligns the terminal ends of a plurality of conductors in a common plane and that confines the said conductors within a maximum diameter adapted to be spliced thereby, and comprised of a hollow cap-shaped body within which a tapered helix of conductive wire twists onto and constrictively engages a bundle of conductors established by the hollow body and its cap wall which closes the same so as to establish both a gauge and a closed connector.

3,716,654
REAL TIME REMOTE USE METERING FOR BROADCAST RECEIVERS

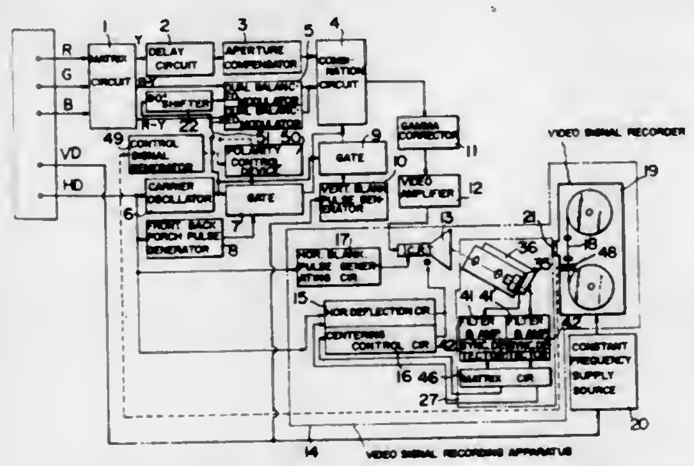
Melvin C. Hendrickson, 605 Gladys, Elmhurst, Ill.; Richard G. Merrell, 7S713 Sierra Drive, Westmont, Ill., and Wilbert Parisoe, 1905 Garland Avenue, Highland Park, Ill.
Filed June 30, 1971, Ser. No. 158,413
Int. Cl. H04n *1/44;* **H04b** *1/00*
U.S. Cl. 178—5.1 **24 Claims**

A system is disclosed for providing real time remote use metering of the receivers in an over-the-air pay TV system of the type in which a characteristic of the composite video signal is varied between different conditions from time to time in accordance with a predetermined code schedule and in which a composite code signal having a plurality of components whose permutation varies in relation to the code schedule is broadcast from a transmitter associated with a central office to all receivers in the system concurrently with the coded composite video signal, and in which there are a multiplicity of code-signal component permutations for each composite video signal condition. Associated with each receiver in the system is a decoder responding to the composite code signal to decode the coded composite video signal, and each of the decoders has a permutation device responsive to a different permutation of the code signal components to develop a predetermined response signal. A common return link links all of the receivers in the system to the central office. The transmitter sends different ones of the multiplicity of code signal component permutations upon different recurrences of a given composite video signal code condition so that response signals are sequentially developed by those of the decoder permutation devices which are in current use. The response signals are then returned to the central office by the common return link. The response signals are returned in time sequence correlated with that of the different code signal component permutations sent by the transmitter. The system also includes provision for remotely disabling any selected decoder from the central station.



3,716,655
RECORDING AND REPRODUCING SYSTEM OF A COLOR TELEVISION SIGNAL BY USING MONOCHROMIC RECORDING FILM

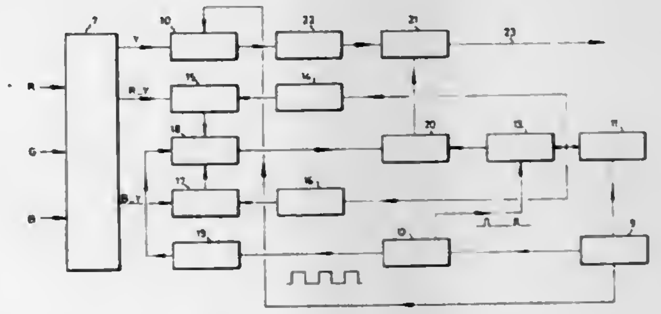
Soichi Iwamura, Fuchu City, Tokyo; Hotaka Minaguchi, Koza-gun, Kanagawa Pref., and Keisuke Murasaki, Shinjuku-ku, Tokyo, all of Japan, assignors to Nippon Hoso Kyokai, Tokyo, Japan
Filed May 21, 1970, Ser. No. 39,313
Claims priority, application Japan, May 22, 1969, 44/39446
Int. Cl. H04n *5/86, 9/34*
U.S. Cl. 178—5.4 CD **12 Claims**



A recording and reproducing system of a color television signal by using monochromic photographic film, wherein one field of the color television signal is recorded sequentially in the plane of a frame of the photographic film by two-dimensional scanning, and the burst signal is recorded as a stripe like pattern on the film in the position out of the recorded frame. During the reproduction, said frame portion and the stripe pattern portion are scanned by a same scanning light and the light outputs are converted into electric signals by applying photoelectric conversion. By this means, a color television signal having correct hue may be obtained, since the reproduced color video signal and the burst signal have no relative phase deviation owing to a fact that their phases variate simultaneously. The scanning light for the recording and reproducing may be obtained from a cathode ray tube device, wherein burst photo spots are inserted at the end portions of the scanning line on the display surface of the cathode ray tube and by detecting direction and amount of deviation of the scanning line and applying feed back to the scanning deflection, it is possible to maintain the position of the scanning line and the luminance of the scanning spot toe constant.

3,716,656
COLOR TELEVISION SYSTEM FOR ELIMINATION OF PHASE ERRORS

Francois Lambert, Paris, and Andrzej Bartosiak, 92 Meudon, both of France, assignors to Centre Electronique De France, Paris, France
Filed Feb. 3, 1971, Ser. No. 112,226
Int. Cl. H04n *9/02, 9/32, 9/42*
U.S. Cl. 178—5.2 R **19 Claims**

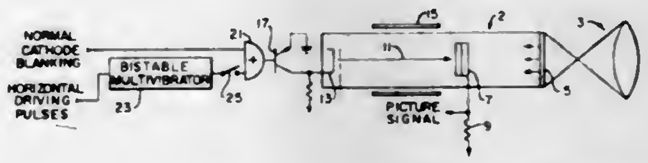


A color television system in which two color difference signals are transmitted separately by modulating a sub-carrier with one signal during odd-numbered lines and the other during even-numbered lines, to avoid the adverse effects of phase errors.

A color burst is used as a marker for one of said signals, and is only transmitted during the relevant line periods. Code translators for producing such a signal from an NTSC signal are described, and also adaptors which enable NTSC receivers to function correctly with either an NTSC input or an input coded in accordance with the invention.

3,716,657
APPARATUS FOR INCREASING SIGNAL TO NOISE RATIO IN TELEVISION LOW LIGHT LEVEL SCENES

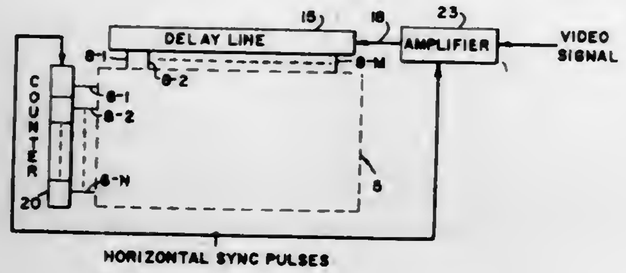
Le Roy L. Niemyer, Jr., Baltimore, Md., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.
Filed April 9, 1969, Ser. No. 814,720
Int. Cl. H04n *5/38*
U.S. Cl. 178—7.2 **9 Claims**



A circuit arrangement for increasing the signal-to-noise ratio of the picture output signal of a television camera tube by alternately blanking the scanning of the image applied to the tube during at least one line scanning period and scanning, during a following line scanning period, a band which covers an adjacent image portion associated with the at least one blanked scanning line.

3,716,658
LIQUID-CRYSTAL TELEVISION DISPLAY SYSTEM

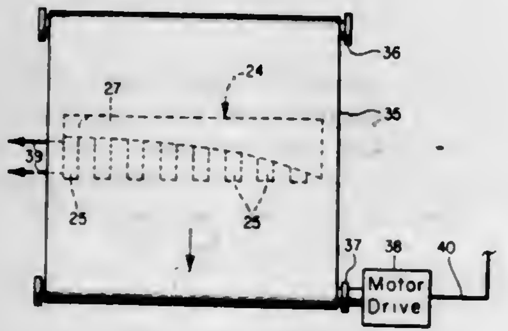
Michael I. Rackman, 1710 Glenwood Rd., Brooklyn, N.Y.
Continuation-in-part of Ser. No. 645,743, June 13, 1967, Pat. No. 3,513,258. This application April 9, 1970, Ser. No. 27,097
Int. Cl. H04n *5/66*
U.S. Cl. 178—7.3 D **12 Claims**



A television system having a horizontal and vertical arrays of parallel conductors with a liquid crystal film interposed between them. The vertical conductors are connected at spaced intervals to a delay line having a delay sufficient for the delay line to represent an entire line of the picture signal. Successive lines of the video signal are fed into the right end of the delay line. The signal travels down the delay line to the left end. Just at the instant when a complete line of the picture signal is within the delay line between the leftmost and the rightmost vertical conductors, one of the horizontal conductors is momentarily energized. This causes a complete line of the picture signal to be displayed. The horizontal conductors are sequentially energized to form the complete display. Each line of the display is formed as a unit at the end of the reception of a complete line of the video singal.

3,716,659
FREQUENCY DOMAIN IMAGE PROCESSING APPARATUS

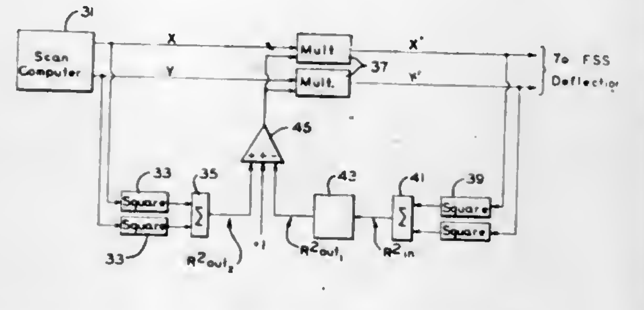
Adrianus Korpel, Prospect Heights, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.
Filed April 9, 1971, Ser. No. 132,847
Int. Cl. H04n *1/22, 3/02, 5/44*
U.S. Cl. 178—7.3 D **17 Claims**



Images are recorded or reproduced by use of a bank of frequency-responsive mechanical resonators which may be arranged in a single row or in a plurality of rows. Within a row, the resonators are individually disposed at what correspond to different image element positions. As a result of response of the resonators, either in reflecting light or in making or responding to a record, the action of the resonators is correlated with a recording or reproducing medium so that either an image is produced or an electrical signal is developed that defines an image. Display may be either of the television or facsimile type. Whatever the particular mechanism of reproduction or recording, use is made of frequency-responsive mechanical resonators to define different image element positions in a frequency-domain image processing system.

3,716,660
APPARATUS TO IMPROVE RESOLUTION IN A SCANNED TRANSPARANCY SYSTEM

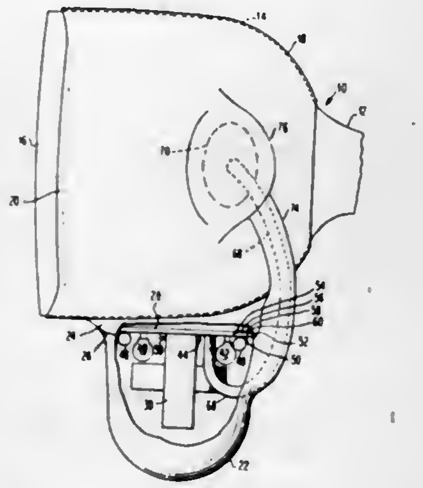
David Friedman, Framingham, Mass., assignor to Singer-General Precision, Inc., Binghamton, N.Y.
Filed June 1, 1971, Ser. No. 148,838
Int. Cl. H04n *3/16*
U.S. Cl. 178—7.7 **3 Claims**



Apparatus to improve resolution and decrease distortion in system wherein a video signal is obtained by scanning a transparancy in a manner which requires increased scan speeds as the scanning spot moves away from the center is shown. A radial distortion lens having high axial demagnification decreasing toward the edges is placed between the scanner and transparancy and means are provided to correct the scan so that the combined output of the scanner and lens is the same as the scanner alone, the combined system resulting in a smaller spot size on axis and a decrease in required scanning speed toward the edges.

3,716,661
CATHODE RAY TUBE MODULE

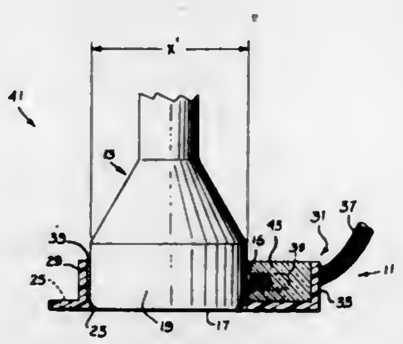
James C. Greeson, Jr., Woodstock, N.Y., assignor to International Business Machine Corporation, Armonk, N.Y.
Filed Dec. 28, 1970, Ser. No. 101,673
Int. Cl. H01j *29/06, 29/96*
U.S. Cl. 178—7.8 **7 Claims**



A sealed assembly including a cathode ray tube and high voltage power supply source and terminal elements. The high voltage portions of the power supply and the anode cable and terminal are all enclosed by an implosion safety shroud over the funnel of the tube. The unitary assembly can be replaced as a whole without exposing service personnel to the possibility of high voltage shock.

3,716,662
SUPPORT AND HIGH VOLTAGE PROTECTIVE MEANS FOR A CATHODE RAY TUBE

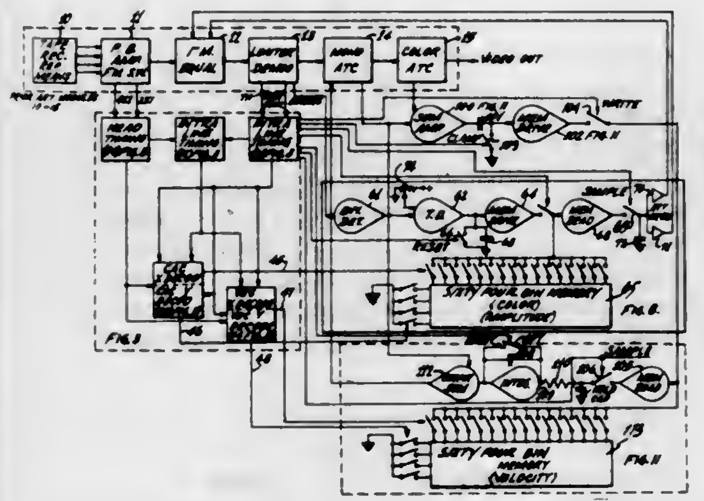
Alfred D. Johnson, Seneca Falls, N.Y., assignor to GTE Sylvania Incorporated
Filed April 21, 1971, Ser. No. 135,992
Int. Cl. H04n *5/645*
U.S. Cl. 178—7.8 **2 Claims**



Supportive and protective means for mounting a cathode ray tube is formed of insulative material in a manner to have a planar mounting portion with an integral collar-like portion protruding therefrom. The mounting portion has an opening therethrough to accommodate the face portion of the tube. The collarlike portion is peripheral to the opening thereby providing encompassment of the face and forward portions of the tube. One area of the collar has a pocket formed therein to provide protection for the anode connection.

3,716,663
COLOR TELEVISION RECORDER-REPRODUCER SYSTEM

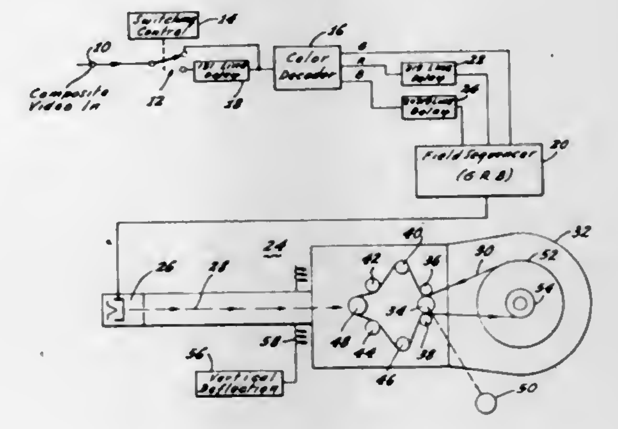
Thomas V. Bolger, Pennsauken, N.J., assignor to RCA Corporation
Continuation of Ser. No. 659,218, Aug. 8, 1967, abandoned. This application Oct. 26, 1970, Ser. No. 84,173
Claims priority, application Great Britain, May 22, 1967, 23,631/67
Int. Cl. H04n *9/48*
U.S. Cl. 178—5.4 AC **8 Claims**


F.M. EQUAL
MONO ATC
COLOR ATC
VIDEO OUT
SAMPLE
SIXTY FOUR BIN MEMORY (COLOR) (AMPLITUDE)
FIG. 8
FIG. 9
SIXTY FOUR BIN MEMORY (VELOCITY)
FIG. 11

There is disclosed an automatic color amplitude and velocity error corrector for a color television recorder/reproducer system. Velocity errors which cause distortion in reproduced color video signals are corrected by combining two prior art error signals and converting the combined signal into a waveform which is more representative of the actual timing error introduced in the television signal by the record/playback process. The combined error signal is generated on a successive line-by-line basis and stored in a memory which is read at an interval during each television line to control a delay line in the recorder/reproducer color television signal playback path to afford compensation thereto. Color amplitude errors which produce saturation of the picture are compensated by comparing the level of the envelope of color bursts associated with a television line with a preset threshold signal. The resulting comparison signal is stored in a memory for each line and the memory is then accessed during the line in question to control equalization of the playback video signal by varying an attenuator located in the F.M. equalizer portion of the signal processing path. In this manner both color amplitude and velocity or phase errors in color television tape recorder/playback units are substantially reduced on a line-by-line basis.

3,716,664
SEPARATION COLOR RECORDER SYSTEM WITH RECORDING ON MOTION PICTURE FILM USING LESS THAN A FULL FIELD OF INFORMATION TO RECORD EACH FRAME OF FILM

Richard F. Dubbe, Camarillo, Calif., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed Nov. 12, 1970, Ser. No. 88,641
Int. Cl. H04n *5/48*
U.S. Cl. 178—5.4 CD **29 Claims**



A system to provide for the production of standard motion picture color film from a color video signal or color information composed of color components. The color video signal is decoded into its separate green, red, and blue components which components form a repeating color group. Each repeating color group includes individual colors from a single color field through the use of delay. The delay of the individual colors may be in time and with a recording of the repeating color group by the use of a single gun continuous film motion electron beam recorder on a black and white separation master. The delay of the individual colors may be in space and with the recording on the black and white separation master accomplished through the use of a three gun continuous film motion electron beam recorder. The color video signal occurs at 60 fields per second (50 fields per second in particular locals) but the black and white separation master is recorded at 72 frames per second (75 fields per second in the particular locals) so as to provide for a conversion from the 60 or 50 field per second video signal to a 24 frame per second color film. The color film is made from the separation master by exposing each frame of the color film using appropriate color filters in sequence to three frames on the black and white separation master representing the green, red, and blue separation images.

3,716,665
COLOR TELEVISION RECEIVER

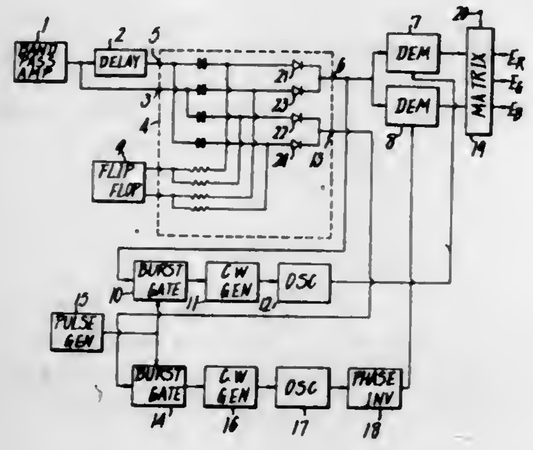
Minoru Morio, Tokyo, and Koichiro Mima, Kanagawa-ken, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed June 15, 1971, Ser. No. 153,363

Claims priority, application Japan, Nov. 17, 1970, 45/101285

Int. Cl. H04n *9/02*

U.S. Cl. 178—5.4 P **12 Claims**



In a decoding system to receive PAL television signals, two synchronous demodulators are used, each connected to its own reference signal source. Both demodulators are connected to one pole of a switching circuit equivalent to a double-pole-double-throw switch and one oscillator control circuit is connected to the same pole to be controlled by corresponding burst signals. The other oscillator control circuit is connected to the other pole of the switching circuit to receive alternative burst signals. The oscillations supplied to the demodulators may both have the same phase as the burst signals or, by vector addition, one may be modified to correspond to a chrominance component modulation axis. As a further alternative, both oscillations may be selectively combined to be fed to the demodulators in the proper axes for color difference signal demodulation.

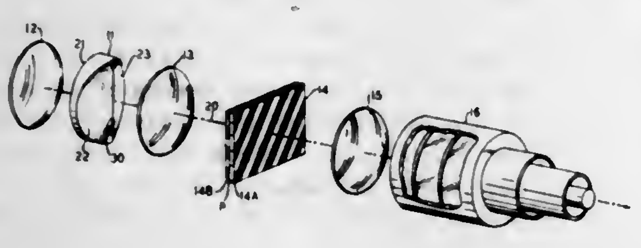
3,716,666
OPTICAL SPATIAL FREQUENCY FILTER

Arthur Bertel Larsen, Colts Neck, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed June 29, 1971, Ser. No. 157,995

Int. Cl. H04n *9/06*

U.S. Cl. 178—5.4 ST **14 Claims**



In an optical system for forming a representation of a scene at an image plane, a wedge structure of optical quality material is disposed between the scene and the image plane. The light passing through different sections of the wedge structure is deflected in different directions, forming a plurality of displaced images at the image plane. The summation of the variously displaced images results in a modulation transfer function exhibiting substantial attenuation of the spatial frequency components within a predetermined frequency range. The wedge is designed and oriented to produce angular deflections which yield specific displacements of the images and a corresponding spatial frequency rejection band. The filter may be used to avoid aliasing in color television cameras having striped color modulating gratings by utilizng the wedge to insure high attenuation in the vicinity of the spatial modulation frequency produced by the striped color gratings.

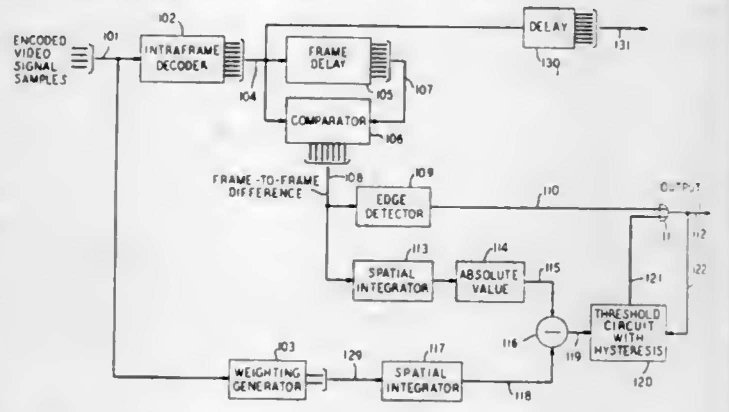
3,716,667
APPARATUS FOR DETECTING THE MOVING AREAS IN A VIDEO SIGNAL

Denis John Connor; John Ormond Limb, both of New Shrewsbury; Roger Fabian Wedgwood Pease, Holmdel, and William George Scholes, Jackson, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Berkeley Heights, N.J.

Filed Oct. 26, 1971, Ser. No. 192,283

Int. Cl. H04n *7/12*

U.S. Cl. 178—6 **17 Claims**



A frame-to-frame difference signal is developed for each element-to-element difference word corresponding to a picture element in a video signal. The frame-to-frame difference signal for each picture element is combined with the same type signal for the picture element above it in the same video field and the sum is checked against a high threshold level in order to determine whether the picture element is part of a high contrast moving edge. In addition, the frame-to-frame difference signal for each picture element is combined with the frame-to-frame difference signals for all of the picture elements in a predetermined area of the picture to develop a first value whose amplitude is proportional to frame-to-frame differences caused by both movement and quantization noise. A second functional value whose amplitude is proportional to the expected quantization noise in the area of picture elements under consideration is developed in response to the element-to-element difference signals for these picture elements. The second value is subtracted from the first functional value in order to develop a third value whose amplitude is dependent on frame-to-frame differences caused by movement and is relatively insensitive to quantization noise. This third value is checked in a threshold circuit having both a hysteresis effect with respect to amplitude and an increased sensitivity due to previous recognitions of movement in the area encompassing the picture element in order to establish a second indication of movement for the picture element under consideration.

3,716,668
ENGRAVING MACHINE

William J. Barron, Peru, Ill., assignor to Graphic Electronics, Inc., LaSalle, Ill.

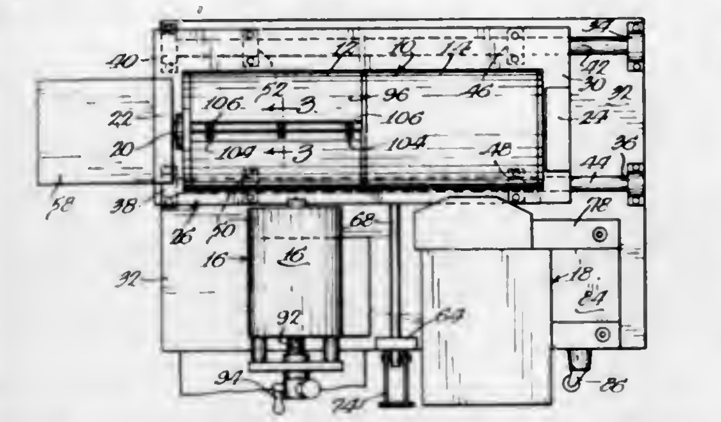
Filed Dec. 28, 1970, Ser. No. 102,018

Int. Cl. G01d *15/00, 15/28;* **H04n** *1/24*

U.S. Cl. 178—6.6 B **5 Claims**

An improved engraving machine having a cylinder on which is wrapped in side-by-side relation an image to be reproduced and a plate to be engraved with such image, including a

scanning member and a cutting member arranged adjacent respective portions of the cylinder for cooperation with the image and the plate to be engraved respectively, the apparatus



including means for rotating the cylinder and moving the same axially relative to the scanning and cutting carriages while the latter remain stationary.

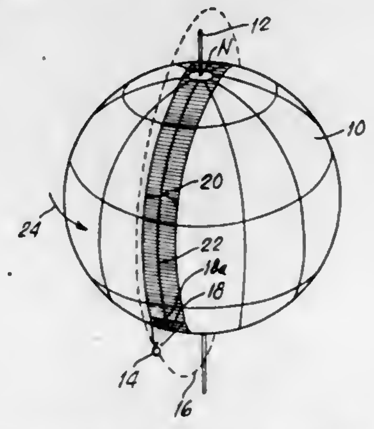
3,716,669
MAPPING RECTIFIER FOR GENERATING POLARSTEREOGRAPHIC MAPS FROM SATELLITE SCAN SIGNALS

Kantaro Watanabe, c/o Japan Engineering Development Co., TBR Building, No. 10-2, 2-chome, Nagata-cho, Chiyoda-ku, Tokyo, Japan

Filed May 14, 1971, Ser. No. 143,454

Int. Cl. G01s *7/06;* **G03b** *27/68;* **H04n** *1/24*

U.S. Cl. 178—6.7 A **18 Claims**



Disclosed is a system including electrical, mechanical and optical components and serving to generate polarstereographic maps of the Earth surface from scan signals sent by meteorological satellites such as Nimbus. The satellite scan signals are received by suitable radio equipment and are used to generate scan line images on a cathode ray tube having a concave face matching the Earth's curvature to compensate for the face that the satellite scans a spherical surface. The cathode ray tube is positioned along a circular track such that a scan line image on the CRT concave face is congruent with a sphere concentric with the track. Two diametrically opposite points of the sphere are designated South and North pole respectively, and a photocamera is positioned near the track such that the front nodal point of its lens is at either the South or the North pole of the sphere. The purpose of the circular track system is to compensate for the orbital motion of the satellite around the Earth and to project on planar film in the camera a polarstereographic projection of the scanned Earth surface. To that end, the cathode ray tube and the camera are moved with respect to each other along the circular track in synchronism with the orbital motion of the satellite around the Earth while the camera remains with the front nodal point of its lens at the South (or North) pole point of the track. The camera has a zoom control which keeps the front nodal point of the camera lens at the South (or North) Pole as the cathode ray tube and the camera move with respect to each other. A compensation is made for the east-west rotation of the Earth by means of rotating the camera around the North-South axis of the track. A further compensation is made for inclination of the satellite orbit from the Earth axis by means of adjusting the orientation of the camera with respect to the track plane. Lee than a 360° track may be used if a map of only a portion of the scanned Earth surface is desired.

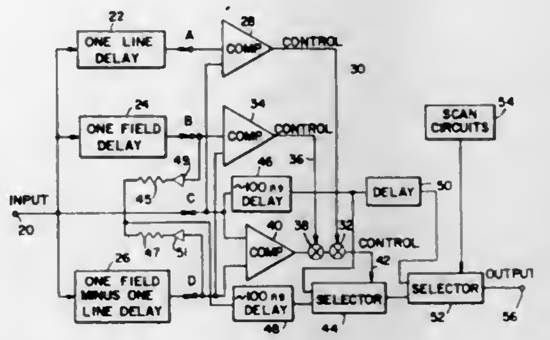
3,716,670
COMB EFFECT ELIMINATION

John D. Lowry, Willowdale, Ontario, Canada, assignor to Ellanin Investments, Ltd., Toronto, Ontario, Canada

Filed Dec. 20, 1971, Ser. No. 209,981

Int. Cl. H04n *5/84*

U.S. Cl. 178—6.7 A **8 Claims**



The so-called "comb effect" in the recording of video pictures on film, caused by the lateral displacement of a moving object against a contrasting background during the time interval between an odd-field scan and the corresponding even-field scan interlaced with the odd-field scan to form a frame of the video picture, is eliminated by comparing each line of the even-field scan (the prime line) with the preceding even-field line and with the preceding odd-field line, and comparing the preceding odd-field line with the following odd-field line. If the comparisons show identity between the pair of even-field lines and between the pair of odd-field lines, but a difference between the prime line and the odd-field line, the circuit substitutes adjacent odd-field information for the prime line information; otherwise the circuit transmits the prime line unchanged. During the odd-field scan, all lines are transmitted without change.

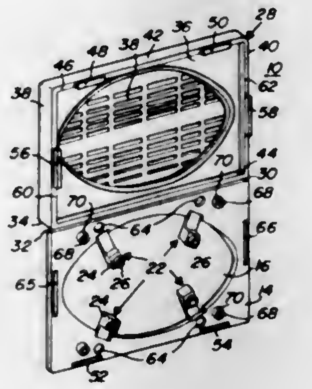
3,716,671
SPEAKER HOUSING

Earl C. Karr, Lombard, Ill., assignor to Motorola, Inc., Franklin Park, Ill.

Filed May 17, 1971, Ser. No. 144,033

Int. Cl. G10k *13/00;* **H04r** *1/28*

U.S. Cl. 179—1 E **8 Claims**

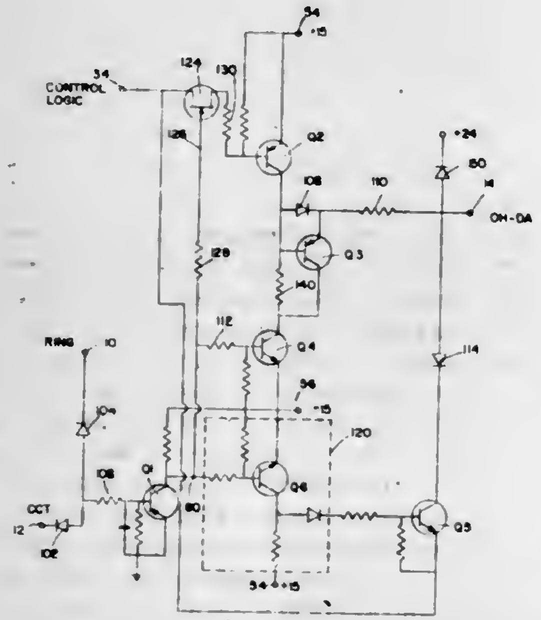


Speaker mounting apparatus includes a molded plastic housing having a base plate and a cover attached thereto by an integral hinge formed therebetween. Integral hinged mounting tabs are formed on the base plate adjacent a central opening therein provided to accommodate a speaker unit. The base plate is positioned on an apertured panel with the central opening of the former in alignment with the aperture of the latter. The tabs are folded into the aperture and about the panel onto the opposite surface thereof. Screws extending through the base plate and panel are received in the tabs to secure the housing on the panel. The speaker unit is mounted on the base plate and the cover is swung thereover about the integral hinge. Locking tabs formed on the cover are received in apertures in the base plate to removably secure the two portions in a joined condition.

3,716,672
MODEM CBS/CBT INTERFACE

Richard D. Fretwell, Columbus, Ohio, assignor to Design Elements, Inc.

Filed Aug. 9, 1971, Ser. No. 170,116
Int. Cl. H04m *11/06*
U.S. Cl. 179—2 DP **9 Claims**



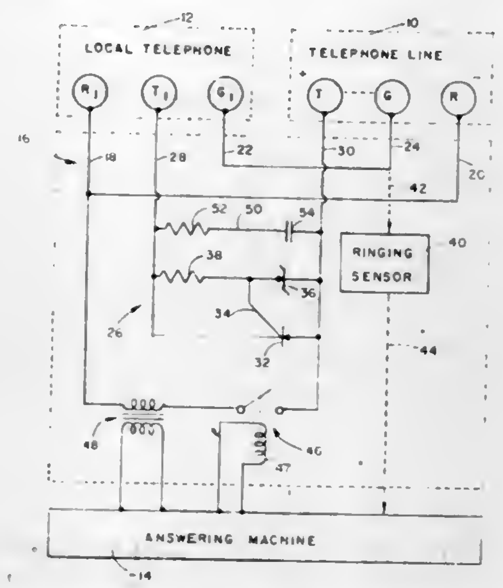
A logic interface circuit for providing appropriate on hook and off hook output states to the QH-DA terminal of either a CBS or CBT type telephone data link system. The appropriate output occurs in response to the command of the modem control logic without the necessity of switching or adapting the modem circuit during installation to the CBS or CBT system in which it is installed.

3,716,673
ANSWERING MACHINE TELEPHONE LINE COUPLING DEVICE

Kalju Meri, Maspeth, N.Y., assignor to Electrospace Corporation, North Bergen, N.J.

Filed Nov. 29, 1971, Ser. No. 202,791
Int. Cl. H04m *1/64*
U.S. Cl. 179—6 R **9 Claims**

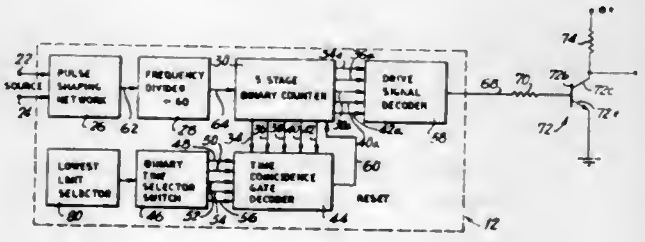
A device connected between a telephone line and its associated local telephone for coupling an answering or recording machine therebetween. The device includes a voltage sensing member connected in series between one standard circuitry terminal of the telephone line and its associated local telephone terminal to prohibit the transmission of voice or other audible communications from the local telephone when a telephone call is made thereto. The device also includes a ringing sensor connected to the telephone line for activating the answering machine, and a coupling switch which is moved into a closed position by the energizing of the answering machine to close the telephone line circuit loop. A line transformer is disposed in series with the coupling switch to provide a signal path to the answering machine for the recording of information from the telephone line when the coupling switch is closed. A branch line is preferably disposed in series with the associated telephone terminals and in a parallel arrangement with the voltage sensing member to permit reception of audible signals or communications from the receiver of the local telephone.



3,716,674
VARIABLE TIMING AUTOMATIC INTERRUPTER CIRCUIT FOR COMMON TELEPHONE SENDER EQUIPMENT

George Manos, Bridgeport, Conn., assignor to Porta Systems Corp., Roslyn, N.Y.

Filed Oct. 15, 1970, Ser. No. 81,044
Int. Cl. H04m *3/22*
U.S. Cl. 179—18 FA **10 Claims**

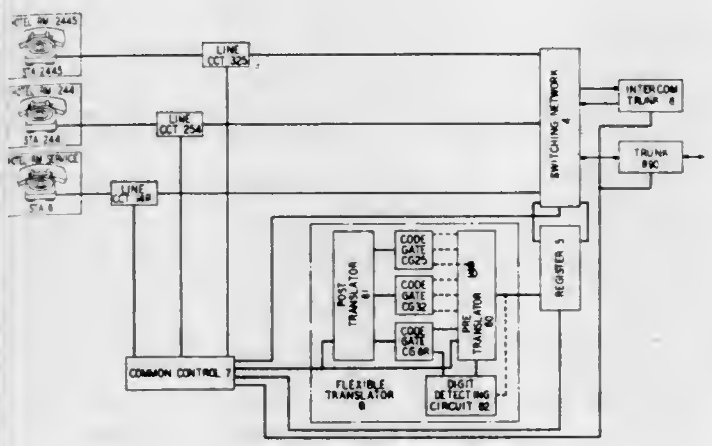


In a telephone system employing common sender equipment an automatic interrupter circuit for connection to a common sender for disconnecting said common sender from a particular subscriber line after a predetermined period of inactivity upon said particular subscriber line. The automatic interrupter circuit comprises a timing pulse generator adapted to feed pulses having a predetermined width and selectively variable repetition rate to said common sender to cause disconnection of the same from said particular subscriber line after the reception of two successive pulses. The timing pulse generator comprises a pulse shaping network connected to a frequency divider, in turn connected to a binary counter, the output of said binary counter being applied as a first input to a time coincidence gate decoder and the second input thereto being obtained from a time selector switch. The output of said binary counter is also connected as an input to a drive signal decoder and when a coincidence is detected by said time coincidence gate decoder a reset pulse is fed therefrom to said binary counter which results in a pulse having a fixed duration at the output of said drive signal decoder, which fixed duration pulse is indicative of the selected repetition rate of the timing pulse generator.

3,716,675
FLEXIBLE TRANSLATOR

James John Marek Jr., and George William Taylor, both of Boulder, Colo., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed Dec. 8, 1971, Ser. No. 205,802
Int. Cl. H04q *3/47*
U.S. Cl. 179—18 ET **14 Claims**



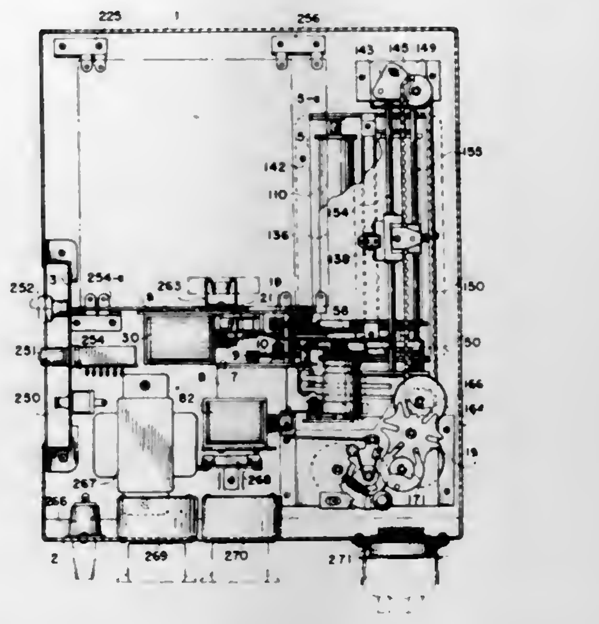
A flexible translator arranged to translate one, three, and four digit input numbers into three digit output numbers. The translator includes a plurality of identical two and three terminal code gates each having an output defining the first two digits of the output numbers. The translator is arranged so that a single digit input enables digit detecting circuitry and a two terminal code gate to pass predetermined signals through the translator to obtain a corresponding three digit output number. The translator is further arranged so that the first two digits of three and four digit input numbers enable two terminals of predetermined ones of the three terminal code gates. For a three digit input number, the digit detecting circuitry enables the third terminal of preselected code gates and passes the last digit of the input number through the translator to obtain the three digit output number. For a four digit input number, the digit detecting circuitry utilizes the third digit of the four digit input number to enable the third terminal of other code gates and passes the last digit of the input number through the translator to obtain the three digit output number.

3,716,676
AUTOMATIC TELEPHONE DIALER UTILIZING MAGNETIC TAPE STORAGE WITH IMPROVED INDEXING MEANS

Kenzo Tatematsu, Amagasaki; Hiroo Hosono, Osaka; Toshio Katagiri, Neyagawa; Akira Nishikiori, Hirakata, and Takashi Minato, Kadoma, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Oaza Kadoma, Kadoma, Kadoma-shi, Osaka, Japan

Filed Dec. 28, 1970, Ser. No. 101,943
Claims priority, application Japan, Dec. 29, 1969, 44/359; Nov. 20, 1970, 45/116148; Dec. 15, 1970, 45/113892; Dec. 15, 1970, 45/113891; Dec. 15, 1970, 45/113890; Dec. 15, 1970, 45/113889; Dec. 4, 1970, 45/107700
Int. Cl. H04m *1/46*
U.S. Cl. 179—90 BB **21 Claims**

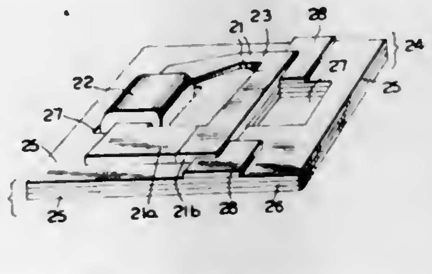
An automatic dialling device in which dial impulses corresponding to dial digits of a telephone number are recorded in magnetic tape in advance and the recorded signals are reproduced as occasion demands thereby to automatically transmit the dial impulses to a telephone line for accomplishing a call. Said automatic dialling set specifically comprises a multiplicity of switches which can be individually operated to designate a multiplicity of parties to be called, wide magnetic tape having a multiplicity of transverse tracks and means for automatically selecting tracks corresponding to the called parties which have been designated.



3,716,677
MULTI-CHANNEL MAGNETIC HEAD

Takashi Tanaka, and Yukihiro Yanagiuchi, both of Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Osaka, Japan

Filed June 5, 1970, Ser. No. 43,715
Int. Cl. G11b *5/16, 5/20, 5/28*
U.S. Cl. 179—100.2 C **7 Claims**



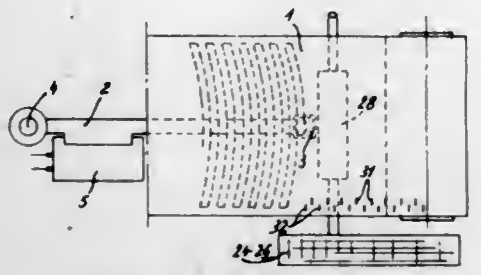
A multi-channel magnetic head composed of a stack of a plurality of elementary head units. Each unit has a substantially D-shaped magnetic core having a magnetic gap. A winding is wound on said core, and a support plate is provided on which said D-shaped core is positioned. The support plate has at least one recess in which said winding is positioned. The support plate is a laminated structure having a magnetic sheet and non-magnetic sheets. The plurality of elementary head units are stacked with the gaps of the elementary head units aligned in a single straight line.

3,716,678
APPARATUS FOR CONTROLLING ADVANCE OF A RECORD SUPPORT AND TRANSVERSE DISPLACEMENT OF A SENSING HEAD

Marcel Jules Helene Staar, 479 Avenue Louise, Brussels, Belgium

Filed Nov. 9, 1970, Ser. No. 87,912
Int. Cl. G11b *21/04, 27/26*
U.S. Cl. 179—100.2 T **9 Claims**

A mechanism is provided for controlling the advance of a record support and the displacement and direction of an oscillating recording and reading head. The record support carries two rows of track marks controlling through the action of an optical means the displacement of the record support while determining at the same time the direction of the head dis-



placement. The record support may be constituted of reflective material or coated therewith and the two rows of track marks are non-reflective and arranged successively to provide three sets of signals in the optical means.

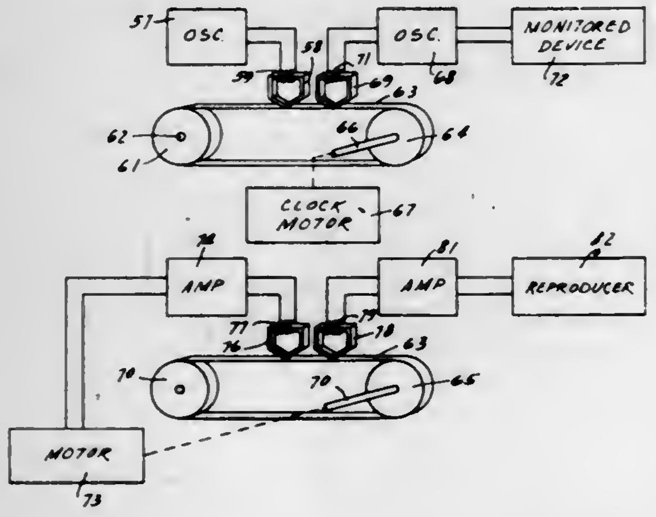
3,716,679
VEHICLE SPEED RECORDING AND REPRODUCING DEVICES

Dieter Georg Graesslin, Klosterbergstrasse 29; Siegbert Friedrich Hils, J. G. Schultheissweg, and Kurt Ropin, Winterbergstrasse 30, all of 7742 St. Georgen, Germany

Filed Aug. 27, 1970, Ser. No. 67,404

Int. Cl. G11b *5/00*

U.S. Cl. 179—100.2 S **1 Claim**



Recording devices with a recording medium which may be driven by the machine to be monitored and has a fixed frequency time track recorded on the medium. Also the recording medium can be driven at a fixed rate and the monitored device may drive a variable frequency generator which is magnetically coupled to the magnetic medium. Another modification provides mixing time reference signals and coupling the results to the magnetic medium.

3,716,680
NEGATIVE IMPEDANCE CONVERTERS SUITABLE FOR BILATERAL GAIN REPEATERS

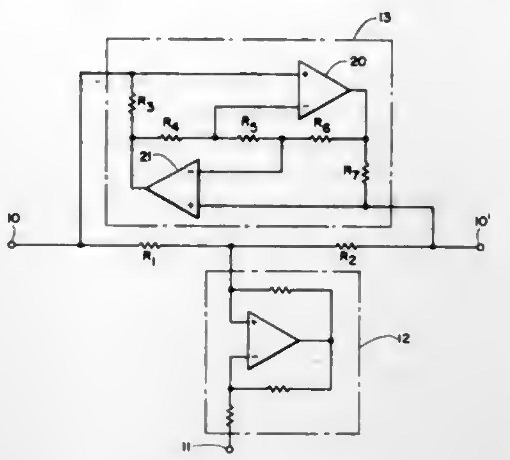
Jin Twan Lim, Kanata, Ontario, Canada, assignor to Bell Canada-Northern Electric Research Limited, Ottawa, Ontario, Canada

Filed Sept. 30, 1971, Ser. No. 185,096

Int. Cl. H04b *3/36, 3/16*

U.S. Cl. 179—170 G **10 Claims**

The realization of novel floating and stable negative impedances utilizing operational amplifiers has been achieved. Stable bilateral gain repeaters in two preferred



configurations are thus possible, which utilize only operational amplifiers and resistors.

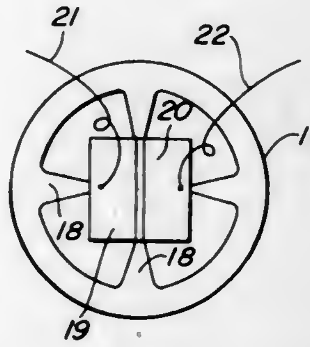
3,716,681
PIEZOELECTRIC TRANSDUCER HAVING SPIDER-LIKE FRAME STRUCTURE

Gilbert C. Barrow, Scituate, Mass., assignor to Massa Division, Dynamics Corporation of America, Hingham, Mass.

Filed Oct. 19, 1970, Ser. No. 81,891

Int. Cl. H04r *17/00*

U.S. Cl. 179—110 A **11 Claims**



A piezoelectric ceramic element is assembled in a spider-like frame member. The piezoelectric element and the frame cooperate to form a bilaminar vibrator with combined dimensions that determine the resonant frequency. In addition, a sound opaque mask, contained within a second spider-like frame structure, may be assembled in alignment with the spider-like frame structure containing the bilaminar piezoelectric transducer element. The mask covers a portion of the bilaminar element which vibrates out-of-phase with those other portions of the element that are exposed to the medium.

3,716,682
TURN SIGNAL SWITCH

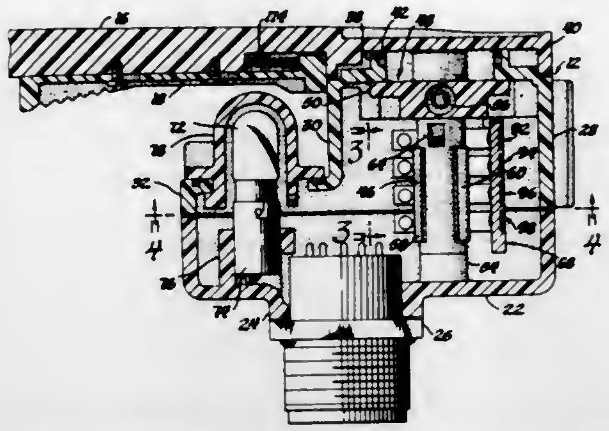
Werner O. Wizemann, Michigan City, Ind., assignor to Meridian Industries, Inc., Southfield, Mich.

Filed Aug. 26, 1971, Ser. No. 175,232

Int. Cl. H01h *3.16*

U.S. Cl. 200—61.27 **7 Claims**

A heavy duty turn signal switch is disclosed for use in trucks and similar road vehicles. The turn signal switch is of the " hang-on" type (non-self cancelling and includes a hermetically sealed casing containing the switching mechanism. The switching mechanism comprises two rows of contact sets with each set being formed of flexible contact blades mounted in cantilever fashion on a printed circuit board. The contact sets are actuated by a barrel cam which is displaced by an operating lever between neutral left turn, right turn and hazard warning positions. The movement of the operating lever is indexed



by a detent mechanism and a lockout arrangement is provided to avoid inadvertent movement to the hazard warning position.

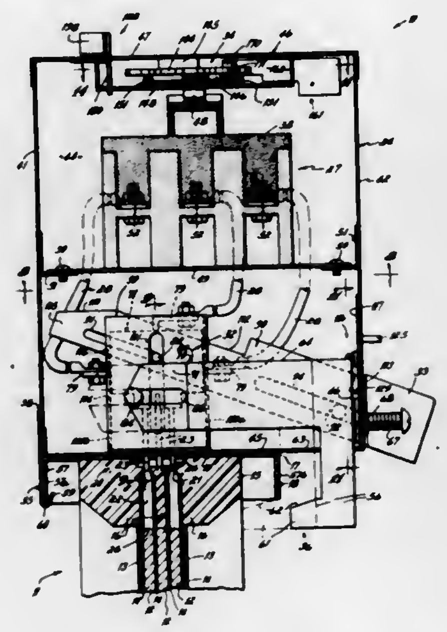
3,716,683
PLUG UNIT FOR USE WITH PLUG-IN BUS DUCT

Paul M. Hafer, Florence, Ky., assignor to Arrow Hart, Inc., Hartford, Conn.

Filed Aug. 30, 1971, Ser. No. 176,066

Int. Cl. H01h *9/20, 33/46*

U.S. Cl. 200—50 R **15 Claims**



A plug unit comprising an off-on switch and a stab carrier mounted inside of a housing, the housing being adapted for interconnection with a plug-in bus duct and the stab carrier being linearly movable into and out of engagement with the bus duct's busbars after the housing has been mounted to the bus duct. The plug includes a first handle outside the housing that is manually operable for moving the stabs into and out of busbar contact after the housing has been mounted to the bus duct, and a second handle located outside the housing that is manually operable for opening and closing the off-on switch after the housing has been mounted to the bus duct. The first handle is interconnected with safety structure that requires use of both an operator's hands simultaneously to manually extend or retract the stabs into and out of busbar contact, that prevents extending the stabs into busbar contact until the plug unit is fixed to the bus duct in the final operating attitude, that prevents retracting the stabs from busbar contact unless the plug unit is fixed to the bus duct in the final operating attitude, that prevents extending the stabs into busbar contact unless the off-on switch is open, and that prevents retracting the stabs from busbar contact unless the off-on switch is open. The second handle is interconnected with safety structure that prevents opening of the housing's cover unless the off-on switch is open, that prevents closing of the off-on switch when the housing's cover is open, that allows the plug unit to be 'locked out' when desired so as to keep the off-on switch open, and that cooperates with the first handle as described.

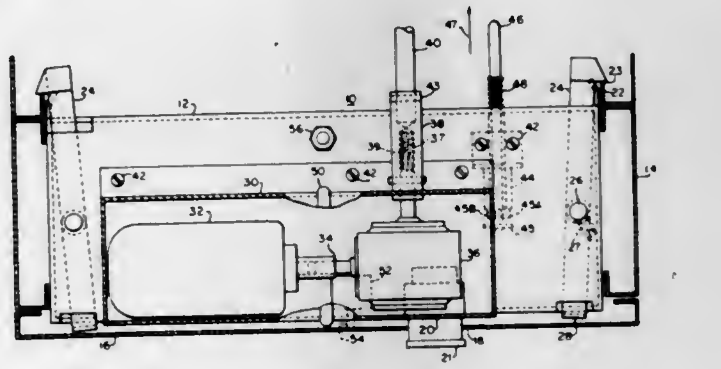
3,716,684
PORTABLE CIRCUIT BREAKER LEVERING DEVICE FOR METAL-CLAD SWITCHGEAR

James W. McMillen, and Glenn E. Rhodes, both of Monroeville, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Dec. 30, 1971, Ser. No. 214,332

Int. Cl. H01h *9/20*

U.S. Cl. 200—50 AA **8 Claims**



Apparatus suitable for placing on the floor or in front of the floor of a metal-clad switchgear cabinet and to be secured to cabinet. The apparatus includes a lightweight portable frame which has an electric motor and a gear reduction transmission mounted thereon to be coupled to the levering-in mechanism of a circuit breaker to be levered into or out of the cabinet. The apparatus may be operated with the cabinet door opened or closed, and it may be operated remotely and automatically. Cooperating limit switches, one of which may be disposed on the switchgear cabinet, and one of which may be disposed on the frame, provide control signals to a time delay relay which may be disposed on the frame to actuate the electric motor to an "off" state after the circuit breaker has been completely levered into or levered out of the cabinet.

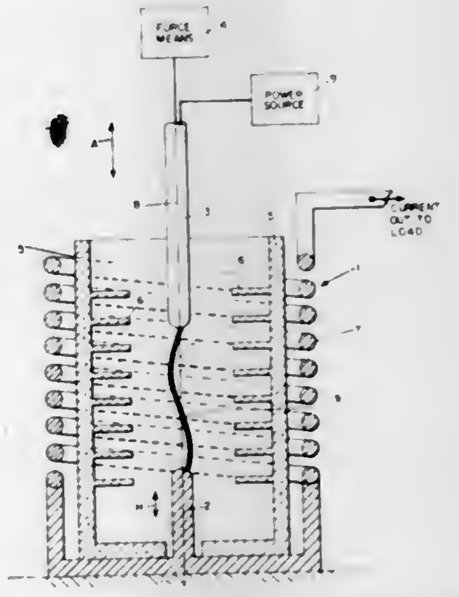
3,716,685
MAGNETIC CIRCUIT BREAKER

Gerald L. Wilson, Wayland, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Sept. 14, 1970, Ser. No. 71,792

Int. Cl. H01h *33/18*

U.S. Cl. 200—147 R **9 Claims**



A circuit breaker adapted to interrupt substantial values of electric current. The breaker disclosed features a magnetic field in the region in which the break in current occurs and oriented in a direction both parallel to and radially perpendicular to the general direction of current flow at the instant the circuit is interrupted to create a kink instability in the arc thereby formed and to cause the arc to move into contact with surrounding baffles.

3,716,686

COMPRESSED-GAS MULTI-BREAK CIRCUIT-INTERRUPTER HAVING CYLINDRICAL CHAMBERS WITH ECCENTRIC CONTACTS

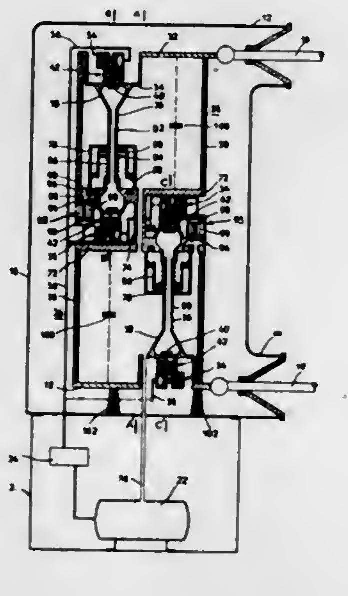
Jean Claude Henry, Grenoble, Georges Henry, St. Martin-le-Vinoux, and Cesar Castelli, Montfleury, France, assignors to Merlin Gerin, Societe Anonyme, Grenoble, France

Filed May 10, 1971, Ser. No. 141,630

Claims priority, application France, May 26, 1970, 19,259

Int. Cl. H01h *33/54*

U.S. Cl. 200—148 R **9 Claims**



A multiple-break, compressed gas circuit-interrupter pole unit having longitudinally aligned arc extinguishing chambers of insulating material. To reduce the overall length, the axes of the contact means of successive chambers are staggered to permit overlapping of members associated with the contact means, successive chambers are staggered to permit overlapping of members associated with the contact means, such as exhaust valves or contact movement control means.

3,716,687

METHOD AND APPARATUS FOR COOKING

Ronald Jack Walker Constable, Eythorne, near Dover, England, assignor to Hirst Microwave Industries Limited, Aylesham, near Canterbury, Kent, England

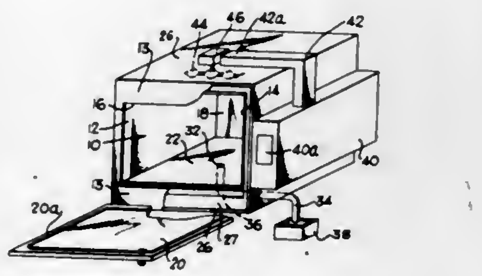
Filed Aug. 18, 1971, Ser. No. 172,860

Claims priority, application Great Britain, Aug. 18, 1970, 39,785/70; Feb. 5, 1971, 4,054/71

Int. Cl. H05b *69/06*

U.S. Cl. 219—10.55 **54 Claims**

Apparatus for cooking food comprises the combination of a hot plate or grill device arranged in a microwave oven so that steak or chops or like food of relatively small thickness can be rapidly cooked. The hot-plate comprises conductive material forming a short circuit for the microwave field and this is considered to limit the depth of penetration of the microwave energy into the food, thus enabling rare and medium steaks or the like to be cooked. Further, it is found that the food can be properly browned on its surface, as well as correctly cooked in the interior regions, in very short cooking times. It is preferred that the oven also be provided with a fan for rapidly recirculating the air in the oven to enable food to be cooked by the combination of microwave energy and recirculated air at cooking temperatures, this method being particularly applicable to roasts such as roast beef, roast chicken etc. A removable tray may be provided for supporting the food in or near the centre of the microwave field during this latter method. The hot-plate itself, or an auxiliary heater, may be employed for heating the air during this method. In one embodiment, the fan used for recirculating the air is partially microwave transparent and partially of conductive material and is arranged so that the conductive parts act as a mode stirrer. The fan is preferably located behind a shield plate in the microwave cavity to draw air through a central aperture in the plate and blow it around the edges and in the case where the fan acts as a mode stirrer, the shield plate is of heat resistant microwave transparent material. The hot-plate may have a ridged surface for forming stripes on steak or the like and an auxiliary hot-plate may be provided, having a plane food supporting surface, for placing on the ridged surface when it is desired to cook food without forming stripes on it.



3,716,688

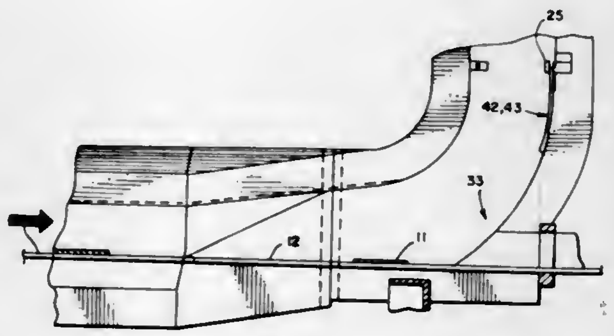
REFLECTOR AND WAVEGUIDE APPLICATOR

Ray M. Johnson, Danville, Calif., assignor to Microdry Corporation, San Ramon, Calif.

Filed Oct. 29, 1971, Ser. No. 193,907

Int. Cl. H05b *9/06*

U.S. Cl. 219—10.55 **11 Claims**



In a waveguide applicator using a water load termination for absorbing remnant power after the material being processed leaves the applicator, a metallic gate is interposed between the water load and the location at which the product exits the applicator. One edge of the gate is hinged about a broadwall of the guide, and this edge is in continuous electrical contact with the broadwall. The gate is adjustable for selective reflection of power back through the guide to make a second pass in processing the material, thereby enhancing the system's efficiency.

3,716,689

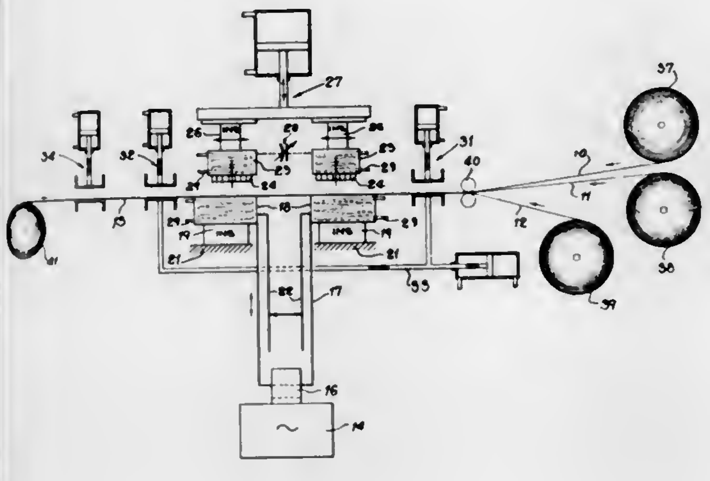
HIGH FREQUENCY DIELECTRIC HEATING PROCESS AND APPARATUS

Raymond P. Meenen, Hawthorne, N.J., assignor to Mayflower Electronic Devices, Inc., Little Ferry, N.J.

Division of Ser. No. 824,076, May 13, 1969, Pat. No. 3,596,035. This application March 15, 1971, Ser. No. 124,427

Int. Cl. H05b *9/04*

U.S. Cl. 219—10.61 **1 Claim**



A high frequency heating machine for laminating fabrics material in which a heating electrode for each side of the material is divided into two parts and in which each of the four electrodes is preheated, the two electrodes one one side of the material dividing the load and having capacitors therebetween. Mechanism is provided for step-by-step passage of the material between the two opposing sets of electrodes in which the dies are spaced three times the effective width of one die and in which the stroke of the material for each step is twice the effective width of one die.

3,716,690

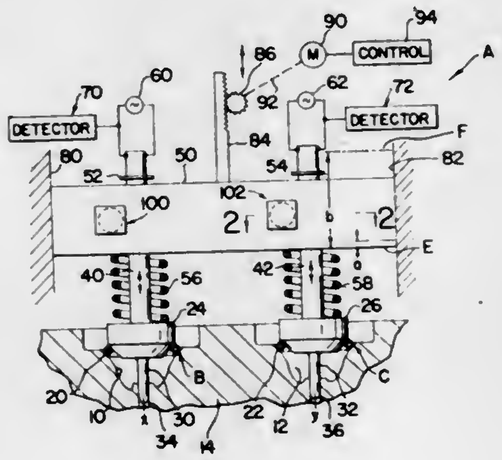
APPARATUS FOR SETTING THE AIR GAP BETWEEN AN INDUCTOR AND A VALVE SEAT

William G. Bryant, Lakewood, Ohio, assignor to Parks-Ohio Industries, Inc.

Filed March 27, 1972, Ser. No. 238,515

Int. Cl. H05b *5/04*

U.S. Cl. 219—10.77 **15 Claims**



A device and method for setting the air gap between a valve seat and an inductor which is movable with respect thereto comprising a circuit including, in series, the inductor, the valve seat and an electrical indicating means for making an indication only when the inductor and seat are in electrical contact to complete the series circuit and means for using this circuit to set the aforementioned air gap.

3,716,691

SHIELDED ARC WELDING WITH AUSTENITIC STAINLESS STEEL

Howard E. Baybrook, Leechburg, and Joseph A. Chivinsky, Sarver, both of Pa., assignors to Allegheny Ludlum Industries, Inc., Pittsburgh, Pa.

Filed April 27, 1971, Ser. No. 137,957

Int. Cl. B23k *35/00*

U.S. Cl. 219—137 **11 Claims**

An austenitic stainless steel which is suitable for use as a filler metal in gas shielded arc welding and a gas shielded arc welding process employing said steel as a filler metal. The steel consists essentially of, in weight percent, up to 0.1 percent carbon, 7.5 – 16.0 percent manganese, up to 1.0 percent silicon, 17.5 – 26.0 percent chromium, 5.0 – 17.0 percent nickel, 0.75 – 4.0 percent molybdenum, 0.2 – 0.38 percent nitrogen, balance iron and incidental impurities, and is additionally limited as follows:

1. The ratio of austenitizing elements to ferritizing elements is greater than 1 in accordance with the following expression:

$$[\%\,\mathrm{Ni} + 30\,(\%\mathrm{C} + \%\mathrm{N}) + 0.5\,(\%\mathrm{Mn})]/[\%\mathrm{Cr} + \%\mathrm{Mo} + 1.5\,(\%\mathrm{Si})] > 1$$

2. The manganese to nitrogen ratio is at least 42; and
3. The sum of the chromium, manganese, nickel and molybdenum content is at least 38.

3,716,692

TEMPERATURE CONTROLLED SOLDERING IRONS

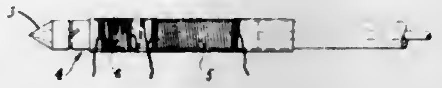
Rudolf Schick, 181 High Street; Robin William Mackie, 15 Livingstone Street, and Alan Lindsay Royston, 1 Mountfield Road, all of Victoria, Australia

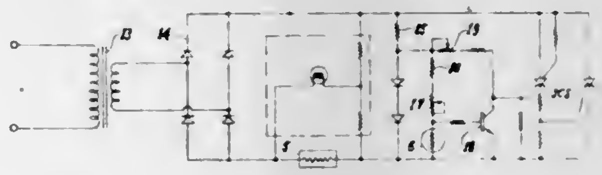
Filed Feb. 19, 1971, Ser. No. 117,014

Claims priority, application Australia, July 16, 1970, 17701/70

Int. Cl. H05b *1/02*; **B23k** *3/04*

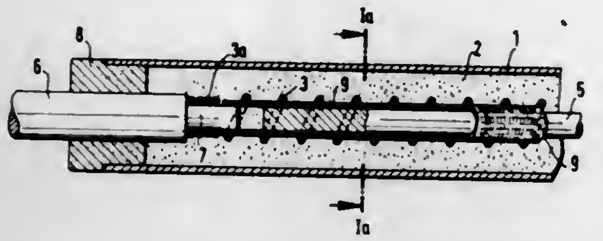
U.S. Cl. 219—241 **5 Claims**





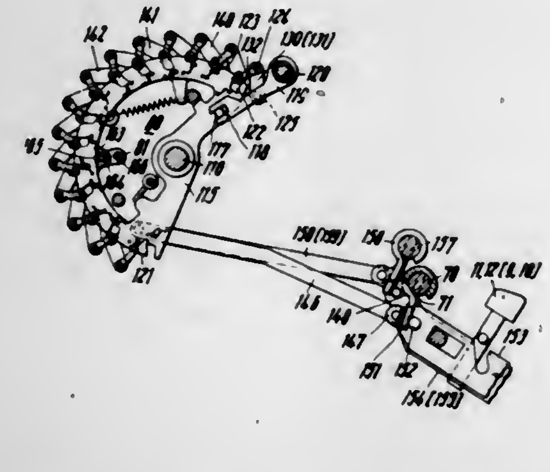
A temperature controlled electrical soldering iron includes a soldering tip removably secured in a nickel or nickel alloy barrel. An electric heating coil is wound around the barrel and heating current is supplied thereto through a solid state SCR temperature control circuit. The control circuit includes a nickel wire temperature sensing element wound about the barrel in axially displaced, non-overlapping relationship to the heating coil with the sensing element being in closer proximity to the soldering face of the soldering tip than the heating coil. The variation in resistance of the sensing element as the soldering tip temperature changes causes the SCR to be turned on andoff through a triggering circuit including a transistor and a silicon controlled switch.

3,716,693
TUBULAR HEATING ELEMENT
Richard Bleckmann, Moserstrasse 29, Salzburg, Austria
Filed May 17, 1971, Ser. No. 143,990
Claims priority, application Austria, May 21, 1970, 34535
Int. Cl. H05b *3/10*
U.S. Cl. 219—553 **18 Claims**



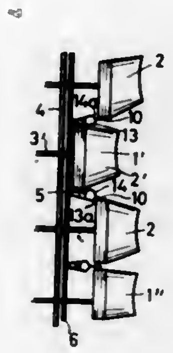
An electrical tubular heating element comprises an outer tube of metal and at least one electrical heating resistance, which is arranged in the outer tube. The zone adjacent to the inner wall of the outer tube is filled with magnesium oxide or another insulating material with a high melting point. Immediately adjacent to the heating resistance at least one layer or glass or another additional insulating material is provided so that when the temperature of the outer tube reaches a certain maximum value, a leakage current sufficient for switching off the tubular heating element flows between the coils of the heating resistance or a wire core arranged inside this heating resistance.

3,716,694
BLOCKING DEVICE FOR REGISTERING BUSINESS MACHINES
Gerhard Rethmeier, Oldentrup, Germany, assignor to Anker-Werke AG, Bielefeld, Germany
Filed Sept. 23, 1970, Ser. No. 74,619
Claims priority, application Germany, Sept. 24, 1969, P 19 48 233.6
Int. Cl. G07g *1/00*
U.S. Cl. 235—7 R **9 Claims**



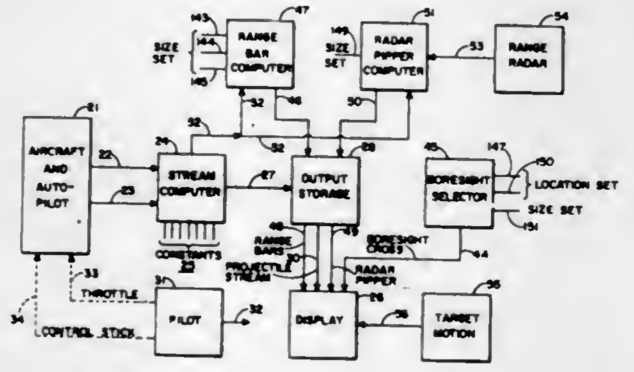
Blocking device for registering business machines having a keyboard field including number key banks and amount-key banks, including blocking means operatively connected to and adjustable by keys of the number key banks and of the amount-key banks, and sensing members cooperating with the blocking means for releasing a respective machine run, the blocking means being formed with locking and releasing profiles for locking the keys as well as for intermediately locking the sensing members and for completely releasing the sensing members from controlled condition thereof.

3,716,695
KEYBOARD LOCKING ARRANGEMENT
Josef Hauger, Villingen, Germany, assignor to Kienzle Apparate GmbH, Villingen, Germany
Filed May 24, 1972, Ser. No. 256,582
Claims priority, application Germany, May 27, 1971, P 21 26 286.2
Int. Cl. G07g *1/00*
U.S. Cl. 235—26 **15 Claims**



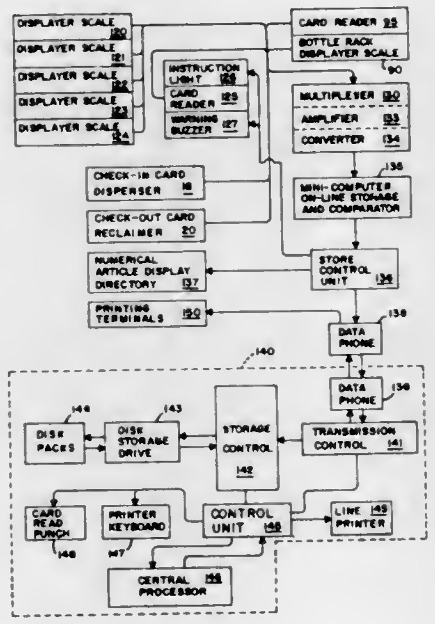
Between pairs of adjacent keys or key buttons, of a keyboard on which the keys are mounted in crossing columns and rows, resiliently bendable locking plates are mounted on a support plate so that in the normal position of the locking plate, adjacent keys cannot be simultaneously depressed. When only one key is depressed, the respective locking plates are resiliently bent to locking positions located under the adjacent keys which then cannot be depressed.

3,716,696
PROJECTILE STREAM DISPLAY APPARATUS
Arthur F. Hayes, Fridley, and Robert L. Schultz, Edina, both of Minn., assignors to Honeywell, Inc., Minneapolis, Minn.
Filed Sept. 4, 1970, Ser. No. 69,536
Int. Cl. G06f *15/58*
U.S. Cl. 235—61.5 E **16 Claims**



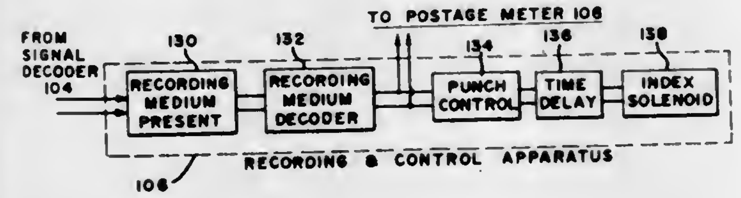
Digital computer apparatus and computer controlled process for displaying the locus of the present positions of a plurality of projectiles, if discharged sequentially from a freely moving vehicle at known intervals beginning at a predetermined time in the past, as seen from a predetermined point in the vehicle, including computer means for iteratively determining said present positions and for modifying the locus in accordance with changes in parameters of the movement of the vehicle and the projectiles: also included are means for identifying points on the locus at selected distances from the vehicle.

3,716,697
AUTOMATIC MARKETING SYSTEM
Stanley M. Weir, Santa Clara, Calif., assignor to FMC Corporation, San Jose, Calif.
Continuation of Ser. No. 825,260, May 16, 1969, abandoned. This application May 5, 1971, Ser. No. 140,620
Int. Cl. G06r *3/00;* **E04h** *3/04*
U.S. Cl. 235—61.9 R **12 Claims**



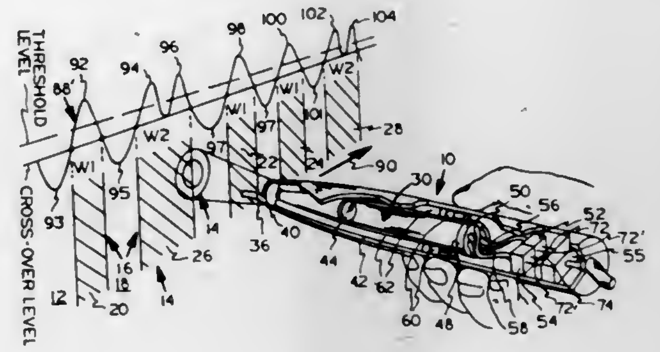
In a self service store, sales display fixtures are provided with means for sensing the weight of articles supported thereon, while card readers are associated with the fixtures to identify customers selecting articles therefrom. Data processing equipment scans the weight sensing means and the card readers while customers are shopping, and upon completion thereof, provides each customer with a printed invoice of the articles selected and the cost of the articles.

3,716,698
CONTROL AND RECORDING APPARATUS
Luther G. Simjian, Greenwich, Conn., assignor to General Research, Inc., Greenwich, Conn.
Filed Sept. 2, 1971, Ser. No. 177,316
Int. Cl. G06k *1/02;* **H04q** *1/00*
U.S. Cl. 235—61.1 **17 Claims**



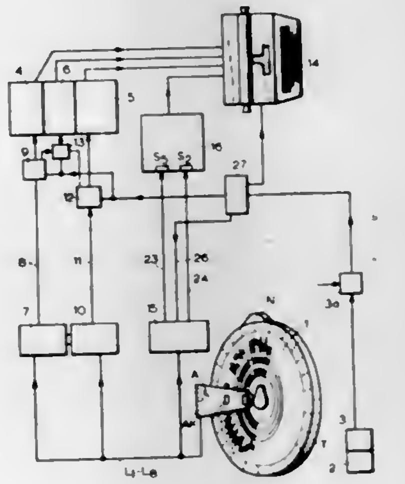
A control and recording apparatus operable in conjunction with a remotely controlled instrumentality includes a removable recording medium adapted to record the arrival of a signal which controls such instrumentality. Means are provided to sense that the medium is of proper character and present in predetermined position. In the absence of a medium or if it is not of the proper character operation of the instrumentality is blocked. The apparatus includes resetting means which become operable upon the removal of the recording medium from the apparatus.

3,716,699
METHOD AND APPARATUS FOR OPTICAL CODE READING
Alton B. Eckert, Jr., 79 Toilsome Avenue, Norwalk, Conn., and Howell A. Jones, Jr., 176 Taunton Road, Fairfield, Conn.
Filed April 2, 1971, Ser. No. 130,638
Int. Cl. G06k *7/10;* **E04g** *17/00*
U.S. Cl. 235—61.11 E **13 Claims**



Reading of a binary printed code consisting of width-coded elements is described. Radiation from a scanning spot is directed at a pair of photo-detectors which are responsive to radiation from concentric areas of the scanning spot. The signals from the photo-detectors are used to produce an analog comparison output representative of the difference between the amount of radiation incident upon the respective detectors. The scanning spot size is selected in view of the width of the code elements so that, during a scan of the reader, narrow code elements are identified by a single excursion, and wide code elements are indicated by a double excursion in the comparison output. Logic circuitry is provided to recognize the single and double excursions in the comparison output, and provide output signals representative of the binary code.

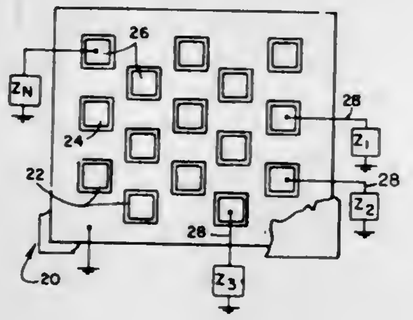
3,716,700
INSTRUMENT FOR AUTOMATICALLY MAKING EVALUATIONS FROM RECORDING CHARTS
Heinz Kelch, Buchenberg; Josef Krickl, Bad Durrheim; Eduard Schuh, and Siegfried Spauszus, both of Villingen, all of Germany, assignors to Kienzle Apparate GmbH, Villingen, Germany
Filed Jan. 26, 1972, Ser. No. 220,994
Claims priority, application Germany, Jan. 30, 1971, P 21 04 351.6
Int. Cl. G06k *11/00*
U.S. Cl. 235—61.6 A **25 Claims**



An apparatus has a rotating table which rotates at a predetermined speed. A tachograph chart having wide and narrow beam recordings as well as sawtooth type recordings recorded in adjacent tracks is placed on the rotating table. A scanning station has a plurality of photo diodes arranged in a direction perpendicular to the tracks, the photo diodes being arranged adjacent to each other in a row whose length dimension is greater than the width of any recording and is movable so it can be positioned opposite any recording to be evaluated. A motor drives the rotating table at the predetermined speed and controls a pulse generator to thereby cause the latter to generate time pulses having a frequency correlated to the speed of the motor. Three logic circuits, all connected to the scanning station and arranged to recognize narrow and wide beam recordings and sawtooth type recordings respectively, are connected to counters, the time pulses being directed to selected counters to provide an indication of the engine off, on and driving times and suitable signals are transmitted to a distance counter to register the total distance travelled.

3,716,701
ENCODED DATA CARD SYSTEM

David J. Cohen, 9614 N. Crawford, Skokie, Ill. 60604
Filed Nov. 9, 1970, Ser. No. 87,774
Int. Cl. G06k *7/08;* **G11b** *25/04*
U.S. Cl. 235—61.11 H **18 Claims**

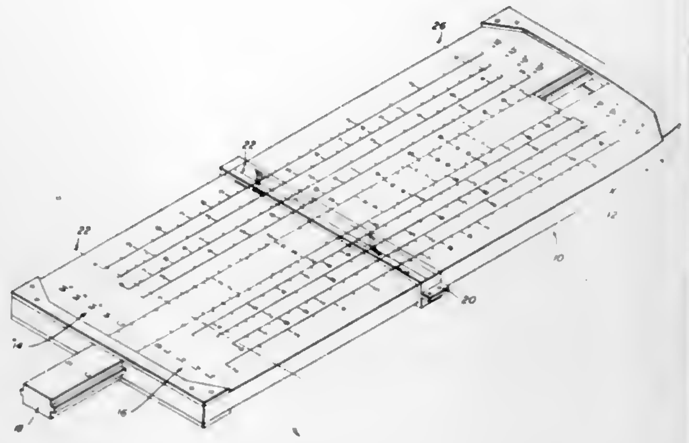


This invention relates to a high bit density encoded data card and code detector wherein the data is concealed from the observer thereof. The card comprises a thin metallic plate of a non-ferrous or ferrous material in which a plurality of holes are selectively placed. The code detector comprises a plurality of conductive squares or circles upon an insulated board; the holes of the card being selectively placed to correspond spacially with the conductors of the board. When an audio frequency voltage is applied in proximity to the card by means of a conductive plate placed thereon but insulated therefrom, voltage will be capacitively coupled only to those conductors of the board which are opposite the holes of the card.

3,716,702
MULTI-PARAMETER CONVERTING SLIDE RULE

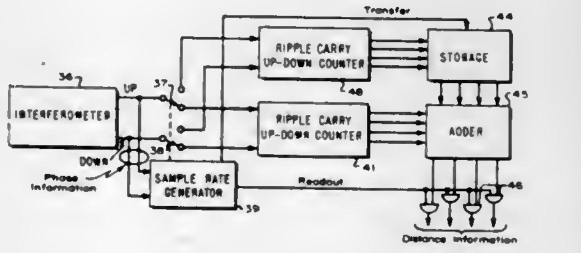
Francis J. Hopcroft, Qtrs. 2520 F, Fort Lewis, Wash.
Filed Dec. 3, 1971, Ser. No. 204,564
Int. Cl. G06g *1/02*
U.S. Cl. 235—70 R **4 Claims**

A slide rule is provided for use in converting dimensions in one measurement standard directly to dimensions in another measurement standard while performing mathematical operations. Dimensions given in feet and inches or in metric parameters can be multiplied together, cross-multiplied, divided individually or divided one by the other with an answer indicated directly on the appropriate scale in either parameter. The slide rule includes a body with a pair of rails and a slide movably mounted between the rails. An indicator with a hairline is slidably mounted to the body and conventional C and D scales are provided along the rails and along the slide. Additional C scales selectively folded for indicating in metric measure, foot measure or inch measure are provided along the body portion.



3,716,703
METHOD AND APPARATUS FOR INTERRUPTING CONTINUOUS PULSE TRAINS FOR COUNTER READOUT WITHOUT INFORMATION LOSS

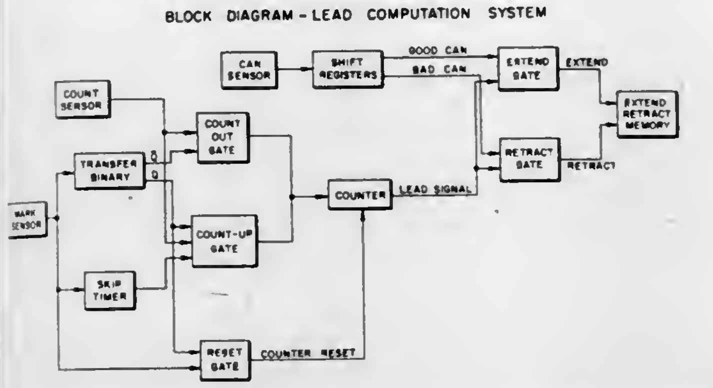
Gary B. Gordon, Cupertino, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.
Filed Mar. 9, 1970, Ser. No. 17,529
Int. Cl. G06m *3/04*
U.S. Cl. 235—92 PL **18 Claims**



A pulse counter system for determining the difference tally count between the pulses of two continuous trains of incoming pulses with an up-down counter includes means for interrupting the flow of pulses to the counter to allow time for the counter to stabilize and be read out, said means accounting for said interrupted pulses to avoid losing information. In one instance, an equal number of pulses is interrupted from each of the up count and down count trains, so that no information is lost in the counter. In another instance, the interrupted pulses are counted in an auxiliary up-down counter, the difference count being taken from the auxiliary counter and digitally added into the main counter after each readout of the main counter. In another embodiment, the difference count of the pulses in the interruption period is kept in the auxiliary counter, the output of the main counter and the auxiliary counter being added together digitally to give the count output. In another embodiment anticoincidence circuitry and gates are used for feeding the interrupted pulses serially back into the main counter from the auxiliary counter after each readout of the main counter to accomplish addition. Also, two up-counters plus a subtraction circuit may be used to perform the functions of a reversible or up-down counter and anticoincidence circuitry.

3,716,704
ELECTRICAL CONTROL SYSTEM

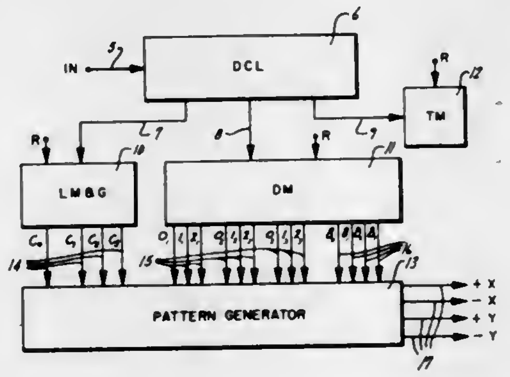
Kenneth P. Dixon, Lakewood, Colo., assignor to Systems Engineering Associates, Inc., Wheat Ridge, Colo.
Filed July 8, 1970, Ser. No. 53,197
Int. Cl. G06m *3/14*
U.S. Cl. 235—92 PD **8 Claims**



An electrical control system for automatically controlling operations on successively fed workpieces in a variable speed machine, comprising a workpiece scanning sensor, a rotating timing wheel provided with one or more sets of electrically countable devices, each set consisting of a predetermined number of said countable devices equi-spaced apart circumferentially on the wheel or a segment thereof, said wheel revolving at a speed which causes a set of said countable devices to pass one workpiece station in one revolution or a predetermined part of one revolution of the wheel depending on the number of sets of said devices on the wheel, and including a mark sensor, a count sensor, and count-up and count-out counters connected to the count sensor for counting the timing wheel devices to measure the speed of operation of the machine and to measure the lead time and for generating a signal at the end of the lead time, the combined counts of the count-up and the count-out counters being equal to the output of one set of said countable devices.

3,716,705
PATTERN GENERATOR AND METHOD

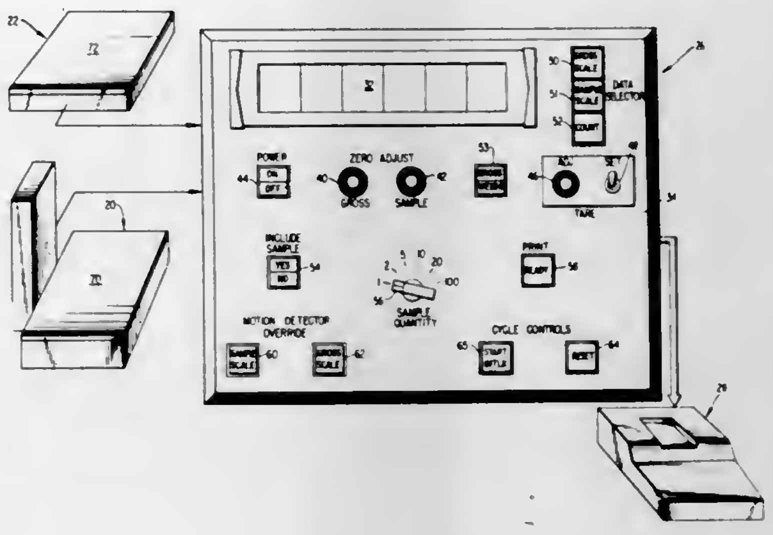
Richard M. Newell, 1204 St. Mary Drive, Livermore, Calif.
Filed Aug. 18, 1970, Ser. No. 64,774
Int. Cl. G06f *15/20*
U.S. Cl. 235—151 **12 Claims**



Pattern generator and method for generating functional representations of line segments consisting of discrete increments. Standard logic elements are utilized in tree networks which successively combine length and direction input data of different orders of magnitude to produce line segment representations of increasing orders of magnitude. The tree networks are constructed in stages which can readily be cascaded to increase the numbers of increments and line segments which can be generated.

3,716,706
PIECE COUNTING SYSTEM

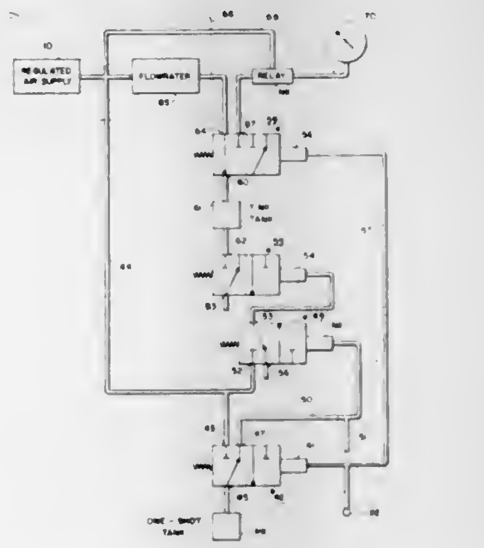
Alden J. Gray, Wallingford, Vt., assignor to Howe Richardson Scale Company, Clifton, N.J.
Filed April 1, 1971, Ser. No. 130,291
Int. Cl. G01g *19/413*
U.S. Cl. 235—151.33 **20 Claims**



A piece counting system for determining the number of pieces in a lot by recurrently advancing a counter circuit from a predetermined starting count to coincidence with a digital signal that represents the weight of a known number of said pieces and by supplying a quotient signal each time coincidence is reached until the summation of counts that the counter circuit has been advanced by becomes equal to or greater than a digital signal representing the weight of the unknown number of pieces.

3,716,707
PNEUMATIC RATEMETER AND COUNTER

Martin J. Sharki, 3202 Merrick, Houston, Tex., and Phil H. Griffin, 412 East Gaywood, Houston, Tex.
Filed Dec. 29, 1971, Ser. No. 213,675
Int. Cl. G06m *1/00*
U.S. Cl. 235—200 **9 Claims**

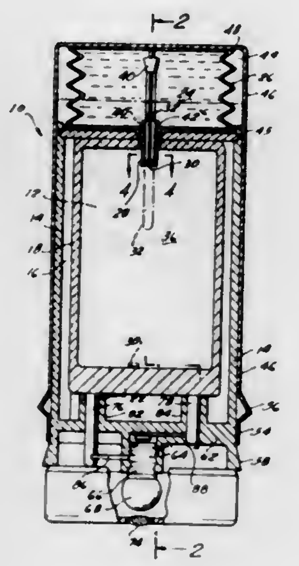


A one-shot sensor valve receives a mechanical force from pump rod movement and operates to pressurize a one-shot air tank from a regulated air supply. When the pump rod moves back to its original position, the one-shot tank is discharged into fluidic logic circuitry which energizes a counter and passes the air signal to a ratemeter transfer valve and into a one-shot storage valve. The one-shot storage valve stores air pressure in a second one-shot air tank and a time air tank receives compressed air at a constant and predetermined rate from a flowrater through the ratemeter transfer valve. When the transfer valve is energized, the pressure in the time tank is transferred through a booster relay to a readout device. As the signals are coupled from the counter to the ratemeter, the second one-shot air tank is released into a dump pilot valve operator and a dump valve to discharge the time air tank. In the time between the dumping of the time tank and its transfer into the readout device, the time tank is building pressure at a set rate determined by the flowrater. The time between pulses is then represented by a pressure buildup in the time tank. In an alternative embodiment, the flowrater is replaced with a timing motor which drives a timing disc having a hole therethrough which causes air to be passed alternately through a pair of air switches which respectively cause an air volume tank to be pressured up and dumped at a rate commensurate with the rotation of the disc. Based upon the principal that when a given volume of air at a given pressure is allowed to expand into a second volume on a timed cycle, the resultant pressure at any time is a measure of the time from the first cycle to the time of measurement, the pressure in the air timing tank at any time is thus proportional to the rate of pulses generated by the one-shot sensor valve or by the mechanical force that causes the one-shot sensor valve to operate.

3,716,708
FLASHLIGHT WITH RESERVE CELL

Gordon E. Kaye, Irvington, N.Y., assignor to P. R. Mallory & Co., Inc., Indianapolis, Ind.

Filed Aug. 17, 1970, Ser. No. 64,456
Int. Cl. F21l *7/00*
U.S. Cl. 240—10.6 R **7 Claims**



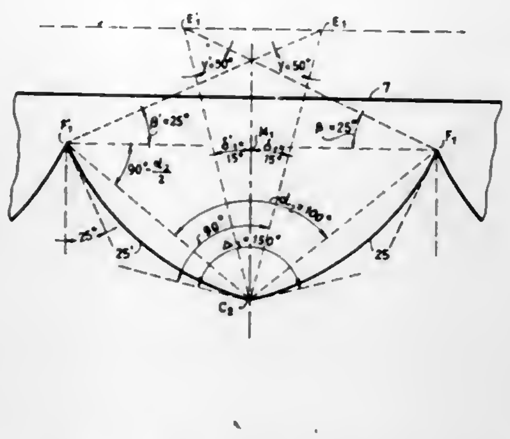
A reserve cell battery serves as a handle for a flashlight, made to be an economical throw-away unit to be discarded after the cell is used up.

3,716,709
ZERO LUMINANCE LIGHTING PANEL

Ingacio Goytisolo Taltavull, Calle Madrazo, 83, Barcelona, Spain

Filed June 14, 1971, Ser. No. 152,726
Int. Cl. F21v *5/04*
U.S. Cl. 240—106.1 **10 Claims**

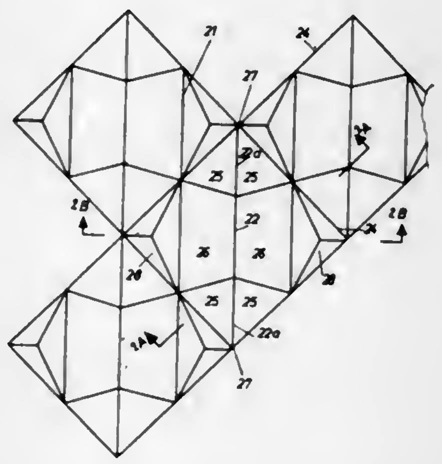
A transparent prismatic lighting panel, having on its exterior surface a multiplicity of pyramids or cones having curved lateral surfaces. The curvature being such that substantially all of the light rays refracted through these surfaces form, with the axis of the pyramid or cone, angles which do not fall between 60° and 90°. As a result of which the panel gives rise to substantially zero luminance.



3,716,710
LAMP COMPRISING AN ELONGATED LIGHT SOURCE, PARTICULARLY A ROD-SHAPED FLUORESCENT LAMP, AND SHADE OF TRANSPARENT MATERIAL

Friedrich Clostermann, Hagen, and Han-Joachim Richter, Neheim-Husten, both of Germany, assignors to Trilux-Lenze KG, Neheim-Husten, Germany

Filed April 16, 1970, Ser. No. 29,088
Claims priority, application Germany, April 21, 1969, P 19 20 071.6
Int. Cl. F21v *5/00*
U.S. Cl. 240—106 R **9 Claims**

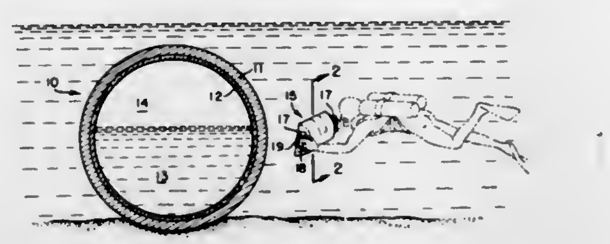


A lamp comprising an elongated light source, such as a rod-shaped fluorescent lamp, and a lamp shade of transparent material. The lamp shade has its surface provided with a first set of grooves defining ridged elevations between them and extending parallel to the axis of the elongated light source, and two sets of diagonal grooves symmetrically crossing said first set of grooves in such a manner that the vertex lines defining the bottoms of the troughs formed by the diagonal grooves intersect on the lines of the ridges between neighboring longitudinal grooves and thereby divide the surface into panels of which each contains a prismatic center configuration having a face on each side of a longitudinal ridge, two quarter faces divided by a hip at each end of the ridge and a triangular base pyramid adjoining the foot of the face on each side of the ridge.

3,716,711
WATER LEVEL GAUGE USING NEUTRON SOURCE

Bernhardt D. Olesen, San Diego, Calif., assignor to the United States of America as represented by the Secretary of the Navy

Filed June 18, 1971, Ser. No. 154,321
Int. Cl. G01n *21/26*
U.S. Cl. 250—43.5 **4 Claims**

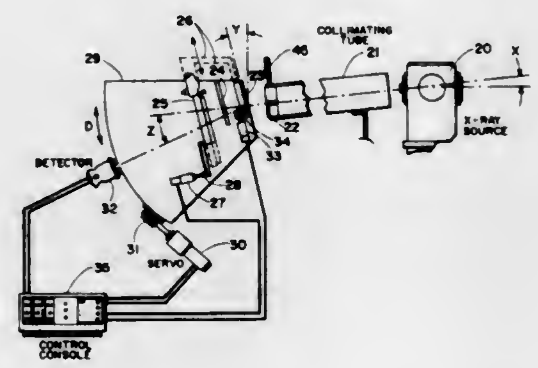


A radioactive source of energy emitting neutrons is placed adjacent a sunken hull and neutrons pass relatively unimpeded through the steel hull and, if included, an internal thermal insulator to a compartment interior. If the compartment is unflooded, most neutrons continue on their way, but if the interior is filled with water, a great many of the neutrons are partially backscattered as they encounter the water medium with a percentage of the backscattered neutrons impinging on a particle detector. The particle detector produces signals representative of the backscatter intensity to an indicator which provides an indication to a diver as to whether or not a compartment is flooded. By relocating the invention along the vertical dimension of the compartment and noting where there is an insignificant level of back-scattering, the level to which the chamber is flooded is determined from the vessel's exterior.

3,716,712
APPARATUS FOR AND METHOD OF ORIENTING CRYSTAL WAFERS

Bernhard Peter Piwczyk, Kanata, Ontario, Canada, assignor to Northern Electric Company Limited, Montreal, Quebec, Canada

Filed Sept. 27, 1971, Ser. No. 183,782
Int. Cl. G01n *21/00*
U.S. Cl. 250—51.5 **11 Claims**



Method of and apparatus for orienting crystal wafers, particularly for producing X-ray diffraction topographs. The wafer is mounted slightly inclined to the vertical and rotation about the θ and γ axes is carried out under control of circuits responsive to the intensity of diffraction. The wafer is oriented automatically at a rotative position giving maximum diffraction for each axis. To produce a topograph, scanning of the wafer is provided.

3,716,713
INPUT SCREEN FOR IMAGE DEVICES HAVING REDUCED SENSITIVITY IN THE CENTAL REGION

Nathan D. Levin, Los Altos Hills, Calif., assignor to Varian Associates, Palo Alto, Calif.

Filed Jan. 9, 1969, Ser. No. 790,144
Int. Cl. H01j *1/62*
U.S. Cl. 250—80 **3 Claims**

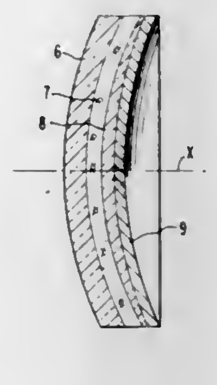
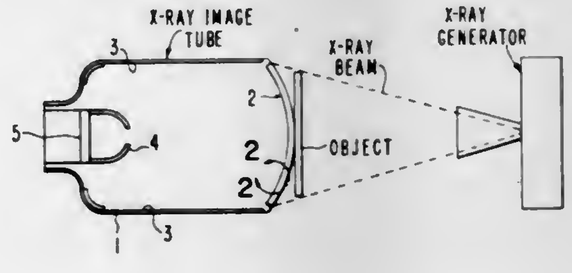


Image device input screen having greater image conversion efficiency in the peripheral region of the screen than in the central region. Preferred embodiments include, separately or in combination, a screen scintillator having the shape of a diverging meniscus, a semi-transparent screen filter layer having the shape of a converging meniscus, and variations in regional compositions of a screen photocathode.

3,716,714
X-RAY IMAGE TUBE HAVING AN OXIDIZED VANADIUM BARRIER INTERPOSED BETWEEN THE SCINTILLATOR AND PHOTOCATHODE

Andreas Niewold, Sunnyvale, and Judith Q. Pon, Cupertino, both of Calif., assignors to Varian Associates, Palo Alto, Calif.

Filed Nov. 15, 1968, Ser. No. 776,089
Int. Cl. G01t *1/20*
U.S. Cl. 250—83.3 **13 Claims**



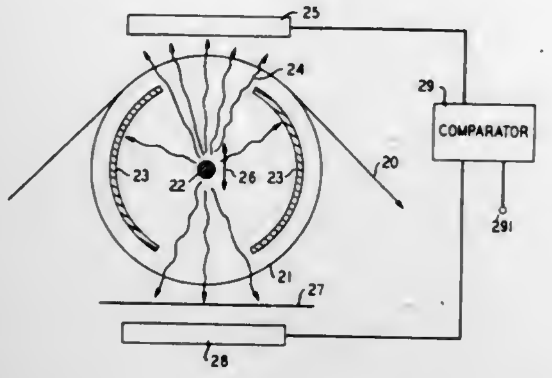
An X-ray image tube is disclosed having a glass barrier comprising oxidized vanadium interposed between the tube scintillator and photocathode.

3,716,715
THICKNESS MEASUREMENTS USING THE MOSSBAUER EFFECT

Richard Lewis Cohen, Berkeley Heights, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill and Berkeley Heights, N.J.

Filed Dec. 4, 1970, Ser. No. 95,126
Int. Cl. G01t *1/16*
U.S. Cl. 250—83.30 **5 Claims**

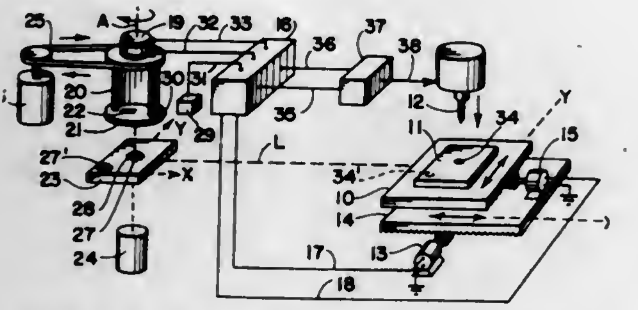
Resonant gamma ray absorption techniques (Mössbauer effect) are used to monitor the thickness of foils or deposited layers containing tin, iron and a number of other elements. The measurements are non-destructive and largely independent of environmental factors such as surface residues (e.g., chemical salts or dirt) and surrounding fluids (e.g., lubricants or plating baths).



3,716,716
PHOTOELECTRIC TWO AXIS POSITIONING SYSTEM

William F. Marantette, and Ruth B. Marantette, both of 20624 Earl St., Torrance, Calif.

Filed Aug. 26, 1971, Ser. No. 175,258
Int. Cl. G01j *1/20*
U.S. Cl. 250—203 R **7 Claims**



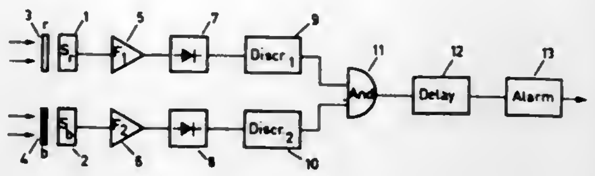
A member is capable of being positioned at precise rectangular coordinate points by providing a circular hole in the member. A light source is positioned on one side of the member and a photocell on the other side to receive light passing through the hole along a given axis corresponding precisely to the coordinate points. A slot is provided between the photocell and hole and extends radially from the given axis beyond the boundary of the hole. By revolving this slot about the said given axis, the photocell will then receive a constant amount of light through the slot for every revolved position only if the hole in the member is exactly centered on the given axis. Any off-centering of the hole from this given axis results in a variable amount of light passing to the photocell from the slot. The resulting variable electrical signal derived from the photocell is then used to actuate servo-motors to move the member in a proper direction to minimize the variations in the signal thereby effecting exact centering of the hole and thus the member at the precise coordinate points.

3,716,717
FLAME DETECTOR AND ELECTRICAL DETECTION CIRCUIT

Andreas Scheidweiler, Stafa, and Peter Muller, Oetwil am See, Switzerland, assignors to Gerberus A.G., Mannedorf, Switzerland

Filed May 28, 1971, Ser. No. 147,826
Claims priority, application Switzerland, Apr. 8, 1971, 5,193/71
Int. Cl. G02t *1/28*
U.S. Cl. 250—217 F **8 Claims**

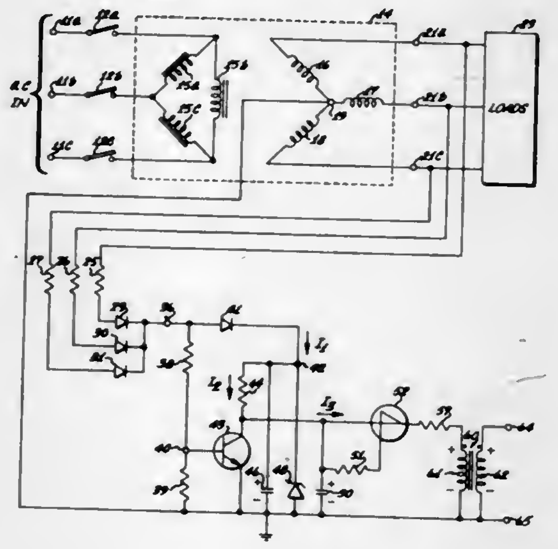
A photoelectric transducer provides signals responsive to a flame; the signals are applied to frequency selective amplifiers, having their frequency ranges of amplification so set that the lower limit of the frequency band of one amplifier is not more than twice the frequency of the upper limit of the other amplifier, preferably each with frequency band width in the order of $\sqrt{2}$, adjacently located, so that harmonics of sensed frequencies are effectively excluded from amplification, while separate amplification channels amplify frequencies of different band width. The overall frequency band width of amplification is preferably between 2 and 40 Hz.



3,716,718
LOSS OF PHASE DETECTOR FOR A POLYPHASE POWER SYSTEM

John R. Nowell, Phoenix, and Luther L. Genuit, Scottsdale, Ariz., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Filed Apr. 3, 1972, Ser. No. 240,608
Int. Cl. H02j *3/00*
U.S. Cl. 307—13 **4 Claims**



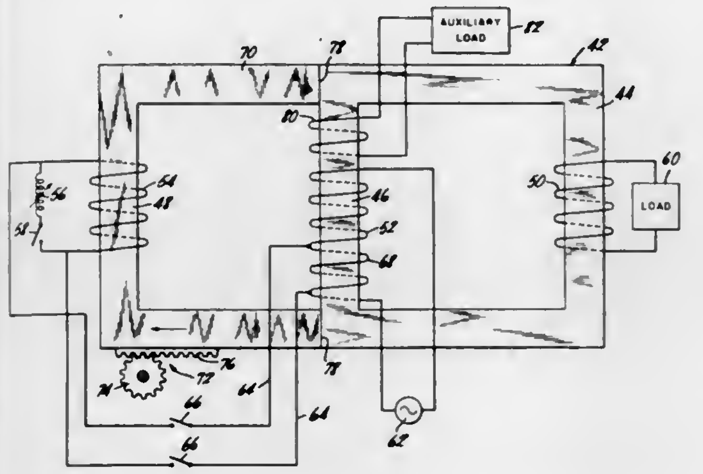
The improved loss of phase detector employs a plurality of diodes connected between a transistor and a polyphase A.C. power system. A single transistor and a silicon unilateral switch provide an alarm signal when power is lost in any one of the phases of the polyphase system. Few components are used so the cost of the detector is relatively low.

3,716,719
MODULATED OUTPUT TRANSFORMERS

Henry W. Angelery, Closter, N.J., and Glenn R. Mohr, Linthicum, Md., assignors to Aerco Corporation, Northvale, N.J.

Filed June 7, 1971, Ser. No. 150,682
Int. Cl. G05f *3/04*
U.S. Cl. 307—17 **8 Claims**

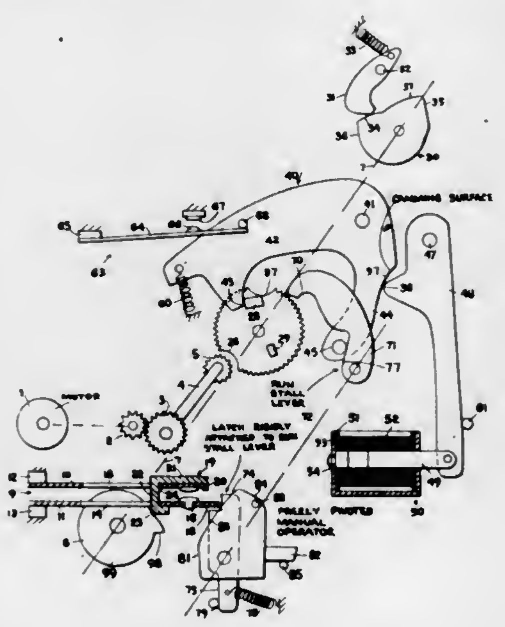
A transformer core has three legs. A variable output secondary winding encircles one leg, and a primary winding encircles another. The voltage across the variable output secondary winding is controlled by varying the amount of leakage flux passing through the third leg. This can be accomplished by providing a separately formed core piece that is movable to vary its area of contact with the third leg. Alternatively, a control winding can be provided which encircles the third leg. The current induced in the control winding, which is modulated by a variable control impedance connected across it, produces a flux that, in proportion to its strength, opposes the primary winding flux, thereby increasing the amount of flux that passes through the secondary winding. A fixed output voltage can be obtained from an additional secondary winding that encircles the same leg as the primary winding.



3,716,720
CONDITION CONTROL DEVICE AND SYSTEM

John L. Harris, Hartland, Wis., assignor to Deltrol Corp., Bellwood, Ill.

Filed April 12, 1971, Ser. No. 133,077
Int. Cl. H01h *7/00*
U.S. Cl. 307—141 **8 Claims**

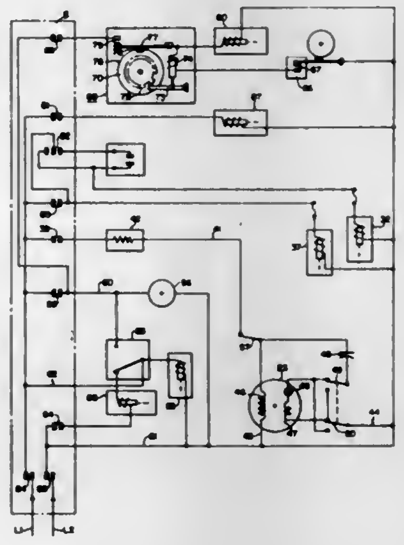


Protection against refrigeration compressor burnout by short cycling is provided by a time delay switching mechanism having a motor and a solenoid controlled by a room thermostat. The motor runs continuously and the solenoid stops and starts the timer by stalling or releasing the timer gear. The timer gear has teeth omitted at the stalling points to allow the motor to run free. A starter cam follower bearing on a starter cam serves to start the timer gear when released by the solenoid. The solenoid operates the stalling and switch control mechanism through a compound leverage and camming system compensating for the non-linear pull curve of the solenoid. The device also includes a combination cam and latch operated switch in which one switch blade carries a follower lifting another blade which is then held by the latch when the follower drops to close the switch. A manual operator is provided for closing the switch independently of the timing mechanism. This manual operator is released automatically by the solenoid dropping out when the thermostat becomes satisfied. The timer also includes an arrangement for locking the compressor switch closed for a period of time when it first closes to allow the system to settle down and thus avoid short cycling.

3,716,721
CONTROL SYSTEM FOR WASHING APPARATUS

Harold F. Gorsuch, Mansfield, Ohio, assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed July 8, 1971, Ser. No. 160,590
Int. Cl. H02p *3/00*
U.S. Cl. 307—141.4 **9 Claims**

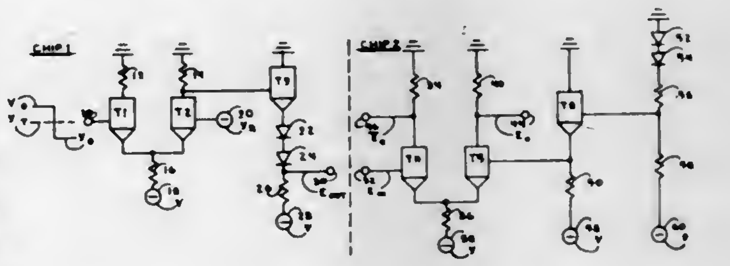


Control for clothes washing machine apparatus incorporating means for extending a predetermined portion of the cycle of operation as desired by the user. The control is further characterized by the provision of a main motor reversing control which along with the cycle extending means is incorporated into what would otherwise by considered a conventional washing machine timer or control.

3,716,722
TEMPERATURE COMPENSATION FOR LOGIC CIRCUITS

Richard W. Bryant, Poughkeepsie, and George K. Tu, Wappingers Falls, N.Y., assignors to Cogar Corporation, Wappingers Falls, N.Y.

Filed Apr. 29, 1970, Ser. No. 32,922
Int. Cl. H03f *1/30;* **H03k** *19/30, 19/34*
U.S. Cl. 307—215 **7 Claims**

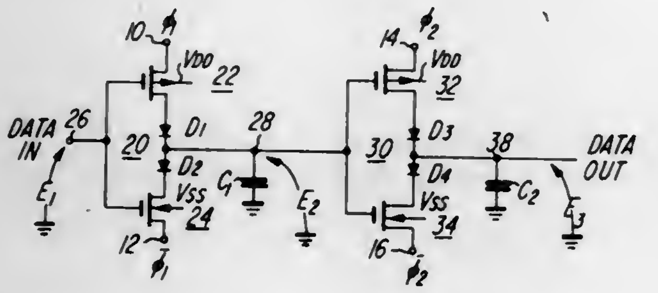


A temperature compensation circuit for an emitter-coupled circuit. Instead of using a fixed reference voltage, the reference voltage is derived from various active devices such that it varies with temperature in the same manner as the input signal levels vary with temperature. By causing the reference voltage to change in accordance with changes in temperature, it is possible to design circuits which have small signal swings yet interface with each other, and are capable of high switching speeds over relatively large temperature ranges.

3,716,723
DATA TRANSLATING CIRCUIT

Robert Charles Heuner, Bound Brook, and Stanley Joseph Niemiec, Somerville, both of N.J., assignors to RCA Corporation

Filed July 6, 1971, Ser. No. 159,779
Int. Cl. G11c *19/00*
U.S. Cl. 307—221 C **8 Claims**

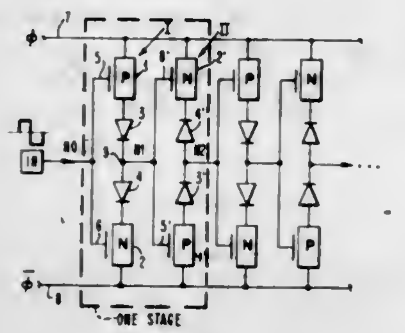


Two current carrying paths, each connected between a different clock pulse terminal and a common capacitive output node, each path including a field-effect transistor in series with a diode. The diodes are poled to permit the node to be charged when one transistor is turned on and discharged when the other transistor is turned on. The clock pulses, during one time interval, cause current to flow through the one of the paths with the turned on transistor, and during the following time interval prevent current flow in either path.

3,716,724
SHIFT REGISTER INCORPORATING COMPLEMENTARY FIELD EFFECT TRANSISTORS

James T. Parrish, Carmel; Dominic P. Spampinato, Ozone Park, and Lewis M. Terman, South Salem, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed June 30, 1971, Ser. No. 158,496
Int. Cl. G11c *19/00*
U.S. Cl. 307—221 C **14 Claims**

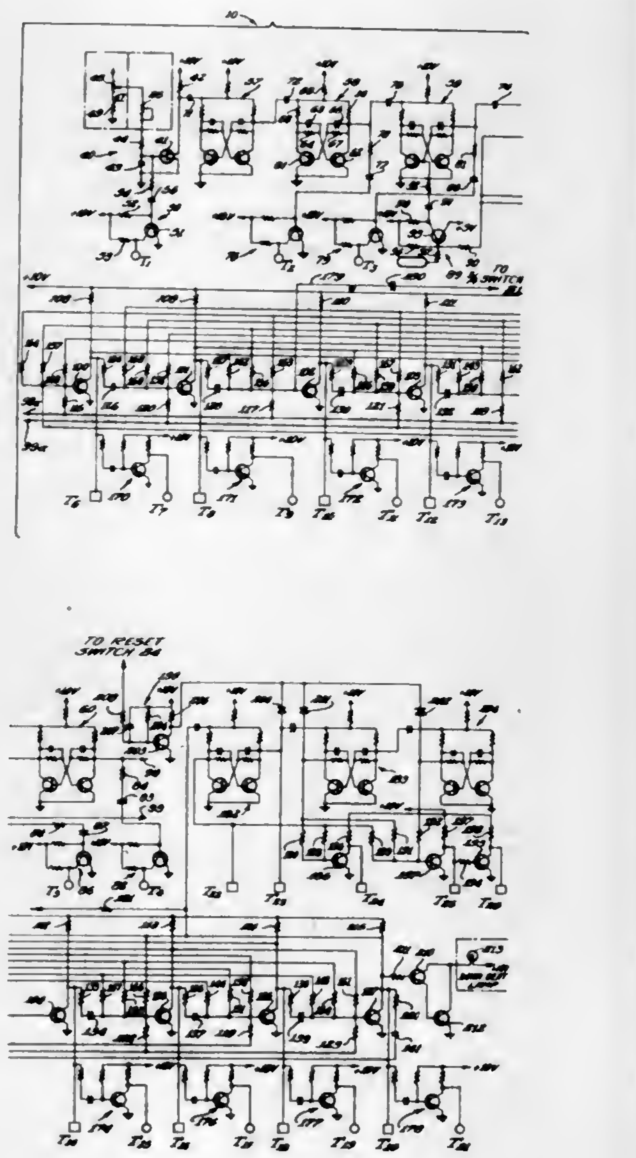


An inverter incorporating a pair of complementary field effect transistors and a pair of Schottky barrier diodes disposed in series with the complementary transistors is disclosed. The gates of the complementary transistors are connected in parallel to a pulsed source which provides positive and negative inputs to the inverter. First and second pulsed sources are connected to the inverter which, during an ENABLE cycle, provide voltages of opposite polarity to the inverter which, operating in a common source mode, charges an output to one of the source potentials. During a DISABLE cycle, the potential at the output is locked at a node by applying to the inverter potentials complementary to those initially applied to the inverter. A shift register stage consisting of the arrangement just described and an inverted inverter is also disclosed. When this shift register stage is actuated, during the ENABLE portion of a given cycle, one inverter is enabled while the other is disabled and, during the DISABLE portion of the given cycle, the other inverter is enabled while the first inverter is disabled. Also included are embodiments which are operable in a static mode as well as a dynamic mode.

3,716,725
RING COUNTER

Alfred B. Freeman, Malibu, Calif., assignor to Chicago Musical Instruments Co., Chicago, Ill.

Division of Ser. No. 699,149, Jan. 19, 1968, Pat. No. 3,553,334. This application Jan. 4, 1971, Ser. No. 103,675
Int. Cl. H03k *23/08*
U.S. Cl. 307—223 **3 Claims**



An electronic ring counter driven by a source of pulses and having controls to bypass some of the stages of the ring counter, each stage employing a single transistor.

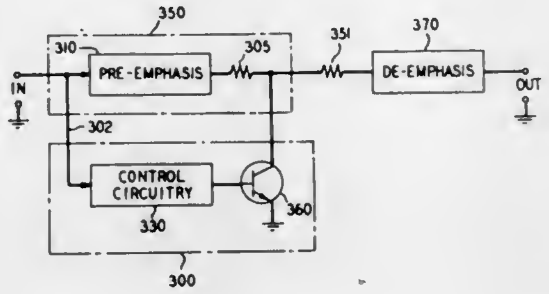
3,716,726
CENTER CLIPPER

David Carlaw Trimble, Holmdel, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill and Berkeley Heights, N.J.

Filed July 13, 1971, Ser. No. 162,155
Int. Cl. H03k *5/08*
U.S. Cl. 307—237 **9 Claims**

In a low distortion center clipper, comparator circuitry including two differential amplifiers provides a control

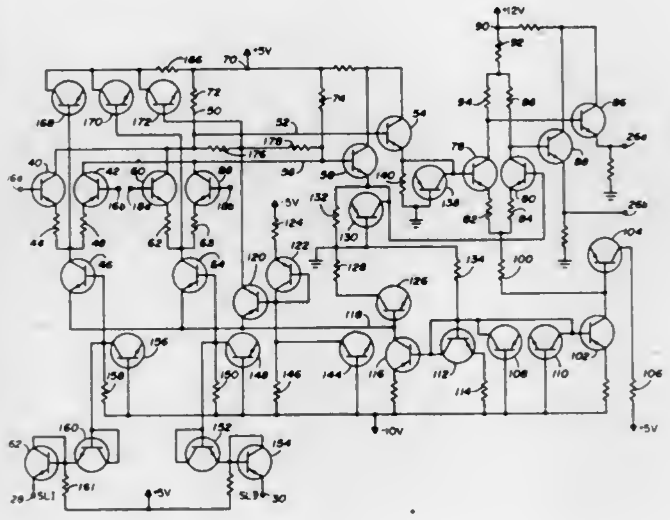
signal when the instantaneous magnitude of the signal to be center clipped lies within the clipping range. The center clipper is coupled to a transmission path, the input to which is the signal to be center clipped, and switching circuitry in the center clipper interrupts the transmission path in response to the control signal.



3,716,727
SWITCHED AMPLIFICATION SYSTEM HAVING RADIATION COMPENSATION CIRCUITRY

Robert A. Stehlin, and Hilton W. Spence, Richardson, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 29, 1969, Ser. No. 888,393
Int. Cl. H03k *17/00*
U.S. Cl. 307—243 **16 Claims**



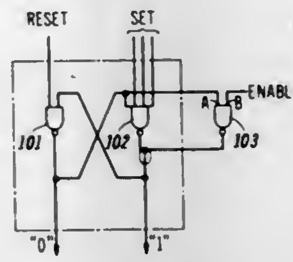
First and second radiation-compensated differential amplifiers are each connected to receive different low level input signals. The outputs of the differential amplifiers are fed into a third amplifier through buffer stages. Switching circuitry is provided to selectively actuate either of the first or second amplifiers to exclusively feed signals into the third amplifier.

3,716,728
MINIMUM DELAY DATA TRANSFER ARRANGEMENT

Victor Hachenburg, Naperville, Ill., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill and Berkeley Heights, N.J.

Filed Oct. 12, 1970, Ser. No. 79,976
Int. Cl. G11c *19/00;* **H03k** *3/286*
U.S. Cl. 307—291 **5 Claims**

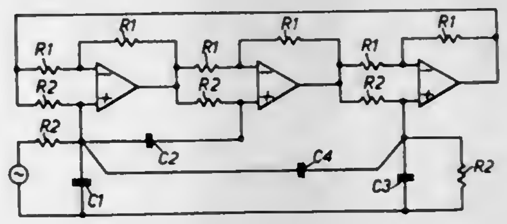
A register structure for a data processor comprising a plurality of multibit flip-flop registers interconnected by means of a data transfer bus is disclosed. The bus comprises a plurality of individual conductors, each individual conductor interconnecting flip-flops similarly situated in each of the plurality of registers. An input gating arrangement for gating data into the flip-flops provides for a transfer of data with minimum delay.



3,716,729
ALL-PASS AND LOW-PASS FILTER COMPRISED OF ACTIVE ELEMENT CIRCULATORS

John Mortimer Rollett, London, England, assignor to The Post Office, London, England

Filed Sept. 8, 1969, Ser. No. 855,879
Int. Cl. H03h *7/02, 11/00*
U.S. Cl. 307—295 **13 Claims**



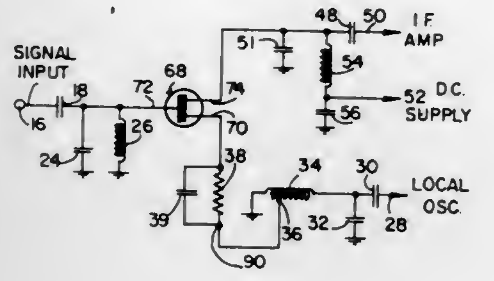
This specification discloses the use of a circulator having at least three ports for the simulation of networks which in their normal realisations include one or more inductive elements. Various circuit arrangements are described including one or more capacitors connected in respective paths between different pairs of ports of the circulator and possibly also including one or more capacitors connected from ports of the circulator to ground, input and output ports of the circuits being connected to ports of the circulator. Depending on the different connections of the capacitors of the circulator low-pass and all-pass filters of various orders can be produced. The use of the invention has the advantage that the filters can be produced without the incorporation of physical inductors which is of importance in the realisation of the filters in micro-circuit form.

3,716,730
INTERMODULATION REJECTION CAPABILITIES OF FIELD-EFFECT TRANSISTOR RADIO FREQUENCY AMPLIFIERS AND MIXERS

Frank J. Cerny, Jr., North Riverside, Ill., assignor to Motorola, Inc., Franklin Park, Ill.

Filed April 19, 1971, Ser. No. 135,278
Int. Cl. H03k *1/16*
U.S. Cl. 307—295 **9 Claims**

Mixers and amplifier circuits are disclosed which may include a plurality of identical FETs connected in parallel to form a composite FET. The decreased input impedance of the composite FET as compared to the input impedance of a single FET results in a decrease in intermodulation. The composite FET may also be a power or large signal FET. In either case, the pinch-off voltage of the composite FET can also be

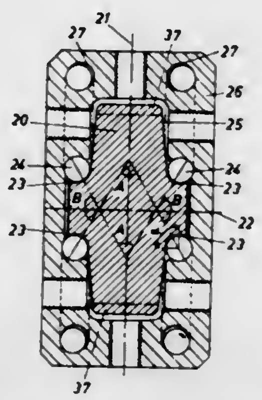


increased to provide a still further decrease in intermodulation.

3,716,731
ARRANGEMENT FOR RECTILINEAR GUIDING OF A MACHINE MEMBER ALONG A BEAM

Sven Walter Nilsson, Partille, Sweden, assignor to SKF Industrial Trading and Development Co. N. V., Overtoom, the Netherlands

Filed July 19, 1971, Ser. No. 163,587
Int. Cl. H02k *41/02*
U.S. Cl. 310—13 **6 Claims**



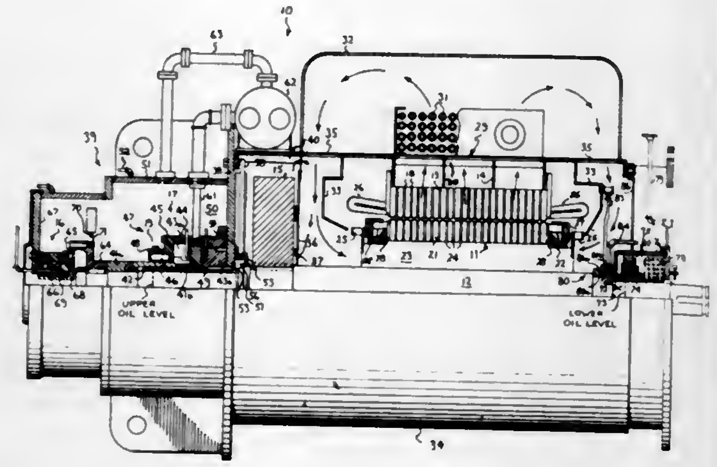
In a rectilinear guiding, a machine member being moveably supported on recirculating balls along a straight guide, said guide being designed as a beam, the cross sectional structure of which giving a high resistance to bending in all directions. Angular contact ball tracksbeing formed in machine member and beam, which latter is designed with ramps forming tangents to said tracks and smoothly sloping away therefrom in order to give the balls a smooth operation at the entry to and the egress from the loaded zone. The beam may preferably be composed by a compound material and serve as an active part of an electric linear motor being attached to the machine member.

3,716,732
VERTICAL INDUCTION MOTOR

James Earl Tillma, Schenectady, N.Y., assignor to General Electric Company

Filed Sept. 21, 1970, Ser. No. 73,767
Int. Cl. H02k *9/00*
U.S. Cl. 310—61 **6 Claims**

A vertical induction motor is described characterized by a rotor, a single flywheel, a double acting thrust bearing and an anti-reverse device sequentially mounted along the motor shaft. A partition serves to separate the double acting thrust bearing from the flywheel and the thrust bearing is enclosed within a housing which encompasses an oil reservoir in association with a sleeve concentrically mounted between the motor shaft and the thrust bearing. In the event of minor leakage, oil between the sleeve and the shaft is removed by centrifugal action at a shoulder situated along the shaft and the oil is collected in a centrifugal seal having an upwardly protruding annular lip proximate the motor shaft. A second partition also is disposed between the rotor and the flywheel to restrict contact between the flywheel and air circulating

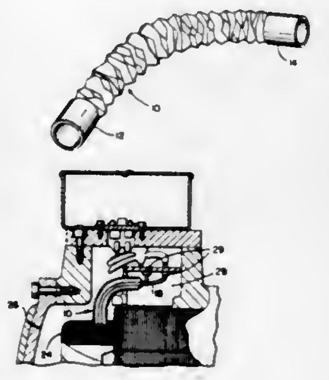


within the rotor except at selected apertures disposed radially inward of the partition. Circulating air thus flows in a first radially inward direction on one side of the partition free from interference with the rotating flywheel while flowing in an opposite direction on the other side of the partition proximate the flywheel.

3,716,733
ELECTRIC MOTOR WITH CORRUGATED PLASTIC PROTECTIVE COVERING ON THE LEAD WIRES

M. Robert Keith, 205 Bristol Road, St. Louis, Mo., and Richard C. Barnes, 5019 Derby Lane, Indianapolis, Ind.

Filed Feb. 2, 1972, Ser. No. 222,891
Int. Cl. H02k *5/00;* **H01b** *17/58*
U.S. Cl. 310—71 **7 Claims**



Electrical lead wires, for example, from the stator of a hermetically sealed electric motor to a junction box are encased in a corrugated sheath of polyethylene terephthalate. The corrugations effectively increase the spacing between the primary insulation on the lead wires and regions of potential insulation abrasion and wear on the stator laminations or the compressor casing.

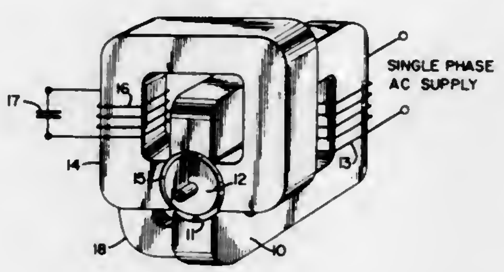
3,716,734
PARAMETRIC MOTOR

Wagih Zaki Fam, Halifax, Nova Scotia, Canada, assignor to Canadian Patents and Development Limited, Ottawa, Ontario, Canada

Filed Oct. 18, 1971, Ser. No. 189,886
Int. Cl. H02k *11/00*
U.S. Cl. 310—72 **3 Claims**

An alternating current electric motor having a rotor, a first magnetic structure defining a first magnetic circuit, a second magnetic structure defining a second magnetic circuit, said first and second magnetic circuits

including the said rotor in their magnetic paths, said first and second magnetic structures each having portions generally at right angles to each other, a first winding on said first structure and connected for energization from an alternating current single phase supply, a second winding

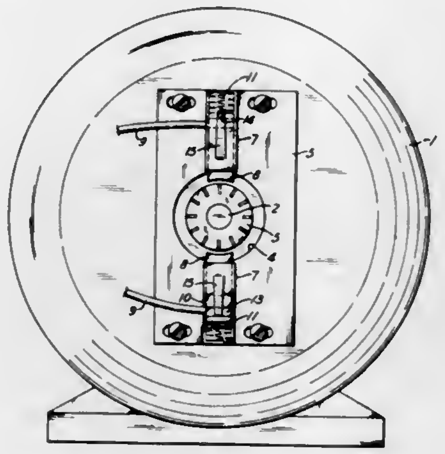


on the said second structure connected to a capacitor to form a closed electrical circuit, said first and second windings positioned in space such that the second winding is excited parametrically from the first winding producing a flux in the second structure 90° out of phase with the first.

3,716,735
ELECTRICAL BRUSH ASSEMBLY

William L. Dippold, St. Marys, Pa., assignor to Stackpole Carbon Comapny, St. Marys, Pa.

Filed Aug. 25, 1971, Ser. No. 174,690
Int. Cl. H02k *13/00*
U.S. Cl. 310—240 **3 Claims**



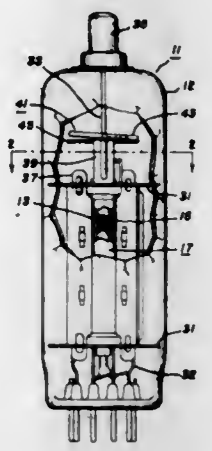
An electric brush is slidably disposed in the socket of a holder, with a spring compressed between the inner ends of the brush and socket. The side of the brush has a recess near its inner end beside an opening in the holder. Extending into this recess is the free end of a tongue that is joined to the holder to hold the brush retracted against the pressure of the spring. A similar brush arrangement is spaced far enough from the one just described for an armature or the like to be inserted between the brushes without touching them. Then the tongues are bent out of the brush recesses so that the springs can expand and move the brushes into engagement with the armature.

3,716,736
ELECTRON DISCHARGE DEVICE

Walter T. Millis, Owensboro, N.Y., assignor to General Electric Company

Filed Oct. 2, 1958, Ser. No. 764,988
Int. Cl. H01j *1/02*
U.S. Cl. 313—39 **17 Claims**

7. A high-power electron discharge rectifier, comprising an anode and a cathode supported in spaced relation thereto, said anode comprising a substantially cylindrical member of plural-layer material defining a barrel portion generally enclosing said cathode and a pair of free ends, said plural-layer material comprising at least one layer of high heat conductivity material disposed to form the surface of the barrel nearer

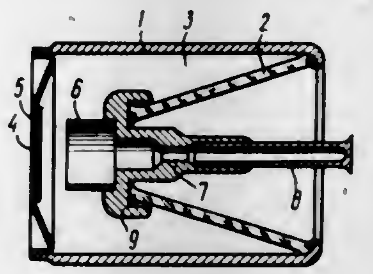


said cathode, whereby to facilitate conductive cooling of said anode and thus to minimize formation of hot spots thereon, and means joining said ends in juxtaposed relation over a portion thereof to define a web, the remote end portions being outwardly flared to provide oppositely extending wings.

3,716,737
X-RAY PULSE TUBE

Nikolai Vasilievich Belkin, ulitsa Tolyatti 11, kv. 39; Eduard-Gfly Vitalievich Alexandrovich, ulitsa Pobedy 19, kv. 10; Anatoly Alexandrovich Razin, ulitsa Lenina 32, kv. 16; Mikhail Alexeevich Kanunov, ulitsa Pushkina 26, kv. 11; and Veniamin Aronovich Tsukerman, ulitsa Vavilova 15, kv. 75, all of Moscow, U.S.S.R.; and Galina Nikolaevna Sloeva, prospekt Narodnogo Opolchenia 177, kv. 62; Leonard Vasilievich Svetkov, prospekt Slavy 20, kv. 119; and Ninel Alexeevna Dron, Kostromskoi prospekt 22, kv. 71, all of Leningrad, U.S.S.R.

Filed Mar. 17, 1971, Ser. No. 125,031
Claims priority, application U.S.S.R., Mar. 23, 1970, 1,418,567
Int. Cl. H01j *19/42*
U.S. Cl. 313—59 **1 Claim**



An X-ray pulse tube wherein the envelope is so designed that the insulation element which is one of the structural components of the tube envelope is completely disposed inside, and is connected to the inner surface of the metal element which is the other structural component of the envelope, which makes it possible to reduce the size of the tube, improve its mechanical and electrical strength and increase the intensity of X-ray flashes.

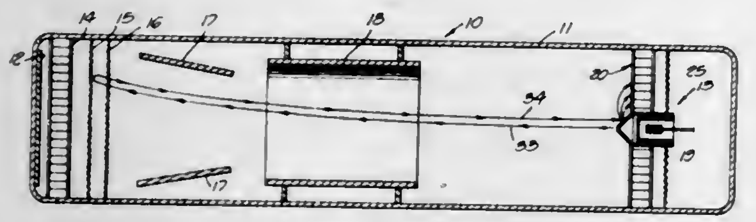
3,716,738
TELEVISION CAMERA TUBE HAVING CHANNEL MULTIPLIER SURROUNDING ELECTRON GUN

Johann Battesta Beeli, Sylmar, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 850,749, Aug. 18, 1969, abandoned. This application April 26, 1971, Ser. No. 137,636

Int. Cl. H01j *31/28, 31/32, 43/24*

U.S. Cl. 313—65 R **4 Claims**



A television camera type tube including a target and an electron gun for producing an electron beam to scan the target. The scanning beam causes a return beam to be produced. A channel-type secondary electron multiplier is located near the gun end of the tube to receive electrons in response to the electrons moving in the return beam.

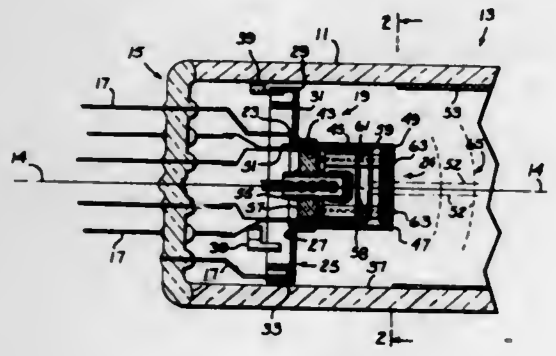
3,716,739
ELECTRON GUN SUPPORT AND SHIELDING MEANS

Donald L. Say, Seneca Falls, N.Y., assignor to GTE Sylvania Incorporated

Filed Aug. 31, 1971, Ser. No. 176,503

Int. Cl. H01j *29/02, 1/92*

U.S. Cl. 313—82 R **2 Claims**



Improved means are provided for supporting and shielding a compact electron gun within the neck portion of a cathode ray tube. An annular member, dimensioned to closely approach the internal diameter of the neck, is formed for attachment to at least three spaced-apart stem leads. An open-ended closed-wall portion, upstanding from the central aperture of the annular member, is dimensioned to encompass the whole of the electron gun therein. Gun retention means are employed to hold the gun within the closed-wall portion in a manner that the forward end of the gun is positioned at the terminal thereof.

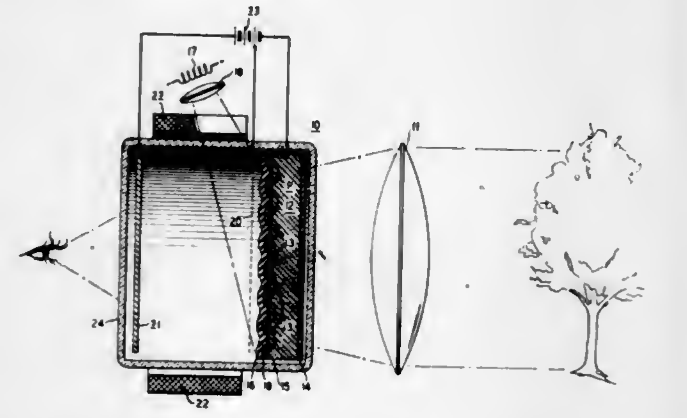
3,716,740
PHOTOCATHODE WITH PHOTOEMITTER ACTIVATION CONTROLLED BY DIODE ARRAY

Merton Howard Crowell, Morristown, and Eugene Irving Gordon, Convent Station, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill and Berkeley Heights, N.J.

Filed Sept. 18, 1970, Ser. No. 73,490

Int. Cl. H01j *31/48*

U.S. Cl. 315—11 **5 Claims**



The specification describes a new type of photocathode comprising a semiconductor diode-array light sensing element in combination with a photoemissive coating. The spatial pattern of electron emission from the photoemitter is controlled by the localized field in the diode array. The local intensity of this field gives a spatial representation of the image incident on the diode array. With a silicon diode array infrared and X-ray response are inherent.

3,716,741
METHODS OF STIMULATING LUMINESCENCE IN PHOSPHORS

Rustum Roy, 528 S. Pugh St.; Heinz K. Henisch, 346 W. Hillcrest Ave.; and William B. White, 542 Glenn Road, all of State College, Pa. 16801

No Drawing. Filed Oct. 15, 1971, Ser. No. 189,765

Int. Cl. H05b *33/00*

U.S. Cl. 313—108 R **13 Claims**

Luminescence is caused by subjecting a luminescent phosphor to excitation by a stream of excited, electrically neutral species, so as to cause an energy transfer from said excited species to said luminescent phosphor, whereby said phosphor is caused to luminesce. In a preferred embodiment, the neutral species is OH*, and the phosphor is a rare earth oxide phosphor containing a terbium oxide or europium oxide activator.

3,716,742
DISPLAY DEVICE UTILIZATION GAS DISCHARGE

Norihiko Nakayama, Kobe, and Mitsuoki Osawa, 641-1-1, Okubomachi, Okubo-cho, Akashi-shi, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed March 2, 1971, Ser. No. 120,284

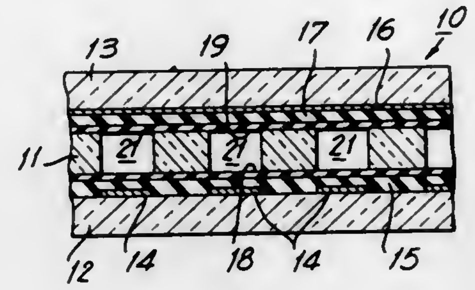
Claims priority, application Japan, March 3, 1970, 45/18213; Dec. 29, 1970, 45/128634

Int. Cl. H01j *61/36*

U.S. Cl. 313—182 **7 Claims**

A pair of insulating substrates are positioned in spaced parallel relation having inside surfaces opposite each other with a gap filled with gas capable of ionization. A first group of electrodes are positioned on the inside surfaces of one of the substrates, and a second group of electrodes are positioned on the inside surfaces of the other of the substrates. The first group of electrodes are positioned in rows and the second group of electrodes are positioned in columns, and the first and second groups of electrodes are transversely positioned relative to each other. The surfaces of the first and second groups of electrodes are covered with dielectric layers, and

each of the dielectric layers is covered with a protective layer to protect the surfaces inside the display device from sputtering. Each cross point of an electrode of the first group and an electrode of the second group is a discharge point for display.



3,716,743
HIGH-PRESSURE METAL-VAPOR DISCHARGE TUBE

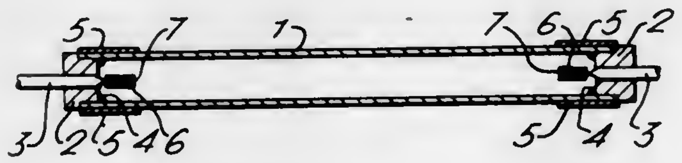
Hideo Mizuno; Sadao Kimura, both of Takatsuki; Hidezo Akutsu, Ashiya; Haruo Yamazaki, Yasu-gun; Takio Okamoto, Kusatsu; Yoshiaki Watarai, and Shoichi Baba, both of Takatsuki, all of Japan, assignors to Matsushita Electronics Corporation, Kadoma City, Osaka Prefecture, Japan

Filed Aug. 28, 1970, Ser. No. 67,691

Claims priority, application Japan, Aug. 29, 1969, 44/69487

Int. Cl. H01j *17/16*

U.S. Cl. 313—220 **10 Claims**



In a discharge tube of saturated metal vapor pressure type containing high-pressure gaseous or vaporized metals, the temperature of the coolest points existing at both ends of the discharge tube can be raised by forming a layer or layers of a metal or metals of high melting point, low vapor pressure and good thermal conductivity, such as niobium, on the outer wall at the ends of the discharge tube; thereby, providing better radiant emission, especially higher color temperature and an improved color rendering property compared with conventional high-pressure metal-vapor discharge tubes. The discharge tube of the above-mentioned construction can be manufactured easily and has a longer life under burning conditions corresponding to those for conventional type high-pressure metal-vapor discharge tubes.

3,716,744
HERMETIC END SEALS FOR ENVELOPE OF A METAL VAPOR LAMP

Andre Emile Delembre, Asmeres, France; Georges Roger Jarrige, deceased, late of Bagneux, France; by Jeanine Jarrige, administratrix, Germain Sucy-en-Brie, and Dat Nhiep Nguyen, Chatenay-Malabrey, both of France, assignors to ITT Industries, Inc., New York, N.Y., by said Delembre and Nguyen

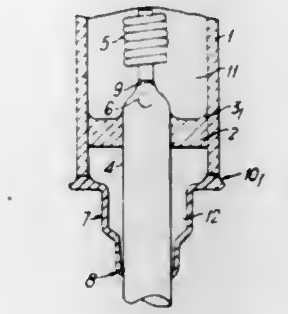
Filed Aug. 13, 1971, Ser. No. 171,578

Claims priority, application France, Aug. 27, 1970, 7031286

Int. Cl. H01j *61/30, 61/36*

U.S. Cl. 313—220 **6 Claims**

An alkali-metal-vapor discharge lamp has an inner vitreous material hermetic seal between an electrode stem and translucent tubular envelope and an outer metal seal between a metal end cap and the envelope. The cap is also sealed to the stem which extends from the tube.



ERRATUM

For Class 315—11 see:
Patent No. 3,716,740

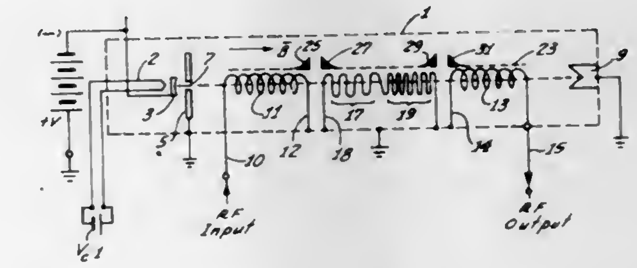
3,716,745
DOUBLE OCTAVE BROADBAND TRAVELING WAVE TUBE

Robert Matthews Phillips, Redwood City, Calif., assignor to Litton Systems, Inc., San Carlos, Calif.

Filed July 22, 1971, Ser. No. 165,263

Int. Cl. H01j *25/34*

U.S. Cl. 315—3.6 **18 Claims**



An O-type traveling wave tube of the invention includes a slow wave structure having a broad band characteristic over a predetermined range of frequencies and in some cases is capable of broad band operation over a double octave of frequencies. In this the slow wave structure comprises a combination of a substantially nondispersive delay line, such as a helix, with a substantially dispersive delay line, such as a ring loop section. The ring loop sections complement in gain the gain drop off characteristic of the helix at the edges of the frequency band at which the gain from the helix circuit tapers off. In this the overall gain of the traveling wave tube is enhanced and extended over a frequency spectrum greater than that which is available solely with the helix construction.

3,716,746
KLYSTRON

Artur Kraus, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Germany

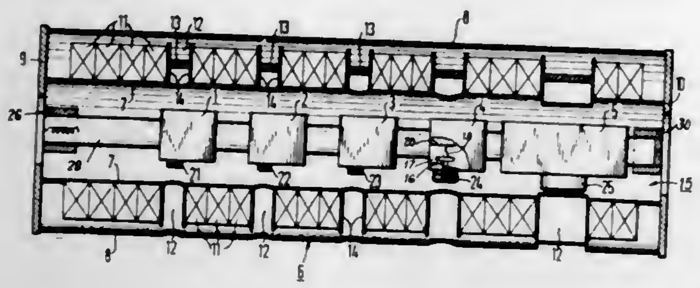
Filed July 22, 1971, Ser. No. 165,100

Claims priority, application Germany, July 24, 1970, P 20 36 942.0

Int. Cl. H01j *23/08*

U.S. Cl. 315—5.35 **6 Claims**

This invention provides an improvement in a Klystron tube assembly including a tube portion installed within an assembled magnetic system, the tube portion having several chambers each of which contains interaction sections and vacuum-closed coupling openings from which coupling conductors can be extended to the exterior of the Klystron, the chambers being arranged between an electron gun and an electron collector, and the surrounding magnetic system producing an axial magnetic field directed essentially parallel to the axis of the beam of the electron gun. The improvement comprises recesses arranged in the magnetic system so that coupling conductors can be shifted therein to be perpendicular to the axis of the electron beam and means arranged on the chambers to have the coupling conductors attached thereto in a manner whereby the tube portion can easily be withdrawn from and inserted into the magnetic system.



3,716,747

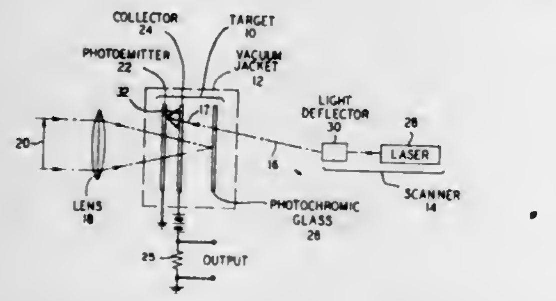
TELEVISION CAMERA TUBE UTILIZING LIGHT BEAM SCANNING

Chandra Kumar Naranbhai Patel, Summit, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill and Berkeley Heights, N.J.

Filed Sept. 4, 1970, Ser. No. 69,539

Int. Cl. H01j *29/46*

U.S. Cl. 315—10 **11 Claims**



The target of a television camera tube includes a photoemitter or a photoconductor and a photochromic glass layer disposed between an image being viewed and the source of a scanning laser beam. The image is focused onto one surface of the photochromic glass layer while the scanning beam is made incident on the opposite surface thereof. The beam transmitted through the layer emerges with modulated intensity corresponding to the intensity pattern of the image and then impinges on the photoemitter, for example, to generate free electrons modulated in scan time in accordance with the image intensity pattern. These electrons are collected to produce an electrical signal representative of the image.

3,716,748

SATURABLE REACTOR FOR CORRECTING RASTER DISTORTION

Takeyoshi Sohoma, Funabashi, Chiba Prefecture, Japan, assignor to Denki Onkyo Co., Ltd., Tokyo, Japan

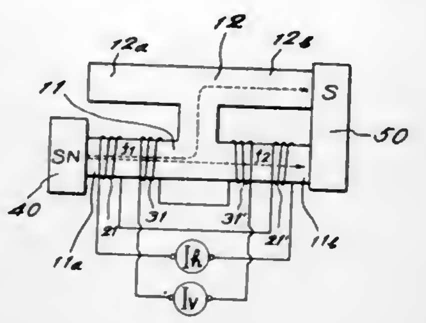
Filed July 29, 1970, Ser. No. 59,155

Claims priority, application Japan, July 24, 1969, 44/73474

Int. Cl. H01j *29/76*

U.S. Cl. 315—27 SR **5 Claims**

A saturable reactor comprising an H-shaped core on which are wound two coils, each coil being divided respectively into two coil parts and each coil part being constituted of symmetrical winding on the left and right arms of a yoke with the coupling part formed on the middle of the aforementioned core as the center. One of the aforementioned coils is constituted so that the magnetic flux generating direction of the pair of coil parts wound on the yoke mentioned above would be identical, while the other coil mentioned above is constituted so that the magnetic flux generating direction of the pair of coil parts wound on the yoke mentioned above would be mutually opposite.



3,716,749

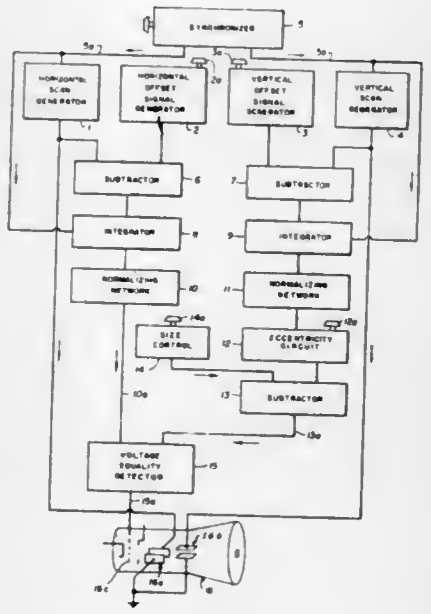
DISPLAY SYSTEM TO GENERATE SYMBOLS FORMED OF CONIC SECTIONS

Kenneth G. Colby, Barboursville, and Robert F. Riggs, Charlottesville, both of Va., assignors to Sperry Rand Corporation

Filed Dec. 7, 1970, Ser. No. 95,739

Int. Cl. H01j *29/70*

U.S. Cl. 315—23 **11 Claims**


SYNCHRONIZER
HORIZONTAL SCAN GENERATOR
HORIZONTAL OFFSET SIGNAL GENERATOR
VERTICAL OFFSET SIGNAL GENERATOR
VERTICAL SCAN GENERATOR
SUBTRACTOR
INTEGRATOR
NORMALIZING NETWORK
SIZE CONTROL
ECCENTRICITY CIRCUIT
SUBTRACTOR
VOLTAGE EQUALITY DETECTOR

Apparatus for generation of symbols on the screen of a cathode ray tube is disclosed featuring integration of the electron beam scanning potentials, signal normalization, and voltage equality detection of the integrated signals to generate, according to the adjustment of biasing controls, symbols formed of conic sections locatable in any position on the screen for navigation, identification, or other purposes.

3,716,750

MAGNETRONS

Kusuo Nakada, 13 Machibo, and Tomokatsu Oguro, 3550 Hayano, both of Mobara-shi, Japan

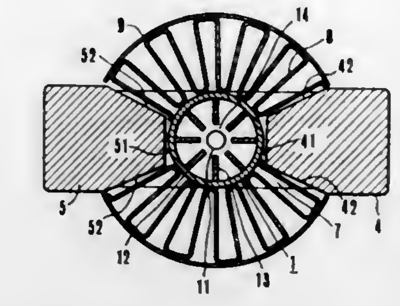
Filed May 12, 1971, Ser. No. 142,641

Claims priority, application Japan, May 30, 1970, 45/46034

Int. Cl. H01j *25/50*

U.S. Cl. 315—39.71 **9 Claims**

In a magnetron device of the class comprising a magnetron tube, permanent magnets on radially opposite sides of the magnetron tube yoke means for applying a magnetic field across the magnetron tube, and cooling means surrounding the magnetron tube and at least a portion of the permanent magnets, the widths of the permanent magnets being gradually decreased toward the magnetron tube thus forming tapered side surfaces.



3,716,751

STARTER DEVICE FOR A DISCHARGE LAMP

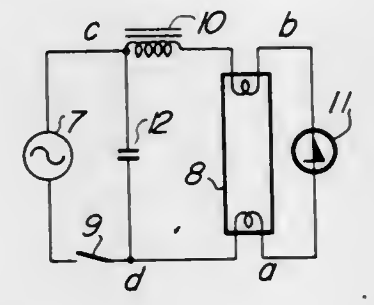
Toru Takei, Higashinari-ku, Osaka; Yasutaka Kawai, Higashiosaka-shi, and Takeshi Matsushima, Nara-shi, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Claims priority application Japan, May 21, 1968, 43/35240; May 17, 1968, 43/33451; May 21, 1968, 43/35241; May 24, 1968, 43/35853; May 24, 1968, 43/43740

Filed May 5, 1969, Ser. No. 821,611

Int. Cl. H05b *41/16*

U.S. Cl. 315—106 **9 Claims**



A starter device for a discharge lamp instantaneously lighting a preheating type fluorescent discharge tube where in parallel to the said fluorescent discharge tube is connected a reverse blocking diode thyristor, the breakover voltage being lower than the maximum value of the rated voltage of the power source but higher than the discharge voltage of the said fluorescent discharge tube while the blocking voltage being sufficiently larger than the said breakover voltage.

3,716,752

ELECTRONIC FLASH INTENSITY CONTROL CIRCUITS

Hiroshi Iwata, Joto-ku, Osaka, Japan, assignor to West Electric Company, Ltd., Osaka, Japan

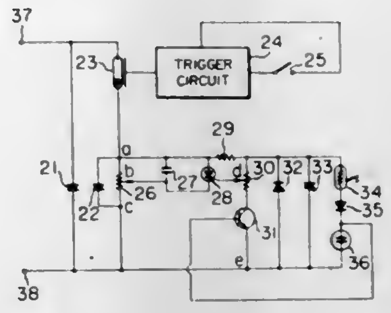
Filed Oct. 16, 1970, Ser. No. 81,349

Claims priority, application Japan, Oct. 20, 1969, 44/84072; Oct. 20, 1969, 44/84073; Oct. 20, 1969, 44/84074

Int. Cl. H05b *41/40*

U.S. Cl. 315—151 **6 Claims**

Electronic flash intensity control circuits for controlling the light output of a discharge tube, comprising a first capacitor having a stored energy, a trigger circuit connected operatively to the discharge tube for causing the discharge tube to operate and thereby the discharge of said first capacitor to initiate, a series circuit of a resistor and the discharge tube connected in parallel with the first capacitor for consuming a part of the stored energy in the first capacitor, a semiconductor control element having an anode, a cathode and a gate and connected in parallel with the resistor for being rendered conductive at a desired time so as to control the output of the discharge tube, and means connected to the semiconductor control element for applying a control voltage to the gate thereof, wherein the terminal voltage of the resistor in the course of the discharge of the first capacitor is divided by a suitable dividing ratio, one of the divided voltages is applied between the cathode and the gate of the semiconductor control element, and the one divided voltage and the control voltage are compared with each other to cause the semiconductor control element to conduct at the desired time.



3,716,753

ARRANGEMENT INCLUDING AN ELECTRONIC FLASH TUBE

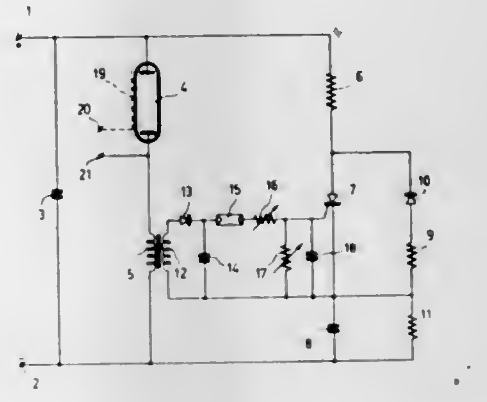
Emil August Exner, Nijmegen, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 3, 1970, Ser. No. 86,516

Claims priority, application Netherlands, Nov. 8, 1969, 6916883

Int. Cl. H05b *37/00*

U.S. Cl. 315—241 P **9 Claims**



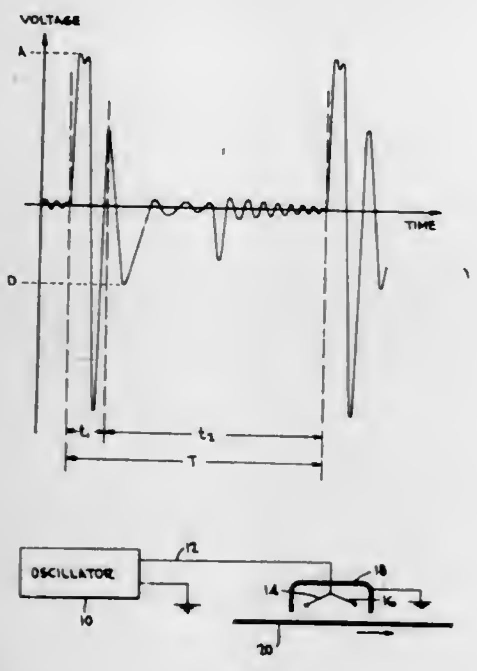
The invention relates to an arrangement including an electronic flash tube which is fed from a previously charged main capacitor.

In a known arrangement a so-called quench tube is arranged across the flash tube. This quench tube is ignited when sufficient light energy is emitted by the flash tube. A drawback of the known arrangement is that the main capacitor becomes completely discharged when this quench tube is ignited.

The invention provides a solution in which the shunt across the flash tube also includes a capacitor. The result of this simple step is that the main capacitor is not completely discharged. This has the advantage that the capacitor can be recharged rapidly again for taking the next flash photograph and that the device serving for the supply of this main capacitor is less rapidly exhausted.

3,716,754
METHOD AND APPARATUS FOR DE-ELECTRIFYING INSULATIVE MATERIALS

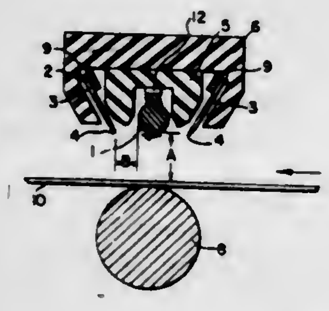
Guy Paul Weber, 25 Rue Verdier Monetti, 76 Arques la Bataille, France, and Philippe Marie Deshayes, Avenue des Canadiens, 76 Neuville les Dieppe, France
Filed Sept. 10, 1971, Ser. No. 179,339
Int. Cl. H01t *19/00;* **H05f** *3/00*
U.S. Cl. 317—2 F **17 Claims**



Method and apparatus for de-electrifying insulative material moving past ionizing electrodes by supplying a de-electrifying waveform having an ionization portion and a damped portion to the ionizing electrodes. The ionization portion of the de-electrifying waveform includes alternate polarity pulses having an amplitude to ionize a gaseous medium surrounding the ionizing electrodes, and the damped portion of the de-electrifying waveform has an amplitude insufficient to ionize the gaseous medium.

3,716,755
ELECTROSTATIC CHARGING AND DISCHARGING APPARATUS

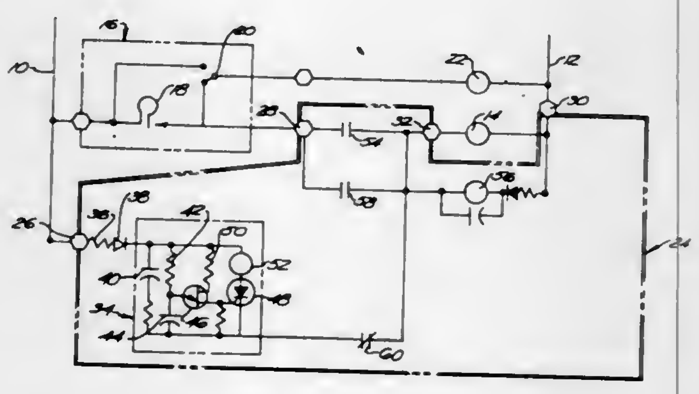
Gerhard Marx, Hahn, Germany, assignor to Kalle Aktiengesellschaft, Wiesbaden-Biebrich, Germany
Filed Dec. 28, 1971, Ser. No. 212,993
Claims priority, application Germany, Dec. 30, 1970, P 20 64 545.8
Int. Cl. E03g *15/02;* **H01t** *19/04;* **H05f** *3/00*
U.S. Cl. 317—2 F **7 Claims**



This invention relates to an apparatus for the electrostatic charging or discharging of the surface of web or sheet-like material, especially the electrostatic charging of photoconductive insulating layers, said apparatus including a charge-absorbing electrode in the form of a rotatable roller means with a roughened surface, said roller means being partially surrounded by an insulator and located between pointed corona electrodes in the form of a series of closely spaced needles which are externally protected by a second insulator, the outer extremity of the said roller means being spaced substantially equally to the points of the needles from the path of a material to be processed by the apparatus.

3,716,756
RECYCLE PREVENTION CONTROL CIRCUIT

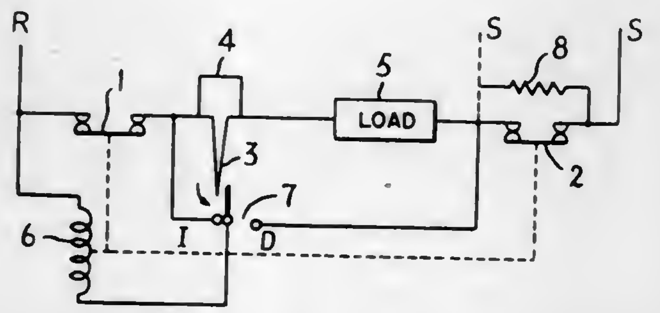
John N. Runge, and Kenneth R. Krusling, both of c/o R-K Electric Co., Inc., 11315 Williamson Road, Cincinnati, Ohio
Filed March 3, 1972, Ser. No. 231,668
Int. Cl. H02h *7/085*
U.S. Cl. 317—13 A **8 Claims**



Timed control for preventing recycling of an electric motor drive compressor after a power interruption. It includes a solid-state pre-set time delay circuit which, upon timing out, closes normally open contacts to permit energization of the motor driven compressor. A latching circuit automatically locks in the power supply to the motor driven compressor and deenergizes the time delay circuit until power is interrupted.

3,716,757
CIRCUIT BREAKER WITH THERMAL TRIPPING DEVICE

Arturo Perez Rodriguez, 2 rue General Moscardo, Madrid, Spain
Filed Feb. 3, 1972, Ser. No. 223,098
Claims priority, application Spain, Feb. 6, 1971, 388017; June 16, 1971, 392343
Int. Cl. H02h *5/04*
U.S. Cl. 317—40 R **7 Claims**

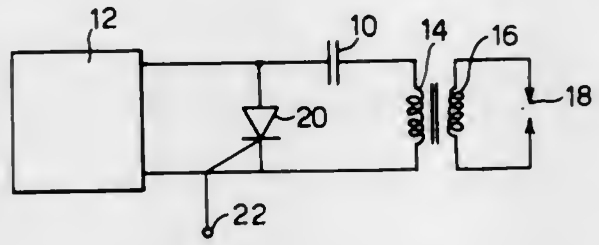


A circuit breaker actuated automatically electrically for interrupting current supply from a multiphase circuit to a load accomplished by a series overcurrent tripping device. An operating coil of the main circuit interruptor has one terminal connected to one phase of the power circuit and its other terminal connected to a movable control contact in a control circuit connected to the other phase of the power circuit. The overcurrent tripping device is a bimetallic device that functions as a thermal tripping device functioning to actuate the

control contact to a position closing the control circuit to energize the operating coil and interrupt the main circuit supply to the load when an overload or short circuit obtains. When the overload or short circuit is removed the bimetallic device cools and the control contact, which is biased to a rest position breaking the control circuit, is restored automatically to its rest position so that the main circuit interruptor is deenergized and automatically allows closing of its main contacts that make-and-break the supply circuit to the load.

3,716,758
THYRISTOR IGNITION CONTROL DEVICE

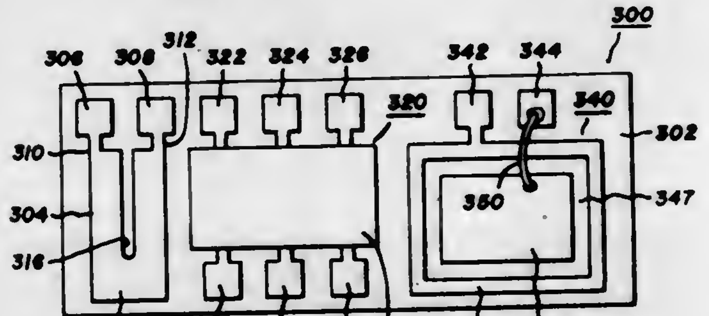
Mario Palazzetti, Avigliana, Italy, assignor to Fiat Societa per Azioni, Turin, Italy
Filed March 10, 1972, Ser. No. 233,634
Claims priority, application Italy, March 12, 1971, 67866 A/71
Int. Cl. F23g *3/00*
U.S. Cl. 317—96 **2 Claims**



A thyristor ignition control device for internal combustior engine ignition circuits. A capacitor is charged from a voltage source and discharges through the primary of a step-up transformer when a thyristor connected across the source is fired, producing a high voltage impulse at the transformer secondary to induce sparking across a gap. To limit the current through the thyristor during the initial stages of firing the transformer has a core, for example of ferrite, with a high initial reluctance, thereby reducing wear in the thyristor.

3,716,759
ELECTRONIC DEVICE WITH THERMALLY CONDUCTIVE DIELECTRIC BARRIER

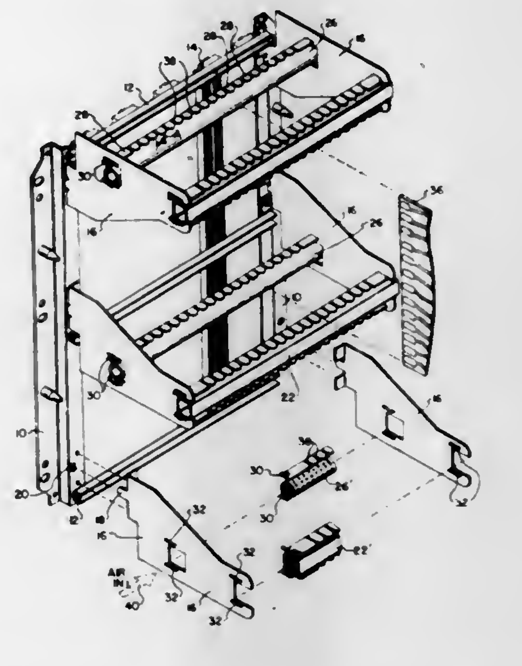
Robert I. Scace, Skaneateles, and Glen A. Slack, Scotia, both of N.Y., assignors to General Electric Company
Continuation-in-part of Ser. No. 843,533, July 22, 1969, Pat. No. 3,609,411. This application Oct. 12, 1970, Ser. No. 79,918The portion of the term of this patent subsequent to Sept. 28, 1988, has been disclaimed.
Int. Cl. H01l *1/12*
U.S. Cl. 317—100 **12 Claims**



An electronic device is provided with an active portion which generates heat as a result of internal power losses, such as a semiconductor element, a resistor, a capacitor, etc. The active portion is mounted in thermally conductive relation with a substrate comprised of a unitary layer consisting essentially of aluminum nitride. The aluminum nitride may be in the form of a single crystal or may be polycrystalline.

3,716,760
PRINTED WIRING CARD SHELF

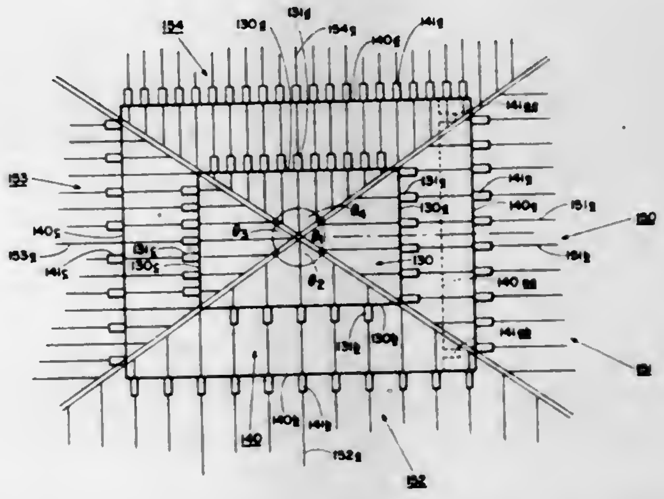
Ansano Bertellotti, 13 Elizabeth Lane, Addison, Ill., and Robert F. Thayer, 35131 Cypress, Glen Ellyn, Ill.
Filed April 27, 1972, Ser. No. 248,277
Int. Cl. H02b *1/02*
U.S. Cl. 317—101 DH **7 Claims**



There is herein disclosed a printed wiring card file including a front support formed of a rectangular tubular member having a slotted steel card guide on its top and bottom surfaces and a rear support formed of a circular tubular member having a slotted card guide at the top and bottom. The front card guide slots are so shaped as to align a wiring card horizontally with the rear card guide slots while the rear support member serves to vertically align the wiring card during insertion.

3,716,761
UNIVERSAL INTERCONNECTION STRUCTURE FOR MICROELECTRONIC DEVICES

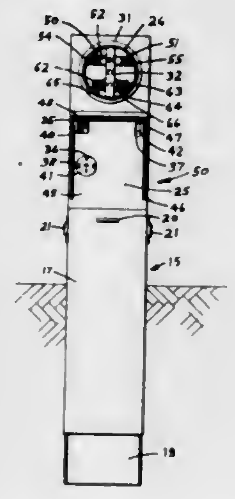
Nikita L. Rotast, Ottawa, Ontario, Canada, assignor to Microsystems International Limited, Montreal, Quebec, Canada
Filed May 3, 1972, Ser. No. 249,833
Int. Cl. H05k *1/04*
U.S. Cl. 317—101 B **1[illegible] Claims**



The invention relates to a lead structure—particularly a beam-lead frame or pattern deposited upon a substrate—which will accommodate devices having shapes and contact configurations according to a given standard. For example, in one embodiment of the invention, the lead structure will accommodate all devices formed according to the EIA JC11.4 standard. The structure is not limited to triangular or rectangular devices but may be patterned to accommodate families of polygonal chips having any number of sides, providing all chips to be accommodated by any given pattern according to the invention comply with certain defined standards.

3,716,762
METER POWER DISTRIBUTION APPARATUS FOR MOBILE HOMES WITH A DETACHABLE FRONT PANEL FOR POWER OUTLET FITTINGS

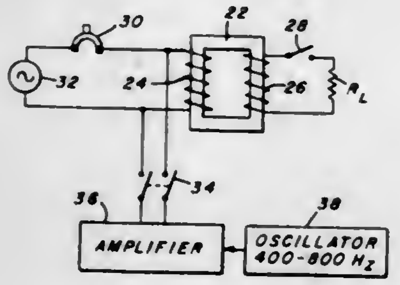
Delworth Shrader, 5088 Nerissa Way, San Jose, Calif.
Filed Aug. 6, 1971, Ser. No. 169,643
Int. Cl. H02b *9/00*
U.S. Cl. 317—107 **11 Claims**



A meter power distribution apparatus in which anchor clips are connected to the meter line side of the watt-hour meter and anchor clips are connected to the load line side of the watt-hour meter.

3,716,763
METHOD FOR REDUCING CORE LOSSES IN SILICON STEELS AND THE LIKE

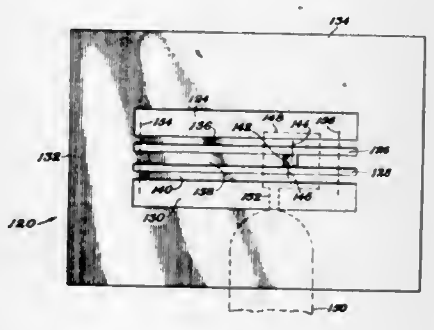
Gerald L. Houze, Jr., Sarver, and Merlin L. Osborn, Saxonburg, both of Pa., assignors to Allegheny Ludlum Industries, Inc., Pittsburgh, Pa.
Filed Dec. 29, 1971, Ser. No. 213,585
Int. Cl. H01f *13/00*
U.S. Cl. 317—157.5 **6 Claims**



Method for reducing core losses in silicon steels and other similar materials having antiparallel domain wall structures by applying high frequency (e.g., 400–800 Hz.) oscillatory wave energy to a winding surrounding a transformer or other device using the steel or the like as a core material. Following a power surge experienced by the transformer or other electrical apparatus, the number of domain walls is reduced, increasing core losses. By applying a pulse of high frequency wave energy following the surge and at a flux density preferably in excess of 15,000 gauss, the number of domain walls can again be increased to reduce core losses.

3,716,764
PROCESS FOR ENCAPSULATING ELECTRONIC COMPONENTS IN PLASTIC

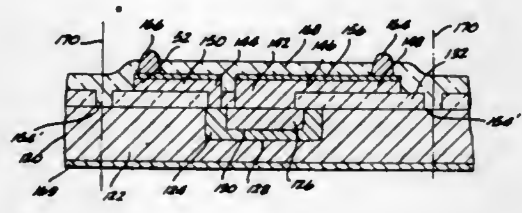
Robert O. Birchler, Dallas, Tex., and E. R. Williams, Jr., Scottsdale, Ariz., assignors to Texas Instruments Incorporated, Dallas, Tex.
Original application Dec. 16, 1963, Ser. No. 331,006, now Patent No. 3,439,238, dated Apr. 15, 1969. Divided and this application Oct. 17, 1968, Ser. No. 768,325
Int. Cl. H01l *1/02*
U.S. Cl. 317—234 **24 Claims**



A method of making contacts to a semiconductor device and encapsulating the device, and the resulting device. A frame having inwardly-extending conductor strips is used to support the assembly during the steps of mounting a semiconductor wafer on one of the strips, connecting conductive wires from electrodes on the wafer to other strips and molding a plastic package around the device. The frame is then severed.

3,716,765
SEMICONDUCTOR DEVICE WITH PROTECTIVE GLASS SEALING

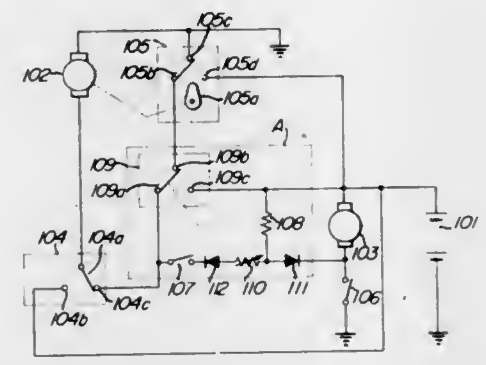
Harold F. Rueffer, Costa Mesa, and Richard J. Belardi, Anaheim, Calif., assignors to Hughes Aircraft Company, Culver City, Calif.
Original application Mar. 14, 1966, Ser. No. 534,135, now Patent No. 3,514,848. Divided and this application Dec. 23, 1969, Ser. No. 889,814
Int. Cl. H01l *5/00*
U.S. Cl. 317—234 R **1 Claim**



1. A semiconductor device comprising: a body of semiconductor material having at least two regions of differing conductivity types formed therein, said regions being separated by a junction extending to a surface of said semiconductor body, a layer of an oxide of said semiconductor material disposed over a substantial portion of said surface, a layer of glass disposed over said oxide layer and extending beyond the entire perimeter of said oxide layer, said glass layer contacting a portion of said surface of said semiconductor body extending beyond said entire perimeter and being sealed to said portion of said semiconductor body, and electrically conductive means extending through said glass and said oxide layers for making electrical contact with at least one of said regions.

3,716,766
COOPERATIVE SYSTEM OF WINDSHIELD WASHER AND WIPER WITH INTERMITTENT WIPER OPERATING MECHANISM

Motoji Suzuki, Okazaki, Japan, assignor to Nippondenso Co., Ltd., Kariya-ski, Aichi-ken, Japan
Filed Dec. 15, 1971, Ser. No. 208,097
Claims priority, application Japan, Dec. 17, 1970, 45/126674; June 3, 1971, 46/46572
Int. Cl. H02p *1/58;* **B60s** *1/02*
U.S. Cl. 318—102 **13 Claims**

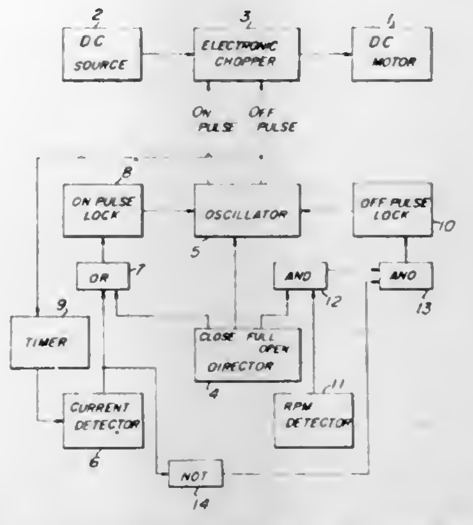


A system for cooperatively operating a windshield washer and a windshield wiper is provided which comprises a washer motor connected in series with a washer switch, a heating wire connected in parallel with said washer motor, a temperature responsive switch connected between a wiper motor and a power source and adapted to operate with a thermal time delay provided by said heating wire, and an intermittent operation switch directly connected to said heating wire, the series circuit comprising said intermittent operation switch and said heating wire being connected in parallel with said temperature responsive switch, whereby by simply closing the washer switch the washer is readily brought into operation and the wiper is also brought into operation with said thermal time delay, while on the other hand upon closing of the intermittent operation switch the wiper is intermittently operated at such intervals of time as related to said thermal time delay.

3,716,767
CONTROL DEVICE FOR ELECTRIC AUTOMOBILES INCLUDING ACCELERATOR POSITION AND CURRENT FEEDBACK

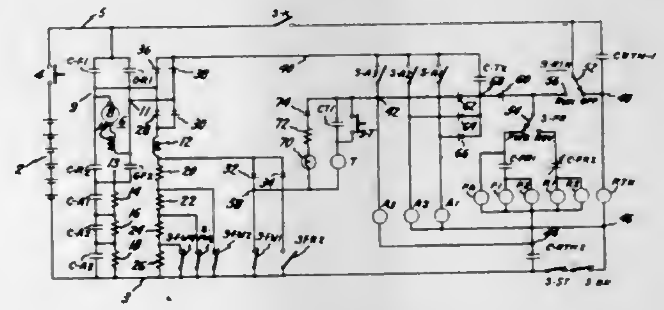
Sigeru Kuriyama and Seiki Kikuchi, Katsuta, Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Dec. 14, 1971, Ser. No. 207,781
Claims priority, application Japan, Dec. 26, 1970, 45/118,562
Int. Cl. H01p *7/00*
U.S. Cl. 318—139 **4 Claims**

For the purpose of controlling a wheel driving motor with the aid of a thyristor chopper, there is provided a multivibrator adapted to produce an "ON" gate pulse for rendering the chopper operative and an "OFF" gate pulse for rendering the chopper inoperative, and the cyclic period of oscillation of the multivibrator is controlled by means of an accelerator pedal. When the accelerator pedal is at its full open position and the speed is above a predetermined level, the multivibrator is locked not to provide "OFF" gate pulse. Output current of the thyristor chopper circuit is detected by a current detecting circuit. Provision is made for means for imparting preference command to the multivibrator to enable the latter to produce "OFF" gate pulse when the magnitude of the detected current reaches a predetermined level. The command circuit is designed so that the generation of "ON" gate pulse is temporarily locked after an "OFF" gate pulse has been generated, thus securing the stability of control.



3,716,768
CONTROL ARRANGEMENT FOR ELECTRICALLY PROPELLED TRACTION VEHICLE

William B. Mason, Schenectady, N.Y., assignor to General Electric Company
Filed Mar. 20, 1972, Ser. No. 236,105
Int. Cl. H02p *7/14*
U.S. Cl. 318—139 **13 Claims**

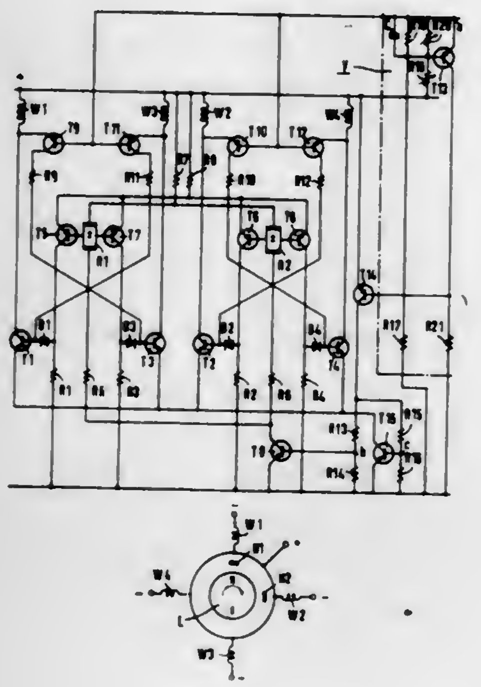


A control arrangement for a battery powered traction vehicle having a foot pedal type of throttle control. Application of increasing pressure to the pedal sequentially closes a motor contractor to energize the motor, closes armature switches to decrease series armature resistance, and opens field weakening switches to provide field weakening. Provision is made for motor operation at predetermined torque-speed increment without continued application of pedal pressure. A logic circuit is responsive to closure of a preselected armature switch and of a preselected field weakening switch is connected in circuit with a relay connected to maintain operation of the vehicle at the desired torque-speed increment upon activation of a control switch.

3,716,769
BRUSHLESS D.C. MOTOR HAVING PERMANENT MAGNET ROTOR AND HALL EFFECT COMMUTATION INCLUDING SPEED CONTROL RESPONSIVE TO WINDING VOLTAGE

Julius Brunner, Nurnberg, Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munchen, Germany
Filed Dec. 22, 1971, Ser. No. 210,635
Claims priority, application Germany, Dec. 23, 1970, P 20 63 351.6
Int. Cl. H02k *29/00*
U.S. Cl. 318—254 **4 Claims**

A brushless DC motor comprises switching means coupled to and controlled in condition by a comparator circuit. The control current terminals of a pair of Hall effect generators are connected to the negative polarity terminal of a DC voltage source through the switching means. The base electrodes of four coupling transistors are connected to each other. Each pair of coupling transistors are connected to a corresponding pair of the winding branches of the motor which are mutually displaced electrically by 180°. There are four power transistors. The collector electrode of each coupling transistor of a pair of coupling transistors is connected to the base electrode of the power transistor connected to the other of the corresponding pair of winding branches. A voltage proportional to the speed of rotation of the rotor at the emitter-base paths of the coupling transistors is provided at the winding branches.



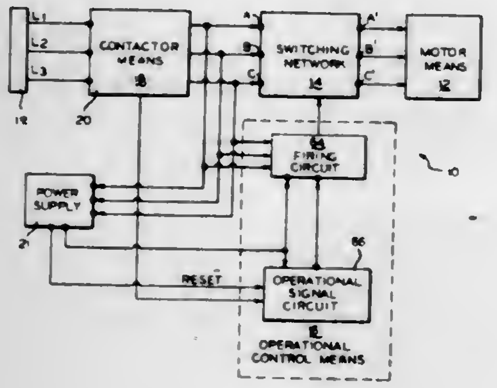
3,716,770
SLOW START-STOP MOTOR CONTROL SYSTEM

Victor J. Habisohn, Hoffman Estates, Ill., assignor to Reliamatic, Inc., Chicago, Ill.

Filed April 20, 1970, Ser. No. 29,869

Int. Cl. H02m *1/18*

U.S. Cl. 318—259 **36 Claims**



A solid state motor control system including means for providing a slow motor start by increasing torque at a slow rate until full torque is reached which corresponds to full speed, and a slow motor stop by increasing counter motor torque at a slow rate until the motor approaches zero speed.

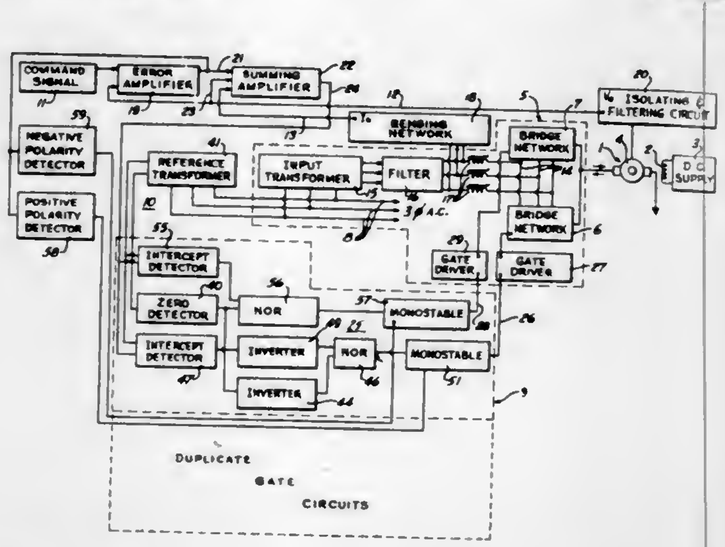
3,716,771
DC MOTOR SPEED CONTROL WITH MOTOR VOLTAGE AND CURRENT SENSING MEANS

John T. Maynard, New Berlin, Wis., assignor to A. O. Smith Corporation, Milwaukee, Wis.

Continuation of Ser. No. 713,247, March 14, 1968, abandoned. This application March 1, 1971, Ser. No. 122,636

Int. Cl. H02p *5/16*

U.S. Cl. 318—331 **16 Claims**



This disclosure is directed to a feedback control for a D.C. shunt motor for motoring and regenerating modes of operation. The motor armature is connected to a three-phase A.C. input by a pair of full wave bridge networks connected in parallel and having silicon controlled rectifiers in each leg.

Input and feedback signals are summated to an error signal which is then summated with a cemf signal to establish a control signal connected to actuate a gating regulating means which in turn controls firing of the controlled rectifiers of the two bridges with a zero current firing angle control.

The gating regulator connected to the rectifier is a "nor" logic current for each unit and includes a zero current detector in combination with an intercept detector which provides an output during the proper half cycle of the applied voltage and further transmits a signal in accordance with the desired phase angle for firing of the controlled rectifier.

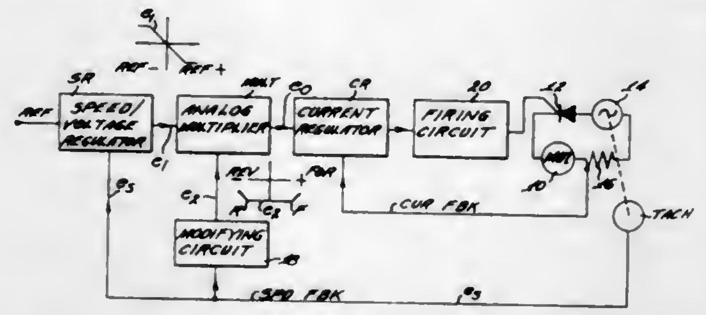
3,716,772
TAPERED CURRENT LIMIT PROTECTION FOR D. C. MOTOR

Dale E. Larson, Milwaukee, Wis., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Feb. 28, 1972, Ser. No. 229,889

Int. Cl. H02p *5/16*

U.S. Cl. 318—332 **11 Claims**



A tapered current limit control for a thyristor-powered direct current shunt motor lowers the current limit level in speed ranges wherein the current carrying ability of the motor is reduced. A variable transconductance analog multiplier is inserted between a speed/voltage regulator which derives the current reference and a current regulator which receives the modified current reference and controls the firing circuit for the thyristors, and a modifying circuit including an absolute value amplifier responsive to motor speed attenuates the gain of the analog multiplier when motor speed exceeds predetermined magnitudes in both the forward and reverse directions of motor rotation.

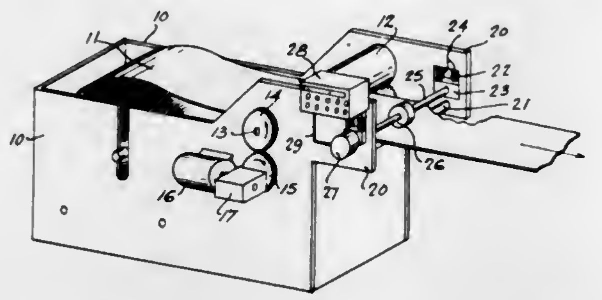
3,716,773
DIGITAL CONTROL DEVICE FOR STRIP METAL FEEDER

Andrew Raoul, 672 E.C. Row Avenue, Windsor, 12, Ontario, Canada

Filed June 4, 1971, Ser. No. 150,046

Int. Cl. G05b *19/26*

U.S. Cl. 318—600 **14 Claims**



A control device for a strip metal feeder is described which provides a very accurate control of the distance of advancement of the strip metal during an operational cycle. The device comprises

a. a measuring wheel of known circumference adapted to engage the strip metal whereby rotational movement of the wheel is actuated by movement of the strip metal,
b. a rotary transducer operatively connected to said wheel for generating electric pulse data proportional to the rotation of the wheel, and
c. an electronic counter with presets for counting electric pulses received from the transducer and stopping the feeder after a predetermined number of pulses have been received.

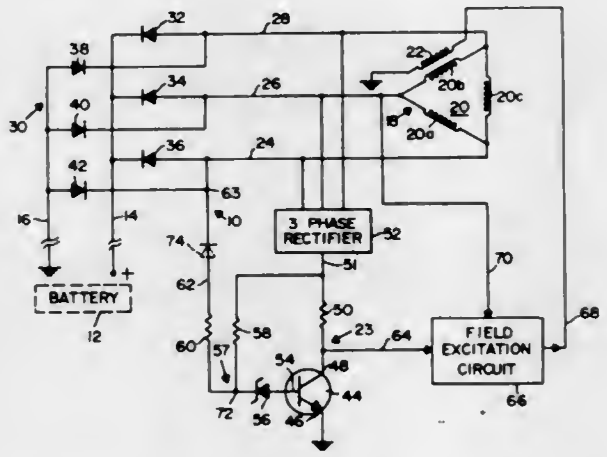
3,716,774
VEHICLE POWER SUPPLY SYSTEM WITH VOLTAGE REGULATOR LOAD COMPENSATION

Melvin A. Lace, Prospect Heights, Ill., assignor to Motorola, Inc., Franklin Park, Ill.

Filed Aug. 2, 1971, Ser. No. 168,242

Int. Cl. H02p *9/30*

U.S. Cl. 320—64 **8 Claims**



A power supply system for a vehicle providing power to a load remotely located therefrom and connected to the system by conductors having a predetermined voltage loss includes an electronic regulator circuit which controls the output voltage of the system. The regulator circuit is connected to sense the voltage drop across a rectifying diode connected to the output of the AC generator of the system, which varies in accordance with the current output of the generator, and in accordance therewith varies the output voltage of the system to compensate for the loss in said conductors.

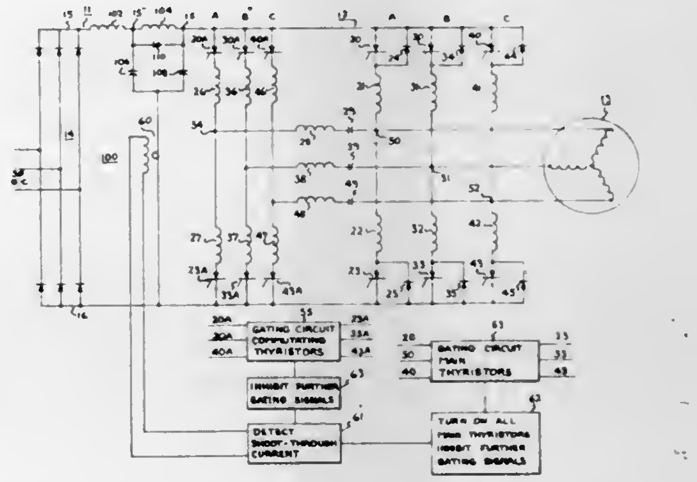
3,716,775
SHORT CIRCUIT PROTECTION MEANS FOR POWER CIRCUITS

Einar Aasen Skogsholm, Erie, Pa., assignor to General Electric Company

Filed July 14, 1971, Ser. No. 162,575

Int. Cl. H02m *5/44*

U.S. Cl. 321—5 **16 Claims**


GATING CIRCUIT COMMUTATING THYRISTORS
GATING CIRCUIT MAIN THYRISTORS
INHIBIT FURTHER GATING SIGNALS
DETECT SHOOT-THROUGH CURRENT
TURN ON ALL FOUR THYRISTORS INHIBIT FURTHER GATING SIGNALS

A solid state power circuit, such as a polyphase inverter for energizing an A-C motor in an A-C adjustable speed drive system, includes two or more parallel connected series circuits each including a pair of alternately conductive thyristors in series inductive means and a filter network including at least two L-C stages for supplying D-C electric power to the series circuits from a source of electric potential. When a short circuit or shoot-through in the power circuit has occurred or, under some conditions, is about to occur, the resulting high current flow to the series circuits from the filter network is detected and all of the thyristors of at least two of the series circuits are turned on simultaneously in response to the detected current such that the filter capacitor of the L-C stage adjacent the series circuits will resonate with the total effective parallel inductance in the series circuits to provide sufficient reverse voltage to turn off all of the thyristors. To respond to increased current flow resulting from a wide range of fault conditions in an effective and economical manner, the detection means is responsive to the capacitive current flow in at least two of the L-C stages including the two stages adjacent the series circuits. A diode or similar rectifier is provided across the filter inductor of the L-C stage adjacent the series circuits to prevent excessive voltage on the resonating capacitor, to control ripple voltage, and to prevent undamped oscillations in the filter network.

3,716,776
HIGH VOLTAGE RESISTANT ELECTRICAL COMPONENT, IN PARTICULAR FOR COLOR TELEVISION RECEIVERS

Rainer Dangschat, Landsham, Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Germany

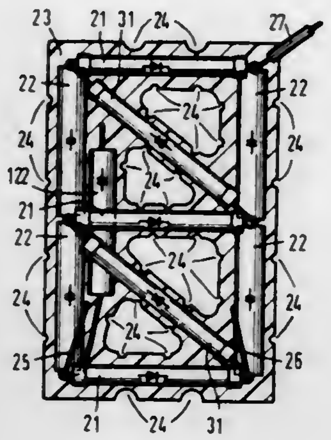
Filed April 21, 1972, Ser. No. 246,459

Claims priority, application Germany, May 19, 1971, P 21 24 981.0

Int. Cl. H02m *7/00*

U.S. Cl. 321—8 R **4 Claims**

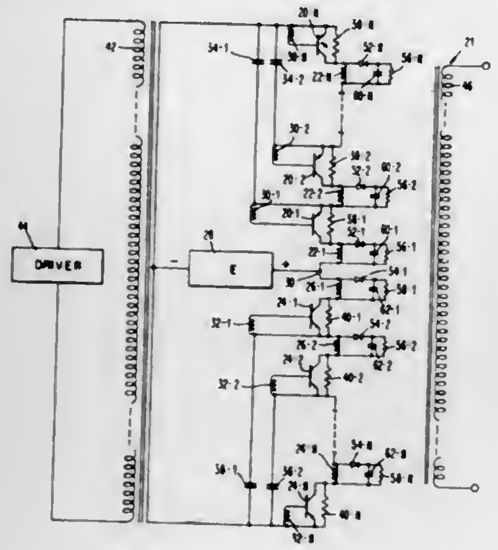
A high voltage resistant lattice-shaped electrical component employs a plurality of capacitors and diodes interconnected and arranged as a lattice structure in perpendicular lattice directions and in a direction inclined to the perpendicular directions, those elements which are arranged in a first lattice direction and both elements which are inclined thereto being disposed in one plane and the elements arranged in the second



lattice direction are disposed in a plane parallel to the first mentioned plane, and at least one additional electrical element lying parallel to the elements of the second lattice direction and preferably at a distance therefrom, the elements being cast in a resin as cores of an open lattice.

3,716,777
INVERTER POWER SUPPLY EMPLOYING SERIES CONNECTED MULTI-TRANSISTOR SWITCHES

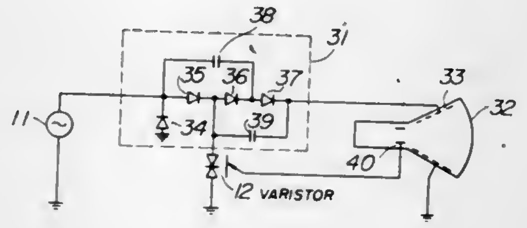
George W. Lynch, Tappan, N.Y., and Charles B. Zarowin, Rowayton, Conn., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Sept. 16, 1971, Ser. No. 181,028
Int. Cl. H02m *7/48*
U.S. Cl. 321—27 R **1 Claim**



The disclosure describes an inverter circuit which may be used as a power supply. The circuit includes an even number plurality of transistors connected in series with a source of potential connected to the mid-point of the series arrangement. Each of the transistors has a secondary transformer winding connected across its base and emitter which is coupled to a primary transformer driven by an input signal source. The secondary transformer windings are connected through capacitors to a common point, for example, one end of a DC power supply. A resistor is connected across the emitter and collector of each transistor for uniform static voltage distribution and the transistors are connected in series by separate ones of a set primary output transformer windings connected between each transistor. A "poled RC" circuit including a diode, a capacitor and a resistor is connected across each transistor for dynamic voltage distribution. A secondary output transformer winding is also included across which an output voltage is produced which in the preferred embodiment may be a square wave voltage.

3,716,778
HIGH VOLTAGE GENERATING APPARATUS

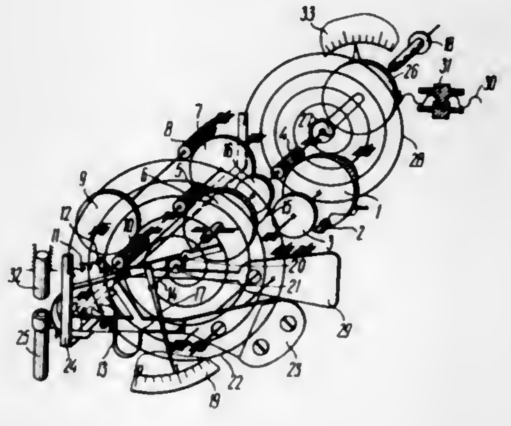
Hideo Sato, Tokyo, Japan, assignor to Denki Onkyo Company, Ltd., Tokyo, Japan
Filed April 7, 1971, Ser. No. 132,095
Claims priority, application Japan, April 9, 1970, 45/30326
Int. Cl. G05f *1/00*
U.S. Cl. 323—8 **5 Claims**



A rod shaped varistor having a high breakdown voltage is connected across a source of high voltage so as to maintain the output voltage at a substantially constant value. The varistor is provided with a ring-shaped terminal for deriving an intermediate voltage which is adjustable by moving the ring-shaped terminal along the varistor.

3,716,779
MAGNETIC SPRING-CONTROLLED WINDING APPARATUS FOR GAGING THE THICKNESS OF NON-MAGNETIC COATINGS ON METAL PRODUCTS

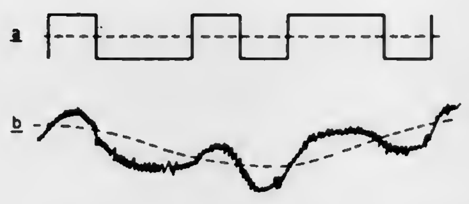
Nikolai Sergeevich Akulov, Minsk, U.S.S.R., assignor to Otdel Fiziki Nerazrushajuschego Kontrolya Akademii Nauk BSSR, Minsk, U.S.S.R.
Filed Feb. 1, 1971, Ser. No. 111,324
Int. Cl. G01r *33/12*
U.S. Cl. 324—34 TK **2 Claims**



An apparatus for gauging the thickness of non-magnetic coatings on metal products comprising a winding arrangement including an auxiliary lever adapted to engage a main lever carrying a permanent magnet, a gear train having shaft mounted gears, one of the shafts in the gear train of the apparatus mounting an auxiliary spring element linked to said auxiliary lever, to provide movement of the permanent magnet toward an auxiliary magnet upon the former breaking contact with the surface of the coatings.

3,716,780
SYSTEM FOR THE ACCURATE REPRODUCTION OF PULSE CODE MODULATION SIGNALS RECEIVED AS AN UNFAVOURABLE SIGNAL-TO-NOISE RATIO

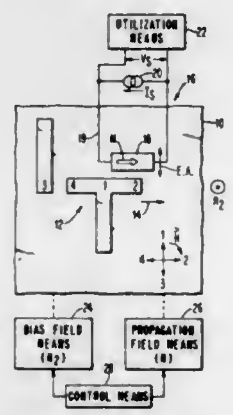
Cornelis Johannes van Elk, Jacob Frederik Raatgever, Albertus Marinus Morrien, Jan Gijsbert, and Dirk van der Lee, Hilversum, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.
Filed Apr. 5, 1971, Ser. No. 131,150
Claims priority, application Netherlands, Apr. 4, 1970, 7004875
Int. Cl. H04b *1/12*
U.S. Cl. 325—324 **7 Claims**



A system for the accurate reproduction of pulse code modulation signals received at an unfavourable signal-to-noise ratio, comprising two signal integrators controlled by clock pulses and a detection circuit connected thereto, which together form part of a first control loop for phase readjustment of the clock pulse generator and a second control loop for rendering the reference level required for detection of the transitions and the direct voltage level of the incoming signal equal to each other.

3,716,781
MAGNETORESISTIVE SENSING DEVICE FOR DETECTION OF MAGNETIC FIELDS HAVING A SHAPE ANISOTROPY FIELD AND UNIAXIAL ANISOTROPY FIELD WHICH ARE PERPENDICULAR

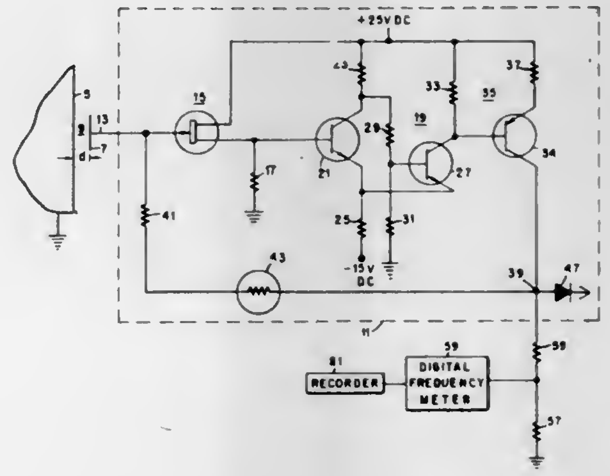
George S. Almasi, Purdy Station, George E. Keefe, Montrose, Yeong S. Lin, Mount Kisco, and David A. Thompson, Somers, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Oct. 26, 1971, Ser. No. 193,904
Int. Cl. G01r *33/02*
U.S. Cl. 324—46 **34 Claims**



A magnetoresistive sensing device for detection of magnetic flux, comprising a magnetoresistive sensing element in which the shape anisotropy field is substantially perpendicular to the uniaxial anisotropy field. The larger of these two magnetic fields is in a direction which is substantially normal to the direction of the signal flux which is to be detected, to insure that the magnetization vector of the sensing element will return to its rest state when the signal magnetic flux is removed. The easy axis of the sensing element can be either parallel or normal to the signal magnetic field direction. Current through the sensing element is preferably provided by a constant current source connected to the element. The direction of current through the element can be either along the direction of the quiescent magnetization state or perpendicular to it. Applications include magnetic bubble domain sensing and sensing of stored magnetic signals on disks or tapes.

3,716,782
CAPACITANCE GAGE FOR MEASURING SMALL DISTANCES

John J. Henry, 105 Audubon Road, Oak Ridge, Tenn.
Filed June 3, 1971, Ser. No. 149,678
Int. Cl. G01r *27/26*
U.S. Cl. 324—61 R **9 Claims**

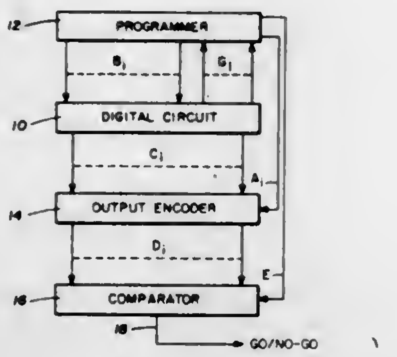


This invention is a capacitance gage for measuring small distances wherein the frequency of an R-C oscillator is varied in proportion to changes in the capacitance responsive to changes in separation between a plate mounted with the gage and a grounded object whose distance is being measured. The gage plate is connected to the input of a Schmitt trigger circuit by means of a field effect transistor amplifier. The output of the Schmitt trigger circuit controls an electronic switch which alternately charges and discharges the probe capacitance in response to the output of the Schmitt trigger circuit between upper and lower voltage triggering levels and the charging frequency is taken in digital form at the output of the switch. The variable frequency output is suitable for high-accuracy, non-contact dimensional inspection with digital readout or direct computer processing. The gage further provides improved performance for medium to high-resistance materials and can be compensated to provide a low temperature drift.

3,716,783
SEQUENTIAL CHECK-OUT SYSTEM INCLUDING CODE COMPARISON FOR CIRCUIT OPERATION EVALUATION

Charles S. Deering, Richardson, Tex., assignor to E-Systems, Inc., Dallas, Tex.
Filed Oct. 30, 1969, Ser. No. 872,582
Int. Cl. G01r *15/12, 31/00*
U.S. Cl. 324—73 **14 Claims**

A "GO" or "NO GO" indication of circuit operation is produced by exercising the operation of the circuit through various modes. To evaluate the operation of a circuit, a programmer produces a series of input check signals in a sequence determined by control pulses. These check signals are connected to the inputs of the circuit under evaluation and exercise the circuit through the various operating modes. As the circuit is exercised, output signals are produced which connect to an encoder. The encoder produces an operations code in response to the circuit output signals. This operations code is compared with a standard



code which has been derived in advance. If the operations code compares favorable with the standard code, a "GO" indication is produced; if the two codes do not match, a "NO GO" indication is produced. Either analog or digital circuits may be checked for operation.

3,716,784
DATA HANDLING ARRANGEMENTS

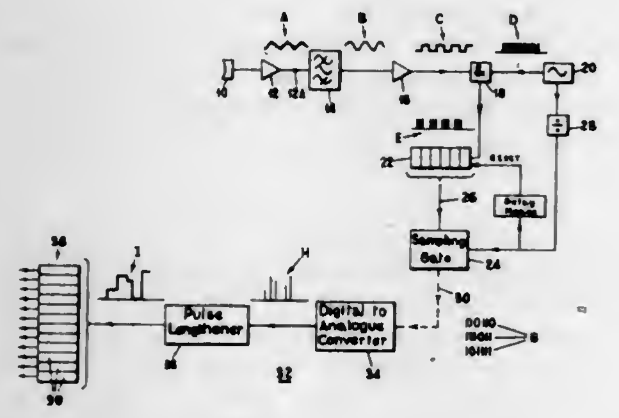
Eric A. N. Whitehead, London, Henry G. Carpenter, Barton-on-Sea, and Peter D. Chinn, London, England, assignors to Elliott Brothers (London) Limited, London, England

Continuation-in-part of abandoned application Ser. No. 723,434, Apr. 23, 1968. This application Jan. 22, 1971, Ser. No. 108,754

Claims priority, application Great Britain, Apr. 27, 1967, 11,249/67

Int. Cl. G01r *23/16, 23/00*

U.S. Cl. 324—77 B **9 Claims**



A data handling system for transmitting the frequency spectrum of an input band-limits the input, converts it into a rectangular waveform, and gates the "mark" pulses of the waveform with clock pulses. Each set of gated clock pulses, representing in number the width of the "mark" pulse, is fed into a binary counter. Sampling means, operative at a submultiple of the clock pulses, repeatedly samples the count of the counter and transmits the binary count values to a receiver. There, they are converted into a rectangular waveform whose amplitude varies with the digital values, and the rectangular waveform, whose frequency spectrum corresponds with the frequency spectrum of the band-limited input, is then fed to a frequency analyser. In a multi-channel version of the system, in which the input to each channel is derived from a respective one of an array of transducers, the counters of the channels are sampled sequentially and transmitted to the receiver which weights and combines them so as to produce an output representing the response of the array in a particular one of several different directions.

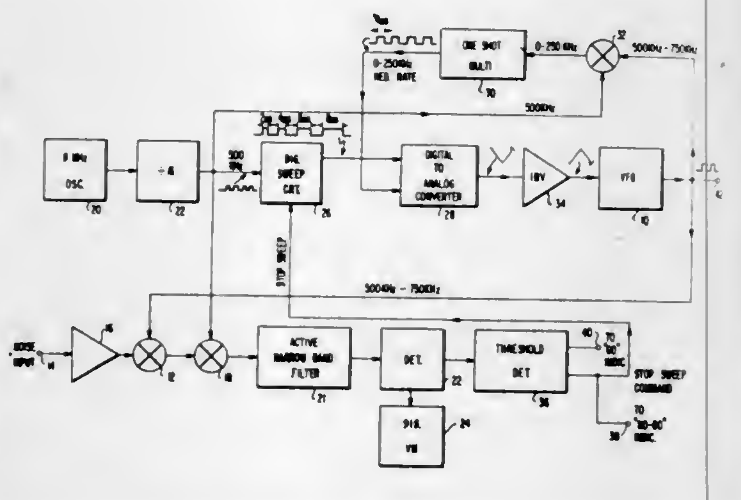
3,716,785
DIGITALLY CONTROLLED WAVE ANALYZER

Harvey M. Masters, Ellicott City, and John L. Nugent, Martin Hunt, and James Peters, Baltimore, Md., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed June 22, 1971, Ser. No. 155,495

Int. Cl. G01r *27/00*

U.S. Cl. 324—77 B **10 Claims**



Apparatus for measuring noise spectra, both AM (amplitude modulation) and FM (frequency modulation), of RF signals over a predetermined frequency range by sweeping a variable frequency square wave oscillator by means of an analog ramp signal generated by a digital sweep circuit which produces a sequence of square wave pulses whose pulsewidth incrementally increases by the same amount over a predetermined time period. The variable frequency oscillator is driven and automatic frequency controlled from a digital clock oscillator which is also fed to a mixer. The mixer is directly coupled to a first mixer which has inputs comprising the noise signal input and the variable frequency oscillator signal applied thereto. The first and second mixer configuration provides a frequency window through which the desired noise waveform can be detected and measured. The system sweeps a predetermined frequency band and when a noise signal of predetermined amplitude is detected, the sweep circuit is automatically stopped, thereby locking onto an input signal of excessive noise level.

3,716,786
MODULE TESTER AND SORTER FOR USE IN A MODULE TEST SYSTEM

John M. Gearin, Brookfield, Conn., assignor to Cogar Corporation, Wappingers Falls, N.Y.

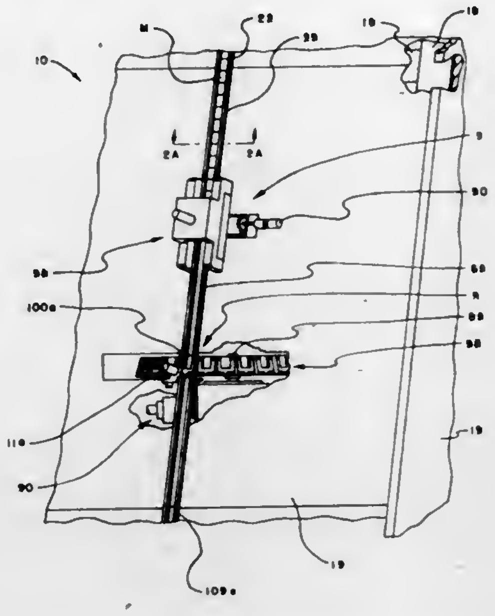
Filed Oct. 2, 1970, Ser. No. 77,454

Int. Cl. G01r *31/22, 15/12*

U.S. Cl. 324—158 F **7 Claims**

A module tester and sorter for determining the electrical characteristics of each of a series of memory modules. If the module has certain characteristics, it is transported by an index wheel to a designated loading bin. If the module has other characteristics, it is transported through the wheel into a different loading bin. A probe is included in the unit and has

an array of contact fingers which as a group are shiftable in a direction transverse of the pins for a position which does not



interfere with movement of the modules to a position engaging the module pins to make electrical contact for the purpose of testing the module circuit.

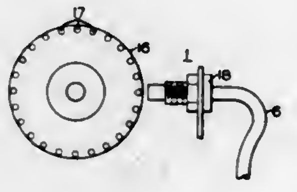
3,716,787
APPARATUS FOR MONITORING SPEED UTILIZING A TUNED CIRCUIT WHOSE PHASE CHANGES IN PROPORTIONAL TO SPEED

Peter W. Hammond, Chargin Falls, Ohio, assignor to Westinghouse Air Brake Company, Wilmerding, Pa.

Filed Nov. 27, 1970, Ser. No. 93,116

Int. Cl. G01p *3/56*

U.S. Cl. 324—173 **4 Claims**



A motion detector system using a pulse tachometer comprising a wheel of non-magnetic, non-conductive material such as fiber or Teflon having a plurality of equally spaced magnetically distinct pins in the periphery which move into proximity of a pick-up coil of a tuned circuit to vary the impedance therein. Varying the impedance effects a circuit phase-shift which is compared with a predetermined reference phase of voltage and current in said circuit to provide an indication of any movement of the wheel and a measurement of the speed of movement in a measured time interval.

3,716,788
TACHOMETER GENERATOR

Koji Nishida, Kariya, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya-shi, Aichi-ken, Japan

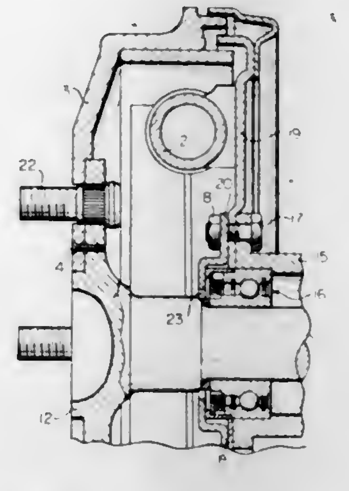
Filed Dec. 22, 1970, Ser. No. 100,625

Claims priority, application Japan, Dec. 23, 1969, 44/122541

Int. Cl. G01p *3/48*

U.S. Cl. 324—174 **4 Claims**

A tachometer generator has a toothed stator and a toothed rotor which may be formed in one piece with the revolvable inner race of a bearing supporting a shaft whose revolving speed is to be measured, the toothed stator is fixed to the stationary outer race of the same bearing, in such a manner that the toothed surfaces of the rotor and the stator are opposed to each other with a small airgap therebetween. The bearing outer race also supports magnetic means having a coil disposed in a magnetic path formed by the aforesaid bearing



and the rotor and stator of the tachometer generator, so that, as the crests and roots of the stator teeth alternately face the crests and roots of the rotor teeth in revolution, a voltage which varies with the corresponding fluctuations in the amount of magnetic flux along the path is electromagnetically induced in the coil.

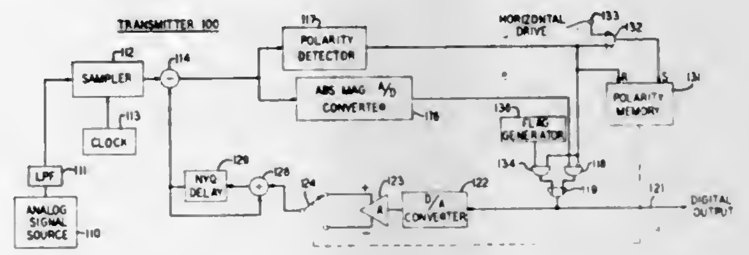
3,716,789
SIGN REDUNDANCY REDUCTION IN DIFFERENTIAL PULSE MODULATION SYSTEMS

Earl Franklin Brown, 513 Runyon Ave., Piscataway, N.J., and William Kaminski, P.O. Box 155A, R.D. Asbury, West Portal, N.J.

Filed April 1, 1971, Ser. No. 130,409

Int. Cl. H04l *3/00*

U.S. Cl. 325—38 A **6 Claims**



A differential pulse code modulation system substantially reduces sign redundancy by transmitting a flag signal only when a change in polarity exists between differential samples. Between the flag signals, only the absolute magnitude of the differential samples is transmitted. In another arrangement, an amplitude word is transmitted after a second flag signal which signifies a change in polarity of a differential sample accompanied by a large amplitude level. The amplitude word operates an expanded scale coding mode which assigns a quantized level to the differential sample that is changed in sign.

3,716,790
SINGLE SIDEBAND SYSTEM UTILIZING TWO TONE MODULATION

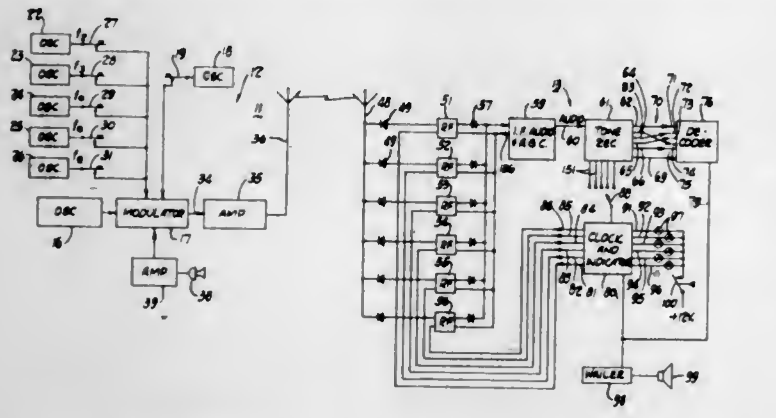
Paul E. Romoser, Lorain, Ohio, assignor to Lorain Electronics Corporation

Filed May 11, 1970, Ser. No. 36,358

Int. Cl. H04b *1/68*

U.S. Cl. 325—49 **17 Claims**

Selective calling of any one of a plurality of receivers is provided in a single sideband system with calling on any one of a plurality of radio-telephone carrier channels. A first audio tone plus a sequence of five additional audio tones modulate the carrier and the carrier and one sideband is fully suppressed before transmission. In the receiver demodulation takes place to produce an output audio tone dependent upon the difference of the first audio tone and any one of the other five audio tones. The demodulated signal is thus a sequence of five audio tones which are sent through a decoding device which does not give a signal if the code is incorrect or if the length of time between tones is not correct. If both of these are correct, then a calling signal is audibly or visibly displayed at the receiver station. The foregoing abstract is merely a resume of one general application, is not a complete discussion of all principles of operation or applications, and is not to be construed as a limitation on the scope of the claimed subject matter.

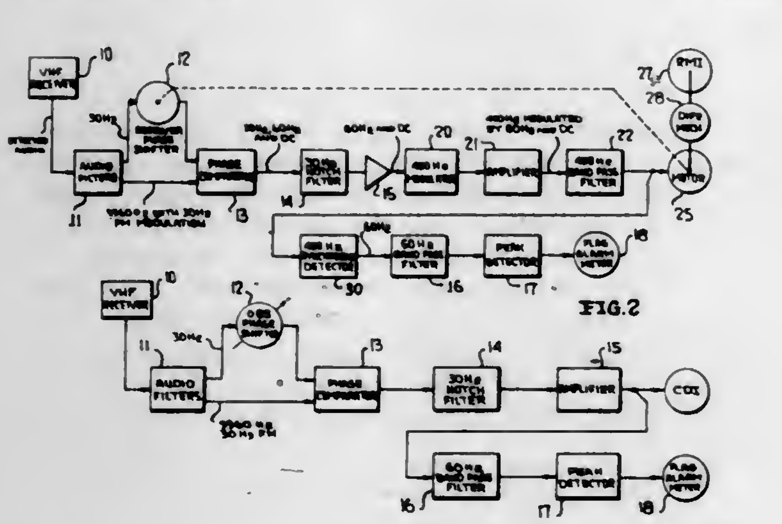


ERRATUM

For Class 325—324 see:
Patent No. 3,716,780

3,716,791
FLAG ALARM SYSTEM APPLICABLE TO A VOR RECEIVER

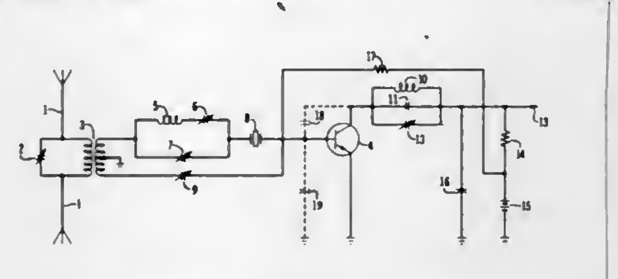
William S. Harries; Gul C. Asnani, both of Kansas City, and John H. Flentie, Independence, all of Mo., assignors to American Standard Inc., Falls Church, Va.
Filed July 24, 1970, Ser. No. 57,962
Int. Cl. H04b *1/00*
U.S. Cl. 325—363 **5 Claims**



A flag alarm system for a VOR receiver (applicable to other purposes) in which two 30 Hz signals of relatively variable phase normally present in two channels of the receiver, while the latter is operating properly, are multiplied together to produce modulation products including a dc component having a value which is a function of said phase, and which in one form of the invention is employed in a servo loop which indicates or controls said phase, and also a double frequency signal of peak amplitude independent of phase difference but a function of the products of the amplitudes of the 30 Hz signals. The double frequency signal operates to hold a flag inoperative, but cannot hold the flag if either or both 30 Hz signals disappear or are radically reduced in amplitude. The system indicates the presence or absence of valid signals, i.e. the two 30 Hz signals, and overall system malfunction, on a fail-safe basis.

3,716,792
SELECTIVE OSCILLATOR MIXER FOR A SUPERHETERODYNE RECEIVER

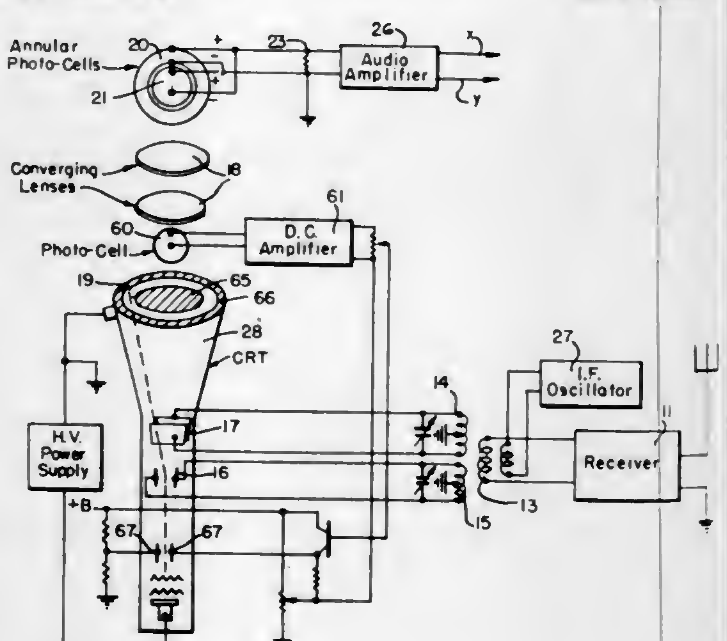
Raymond Waibel Ketchledge, Wheaton, Ill., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.
Filed Aug. 11, 1971, Ser. No. 170,718
Int. Cl. H04b *1/26*
U.S. Cl. 325—438 **9 Claims**



A frequency selective oscillator mixer for a superheterodyne receiver takes the form of a radio frequency band selection filter and a transistor feedback oscillator in which a single piezoelectric crystal is connected in common both in the feedback path of the oscillator and in the filter and the oscillation frequency of the oscillator and the pass band of the filter are tuned to frequencies substantially equal to but slightly different from different harmonics of the crystal.

3,716,793
AMPLITUDE MODULATION DETECTOR FOR RADIO RECEIVERS

Louis W. Parker, 2408 Sunrise Key Blvd., Fort Lauderdale, Fla. 33304
Filed Dec. 7, 1971, Ser. No. 205,532
Int. Cl. H04b *1/16*
U.S. Cl. 325—487 **15 Claims**

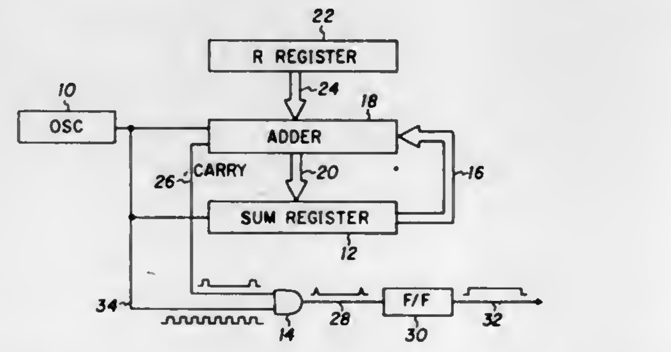


The IF carrier in a radio receiver is used to control the deflection circuits of a cathode ray tube to cause a circular sweep of the tube beam. Light from the resultant circular oscillogram is projected onto two ring-shaped concentric photocells in such fashion that the light falls partially between and partially on said photocells with each photocell receiving one polarity of the AF wave. The sizes of the photocell surfaces are selected so as to extend only to the peak amplitude of modulation on both the positive and negative halves of the AF cycle, to effect clipping of any noise riding on the oscillogram. The combined outputs of the photocells provide the desired demodulated AF signal.

The brilliance of the oscillogram is maintained by a separate photocell controlled circuit. Variations in the basic circuit include the use of ring-shaped secondary emission plates within the cathode ray tube, instead of ring-shaped photocells.

3,716,794
FREQUENCY DIVIDING APPARATUS

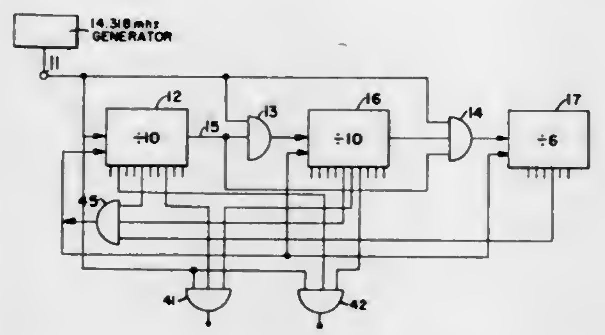
Eugene D. Teggatz, 2435 21st Avenue; Vincent R. De Long, R.R. 2, Old Marion Road, and Dale A. Holtzer, 2550 McGowan Blvd., all of Marion, Iowa
Filed April 26, 1972, Ser. No. 247,628
Int. Cl. H03k *21/00*
U.S. Cl. 328—39 **5 Claims**



Apparatus for altering the frequency of a signal by values other than whole number division comprising the use of an adder and a register for consecutively and cumulatively adding an input number at a rate coincident with the frequency of a signal to be frequency divided and providing an output indicative of each occurrence of the cumulative sum exceeding a predetermined value.

3,716,795
TIME COMB GENERATOR

Buck C. Brown, Rockville, Md., assignor to Control Concepts Corporation, Rockville, Md.
Filed March 18, 1971, Ser. No. 125,647
Int. Cl. H03k *3/02*; H04n *5/06*
U.S. Cl. 328—63 **4 Claims**

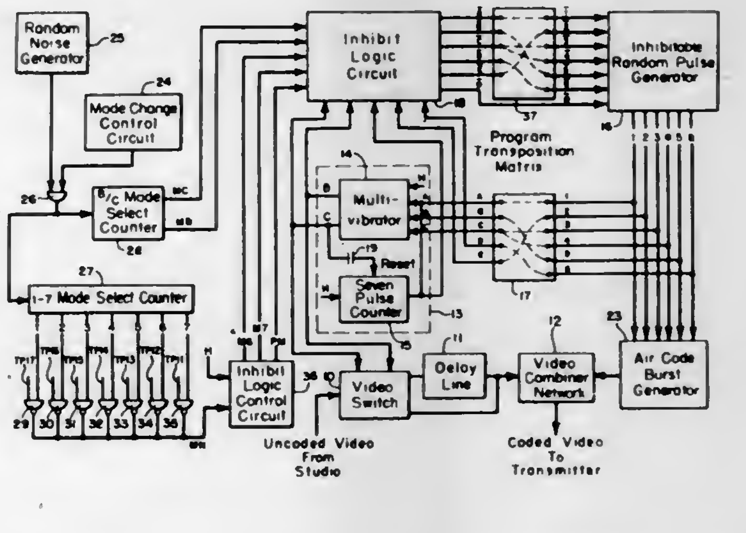


A time comb generator for a television synchronizing generator having a series of three shift register dividers connected in cascade. A pulse train having a frequency of 14.318 MHz is fed to the first shift register which divides the frequency of the pulse train by ten. The divided signal is then fed to a second shift register which also divides by ten. The output of the second shift register is then fed to a third shift register which divides by six. The cascaded arrangement of shift registers are recycled each time 455 pulses have been fed thereto. This is twice the rate at which the horizontal lines are scanned in a television system.

The first two shift registers have five stages and the last has three stages, each of which provide an output incrementally time spaced from the other at equal time intervals, that is, e.g., 10 different outputs can be derived from the first shift register, one being spaced from the next by approximately 70 nanoseconds. The second shift register provides ten equally spaced output signals each approximately 700 ns apart. The third shift register provides six equally spaced output signals each approximately 7000 ns apart. The outputs from the various stages are then selectively combined in a desired manner to position the leading and trailing edges of the various component signals in a television sync signal.

3,716,796
SEMI-RANDOM PULSE GENERATOR

Hyacint E. Harna, Cicero, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.
Filed Nov. 3, 1971, Ser. No. 195,344
Int. Cl. H03b *29/00*
U.S. Cl. 328—63 **10 Claims**

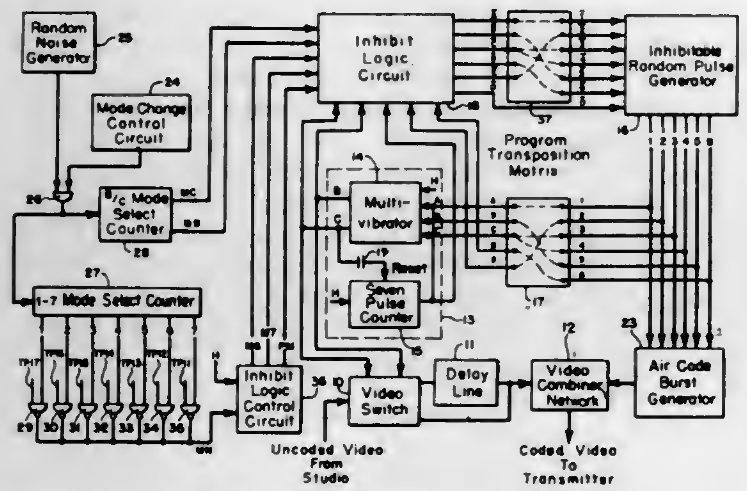


A pulse generator for a subscription television encoder or the like produces control pulses at semi-random intervals of predetermined average duration. The circuit comprises a multi-stage counter to which random noise pulses are periodically applied for a predetermined time interval. At the end of the interval a control pulse is produced if and only if the individual stages of the counter all occupy the same state. To decrease the average interval between control pulses, one or more of the counter stages is selectively forced into the desired state by a switch circuit.

3,716,797
INHIBITABLE RANDOM PULSE GENERATOR

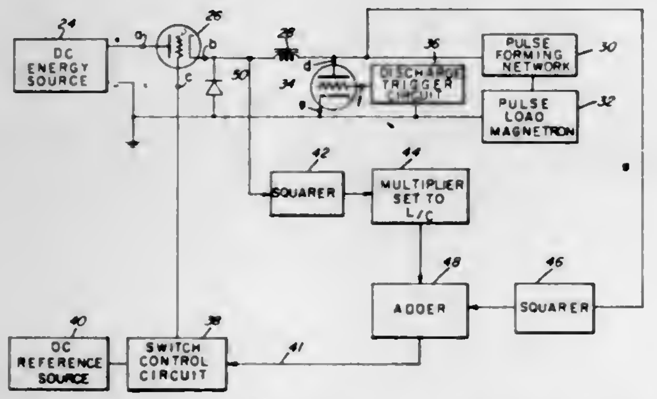
Melvin C. Hendrickson, Elmhurst, and Richard G. Merrell, Darien, Ill., assignors to Zenith Radio Corporation, Chicago, Ill.
Filed Nov. 4, 1971, Ser. No. 195,728
Int. Cl. H03b *29/00*
U.S. Cl. 328—63 **6 Claims**

An inhibitable random pulse generator for a subscription television system or the like generates an output pulse indicative of a random one of a plurality of possible counting states, one or more of which may be inhibited to narrow selection to the remaining states. A plurality of logic elements within the generator are connected in a novel mutually-exclusive circuit whereby one and only one can produce an output at a time. Individual sources of random noise applied to each element produce an output from an unpredictable one of the elements.



Provision is made for inhibiting selected generator outputs by preventing the application of noise to the associated element, and a test mode is provided wherein timing pulses are applied to the elements to obtain a repetitive predictable output.

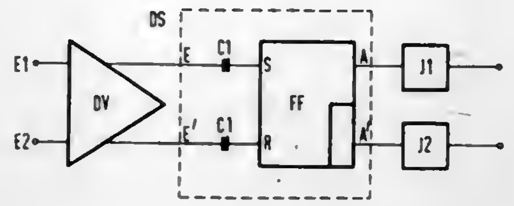
3,716,798
ANTICIPATORY CHARGING REGULATOR
James P. O'Loughlin, 70 Boston Rd., Chelmsford, Mass.
Filed Feb. 25, 1972, Ser. No. 229,375
Int. Cl. H03k *1/02, 1/12*
U.S. Cl. 328—67 13 Claims



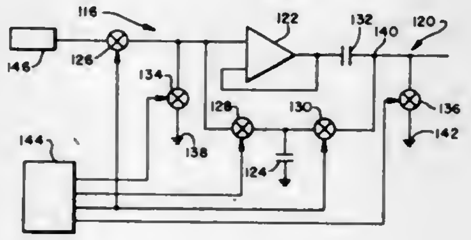
A regulator for resonant-charging circuits in which the state of the energy storage elements of the charging circuit, which includes the charging inductance and pulse-forming network, are measured as the circuit is charged and the charging is halted when the total energy in these elements is at a desired level.

3,716,799
CIRCUIT ARRANGEMENT FOR INTERFERENCE-FREE RECOGNITION OF THE ZERO CROSSINGS OF SINE-LIKE SIGNALS
Guenther Haass, and Dieter Reinhardt, both of Weitheimer Strasse 91, Munich, Germany
Filed April 5, 1971, Ser. No. 131,353
Claims priority, application Germany, April 24, 1970, P 20 20 187.0
Int. Cl. H03k *5/20, 17/30*
U.S. Cl. 328—150 2 Claims

An arrangement for recognizing zero crossings of sine-like signals in the presence of interference utilizes a bistable flip-flop circuit which is capacitively coupled to receive input signals from a differential amplifier having a pair of inputs which are symmetrical with respect to ground. The coupling capacitors and the bias resistors of the flip-flop circuit provide a switching threshold which is smaller during a succession of useful signals and during receipt of individual interference signals. The flip-flop circuit feeds impulse generating means to provide correctly timed, for example, rectangular signals.



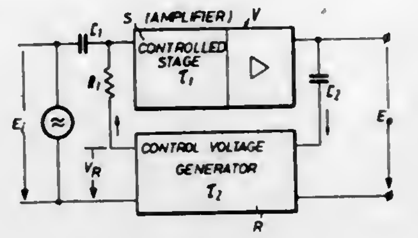
3,716,800
SAMPLE AND HOLD CIRCUIT
James V. Di Rocco, Winchester, Mass., assignor to Gordon Engineering Company, Wakefield, Mass.
Filed Jan. 6, 1971, Ser. No. 104,216
Int. Cl. H03k *5/00*
U.S. Cl. 328—151 4 Claims

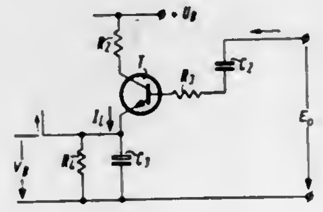


In a sample and hold circuit employing one operational amplifier connected in a high impedance voltage follower configuration, a first switch is connected to the input of the amplifier and second and third switches are connected serially between the output and input terminals of the amplifier. A capacitor is connected between the junction point of the second and third switch and ground. During the sample period, the first and third switches are energized to the ON state and the capacitor is charged to the voltage appearing at the output of the amplifier, the second switch being in the OFF state. During the hold period, the second switch is energized to the ON state and the charge on the capacitor is applied to the input of the amplifier, the first and third switches being in the OFF state.

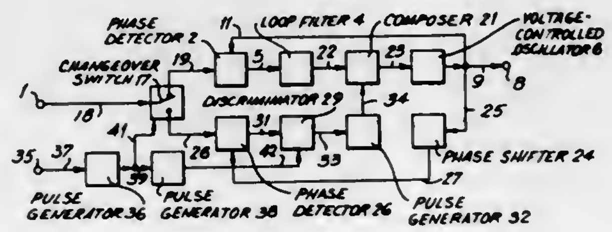
3,716,801
AMPLIFIER WITH IMPROVED AVC CIRCUIT
Willy Minner, Schwaigern, Germany, assignor to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt, Germany
Filed July 7, 1970, Ser. No. 52,814
Claims priority, application Germany, July 7, 1969, P 19 34 306.7
Int. Cl. H03g *3/30*
U.S. Cl. 330—29 2 Claims

An improved AVC circuit for an alternating voltage amplifier which prevents over-control, and thus temporary blocking of the amplifier circuit, upon the occurrence of a sudden large increase in the amplitude of the input signal to the amplifier. The control voltage generating arrangement of the AVC circuit is constructed so that the time constant of the control voltage is increased proportionately to the increase of the output voltage from the amplifier when ever the output voltage exceeds a predetermined value.





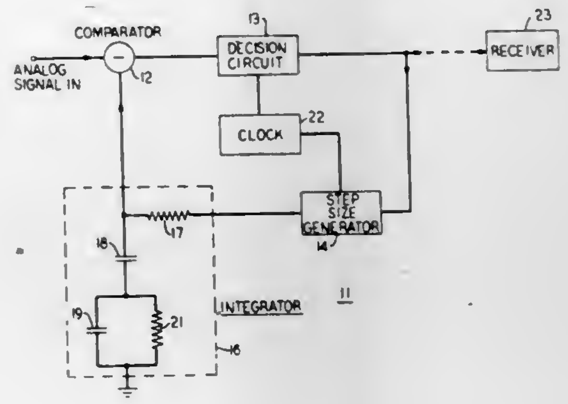
3,716,802
PHASE LOCKED LOOP WITH RAPID PHASE PULL-IN CIRCUIT
Takuro Muratani, No. 2-19-8, Nishiochiai, Shinjuku-ku, Tokyo; Michihisa Okawa, No. 2-1-11, Naka-cho, Musashino-shi, Tokyo, and Hiroshi Nakamura, No. 6-1, 4-chome, Kyodo, Setagaya-ku, Tokyo, all of Japan
Filed April 5, 1971, Ser. No. 131,047
Claims priority, application Japan, April 10, 1970, 45/30548
Int. Cl. H03b *3/04*
U.S. Cl. 331—8 7 Claims



In a loop comprising a phase detector, a low pass filter and a voltage-controlled oscillator, the phase of the output oscillation of the oscillator is synchronized with the phase of the input signal supplied to the loop. Prior to the supply of the input signal to the loop, the phase of the input signal is compared with the phase of the loop by an additional phase detector. If necessary, the phase of the voltage-controlled oscillator in the loop is varied by the additional phase detector so that the phase of the stable point of the loop approaches the phase of the input signal. The input signal is then applied to the loop and the synchronization operation is provided.

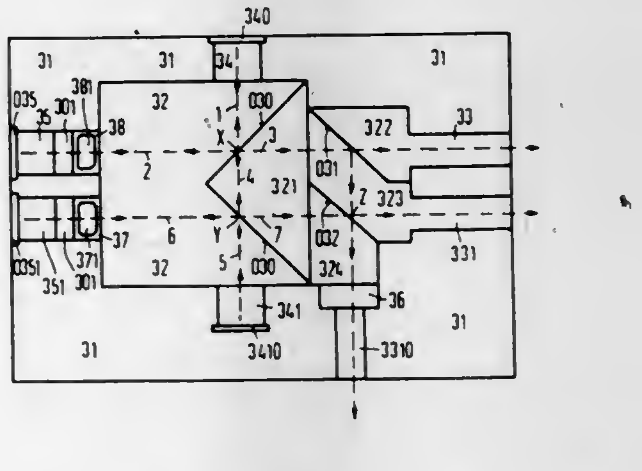
3,716,803
STABILIZED DELTA MODULATOR
James Charles Candy, Convent Station, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill and Berkeley Heights, N.J.
Filed Dec. 27, 1971, Ser. No. 212,311
Int. Cl. H03k *13/22*
U.S. Cl. 332—11 D 5 Claims

In delta modulators, especially those known as adaptive delta modulators, numerous factors such as noise, delay, decision circuit hysteresis, and poor adaptive algorithms can result in instabilities in the form of low frequency, high amplitude oscillations.



Instabilities can be eliminated through means for producing an overshoot in the integrator output, and actuating the decision circuit while the overshoot is present.

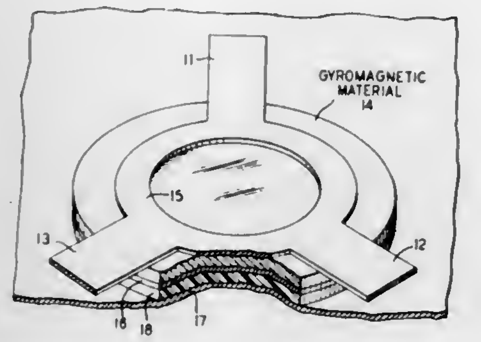
3,716,804
INTEGRATED OPTICAL-ELECTRONIC SOLID STATE SYSTEM
Eberhard Groschwitz, Edward-Schmid-Str. 4, Munich, Germany
Filed March 31, 1970, Ser. No. 24,170
Claims priority, application Germany, April 3, 1969, P 19 17 400.6
Int. Cl. H01s *3/18, 3/10*
U.S. Cl. 332—7.51 20 Claims



A crystal substrate integrates a plurality of optically and electronically operating components. The substrate has a surface having a matrix having at least two circuit layers one above the other and each substantially parallel to the surface of the substrate. The components are positioned in the two circuit layers. Optical paths optically intercouple corresponding ones of the optical components and extend in at least one of the layers predominantly in directions parallel to the surface of the substrate. An optical guide plate propagates light within and parallel to the guide plate in any desired directions. The guide plate comprises different optically functional areas. At least two solid state light sources are optically coupled to the guide plate in a manner whereby when the light sources are operative an information content is provided comprising information components constituted by a network of optically correlated component light beams. The information content has an information structure comprising a plurality of adjustable information components.

3,716,805
DELTA CONNECTED LUMPED ELEMENT CIRCULATOR

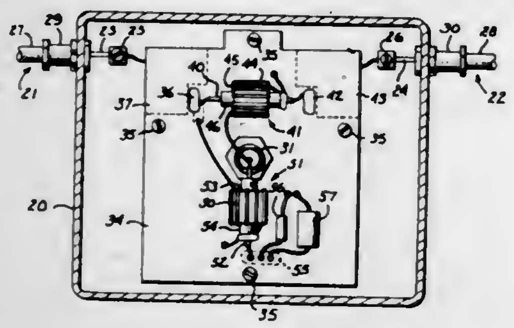
Reinhard Heinrich Knerr, Route 1, Orefield, Pa.
Filed Aug. 30, 1971, Ser. No. 175,868
Int. Cl. H01p *1/32, 5/12*
U.S. Cl. 333—1.1 **9 Claims**



A junction strip line circulator of the lumped constant type in which the gyromagnetically coupled strip line members are delta connected in the common region and tuned by three capacitors effectively connected respectively from each vertex of the delta to a common point and by a further reactance from the common point to the strip line ground plane. Separate mode tuning is facilitated and the crossovers usually found in Y-connected circulators are eliminated.

3,716,806
SIGNAL COUPLING APPARATUS UTILIZING HYBRID TRANSFORMER

Martin L. Zelenz, 11 Joanne Avenue, Seneca County, Seneca Falls, N.Y.
Filed Aug. 19, 1971, Ser. No. 172,981
Int. Cl. H01p *5/14;* **H03h** *7/48*
U.S. Cl. 333—10 **5 Claims**

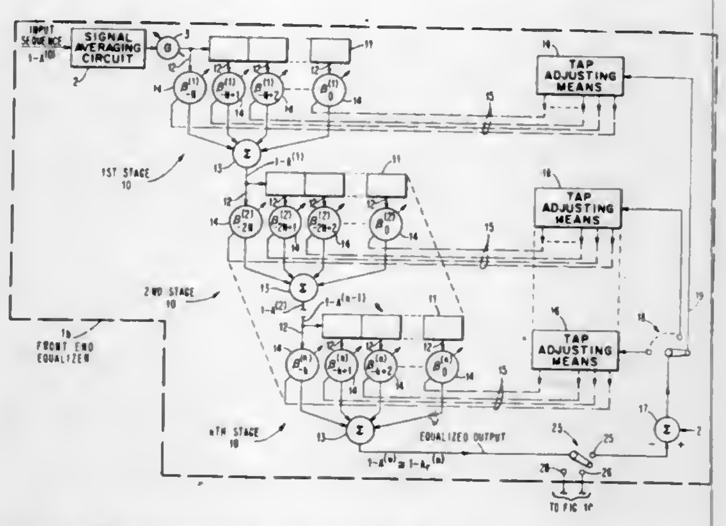


A hybrid transformer signal coupling apparatus is disclosed wherein one winding is a coaxial conductor having an outer conductor which provides electrostatic shielding between the center conductor and a second winding wound on a core of magnetic material. The hybrid transformer is used in a directional coupler for broadband signals such as television signals carried via a coaxial cable.

3,716,807
RECURSIVE AUTOMATIC EQUALIZER AND METHOD OF OPERATION THEREFORE

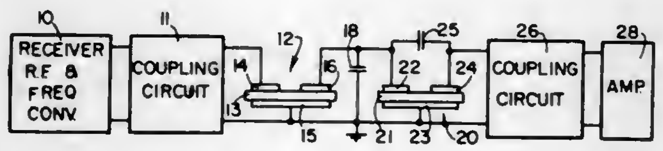
Richard T. Sha, Mohegan Lake, and Donald T. Tang, Yorktown Heights, both of N.Y., assignors to International Business Machine Corporation, Armonk, N.Y.
Filed May 24, 1971, Ser. No. 146,371
Int. Cl. H04b *3/04*
U.S. Cl. 333—18 **26 Claims**

A recursive automatic equalizer with extremely fast convergence is disclosed. The equalizer includes a plurality of equalizer stages connected in cascade which first reduces impulse response of the communication channel to substantially zero. The front portion or sidelobe is reduced to substantially zero distortion by adjusting the tap settings of successive equalizer stages after successive iterations (the first iteration adjusts the tap settings of the first equalizer stage, the second iteration adjusts the tap settings of the second equalizer stage, and so on) such that after *n* iterations a given initial distortion *D* is reduced to substantially zero. The tap setting algorithm involved and the method of operating the cascaded equalizer is disclosed. Finally, after *n* iterations, the output signal which can be described by the function $1-A^{(n)}$ is modified by the reciprocal of the foregoing function and, is this manner, the rear or trailing portion of an input signal which is to be equalized has its rear sidelobe distortion reduced to substantially zero leaving only the desired main pulse. Apparatus for modifying the trailing or rear end of a pulse to be equalized is also disclosed.



3,716,808
BANDPASS FILTER INCLUDING MONOLITHIC CRYSTAL ELEMENTS WITH RESONATING PORTIONS SELECTED FOR SYMMETRICAL RESPONSE

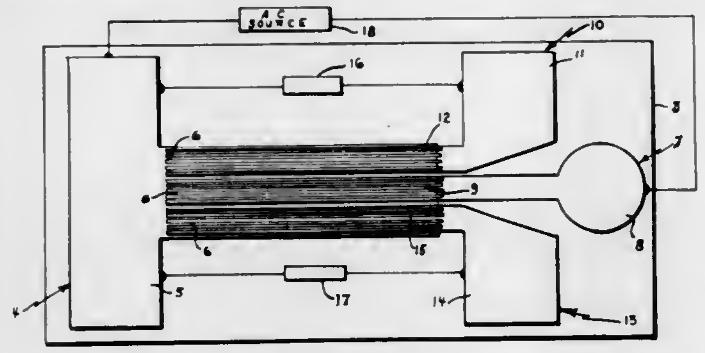
Stanley Malinowski, Park Ridge; James L. Dailing, Glen Ellyn, and Craig P. Smith, Addison, all of Ill., assignors to Motorola, Inc., Franklin Park, Ill.
Filed May 20, 1971, Ser. No. 145,206
Int. Cl. H03h *7/10, 7/00*
U.S. Cl. 333—72 **16 Claims**



A bandpass filter circuit includes a pair of dual coupled monolithic crystal filter elements each formed by a wafer of quartz, or other piezoelectric material, with two pairs of electrodes thereon, each pair cooperating with the wafer to form a resonating portion. The two dual coupled crystal elements are cascade coupled, with the signal to be selected applied to the first pair of electrodes on the first element, then coupled from the second pair of electrodes of the first element to the first pair of electrodes of the second element, and the selected signal derived from the second pair of electrodes of the second element. To reduce the requirement for inductive coupling elements in the filter, the monolithic filter elements are constructed so that the resonant frequencies of certain resonating portions thereof are below the mesh frequencies of the filter, which are at the center frequency of the filter. To provide a filter response characteristic having improved selectivity, i.e. steep skirts, a capacitor is bridged across the electrodes of at least one of the crystal elements. This causes a non-symmetrical response, and to correct this, the filter elements are constructed so that the resonant frequency of one resonating portion of at least one of the crystal elements is increased.

3,716,809
ACOUSTIC SURFACE WAVE RESONATOR

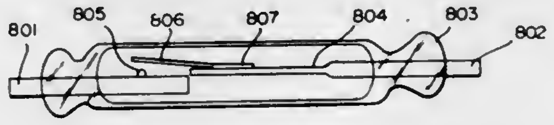
Thomas M. Reeder, Palo Alto, and Richard Smith, Balboa Island, both of Calif., assignors to The United States of America as represented by the Secretary of the Air Force
Filed Aug. 11, 1971, Ser. No. 170,798
Int. Cl. H03h *9/04, 9/20, 13/00*
U.S. Cl. 333—82 R **1 Claim**



High Q performance is achieved in an acoustic surface wave resonator by the use of acoustic surface wave reflectors. The resonator input transducer and the reflectors are affixed to the propagation surface of a piezoelectric substrate member by photolithographic process. The input transducer is an interdigital structure having many long interleaving finger members. The reflectors also have long interleaving finger members and are positioned in close parallel relationship to the transducer finger members. The reflectors are electrically terminated by inductances.

3,716,810
REED SWITCH

Toshito Hara, Kawasaki, and Toshiro Oguma, Suzaka-shi, Nagano-ken, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan
Filed Dec. 8, 1971, Ser. No. 206,013
Claims priority, application Japan, Dec. 11, 1970, 45/109398
Int. Cl. H01h *51/28*
U.S. Cl. 335—154 **9 Claims**

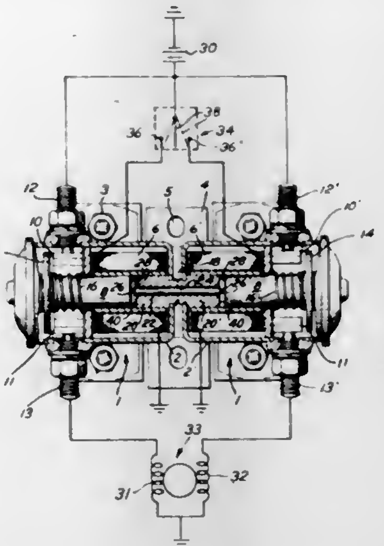


A reed switch comprises a pair of reeds positioned so that the locus of operation of the free end of at least one of the reeds does not cross the other of the reeds. Contact material is provided in the area of the free end of each of the reeds. The contact material on at least one of the reeds is mounted to deviate from the free end of the one of the reeds.

3,716,811
DOUBLE SOLENOID WITH INTERLOCK

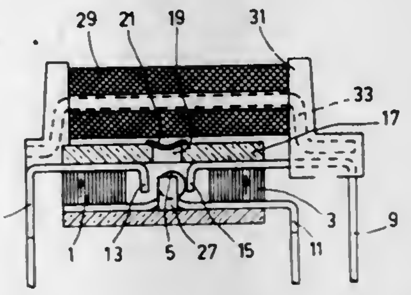
Robert E. Prouty, 7 Northern Avenue, Logansport, Ind., and Robert D. Graf, 604 S. Willow Street, Flora, Ind.
Filed Sept. 20, 1971, Ser. No. 182,015
Int. Cl. H01h *9/26*
U.S. Cl. 335—160 **10 Claims**

A double solenoid electrical switching device comprises a pair of solenoid switches mounted together on a common base, the plungers of which are spaced from each other by a longitudinally movable interlock pin having a length which is such that when the contacts of one of the solenoids are closed, the pin is moved by the plunger of that solenoid to a position in which the plunger of the other solenoid is prevented from moving so as to simultaneously close its contact.



3,716,812
BISTABLE BALL-ARMATURE CONTACT

Reinhard Cornelis Greve, and Hendrik Johannes De Jong, both of Hilversum, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.
Filed Sept. 13, 1971, Ser. No. 179,775
Claims priority, application Netherlands, Sept. 23, 1970, 7014026
Int. Cl. H01h *51/24*
U.S. Cl. 335—179 **11 Claims**

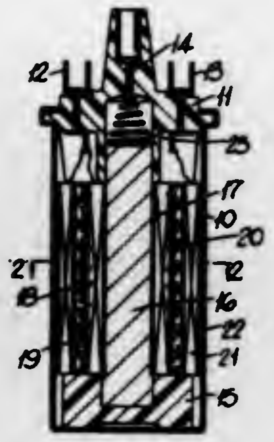


A bistable ball-armature contact having a ball-armature which can be brought to two switching positions by a magnetic flux variation, and which is held in one of the switching positions in the absence of an external magnetic flux by means of at least one permanent magnet for each switching position. The said magnets are polarized in the same direction and encompass the ball-armature, the electrical contacts being formed by two collinear contact strips at one side of the magnets and a supporting strip, situated parallel to the contact strips, for the ball-armature at the other side of the magnets.

3,716,813
IGNITION COILS

Peter Thomas Hillyard, 70 Neville Road, Shirley, Solihull, England
Filed Nov. 23, 1971, Ser. No. 201,466
Claims priority, application Great Britain, Nov. 28, 1970, 56,647/70
Int. Cl. H01f *27/08, 15/14*
U.S. Cl. 336—60 **1 Claim**

An ignition coil has a secondary winding wound on a coil and a primary winding which is co-axial with the secondary winding and is spaced therefrom by a layer of corrugated electrically insulating material defining a plurality of channels extending parallel to the axis of the core. At least one layer of the primary winding is wound on the secondary winding between the secondary winding and the layer of corrugated electrically insulating material.



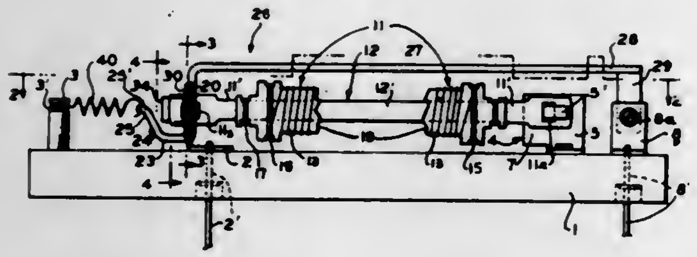
3,716,814
THERMAL SWITCH

William C. Broekhuysen, 1200 South Ocean Boulevard, Boca Raton, Fla.

Filed Feb. 23, 1972, Ser. No. 228,651

Int. Cl. H01h *61/01*

U.S. Cl. 337—123 **10 Claims**



A thermal switch of the type dependent on the differential longitudinal expansion of two separate elongated elements. Contact means to be operated are responsive to the angular orientation of a rocker member, and to that member the two elements are connected to determine that orientation. An appropriate means restrains the rocker member against movement in one direction transverse to the elements, and spring means maintain under tension the restraining means and both the elements. At least one element being subjected to efficient electrical heating, the switch may constitute a thermal relay; neither being so subjected, but the elements being of different thermal expansibilities, the switch may constitute a thermostat.

3,716,815
ELECTRICAL CONNECTORS

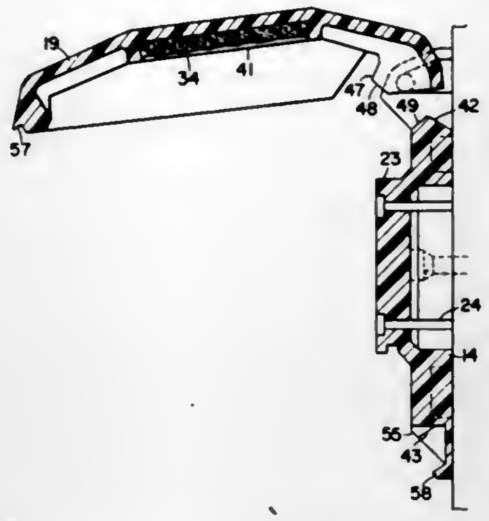
Arthur John Riches, 29 Grange Road, Herne Bay, Kent, England

Filed April 5, 1971, Ser. No. 130,959

Int. Cl. H01r *13/44, 13/50*

U.S. Cl. 339—44 M **8 Claims**

An electrical connector comprising a base of plastics material with a contact carrier upstanding therefrom, and a lid of plastics material hinged to the base and arranged for snap-acting locking closure over the contact carrier, the hinge of the lid embodying a lost-motion mechanism enabling the lid to move bodily in a direction at right-angles to the base during closure.



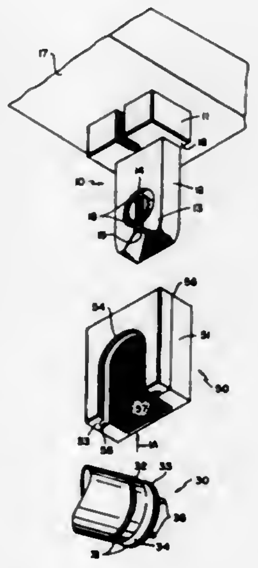
3,716,816
COUPLING FOR SECURING A LAMP IN A LAMPHOLDER

William Johnson, Jr., 11346 Wormer, Detroit, Mich.

Filed Dec. 28, 1970, Ser. No. 102,030

Int. Cl. H01r *33/08*

U.S. Cl. 339—53 **5 Claims**



A coupling adaptable to or integral with a lampholder and cooperable with the base of a lamp to prevent relative axial movement of the lamp with respect to the lampholder into which it is inserted.

3,716,817
ELECTRICAL CONNECTORS

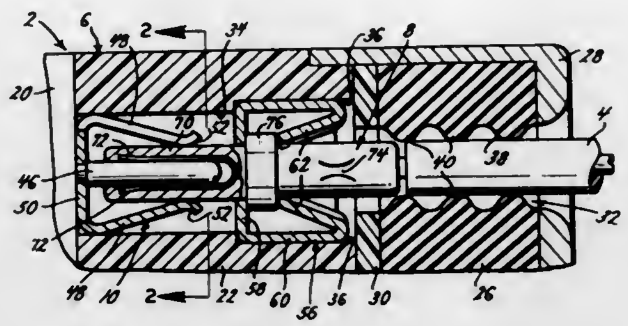
William D. Wolfe, Jr., St. Louis, and Donald M. Bowdish, Overland, both of Mo., assignors to McDonnell Douglas Corporation, Saint Louis, Mo.

Filed April 21, 1971, Ser. No. 135,911

Int. Cl. H01r *13/62*

U.S. Cl. 339—74 R **7 Claims**

An electrical connection is formed by a pair of connectors which engage one another such that contact resistance between the two is extremely low. The one connector is attached to a wire and has a hollow barrel surrounded by a flange. The other connector is disposed within a socket and includes a pin sized to fit within a barrel and a plurality of resilient contact fingers spaced around the pin and in electrical contact therewith. When the first connector is inserted into the socket, the barrel passes over the pin and between the fingers so that the pin engages the internal surface of the barrel while the fingers engage the external barrel surface. The socket contains a locking clip which engages the flange on the barrel and prevents withdrawal of the first connector from the socket.



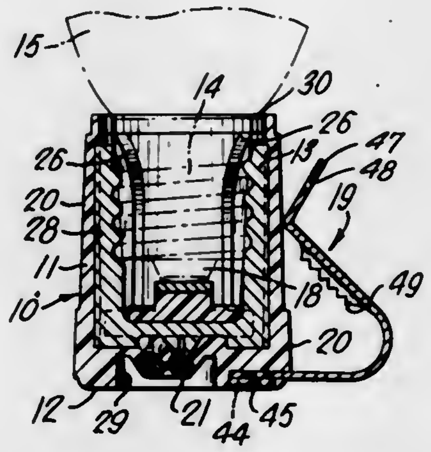
3,716,818
ELECTRICAL HARNESS WITH MOULDED SOCKETS

Laurence Stephen Finkelstein, 42 Lyncroft Road, Montreal, Quebec, Canada

Filed Dec. 21, 1970, Ser. No. 100,342

Int. Cl. H01r *9/08*

U.S. Cl. 339—97 L **3 Claims**



A moulded socket for electric lamp bulbs comprising a hollow cylindrical body and an open end. An electrical cable is moulded within a base formed integrally with the cylindrical body. A center metal contact is partly moulded within the base and held at the center of the socket over the base. A U-shape metal side contact having two opposed sides and a connecting base is also partly moulded within the cylindrical body and adapted to receive and retain a lamp bulb screw base between the opposed sides. Points are formed with the contacts to penetrate the insulation on the electrical cable to make electrical connection with a respective wire. The base of the socket is provided with ventilating holes and guide ribs are formed in the inner surface of the cylindrical body to guide a screw base in the socket and to provide sufficient ventilation thereabout. A holding clip is also moulded, at one end thereof, within the socket base.

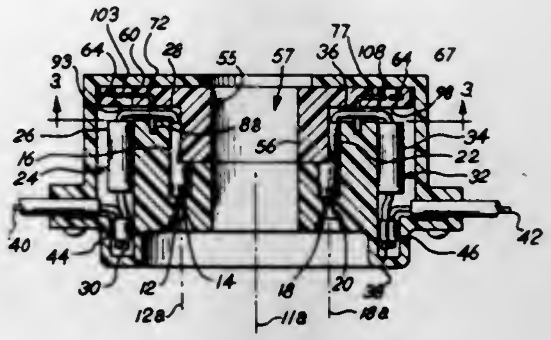
3,716,819
TUBE SOCKET VOLTAGE LIMITING APPARATUS AND METHOD OF MANUFACTURING THE SAME

Anthony Borth, Rural Rt. 1, Morocco, Ind.

Filed April 6, 1970, Ser. No. 25,995

Int. Cl. H01r *13/34*

U.S. Cl. 339—143 T **8 Claims**



A voltage limiting apparatus for use in connection with a tube socket comprising a terminal contact adapted to comate with the pin of a tube. The apparatus preferably comprises a conductive member having a first portion adapted to be connected to a ground point and a second portion electrically connected to the contact. A gap is located between the first and second portions. A nonconductive piece of material rigidly positions the first portion with respect to the second portion so that the size of the gap remains constant, thereby causing the voltage at which an electrical discharge occurs across the gap to remain at a predetermined constant value. A method of manufacturing the apparatus includes the steps of fabricating a conductive member with the first and second portions, molding plastic to the conductive member to fix the positions of the two portions and then forming the electrical gap between the portions.

3,716,820
ELECTRICAL JACK PLUGS

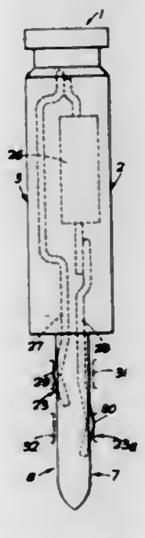
Stanley Thomas Deakin, c/o Sealectro Limited, Walton Road, Portsmouth Hampshire, Farlington, England

Claims priority, application Great Britain, Jan. 27, 1971, 330/71

Filed May 5, 1971, Ser. No. 140,457

Int. Cl. H01r *13/66*

U.S. Cl. 339—147 P **1 Claim**



A jack plug is integrally formed and comprises parts which are longitudinally hinged and releasably lock together to form a hollow body, for enclosing an electrical component, and a probe which has passageways for electrical members extending from the component; and the passageways each have an exterior aperture.

3,716,821

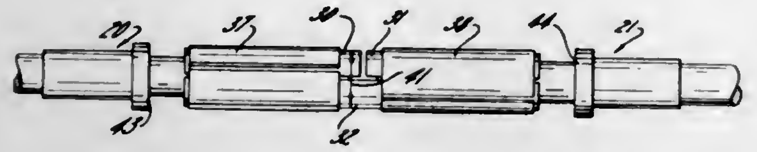
ELECTRICAL CONNECTORS

Arthur I. Appleton, c/o Appleton Electric Co., 1701 West Wellington, Northbrook, Ill.

Continuation-in-part of Ser. No. 770,518, Oct. 25, 1968, abandoned. This application Oct. 20, 1970, Ser. No. 82,452

Int. Cl. H01r *13/16*

U.S. Cl. 339—205 **3 Claims**



An electrical connector is provided wherein a male member is inserted into a female assembly, the male member and contacted female assembly parts having substantially identical radii of curvature. Biasing means are provided for urging the contact parts together with a relatively evenly distributed pressure to provide a substantial area of current conducting interface. In the preferred embodiment, the contact parts of the female assembly include an arcuate contact surface which subtends, in cross section, an arc of less than 180°.

3,716,822

METHOD AND DEVICE FOR DETECTING RELATIVE SPEED BY USING SUPERSONIC WAVE

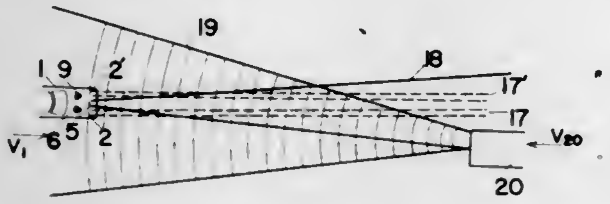
Yasuo Tsuruta, No. 12-22, 3-chome, Nakamagome, Ota-ku, Tokyo, Japan

Filed Sept. 21, 1970, Ser. No. 74,069

Claims priority, application Japan, Sept. 25, 1969, 44/075803

Int. Cl. G01s *9/66*

U.S. Cl. 340—1 R **8 Claims**



A method and device for detecting relative speed by using supersonic wave, wherein the change of cycle due to the Doppler effect of the sound wave reflected from an object moving relative to the sound source of supersonic wave is detected whereby the relative speed of the object is automatically detected and thus the safety mechanism of a transport machine such as an automobile is automatically controlled.

3,716,823

POLYCHROMATIC SONAR OBJECT IDENTIFICATION SYSTEM

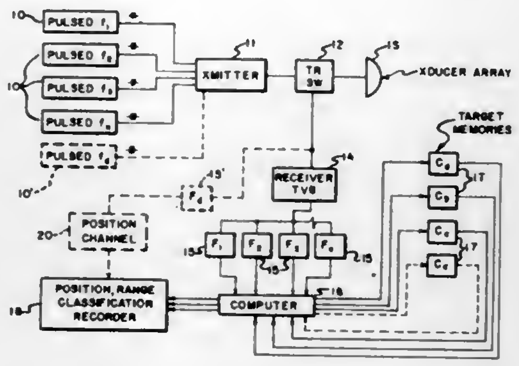
John H. Thompson, Pittsburgh, Pa., and David S. Sims, Ellicott City, Md., assignors to the United States of America as represented by the Secretary of the Navy

Filed Dec. 15, 1960, Ser. No. 76,081

Int. Cl. G01s *9/66*

U.S. Cl. 340—3 R **3 Claims**

1. Apparatus for determining whether an underwater object is mine-like in size and construction comprising means for transmitting toward said object acoustic waves in one spectrum having wavelengths extending over the range of circumferential dimensions of expected mines and in another spectrum having wavelengths extending over the range of twice the case thicknesses of expected mines, means for deriving an unknown signal waveform representative of the acoustic wave spectrum back-scattered by said object, and a computer including memory channels in which is stored a library of known signal waveforms representative of the acoustic wave spectra returned by known mines for comparing said unknown signal waveform with said known signal waveforms and producing an output signal indicating the result of the comparison.



3,716,824

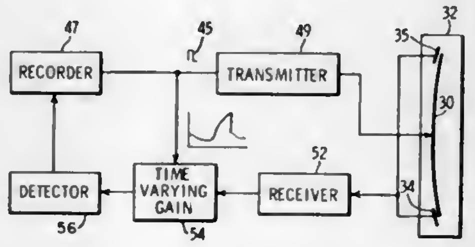
SIDE LOOKING SONAR APPARATUS

John A. Dorr, Crofton Park, and Henry M. Gruen, Annapolis, both of Md., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Oct. 17, 1969, Ser. No. 867,170

Int. Cl. G01s *9/66*

U.S. Cl. 340—3 R **7 Claims**



An arcuate side looking sonar transducer transmits acoustic energy to the sea bottom. Reflected acoustic energy is received by a pair of relatively short receiver transducers positioned over the ends of the transmitter transducer.

3,716,825

CONTOUR MEASURING APPARATUS ESPECIALLY FOR USE IN A SEA BOTTOM ELEVATION MEASUREMENT

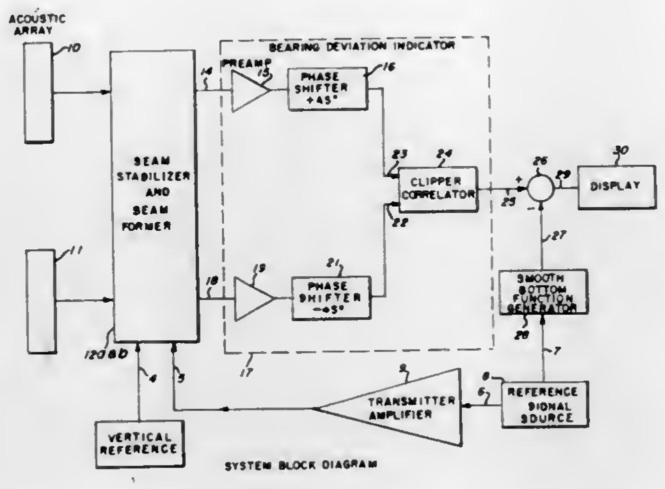
George M. Walsh, Middletown, and Mark A. Chramiec, Newport, both of R.I., assignors to Raytheon Company, Lexington, Mass.

Continuation of Ser. No. 785,102, Dec. 19, 1968, abandoned. This application July 30, 1970, Ser. No. 64,114

Int. Cl. G01s *9/66*

U.S. Cl. 340—3 R **8 Claims**

A contour measuring apparatus for determining the elevation of sea bottom features with respect to a reference plane. The apparatus comprises means for projecting a burst of acoustic energy upon a subsurface contour. As the burst leading edge and the following elements roll over the sea bottom, respective portions of the burst will be reflected back at an angle $\psi(t)$ which varies as a function of time. When a sudden elevation is encountered, the reflected portions of the echo pulse are reflected at an angle $\psi(t) + \Delta\phi$. Consequently, the signals detected at spaced transducer phase centers will show a change in their phase relationship within a given time interval. As seen at an acoustic receiver the variations in contour elevation h appear as changes in the angle of arrival $\psi(t)$ as represented by the incremental angle $\Delta\phi$. Thus, the receiver signal representation of $\psi(t)$ for a flat horizontal reference plane must be subtracted from $\psi(t) + \Delta\phi$ in order to determine $\Delta\phi$.



3,716,826

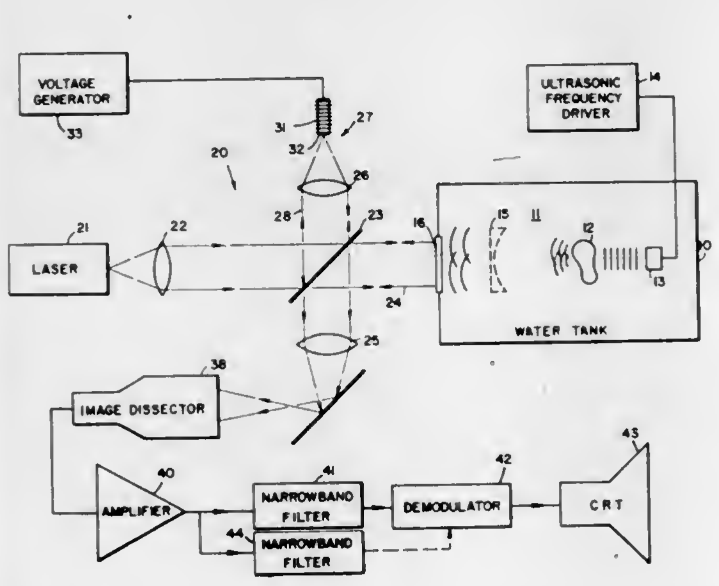
ACOUSTIC TO OPTICAL IMAGE CONVERTER

Philip S. Green, Redwood City, Calif., assignor to American Express Investment Management Company, San Francisco, Calif.

Filed Feb. 2, 1970, Ser. No. 7,486

Int. Cl. G01n *29/00*; **H04b** *11/00*

U.S. Cl. 340—5 H **7 Claims**



A system for visualizing acoustic wave fields incident on an optically reflective, elastic surface. The elastic surface, upon which an acoustic image is impressed, forms the retroreflector for one of the orthogonal intersecting light beams of a Twyman-Green interferometer which illuminates the entire surface. The light beams are generated from a coherent light source and the reference beam is phase modulated or frequency offset with a light modulator. The recombined intersecting beams are scanned electronically with an image dissector thereby to generate an electrical analog signal including the image information superimposed on a temporal frequency carrier. Desired signal components are selectively filtered and displayed on an electronically addressable optical display.

3,716,827

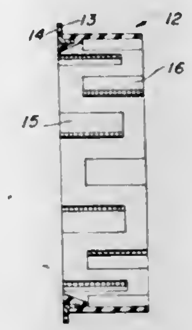
MOUNTING STRUCTURE FOR SPHERICAL SHAPED UNDERWATER TRANSDUCER

Frank Massa, 280 Lincoln Street, Hingham, Mass.

Filed Aug. 3, 1970, Ser. No. 60,258

Int. Cl. G01v *1/00*

U.S. Cl. 340—8 S **9 Claims**



A spherical underwater transducer is flexibly suspended by means of a rubber-like belt equatorially surrounding the sphere. The belt has mounting brackets molded therein and undercut cooling slots formed therein.

3,716,828

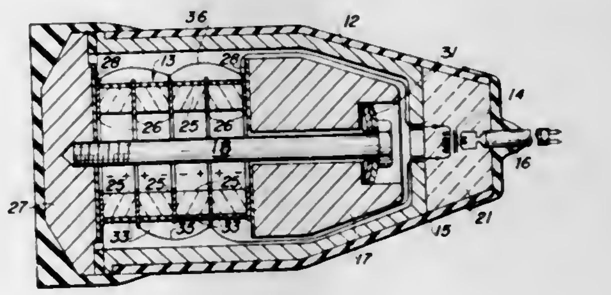
ELECTROACOUSTIC TRANSDUCER WITH IMPROVED SHOCK RESISTANCE

Frank Massa, Cohasset, Mass., assignor to Massa Division, Dynamics Corporation of America, Hingham, Mass.

Filed Feb. 2, 1970, Ser. No. 7,606

Int. Cl. H04r *17/00*

U.S. Cl. 340—10 **7 Claims**



An electromechanical transducer assembly comprises a stacked group of axially aligned piezoelectric ceramic rings. Plates, which have a larger diameter than the ceramic rings, are positioned between each of the adjoining faces of the ceramic rings. Therefore, the edges of the plates extend outwardly beyond the periphery of the ceramic rings. A tape or filament is tightly wound about the rim of each ceramic ring to maintain a radial stress upon the ceramic elements.

3,716,829

APPARATUS FOR AND METHOD OF TREATING SEISMIC DATA HAVING ATTENUATED HIGH FREQUENCIES

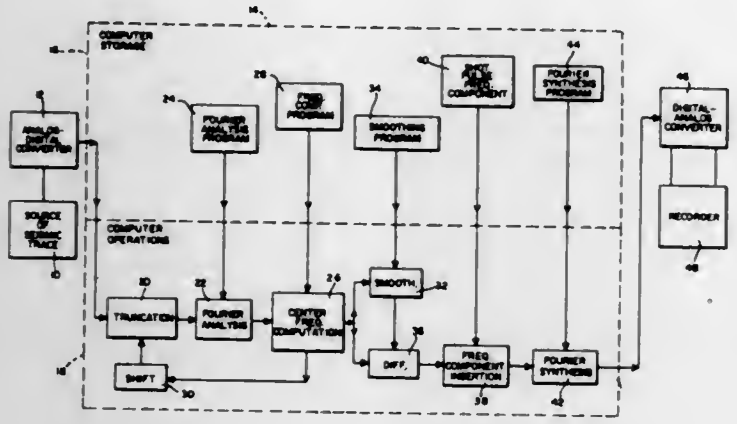
William H. Ruehle, Duncanville, Tex., assignor to Mobil Oil Corporation

Filed Oct. 30, 1970, Ser. No. 85,631

Int. Cl. G01v *1/36*

U.S. Cl. 340—15.5 DP **8 Claims**

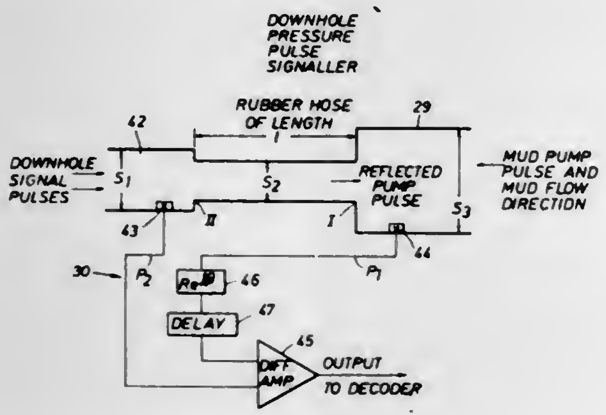
A computer apparatus for and computer performed method of correcting a seismic trace by restoring attenuated high frequency components. The seismic trace is successively truncated, each of the successive truncations is successively Fourier analyzed, and each center frequency of the successive Fourier analyses is computed.



The resulting center frequency function is subjected to smoothing and difference operations followed by insertion of frequency components characteristic of an idealized shot pulse. The corrected seismic trace is then obtained by Fourier synthesis.

3,716,830
ELECTRONIC NOISE FILTER WITH HOSE REFLECTION SUPPRESSION

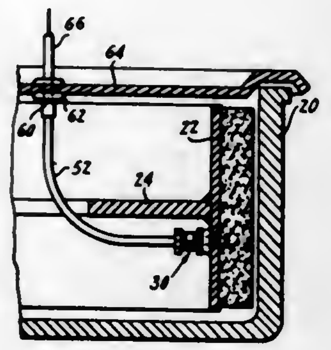
Donald J. Garcia, 14822 Chadbourne Drive, Houston, Tex.
Filed Dec. 18, 1970, Ser. No. 99,441
Int. Cl. G01v *1/36*
U.S. Cl. 340—18 LD **7 Claims**



An illustrative embodiment of the present invention includes methods and apparatus for detecting pressure pulse signals from a remote signalling device in the mud line of a well while the well is being drilled and in the presence of mud pump pressure pulse noise. The apparatus and methods include placing plural pressure sensitive transducers in the mud line and at opposite ends of the flexible hose portion thereof between the metallic line from the mud pump and the rotary swivel portion which is attached to the kelly. Electrical transducer signals sensed on the mud pump end of the hose are processed to take into account the amplitude and phase shift effects of the hose and then delayed by a time sufficient for the pulse to traverse the hose. The processed signals are then combined with those from the second pressure transducer to directionally discriminate against the mud pump noise pulses while detecting pulses from downhole.

3,716,831
WORN BRAKE INDICATOR

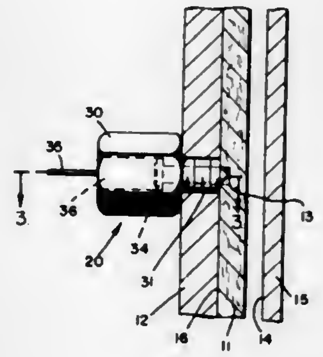
Jackie D. Rikard, 2529 N. Bell St., and Bobby G. Rikard, Rte. 6, both of Kokomo, Ind. 46901
Filed Mar. 23, 1971, Ser. No. 127,132
Int. Cl. B60t *17/22*
U.S. Cl. 340—52 A **1 Claim**



A contact switch assembly mounted to a brake drum and connected to a warning light panel for indication of brake wear when the brake lining wears to a point where the contact switch assembly is exposed to the brake drum.

3,716,832
BRAKE LINING CONDITION INDITOR SYSTEM

Frank J. Gorgie, 9812 La Cresta Circle, Huntington Beach, Calif., and Gene A. Johnson, 2244 East Franzen, Santa Ana, Calif.
Filed April 5, 1971, Ser. No. 131,181
Int. Cl. B60t *17/22*
U.S. Cl. 340—52 A **1 Claim**

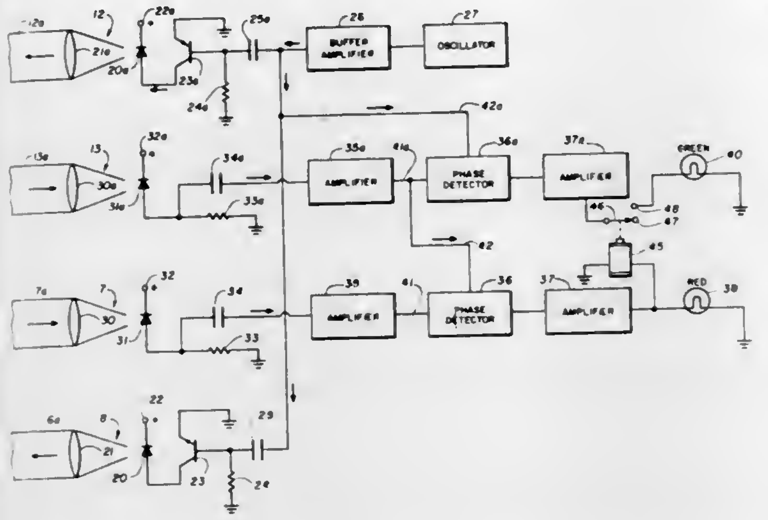


A brake lining condition indicator system having an electrical contact formed of an insulating sleeve attached to the brake lining support and containing a conducting rod extending into the underside of the brake lining and having an electrical display device and power source connected to such contact so that when the brake lining wears down and the braking surface contacts such rods the display device is activated.

3,716,833
VEHICLE HEIGHT CLEARANCE INDICATING APPARATUS

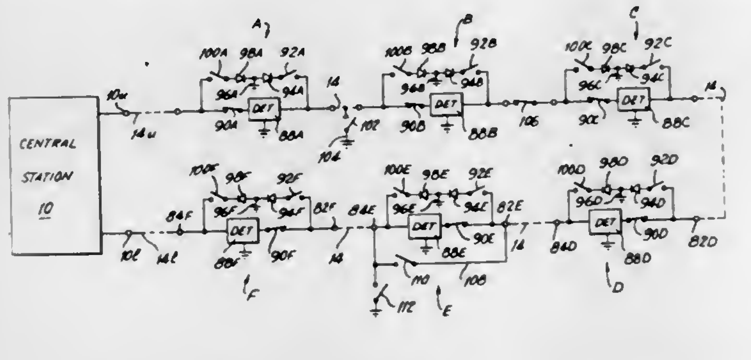
Irving Roth, Williston Park, N.Y., assignor to Sperry Rand Corporation
Filed Dec. 2, 1971, Ser. No. 204,074
Int. Cl. B60q *1/00*
U.S. Cl. 340—61 **10 Claims**

Cooperating pairs of optical signal devices are employed to protect the higher parts of a motor truck from damage due to impact with a structure such as a vehicular passage way. Two directive optical radiators are employed, along with associated phase detecting sensor circuits, the radiators being modulated at the same frequency. The relative phase angles of the detected signals identify the relative height of the passage under the canopy, actuating an alarm where the canopy is too low in comparison to the highest part of the motor vehicle.



3,716,834
DATA TRANSMISSION SYSTEM WITH IMMUNITY TO CIRCUIT FAULTS

Henry G. Adams, Llewellyn park, West Orange, N.J.
Filed Oct. 7, 1971, Ser. No. 187,284
Int. Cl. G08b *29/00;* **H04q** *5/00*
U.S. Cl. 340—147 R **9 Claims**

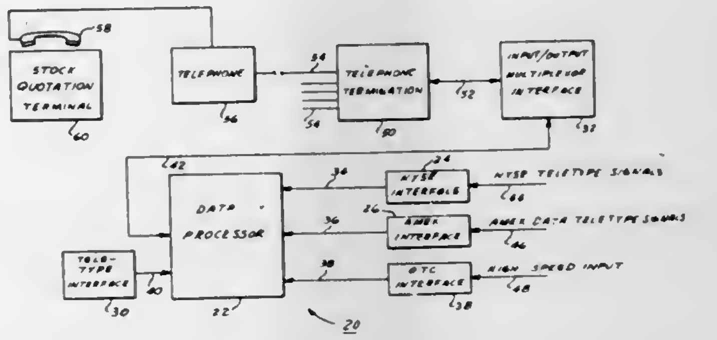


A system for use with a data transmission network having a central station and a plurality of remote stations connected in series by a low grade transmission line such as a telephone pair. The system of the invention is immune to common transmission line faults, such as a line to ground short, a line open circuit, a line to line short, etc. and will continue to operate in spite of such faults. The system is also capable of identifying a transmission line fault when it occurs, the nature of the fault, and the approximate location of the fault in the network.

3,716,835
PERSONAL STOCK QUOTATION SYSTEM

Harold Weinberg, Villanova; Marvin E. Rogers, Feasterville; Michael G. Dodario, Philadelphia, and James A. Benson, Huntingdon Valley, all of Pa., assignors to Sonex, Inc., Philadelphia, Pa.
Filed March 19, 1971, Ser. No. 126,224
Int. Cl. H04m *11/00;* **H04q** *9/00*
U.S. Cl. 340—154 **8 Claims**

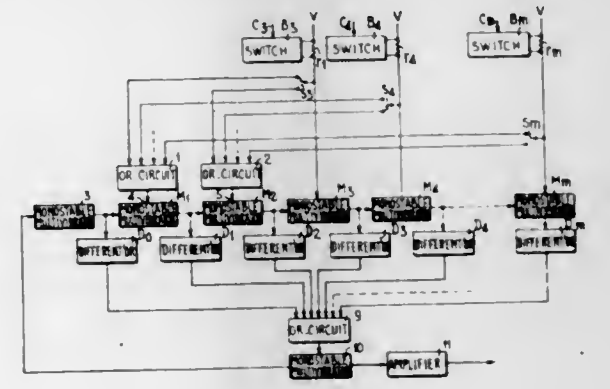
A personal stock quotation system having a data processing system with a memory having stored therein stock market information relating to a plurality of corporations is provided. The data processing terminal is connected to telephone terminal lines. A stock quotation terminal is provided which has a cradle for a telephone handset. The quotation terminal further includes a coupling means adjacent the cradle, signalling means for generating address and control signals for



obtaining the stock information and display means for displaying the stock information obtained from the data processing system. Further features of the stock quotation terminal are touch keys which are utilized for signalling different combinations representative of corporations about which stock information is required.

3,716,836
DATA CODE CONVERSION FOR REMOTE SIGNALLING AND CONTROL SYSTEMS

Raymond Jacquet, Paris, France, assignor to Thomson-CSF, Paris, France
Filed May 14, 1971, Ser. No. 143,477
Claims priority, application France, May 22, 1970, 7018767
Int. Cl. H04q *1/32*
U.S. Cl. 340—167 R **5 Claims**



A message is formed by the output pulses successively delivered by a chain of $(m+1)$ monostable multivibrators, the first one delivering a synchronizing pulse of duration 3T, the other m ones (the time constant of which is made equal to T or $3T/2$ according to the binary signal to be transmitted) delivering the information pulses. When a message has been transmitted a feed back loop triggers the transmission of a further message.

The decoder comprises a synchronizing pulse detector and a chain of m bistable multivibrators controlled by the received signals to restitute the pulses generated in the coder by the first m monostable multivibrators, and m circuits for detecting the duration of these pulses.

3,716,837

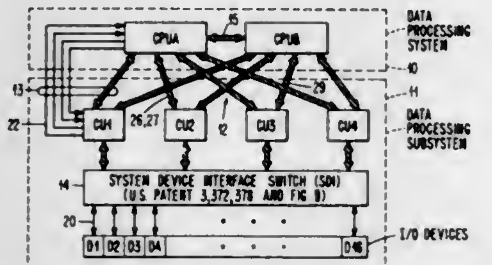
INTERRUPT HANDLING

James M. Waddell, Boulder, Colo., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 22, 1971, Ser. No. 136,429

Int. Cl. G06f *15/16, 9/18*

U.S. Cl. 340—172.5 **15 Claims**


CPUA
CPUB
15
CU1
CU2
CU3
CU4
26,27
12
29
13
22
10
11
DATA PROCESSING SYSTEM
DATA PROCESSING SUBSYSTEM
14
SYSTEM DEVICE INTERFACE SWITCH (SDI)
(U.S. PATENT 3,372,378 AND FIG 9)
20
D1
D2
D3
D4
D16
I/O DEVICES

A multi-unit data processing system provides communication between the various units by sets of data lines with associated control (tag) lines. The control lines carry signals for initiating, controlling, monitoring, and terminating transmissions over the data lines which may contain bytes of data or sets of command signals. All of the communication links are asynchronous, one with the other. Interconnection of the units enables a plurality of units in a first set to service and communicate with any one unit in a second set of units. The second set of units provides selective communication paths between units in a first and third set. The third set units may selectively provide interrupt signals to any one of the second set units. The disclosure teaches timing and lockout provisions for multiple interrupt and multiple unit handling of a single interrupt.

3,716,838

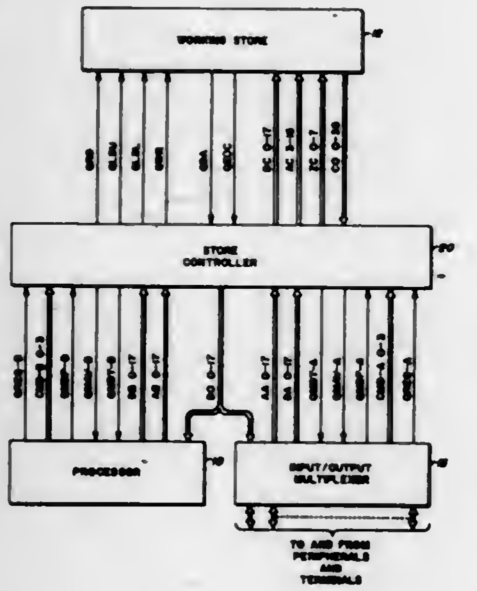
DATA PROCESSING SYSTEM WITH SELECTIVE CHARACTER ADDRESSING OF SYSTEM STORE

Albert Le Messurier Beard, Phoenix, Ariz., assignor to Honeywell Information Systems Inc.

Filed Aug. 24, 1970, Ser. No. 66,170

Int. Cl. G06f *3/00*

U.S. Cl. 340—172.5 **1 Claim**



A multiprocessor data processing system, wherein a plurality of processors are provided access to the system store through a central controller, and wherein the controller automatically responds to each address supplied by a processor to provide for the transfer of a data character between the processor and a particular portion of a data word storage cell represented by said address.

3,716,839

AUTOMATIC MEASURING AND RECORDING DEVICE

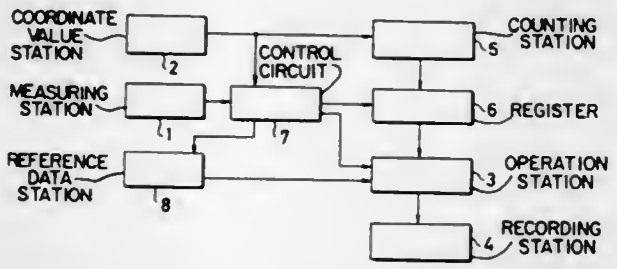
Yasushi Totsuka and Shin-ichi Kamachi, Tokyo, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Continuation-in-part of application Ser. No. 854,832, Sept. 3, 1969. This application Mar. 15, 1971, Ser. No. 124,262

Claims priority, application Japan, Sept. 4, 1968, 43/62,998

Int. Cl. G01b *11/00*

U.S. Cl. 340—172.5 **4 Claims**



Automatic measuring and recording device capable of successively measuring and recording the errors or the deviations of measured values such as the length and the angle relating to an object from the reference data given in the respective measurements without stopping the device. The device comprises a counting station for counting pulses supplied from a digital coordinate value detecting station so as to generate pulses indicative of the coordinate value to be measured, a register connected to the counting station and capable of temporarily storing the content obtained in the counting station, a control circuit for receiving a pulse from a measuring point detecting station so as to generate a memorization instructing pulse as well as an operation and recording instructing pulse in synchronism with the pulses counted in the counting station, an operation station and a recording station connected to the register and the control circuit, a reference data setting station connected to the control circuit and the operation station, the control circuit being connected to the digital coordinate value detecting station as well as the register, the reference data setting station supplying the reference dataum to the operation station each time the control circuit supplies a pulse to the reference data setting station. The register receives the content of the counting station at the moment the memorization instructing pulse from the control circuit is applied thereto during the time the counting station continues the counting operation so as to temporarily store the content of the counting station. The content stored in the register is transferred to the operation station while the reference datum is supplied thereto from the reference data setting station by the application of the operation and memorization instructing pulse from the control circuit within the time period until the next pulse is supplied from the measuring point detecting station so that the content transferred from the register is compared with the reference datum to provide the deviation of the measured value in the object from the reference datum. The thus obtained deviation is successively recorded in the recording station by the operation and recording instructing pulse.

3,716,840

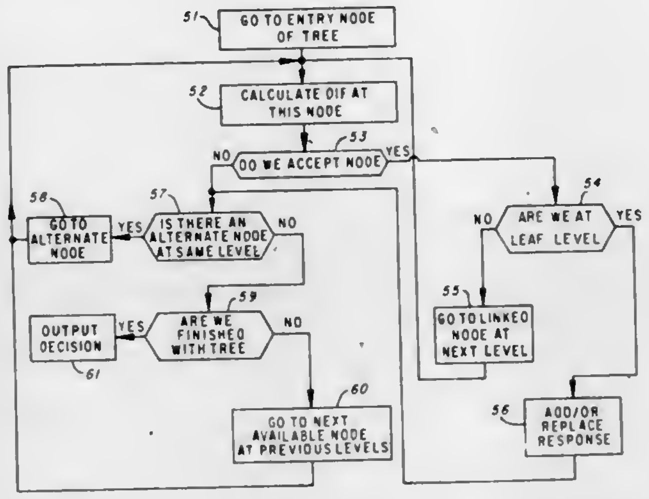
MULTIMODAL SEARCH

Michael K. Masten, Richardson, and William C. Choate, Dallas, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed June 1, 1970, Ser. No. 42,429

Int. Cl. G06f *15/18*

U.S. Cl. 340—172.5 **4 Claims**


51
GO TO ENTRY NODE OF TREE
52
CALCULATE DIF AT THIS NODE
53
DO WE ACCEPT NODE
NO
YES
54
ARE WE AT LEAF LEVEL
58
GO TO ALTERNATE NODE
57
IS THERE AN ALTERNATE NODE AT SAME LEVEL
59
ARE WE FINISHED WITH TREE
OUTPUT DECISION
61
60
GO TO NEXT AVAILABLE NODE AT PREVIOUS LEVELS
55
GO TO LINKED NODE AT NEXT LEVEL
56
ADD/OR REPLACE RESPONSE

A trained processor is described which operates beyond an untrained point. Information is stored in a memory array in a tree-allocated file. Information is stored in the memory as key functions with associated trained responses. After the processor has been trained, it is able during an execution cycle, to find appropriate responses for query key functions. These query key functions are compared with the reference key functions stored in the memory array to find an appropriate trained response. During the execution cycle, there are some query keys for which there is no corresponding reference key function stored in the memory array, therefore, no readily apparent appropriate trained response for the query key. These query key functions for which there is no readily apparent trained response are termed untrained points. Thereupon a query key function which constitutes an untrained point is effectively compared with the reference key functions stored in the memory array to establish and store a difference function for stored reference key functions. Logic means then selects for the untrained point a trained response from those trained responses best satisfying a predetermined decision criteria. During the comparison operation, conditions are measured that indicate when reference key functions corresponding to a given group of trained responses cannot be an appropriate response for the untrained point in question. Logic means waive further examination of some stored reference key functions thereby greatly expediting the efficiency of search. In the multimodal search there are several modes of search, each mode further defining the item being searched.

3,716,841

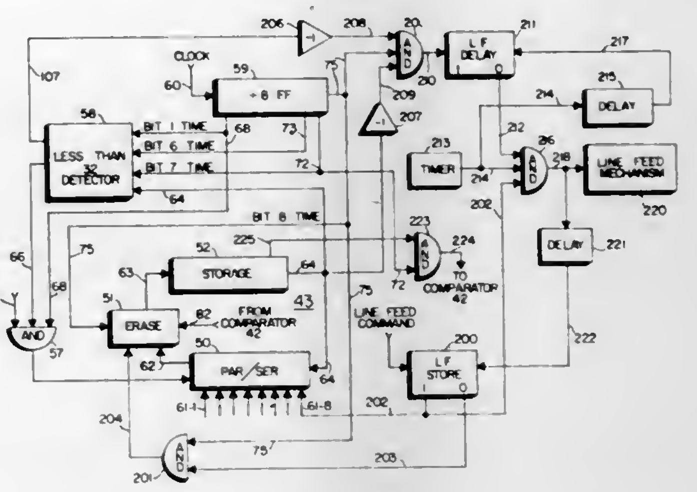
LINE FEED-PRINT INHIBIT SYSTEM

Clifford M. Jones, 601 Meadowview Cove, Waynesboro, Va. Continuation of Ser. No. 734,468, June 4, 1968, abandoned. This application Dec. 7, 1970, Ser. No. 95,967

Int. Cl. G06k *1/00*

U.S. Cl. 340--172.5 **17 Claims**

An end-of-line print control system for a printer identifies those characters received after receipt of a line change command and inhibits printout of the identified characters until previously stored characters are printed and line change is accomplished. The presence of characters to be printed on the old line is used to inhibit line change. After line change, an erase gate eliminates the identification of new line characters permitting their printout.



3,716,842

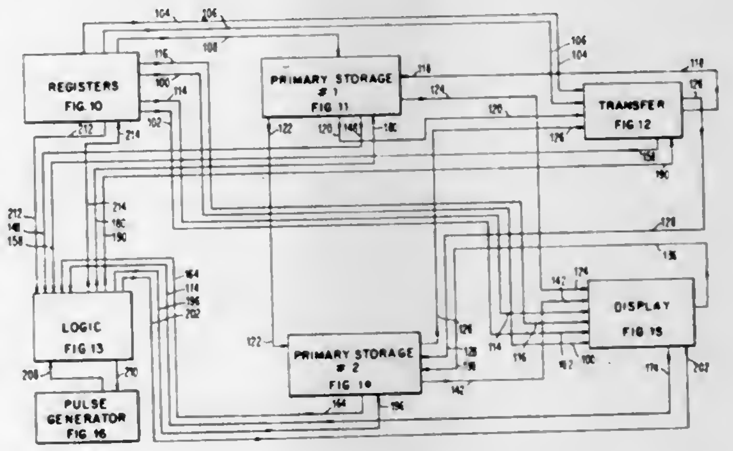
SYSTEM AND METHOD FOR THE CONTINUOUS MOVEMENT OF A SHEET HAVING GRAPHIC SUBJECT MATTER THEREON THROUGH A WINDOW OF A DISPLAY SCREEN

Laszlo Antal Belady, Yorktown Heights; Carlo John Evangelisti, Jefferson Valley, and Robert Ingersoll Roth, Briarcliff Manor, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 5, 1971, Ser. No. 140,477

Int. Cl. G06f *3/14*

U.S. Cl. 340—172.5 **15 Claims**

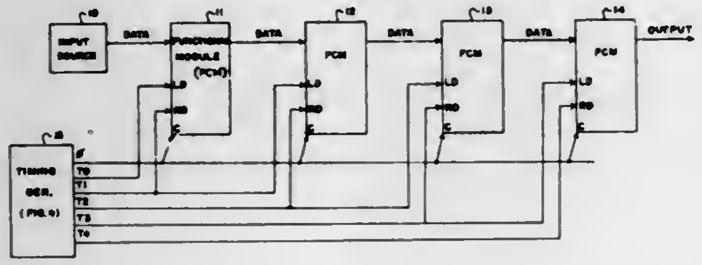


A system which effects the displaying of a sheet having graphic information thereon by achieving its movement in a continuous pass through a window on the screen of the cathode ray tube of a program controlled display unit. To accomplish this, the sheet to be displayed is divided into an orthogonal grid of square cells of a chosen area. There is provided appropriate storage of each of the cells which contains graphic subject matter therein such as the X, Y, coordinates of the cell and the display orders pertinent thereto. Such cellular structure and storage may conveniently be termed "pre-scissoring." By the use of appropriate registers, the information on the sheet is then displayed in a window of the screen by a continuous pass therethrough. Where there is available both primary and secondary storage, all of the cellular information can be contained in secondary storage and only a small portion thereof need be retained in primary storage, i.e., the cells being displayed in the window presently and cells abutting the displayed cells. Where there is available both primary and secondary storage, as cells are passed through the window, there are concurrently brought from secondary storage, cells which follow immediately upon those in primary storage. Consequently, with this arrangement, a smooth continuous pass of the sheet is achieved on the cathode ray tube screen. The cells, after being passed through the window, need not be returned to secondary storage since the readout from secondary storage is nondestructive. However, in the situation where information may be updated or changed when it is in primary storage, provision can be made to return the passed cells to secondary storage. Accordingly, with this system, in any event, there is enabled the continuous smooth pass on a sheet of graphic information through a portion of a cathode ray tube screen and where primary and secondary storage are both available, only a small portion of the information need be resident in primary storage at any one time.

3,716,843
MODULAR SIGNAL PROCESSOR

Joseph W. Schmitt, Hudson, and Donald L. Starkey, Amherst, both of N.H., assignors to Sanders Associates, Inc., Nashua, N.H.

Filed Dec. 8, 1971, Ser. No. 206,070
Int. Cl. G06f *15/16*
U.S. Cl. 340—172.5 **4 Claims**



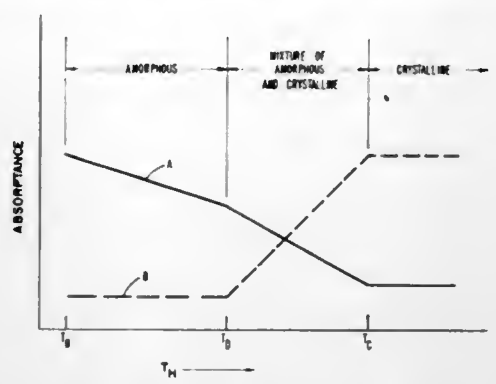
A modular signal processor which is assembled from a set of modules which have common input and output timing specifications such that any one module can be interconnected with any other module to perform a desired signal processing operation under the control of a timing generator. The timing generator is arranged to produce a clock signal of relatively high frequency and sequences of timing signals at a relatively lower frequency. Data is loaded into a module in response to a first one of the timing signal. The module then performs its operation or function upon the data to provide a result data. The result data is then read from the module in response to a subsequently occurring timing signal which is also employed to load the result data into another module. Specifically disclosed herein is a frequency synthesizer processor which employs the following modules: binary coded decimal to binary converter, phase accumulator, look up table and a digital to analog converter and filter.

3,716,844
IMAGE RECORDING ON TETRAHEDRALLY COORDINATED AMORPHOUS FILMS

Marc H. Brodsky, Mount Kisco, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed July 29, 1970, Ser. No. 59,172
Int. Cl. G11c *13/02, 13/04;* **G01d** *15/14*
U.S. Cl. 340—173 LS **19 Claims**

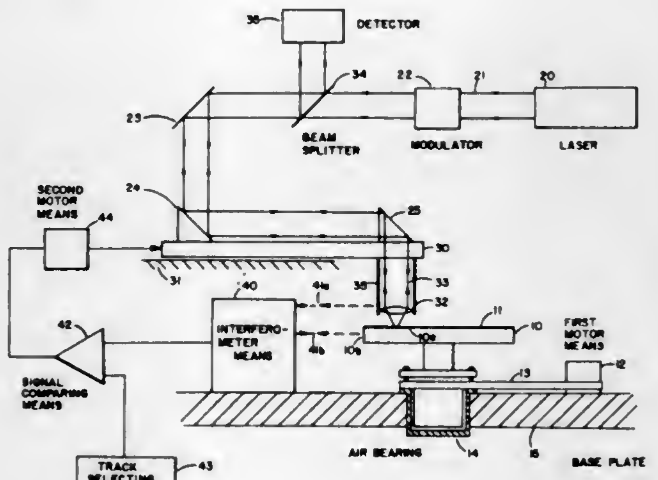
An image can be recorded on a layer of an amorphous material such as Si, Ge, or SiC, by using a beam of electrons or light to locally heat the amorphous material in a predetermined pattern. The image can be optically observed directly after recording or can be reproduced from the transparency. The invention can be used in beam addressable memory devices, in display units, as a hard copy output without the need for development and the like.



3,716,845
OPTICAL MEMORY WITH INTERFEROMETER TRACKING

John H. Chaffin, III, Minnetonka, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed March 9, 1972, Ser. No. 233,201
Int. Cl. G11c *7/00, 13/04;* **G03b** *5/02*
U.S. Cl. 340—173 LM **5 Claims**



An optical mass memory utilizing a rotatable substrate is provided with improved tracking. An interferometer measures the distance between a reflective edge surface on the rotatable substrate and a reflective surface on a movable arm. The final lens for focusing the read-write light beam to a focused light spot on the memory medium is mounted on the movable arm. The electrical signal produced by the interferometer is compared to a track selection signal which is indicative of the desired distance between the reflective edge surface and the reflective surface, and a servo control signal is produced which is indicative of the difference of the electrical signal and the track selection signal. The movable arm is positioned in response to the servo control signal.

3,716,846
CONNECTOR SHEET WITH CONTACTS ON OPPOSITE SIDES

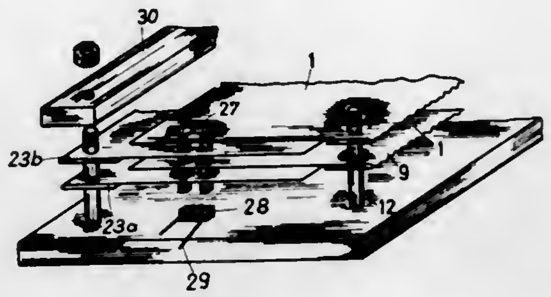
Peter Volckart, Haagstrasse 18a, 6451 Bruchkopel; Hartmut Lehmann, Wellerstrasse 5, 7741 Burgberg, and Raimund Hafner, Zimmerstrasse 18, 722 Dauchingen, all of Germany

Filed Jan. 18, 1971, Ser. No. 107,366

Claims priority, application Germany, Jan. 24, 1970, P 30 03 225.1

Int. Cl. G11c *11/02;* **H05k** *1/00*
U.S. Cl. 340—174 M **13 Claims**

A connector sheet or band with a printed circuit or other conductors only on the front face, has a marginal portion bent along a fold line upon the rear surface. Input and output connectors extending across the fold line are arranged symmetrical to the same and form registering electrically connected contact portions in the front and the rear of the connector sheet abutting corresponding contact portions of other connector sheets when a stack of connector sheets is formed.



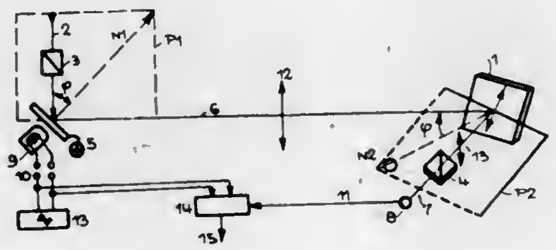
3,716,847
MIRROR UTILIZED IN MAGNETO-OPTICAL READOUT SYSTEM TO ELIMINATE FRESNEL EFFECT

Jean Valin, 78 - Les Essarts Le Roi, France, assignor to Compagnie Internationale pour L'Informatique, Louveciennes, France

Filed May 24, 1971, Ser. No. 146,188

Claims priority, application France, June 10, 1970, 7021267

Int. Cl. G11c *11/42, 11/14*
U.S. Cl. 340—174 YC **11 Claims**



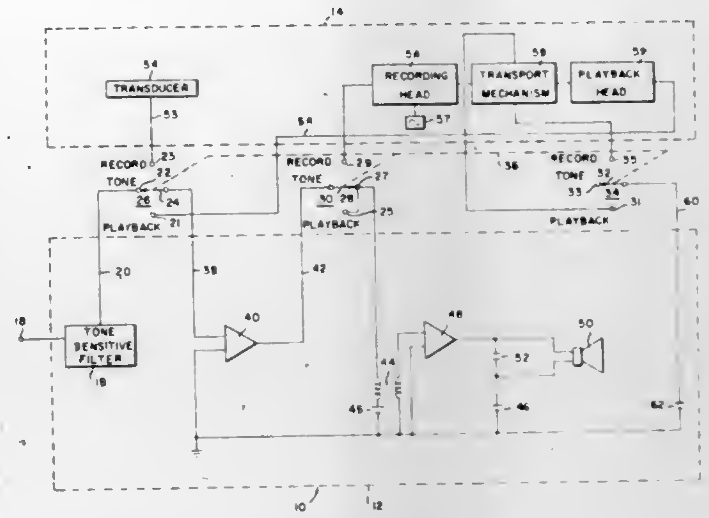
A metallic ferromagnetic layer recording binary bit information is read-out by a device utilizing the Kerr effect. A metallic reflector mirror is provided upstream of the layer and its magnetic material is saturated along one at least of the directions of magnetization significant of one of the binary values of the bit memory points in said layer.

3,716,848
SMALL PORTABLE PAGING RECEIVER WITH AUDIO RECORDING AND REPRODUCING FACILITIES

George J. Schonholtz, Rockville, and Eugene J. Pawlikowski, Silver Spring, both of Md., assignors to said Schonholtz, by said Pawlikowski

Filed Nov. 23, 1970, Ser. No. 91,925
Int. Cl. G11b *31/00;* **H04n** *11/02*
U.S. Cl. 340—311 **7 Claims**

A paging receiver has recorder-playback features compactly arranged in a single and easily transportable unit. A three-position mode selector switch has its brushes arranged to operate, in unison, selectively to positions which permit a



means of amplification common to all modes irrespective of the mode selected.

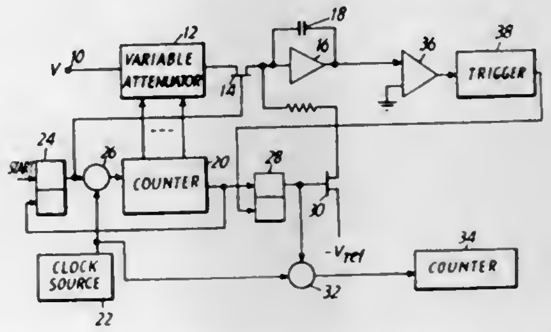
3,716,849
INTEGRATING MEASUREMENTS WITH NOISE REDUCTION

Eric Metcalf, c/o The Solartron Electronic Victoria Rd., Farnborough, England

Filed June 8, 1970, Ser. No. 44,077

Claims priority, application Great Britain, June 10, 1970, 29,432/70

Int. Cl. H03k *13/20*
U.S. Cl. 340—347 NT **17 Claims**



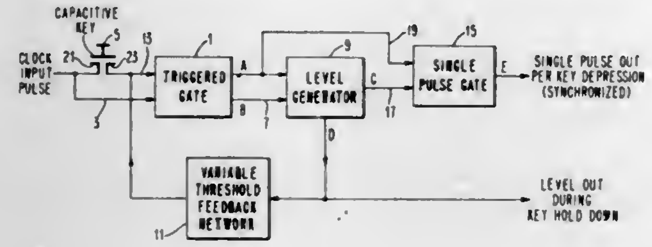
Noise rejection in an integrating type of analogue to digital converter is improved by effecting the integration in accordance with a variable weighting function, preferably a step function. Functions are described which flatten the response versus frequency curve in the neighborhood of the zeroes and introduce more zeroes into this curve. The weighting may be introduced by scaling either on the analogue side or the digital side of the instrument.

3,716,850
SYNCHRONOUS DETECTOR FOR MONOPULSE KEY SAMPLING ELECTRONIC KEYBOARD

Donald E. Fisher, Wappingers Falls, and Peter Pleshko, Kotonah, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 21, 1971, Ser. No. 210,427
Int. Cl. H04q *3/00*
U.S. Cl. 340—365 E **10 Claims**

A synchronous detector for monopulse key sampling in electronic keyboards. A variable threshold feedback network prevents false sampling due to signal distortions caused by "key bounce," and the like. A single output pulse, in synchronism with and of the same time duration as system clock pulses, is produced at the detector output, in response to the clock pulses being capacitively coupled to its input, upon key depression. The single pulse, used to identify the key depressed via a decode circuit, permits "key roll."


CAPACITIVE KEY
5
CLOCK INPUT PULSE
21
23
13
3
1
TRIGGERED GATE
A
B
7
9
LEVEL GENERATOR
C
D
17
19
15
SINGLE PULSE GATE
E
SINGLE PULSE OUT PER KEY DEPRESSION (SYNCHRONIZED)
VARIABLE THRESHOLD FEEDBACK NETWORK
11
LEVEL OUT DURING KEY HOLD DOWN

3,716,851

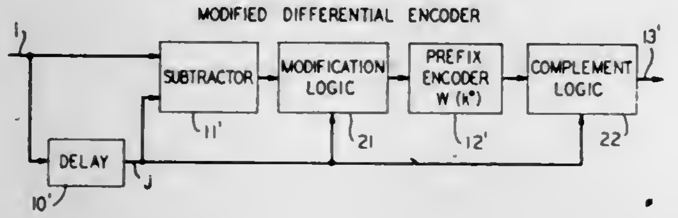
SELF-SYNCHRONIZING SEQUENTIAL ENCODING SYSTEMS

Peter Gabriel Neumann, Rye, N.Y., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Feb. 9, 1971, Ser. No. 113,905

Int. Cl. H04l *3/00*

U.S. Cl. 340—347 DD **9 Claims**



A number of binary variable-length sequential encoders are disclosed which produce near optimum variable-length compression codes and which have very excellent self-synchronizing properties. These self-synchronizing properties are enhanced by encoding properties called symmetry, columnization and association. In an input-output sequential encoding matrix, symmetry refers to the number of mutual reflections, complementations and rotations of a common code kernel. Columnization refers to the property of having each column of codes end in the same digit. Association refers to the property of allowing each code word to correspond to very few (possibly one) inputs.

3,716,852

CODE CONVERSION CIRCUIT FOR A TWO-LEVEL TO MULTI-LEVEL CODE CONVERTER

Akira Sawai, Tokyo, Japan, assignor to Nippon Electric Company, Limited, Tokyo, Japan

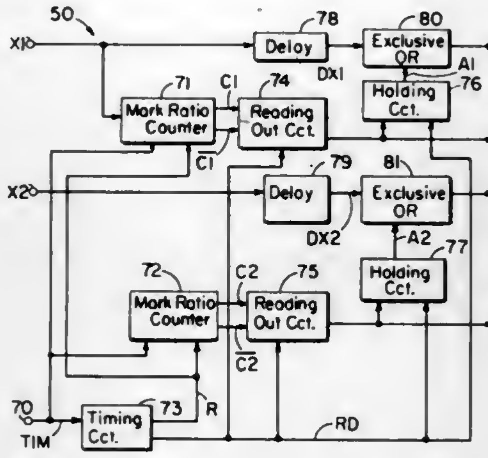
Filed Feb. 25, 1972, Ser. No. 118,671

Claims priority, application Japan, March 5, 1970, 45/19174

Int. Cl. H03k *13/24*

U.S. Cl. 340—347 DD **2 Claims**

A two-level to multi-level code converter includes a first portion for determining which pattern of *n*-digit two-level code inputs has the greatest occurrence frequency, and a second portion for converting the input codes to *n*-digit output codes in response to the outputs of the determining portion so that the frequency of occurrence of the two-level code corresponding to the maximum level of the multi-level code is the highest of the two-level output codes.



3,716,853

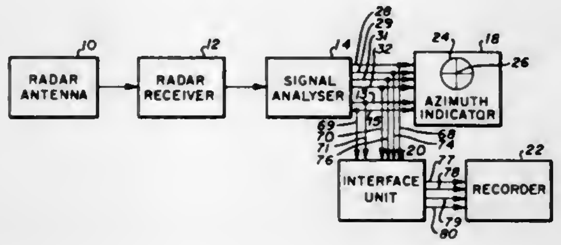
AIRBORNE RADAR DETECTING AND RECORDING SYSTEM

Robert J. La Follette, Santa Clara, Calif., assignor to Itek Corporation, Lexington, Mass.

Filed Nov. 13, 1969, Ser. No. 876,275

Int. Cl. G01s *7/04*

U.S. Cl. 343—5 PR **9 Claims**



A radar detection and recording system for providing a permanent record of certain data regarding radar signals detected during an airborne mission and including means for subsequently reproducing said data. A signal analyzer responsive to a radar detection means analyzes the detected signals and divides them into component signals which are suitable for driving an azimuth indicator means. The component signals are sampled and modified by an interfacing means which converts the signals normally used to energize the indicator means into a coded form suitable for recording on a plural channel magnetic recording device. The recorded signals may then subsequently be utilized to reconstruct the signals originally used to drive the airborne indicator means.

3,716,854

RADAR DETECTOR

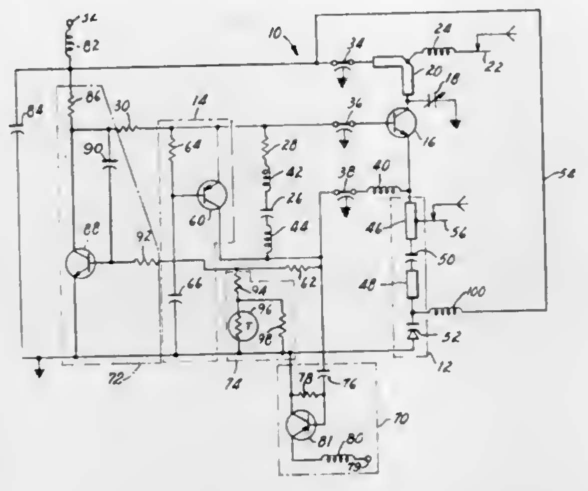
Lincoln H. Charlot, Jr., Tampa, Fla., assignor to Minnesota Mining & Manufacturing Company, Saint Paul, Minn.

Filed July 1, 1970, Ser. No. 51,542

Int. Cl. G01s *9/02*

U.S. Cl. 343—5 PD **8 Claims**

A pulsed radar detector the repetition rate of which is a function of the phase of the feedback signal in the radio frequency (rf) oscillator which produces the pulse of rf energy. A phase-shift circuit which makes the phase of the feedback signal essentially independent of the detector's environment, and a pulse spectrum limiter circuit which limits the pulse of energy to a relatively narrow spectrum of frequencies are disclosed.



3,716,855

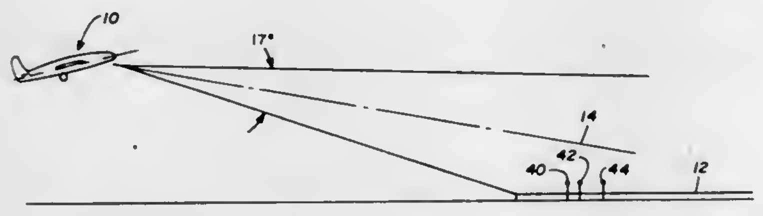
GLIDESLOPE POSITION DETECTION SYSTEM FOR USE WITH AN INDEPENDENT AIRCRAFT LANDING MONITOR

Edward F. Asam, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed July 15, 1970, Ser. No. 55,164

Int. Cl. G01s *9/16*; **H01q** *15/14*

U.S. Cl. 343—5 LS **13 Claims**



An glideslope position detection system wherein a pair of passive reflectors are located in a spaced apart configuration at a known position adjacent an airport runway. Each of the reflectors are shaped to direct different reflection patterns in response to radar signals transmitted from an aircraft during a glideslope approach to the runway. One of the reflectors directs a reflection pattern beneath the glideslope and the other of the reflectors directs a radar reflection pattern above the glideslope, the reflection patterns providing equal amplitude radar returns to an aircraft traveling along the glideslope. The aircraft carries a radar system for detecting the relative radar return signal amplitudes from the two reflectors. Circuitry is responsive to comparison of the radar return signal amplitudes from the reflectors to generate indications of the position of the aircraft relative to the runway glideslope.

3,716,856

POLARIZATION ADAPTIVE MTI RADAR TRANSPONDER

Daniel Edmond Beguin, Saint-Prix, France, assignor to International Standard Electric Corporation, New York, N.Y.

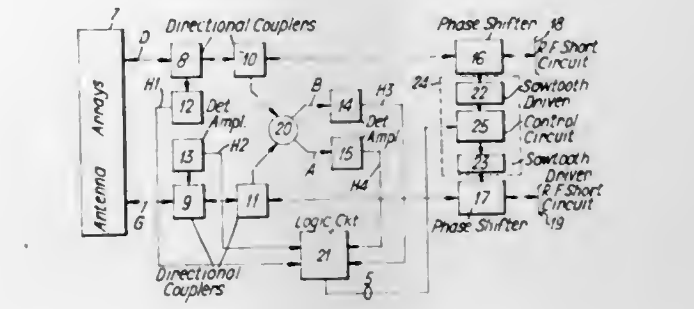
Filed Oct. 6, 1971, Ser. No. 186,899

Claims priority, application France, Oct. 8, 1970, 7036372

Int. Cl. G01s *9/56*

U.S. Cl. 343—6.8 LC **7 Claims**

A transponder beacon for use with a coherent pulse-Doppler radar. The transponder antenna system includes a pair of separately, mutually orthogonally polarized antenna channels. Interrogation pulses are analyzed as to polarization and the polarization of the replies is appropriately automatically determined therefrom. Doppler modulation is added to reply pulses for operation with MTI interrogating radars.



3,716,857

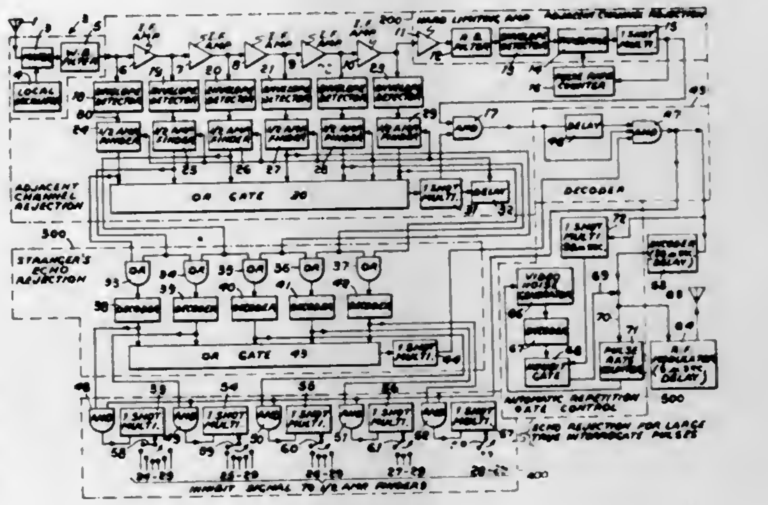
A NAVIGATION SYSTEM UTILIZING PULSE TIMING

Jesse S. Le Grand, Clifton, N.J., assignor to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed Nov. 27, 1970, Ser. No. 93,209

Int. Cl. G01s *7/28*

U.S. Cl. 343—6.8 LC **7 Claims**



In a TACAN navigation system where the received interrogate signals are pulse pairs of substantially equal amplitude, but the amplitude of different pairs may vary widely, pulse timing is utilized to generate response signals. To provide apparatus which is capable of determining the time of arrival of each interrogate pulse regardless of amplitude, the pulses are provided to a plurality of serially connected IF amplifiers, and a half amplitude finder, responsive within selected amplitude limits, is connected to the output of each of said amplifiers, the output of the half amplitude finders providing a timing pulse related to the time of arrival of each of the interrogate pulses.

3,716,858

DISTANCE MEASURING SYSTEM

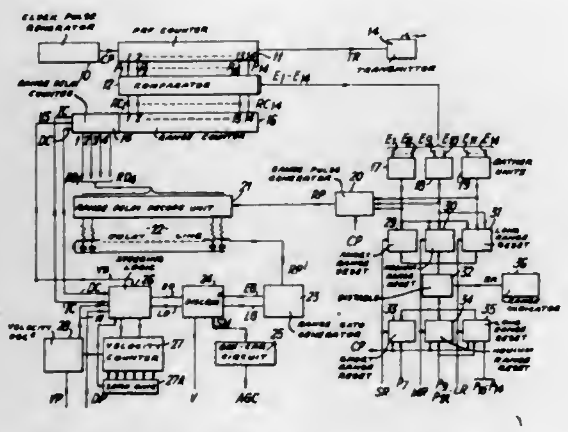
William Douglas Worthington, Bramhall, England, assignor to Ferranti Limited, Hollinwood, Lancashire, England

Filed Apr. 6, 1971, Ser. No. 131,725

Int. Cl. G01s *9/14*

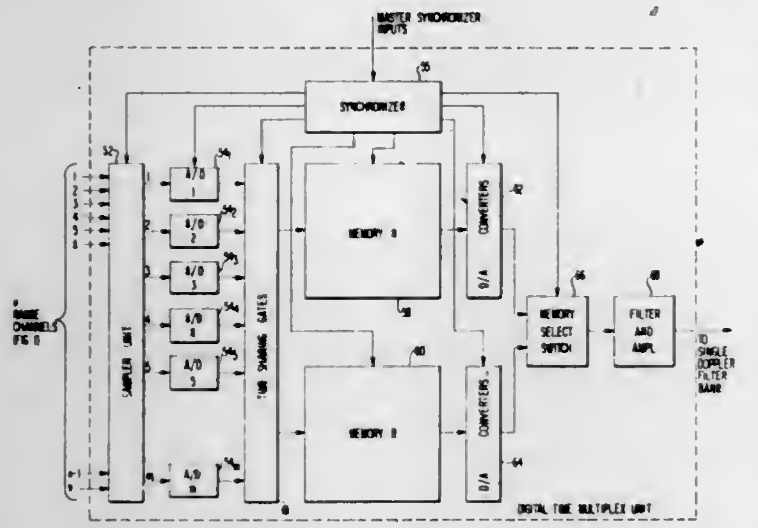
U.S. Cl. 343—7.3 **9 Claims**

Distance measuring system employs a radar or similar source to produce a return signal from a target. Digital techniques are employed to produce and maintain a predetermined time relationship between the return signal and a variable gating pulse produced by the equipment. A distance indication is given when this predetermined time relationship is established.



3,716,859
TIME MULTIPLEXER FOR HIGH PRF PULSE DOPPLER RADAR

William R. Webb, 405 Oak Forest Avenue, Catonsville, Md.; William S. Jones, 2102 Fernglen Way, Baltimore, Md., and Robert E. Hendrix, 209 Winchester Road, Annapolis, Md.
Filed Oct. 27, 1970, Ser. No. 84,304
Int. Cl. G01s *9/42*
U.S. Cl. 343—7.7 **10 Claims**

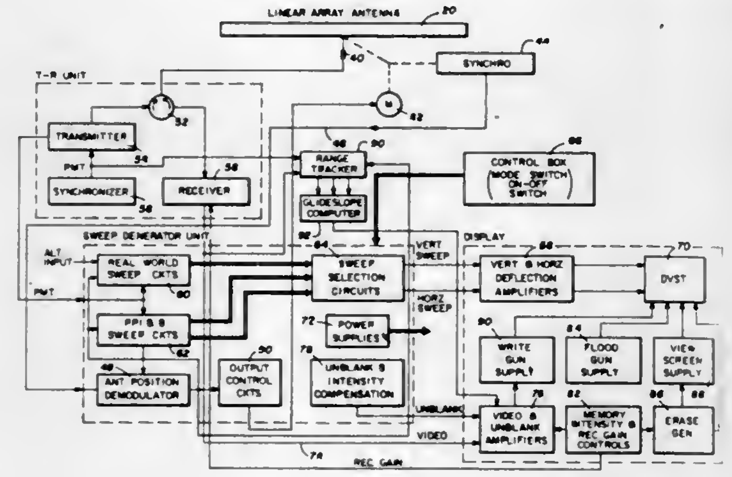


A digital time multiplexer for use in combination with a high PRF range gated pulse doppler radar which eliminates the need for a doppler filter bank for each range gated receiver in the system. The outputs of n range gated receivers are respectively sampled at the Nyquist rate or faster, converted into a digital signal, and fed into a memory unit on a time shared basis. The data is then sequentially read out of the storage on a per receiver basis into a single doppler filter bank for spectral analysis of the doppler band.

3,716,860
INDEPENDENT AIRCRAFT LANDING MONITOR SYSTEM

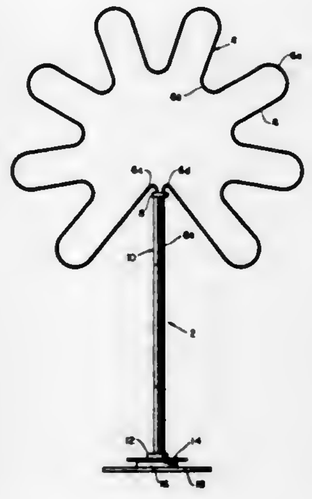
Bartow Bechtel, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.
Filed July 15, 1970, Ser. No. 54,979
Int. Cl. G01s *7/12, 7/16, 9/06*
U.S. Cl. 343—11 R **22 Claims**

An aircraft landing monitor which is independent of ground-based guidance systems and which includes an antenna comprising an elongated housing pivotally mounted about a vertical axis for horizontal movement in the forward portion of an aircraft. The housing supports an edge-slotted waveguide array which is mounted in an elongated horn reflector to thereby direct an antenna radiation pattern forward of the aircraft which is narrower in the azimuth than in the elevation plane. A motor oscillates the antenna housing about the vertical axis to sweep over an azimuth angle sufficient for airport runway detection during a glideslope approach to the runway by the aircraft. Radar transmitter and receiver circuits transmit and receive pulse radar signals via the antenna for radar detection of the runway. A radarscope mounted in the cockpit control panel is responsive to the radar transmitter and receiver for visually displaying an approaching airport runway in real-world linear perspective.



3,716,861
SERPENTINE ANTENNA MOUNTED ON A ROTATABLE CAPACITIVE COUPLER

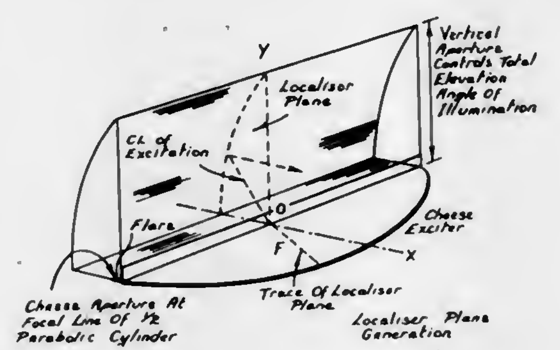
John J. Root, 3875 Waldo Avenue, Bronx, N.Y.
Filed March 22, 1971, Ser. No. 126,448
Int. Cl. H01q *9/16*
U.S. Cl. 343—741 **10 Claims**



This disclosure teaches an antenna including a conductor disposed in a serpentine arrangement defined by a plurality of undulations, wherein the amplitude or size of the undulations determines the directivity of the antenna, and wherein the undulations function to cancel mutual inductance parameters of the antenna while increasing the capacitive reactance thereof, to yield broadband characteristics. The antenna can take a variety of shapes, as for example the undulations may all fall entirely in a common plane and generally define a circle, a square, or an ellipse, etc.; or, such undulations may be arranged to form a ring or other three-dimensional object. The said shape of the antenna and its disposition with the earth's surface also contribute to the directivity of the antenna.

3,716,862
GENERATION OF NAVIGATING PLANES FOR AIRCRAFT LANDING UTILIZING PARABOLIC CHEESE AERIAL

Eric O. Willoughby, Adelaide, Australia, assignor to The University of Adelaide, Adelaide, Australia
Filed Feb. 24, 1970, Ser. No. 13,470
Claims priority, application Australia, Feb. 24, 1969, 50970/69
Int. Cl. G01s *1/14*
U.S. Cl. 343—108 R 8 Claims


Y
Vertical Aperture Controls Total Elevation Angle Of Illumination
Localiser Plane
CL of Excitation
O
Flare
Cheese Exciter
F
X
Cheese Aperture At Focal Line Of ½ Parabolic Cylinder
Trace Of Localiser Plane
Localiser Plane Generation

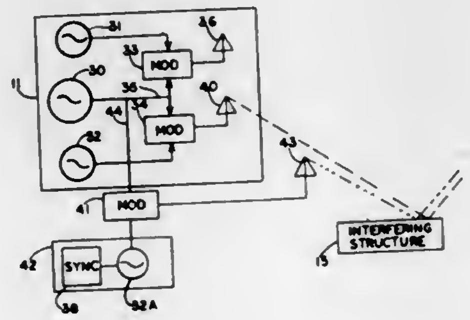
An aerial system for aircraft instrument landing wherein a symmetrical parabolic cheese aerial fed from two excitation centers symmetrical about the focus produces aperture illuminations with variations substantially of the form

$$C \cos \pi x/a \cos^2 \pi x/2a$$

and $D \sin \pi x/a \cos^2 \pi x/2a$
simultaneously in the radiating aperture, wherein 2a is the length and x is the distance from its center and C and D are constant factors measured in terms of illumination intensity per unit length of aperture, thereby producing the equivalent of two identical radiation patterns from the same radiation center mutually rotated with respect to each other which are added and subtracted to produce the navigation information, and with their excitation systems in the same plane.

3,716,863
INSTRUMENT LANDING ERROR CORRECTING SYSTEM

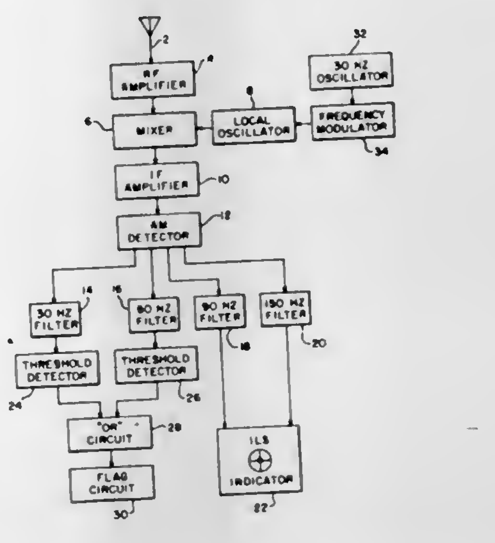
Rabindra N. Ghose, Los Angeles, and Walter A. Sauter, Malibu, both of Calif., assignors to American Nucleonics Corp., Woodland Hills, Calif.
Filed Aug. 6, 1970, Ser. No. 61,566
Int. Cl. G01s *1/16*
U.S. Cl. 343—108 R **11 Claims**



A system is disclosed for automatically reducing antenna radiation pattern errors of the localizer beams of instrument landing systems (ILS) commonly used in the United States of America and elsewhere to assist in landing of aircraft. The system is designed to produce a signal which cancels the error resulting from reflections from physical objects illuminated by the localizer antenna which otherwise would displace the ILS localizer null line of position. The system employs a correction signal generator that is synchronized with the carrier frequency generator of the ILS. Its radiating antenna is collocated with the localizer antennas or in the direct line between the runway localizer antennas and the reflecting physical object. The correction signal generator provides a signal with a modulation that is equal in amplitude and opposite in polarity and phase coherent with that of the dominant signal illuminating the reflecting physical object. The ILS receiver and the landing aircraft in the antenna field automatically adds the reflected dominant ILS and the correction signal algebraically resulting in the elimination of the error.

3,716,864
ILS RECEIVER FOR AIRCRAFT WITH DISTORTION WARNING OR ELIMINATION

Harris A. Stover, Cedar Rapids, Iowa, assignor to Collins Radio Company, Cedar Rapids, Iowa
Filed March 25, 1971, Ser. No. 127,989
Int. Cl. G01s *1/16*
U.S. Cl. 343—108 R **19 Claims**

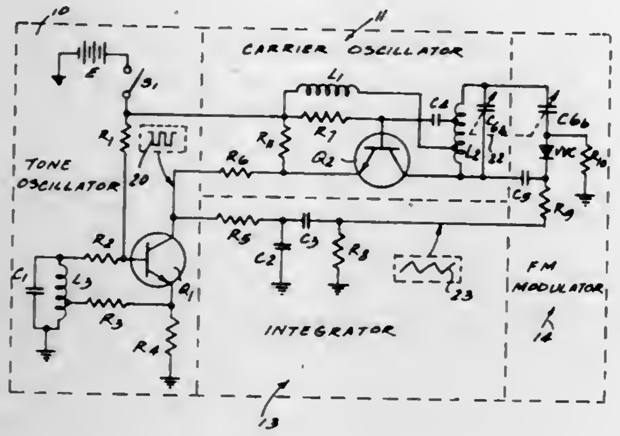


Means for improving the reliability of instrument landing system receivers is disclosed. Filtering techniques detect predetermined harmonics of the basic tone-pair employed in such systems, which harmonics are present in response to heretofore undetected amplitude and frequency distortions which give rise to erroneous output guidance signals. The detection principles lead to receiver design approaches by means of which guidance signal immunity to these distortions may be realized.

3,716,865
RADIO CONTROLLED SYSTEM FOR GARAGE DOOR OPENER

Colin B. Willmott, Chicago, Ill., assignor to Chamberlain Manufacturing Corporation, Chicago, Ill.
Filed June 10, 1971, Ser. No. 151,862
Int. Cl. H04b *1/04, 7/00*
U.S. Cl. 343—225 **5 Claims**

A closure operator including a simultaneously and synchronously pulsed and frequency modulated transmitter for use in conjunction with a remote receiver for controlling a closure operator and in which the range of control is substantially increased over prior art transmitters. By frequency modulating the pulse output of the transmitter, more energy will be received by the receiver without exceeding the radiation limits as established by the Federal Communications Commission thus allowing greater range. The circuit also utilizes a split stator type tuning capacitor in the transmitter which provides for a relatively constant frequency deviation component over a wide RF carrier tuning range.



3,716,866

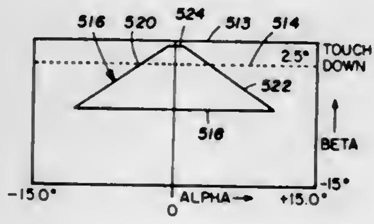
REAL-WORLD PERSPECTIVE DISPLAY FOR USE WITH AN INDEPENDENT AIRCRAFT LANDING MONITOR SYSTEM

James S. Mason, Garland, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed July 15, 1970, Ser. No. 55,166

Int. Cl. G01s *7/24*

U.S. Cl. 343—5 LS **25 Claims**



A radar display for an independent aircraft landing monitor wherein a radar system onboard an aircraft detects an airport runway during glideslope approach. The display includes a radar display tube having horizontal and vertical sweep circuits for controlling the visual display of the tube. Circuitry operates the horizontal sweep circuits of the display tube in synchronism with the azimuth scan of the radar system. Circuits are responsive to the aircraft altitude for generating a driving output signal which varies non-linearly in amplitude with respect to the ratio of aircraft altitude and radar range. Circuitry is responsive to the driving output signal for control of the elevation angle displayed by the vertical sweep circuits of the radar display tube to thereby generate indications of the approaching airport runway in real-world perspective. Provision is also made to selectively display conventional B sweep or PPI displays of the approaching airport runway, and range marker signals are displayed upon the radar display tube during glideslope approach.

3,716,867

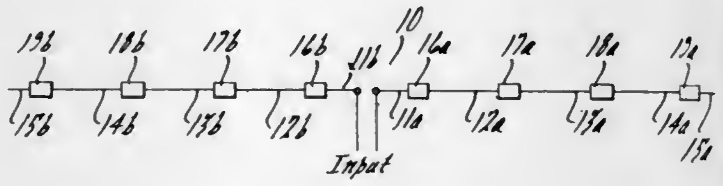
WIRE ANTENNA MULTIPLY-LOADED WITH ACTIVE ELEMENT IMPEDANCES

Paul E. Mayes, 1508 Waverly Dr., Champaign, Ill., and Andrew J. Poggio, 863 Palomino, Pleasanton, Calif.

Filed Aug. 11, 1970, Ser. No. 62,910

Int. Cl. H01q *11/04*

U.S. Cl. 343—701 **10 Claims**



This invention relates to antennas and more particularly to a wire antenna which is multiply-loaded to provide wide band characteristics. By virtue of its novel construction and design, the antenna of this invention will maintain an input impedance value which changes very little over an extended frequency band. Furthermore, single beam omnidirectional radiation patterns can be maintained over a wide band.

3,716,868

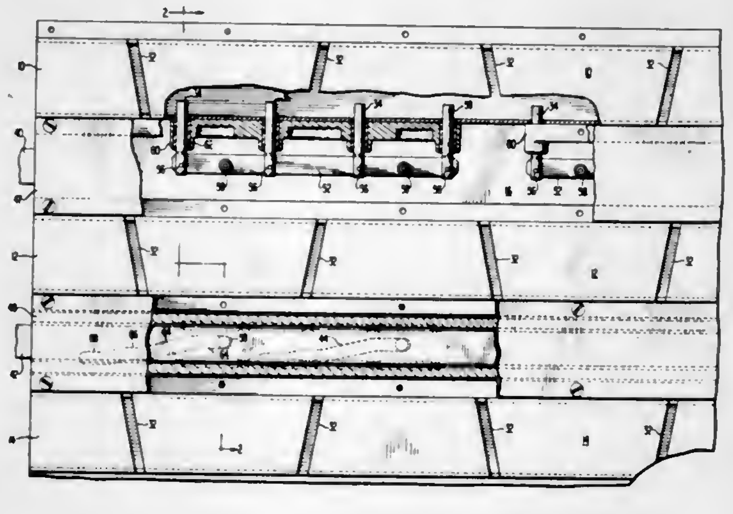
BROADBAND SLOTTED WAVEGUIDE ANTENNA ARRAY

Hall R. McComas, Laurel, and John H. Staehlin, Baltimore, both of Md., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Oct. 20, 1970, Ser. No. 82,446

Int. Cl. H01q *13/10*

U.S. Cl. 343—768 **10 Claims**



A means for broadening the bandwidth of a waveguide slot array by introducing a pair of metallic phase shifter probes between adjacent radiating slots located in the feeding waveguide. The probes are made to penetrate to specific depths within the waveguide thereby effectively restoring the electrical phase between the slots and tuning the array whenever the operating frequency substantially deviates from a predetermined frequency which determines the slot spacing.

3,716,869

MILLIMETER WAVE ANTENNA SYSTEM

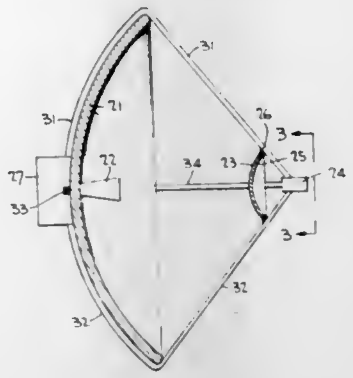
William I. Gould, Jr., Silver Spring, and Jack Evans, Baltimore, both of Md., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration

Filed Dec. 2, 1970, Ser. No. 94,369

Int. Cl. H01q *19/14*

U.S. Cl. 343—779 **12 Claims**

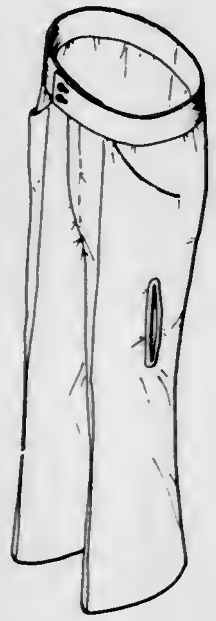
A millimeter wave antenna mounted on a satellite includes a parabolic reflector fabricated of carbon fiber reinforced plastic (CFRP) composite material to enable the parabolic shape of the reflector to be maintained to within three percent of a millimeter wave length despite possible temperature variations on the order of 300° F. between portions of the reflector illuminated by the sun and in the umbra. Waveguides, fabricated from CFRP, for a feed positioned approximately at the focal point of the reflector are the sole mechanical supporting means for the feed. To take advantage of the physical properties of the carbon fiber reinforced plastic composite materials a honeycomb structure is sandwiched between layers of the CFRP. The surface of the reflector illuminated by the feed is coated with a thin film of aluminum which functions as a millimeter wave reflector. The waveguide CFRP interior is coated with a thin film of aluminum to provide the millimeter wave conducting surface.



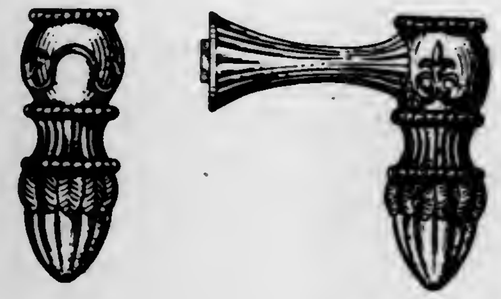
DESIGNS

FEBRUARY 13, 1973

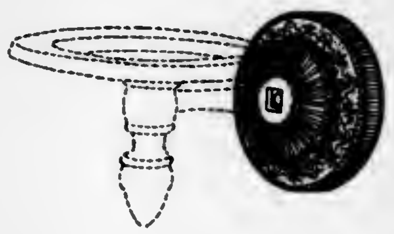
226,295
PAIR OF SLACKS OR SIMILAR ARTICLE
Victor A. Matrangelo, 60 E. 12th St.,
New York, N.Y. 10003
Filed July 9, 1971, Ser. No. 161,428
Term of patent 14 years
Int. Cl. D2—*02*
U.S. Cl. D2—28

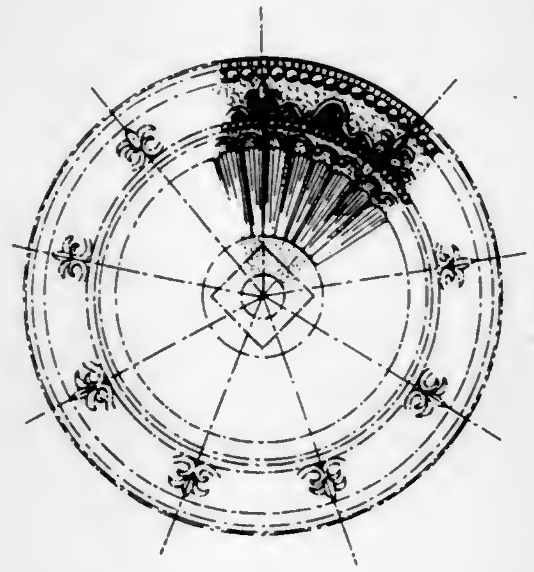


226,296
SUPPORT BRACKET FOR A BATHROOM FIXTURE OR THE LIKE
Sidney J. Shames, 57 Holly Place, Briarcliff Manor, N.Y. 10510, and Harold Shames, 5 Agnes Circle, Ardsley, N.Y. 10502
Filed Mar. 31, 1971, Ser. No. 130,060
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—86

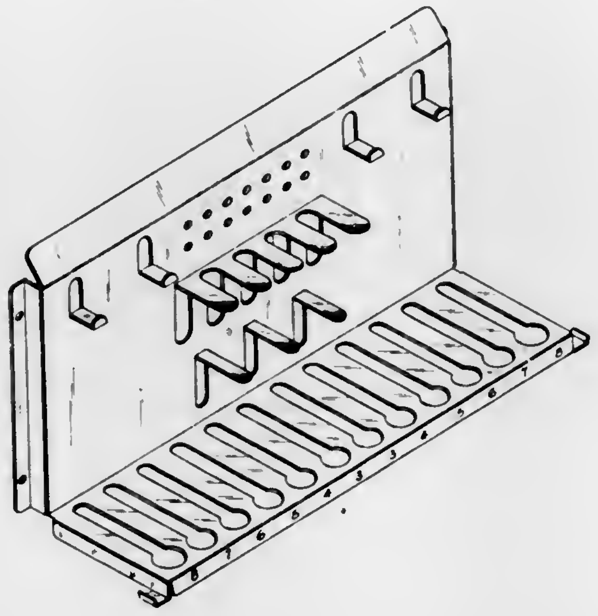


226,297
ESCUTCHEON PLATE FOR A BATHROOM FIXTURE OR THE LIKE
Sidney J. Shames, 57 Holly Place, Briarcliff Manor, N.Y. 10510, and Harold Shames, 5 Agnes Circle, Ardsley, N.Y. 10502
Filed Mar. 31, 1971, Ser. No. 130,061
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—86

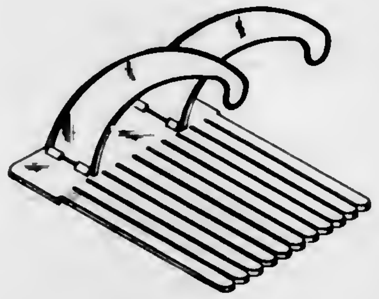




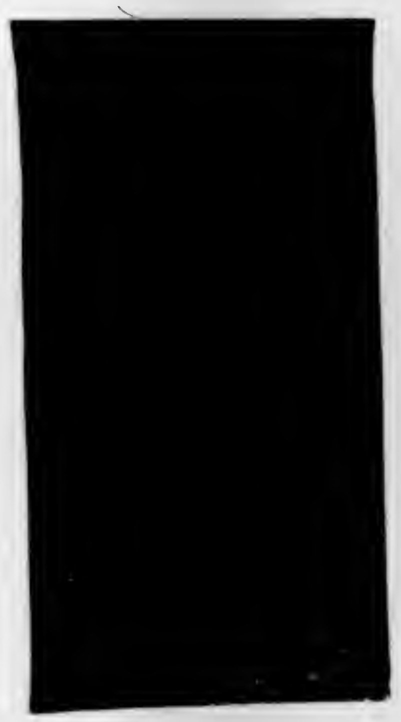
226,298
STORAGE RACK FOR A SET OF MACHINE TOOLS
Robert F. Anderson, 3613 13th St.,
Menominee, Mich. 49858
Filed Dec. 11, 1970, Ser. No. 26,417
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—125



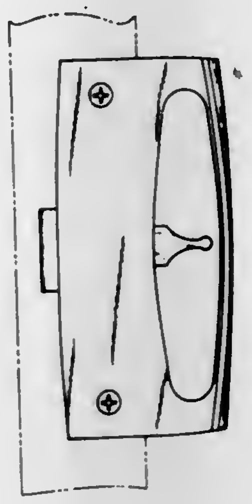
226,299
TROUSER HANGER
Robert L. Gielow, 320 Indian Trail,
Marietta, Ga. 30060
Filed May 19, 1971, Ser. No. 145,119
Term of patent 14 years
Int. Cl. D6—*08*
U.S. Cl. D6—252



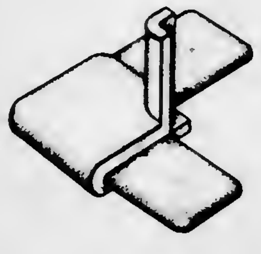
226,300
TEXTILE FABRIC
Leonard C. Clementi, Huntington, N.Y., assignor to Cannon Mills Company, Kannapolis, N.C.
Original design application Feb. 16, 1971, Ser. No. 115,908. Divided and this application Feb. 2, 1972, Ser. No. 223,062
Term of patent 14 years
Int. Cl. D6—*13*
U.S. Cl. D6—265



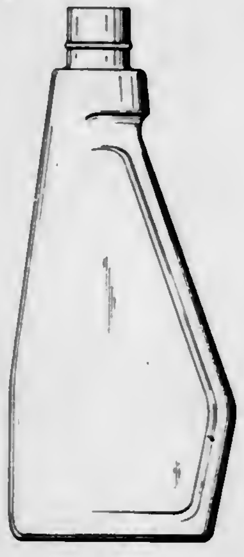
226,301
SLIDING DOOR HANDLE
Raymond N. Dushane, Jr., 932 Sandalwood,
Fullerton, Calif. 92632
Filed July 12, 1971, Ser. No. 161,396
Term of patent 14 years
Int. Cl. D8—*06*
U.S. Cl. D8—151



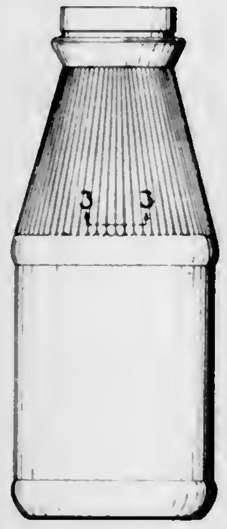
226,302
CORNER INSERT FOR CEILING TRACKS
Melvin W. Tompkins and George F. Retz, New Castle, Ind., assignors to American Standard Inc., New York, N.Y.
Filed May 11, 1971, Ser. No. 142,426
Term of patent 14 years
Int. Cl. D8—*09*
U.S. Cl. D8—225



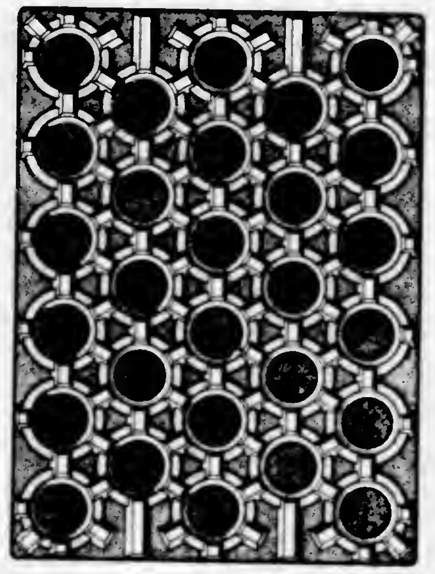
226,303
BOTTLE
Edward J. Kretz, 2120 Marlow, Toledo, Ohio 43606
Filed Oct. 6, 1971, Ser. No. 187,233
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—66



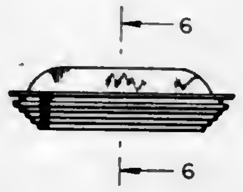
226,304
BOTTLE
Richard L. Weckman, Perrysburg, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio
Filed Oct. 6, 1971, Ser. No. 187,229
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—125



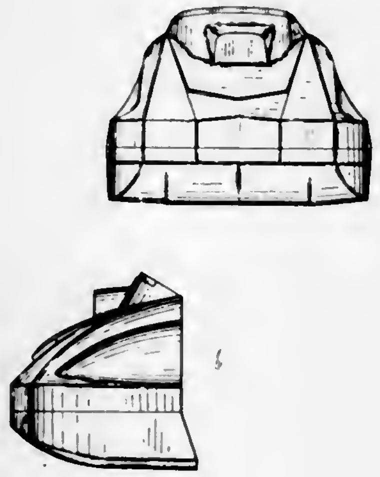
226,305
PACKAGING TRAY
Lawrence T. Wilkes, Lancaster, Ohio, assignor to Anchor Hocking Corporation, Lancaster, Ohio
Filed Apr. 7, 1971, Ser. No. 132,250
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—188



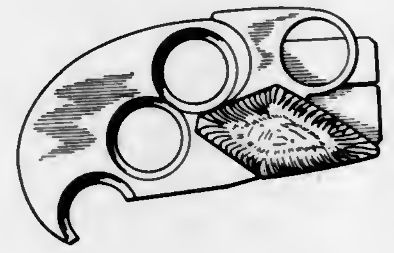
226,306
CAN RESEALER OR THE LIKE
Asa P. Ruskin, 865 West End Ave., New York, N.Y. 10025
Filed Dec. 27, 1971, Ser. No. 212,847
Term of patent 14 years
Int. Cl. D9—*07*
U.S. Cl. D9—282



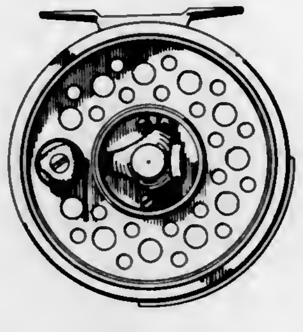
226,307
HOOD FOR SNOWMOBILE
Gaston Marier, 50 Mailhot St., Princeville, Quebec, Canada
Filed Mar. 29, 1971, Ser. No. 129,296
Claims priority, application Canada Jan. 6, 1971
Term of patent 14 years
Int. Cl. D12—*14*
U.S. Cl. D14—24



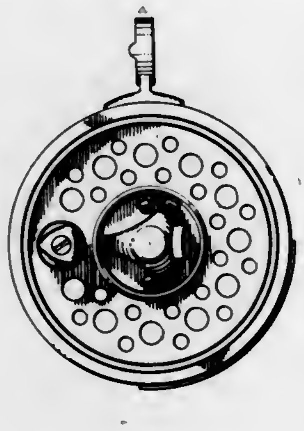
226,308
ARROW RELEASE DEVICE
Ross A. Pinti, 1106 Roemer Blvd., Farrell, Pa. 16121, and Patrick R. Pinti, 62 Stiver St., Hubbard Township, Ohio 44425
Filed July 15, 1971, Ser. No. 163,143
Term of patent 14 years
Int. Cl. D22—*01*
U.S. Cl. D22—5



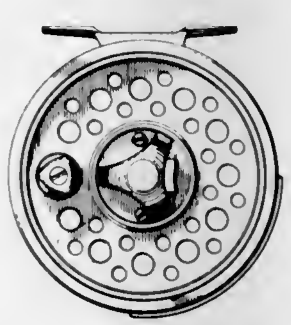
226,309
FLY CASTING FISHING REEL
Jean-Paul Lemery, Cluses, France, assignor to Etablissements Carpano et Pons, Cluses, France
Filed Sept. 29, 1971, Ser. No. 184,984
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—25



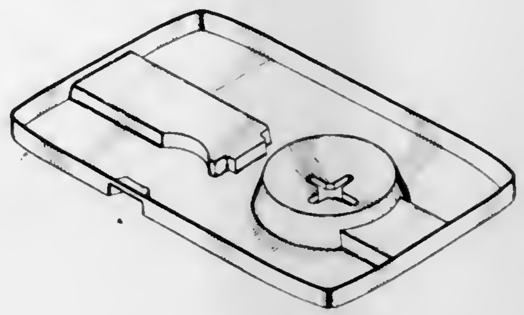
226,310
FLY CASTING FISHING REEL
Jean-Paul Lemery, Cluses, France, assignor to Etablissements Carpano et Pons, Cluses, France
Filed Sept. 29, 1971, Ser. No. 184,986
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—25



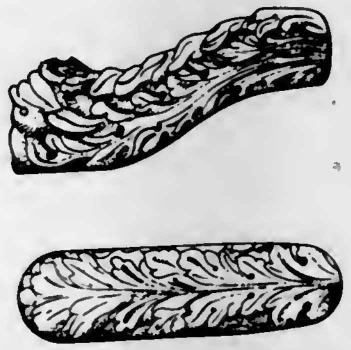
226,311
FLY CASTING FISHING REEL
Jean-Paul Lemery, Cluses, France, assignor to Etablissements Carpano et Pons, Cluses, France
Filed Sept. 29, 1971, Ser. No. 184,987
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—25



226,312
BRINE CABINET INNER BOTTOM
Robert E. Marsh, Milwaukee, Wis.
(5521 Willow View Road, Racine, Wis. 53402)
Filed Feb. 8, 1971, Ser. No. 113,809
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—3



226,313
COVER FOR LAVATORY SPOUT
Ralph La Rue Du Bois, 4242 E. 111th St., Tulsa, Okla. 74135
Continuation-in-part of abandoned design application Ser. No. 23,112, May 25, 1970. This application July 12, 1971, Ser. No. 161,379
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—32



226,314

ARTIFICIAL HEARTH FIRE

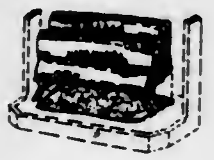
Robert Conroy, San Francisco, Kellogg Fleming, Sausalito, Burton Hirsch, San Mateo, Ray Redel, Albany, and J. B. Steinhilber, Mill Valley, Calif., assignors to Fred Meyer of California

Filed July 12, 1971, Ser. No. 161,397

Term of patent 14 years

Int. Cl. D23—*99*

U.S. Cl. D23—94



226,315

COMBINED TELEVISION CONTROLLER AND SOUND RECORDING UNIT

Masaharu Katayama, Fumiharu Ohta, and Kumi Yanagisawa, Saijo, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

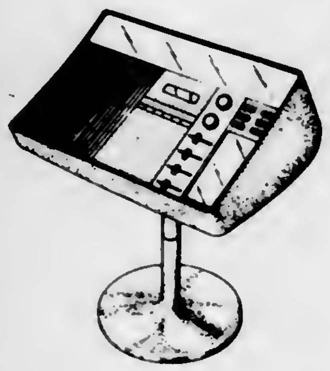
Filed Apr. 5, 1971, Ser. No. 131,591

Claims priority, application Japan Oct. 13, 1970

Term of patent 14 years

Int. Cl. D14—*02*

U.S. Cl. D26—5 C



226,316

CASING FOR PORTABLE RADIO TRANSCEIVER

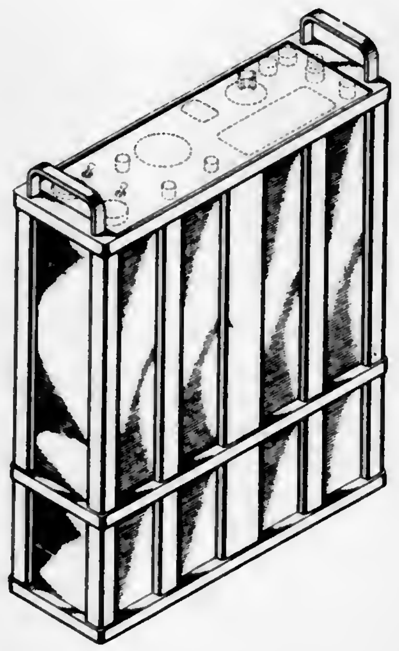
Stanford Seiden, North Miami Beach, Fla., assignor to Sunair Electronics, Inc., Fort Lauderdale, Fla.

Filed Dec. 30, 1971, Ser. No. 214,524

Term of patent 14 years

Int. Cl. D14—*03*

U.S. Cl. D26—14 L



226,317

SIMULATED COIN

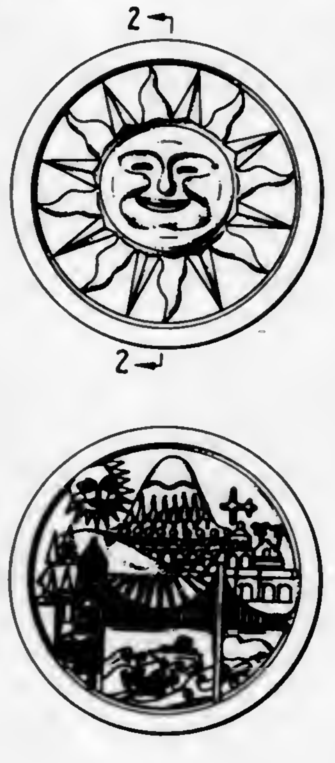
Stanley F. Dann, Oakland, Calif., assignor to World Commerce, Vacaville, Calif.

Continuation-in-part of design application Ser. No. 25,752, Oct. 30, 1970. This application June 21, 1971, Ser. No. 155,387

Term of patent 14 years

Int. Cl. D11—*03*

U.S. Cl. D29—11 F



226,318

PLAYGROUND CLIMBING BARS

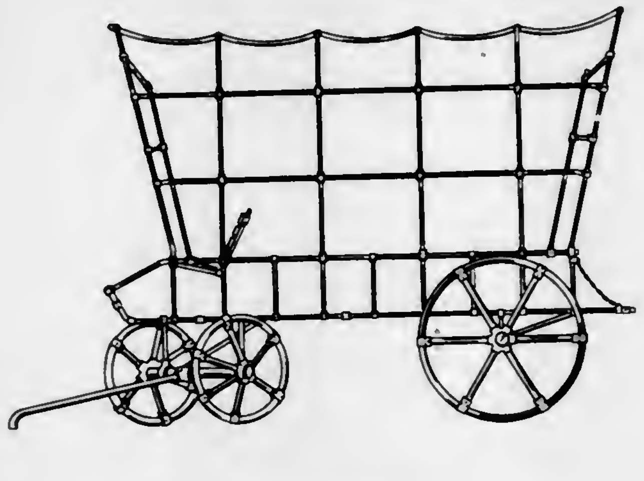
Steven A. Henning and Philip G. Miller, Anderson, Ind., assignors to American Playground Device Co., Anderson, Ind.

Filed June 4, 1971, Ser. No. 150,258

Term of patent 14 years

Int. Cl. D21—*03*

U.S. Cl. D34—5 H



226,319

GOLF PUTTER HEAD

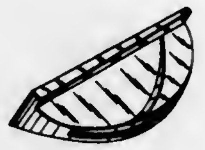
Ronald D. Sanders, 232 Saddle Road, Trinidad, Colo. 81082

Filed June 4, 1971, Ser. No. 150,266

Term of patent 14 years

Int. Cl. D21—*02*

U.S. Cl. D34—5 GH



226,320

TOY LOCOMOTIVE

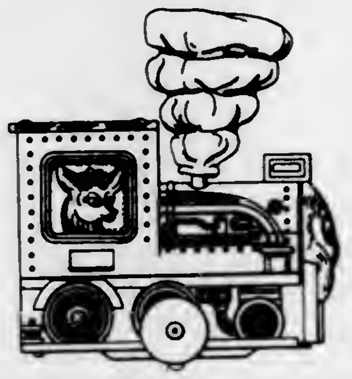
Perry Feuer, Roslyn, N.Y., assignor to Creative Creations, Inc., Hicksville, N.Y.

Filed June 10, 1971, Ser. No. 148,944

Term of patent 14 years

Int. Cl. D21—*01*

U.S. Cl. D34—15 MM



226,321

COMBINED CHECKER AND CHESSBOARD

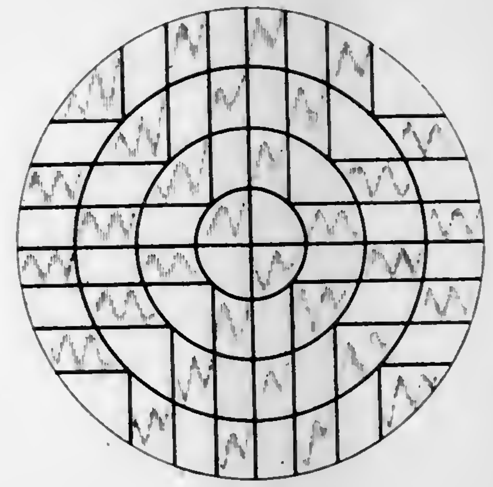
David Aiuppa, W207 S8286 Hillendale Drive, Muskego, Wis. 53150

Filed Aug. 16, 1971, Ser. No. 172,368

Term of patent 14 years

Int. Cl. D21—*01*

U.S. Cl. D34—5 SS



226,322

COMBINED CLOCK AND PERPETUAL CALENDAR

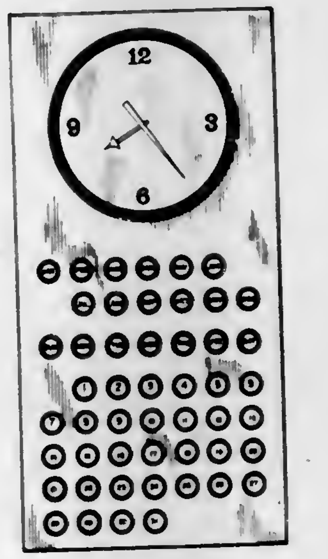
Franklin M. Wills, Chicago, Ill., assignor to Burwood Products Company, Chicago, Ill.

Filed Aug. 4, 1971, Ser. No. 169,169

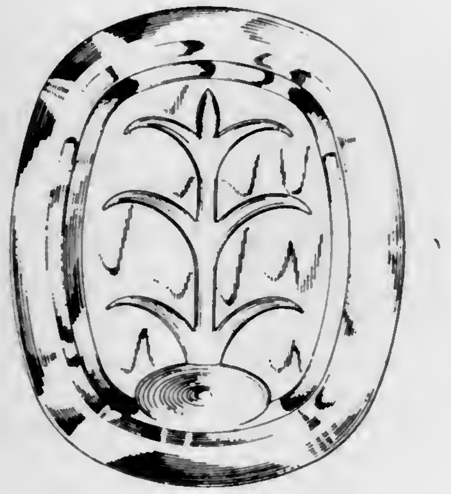
Term of patent 14 years

Int. Cl. D10—*01*

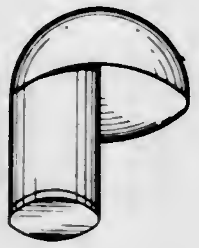
U.S. Cl. D42—7 H



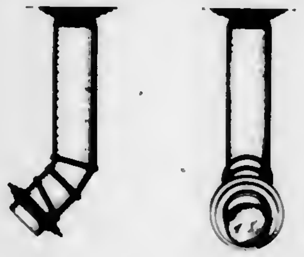
226,323
FOOD SERVING DISH
Ralph P. Wilton, Wrightsville, Pa., assignor to Wilton Brass Company, Columbia, Pa.
Filed Apr. 20, 1971, Ser. No. 135,822
Term of patent 14 years
Int. Cl. D7—*99*
U.S. Cl. D44—10



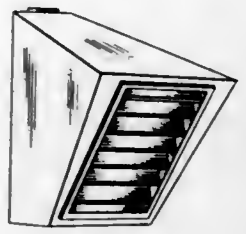
226,324
TABLE LAMP
Giuseppe Longato, Via Makalle 19, Padova, Italy
Filed May 3, 1971, Ser. No. 139,990
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D48—20 R



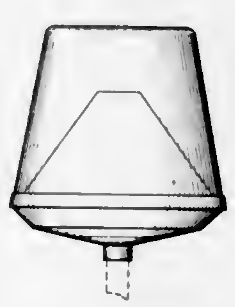
226,325
LIGHTING FIXTURE
Richard B. Poff, 743 N. Main St., Auburn, Ind. 46706
Filed Nov. 12, 1971, Ser. No. 198,487
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D48—23 R



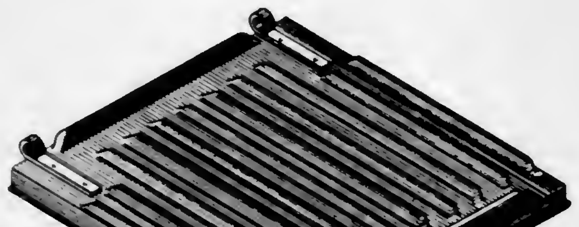
226,326
LUMINAIRE
Eldon L. Anderson, Jr., Fletcher, N.C., assignor to General Electric Company
Filed Dec. 9, 1970, Ser. No. 26,369
Term of patent 14 years
Int. Cl. D26—*03*
U.S. Cl. D48—31



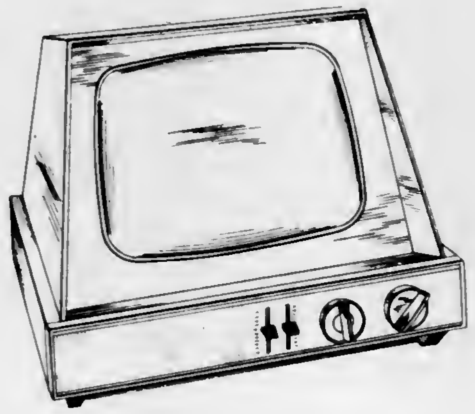
226,327
LUMINAIRE
Eldon L. Anderson, Jr., Fletcher, N.C., assignor to General Electric Company
Filed Jan. 10, 1972, Ser. No. 216,912
Term of patent 14 years
Int. Cl. D26—*03*
U.S. Cl. D48—31



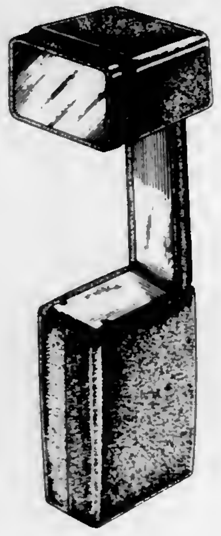
226,328
COVER FOR TRASH RECEPTACLE
Milburn P. Patton, 20 Devonshire Road, Ypsilanti, Mich. 48197, and David Denski, 10471 Territoral, Plymouth, Mich. 48170
Filed Oct. 20, 1971, Ser. No. 191,148
Term of patent 14 years
Int. Cl. D7—*06*
U.S. Cl. D49—35



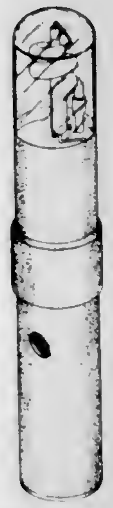
226,329
PORTABLE TELEVISION RECEIVER, OR SIMILAR ARTICLE
George Peter Roegner, Short Hills, N.J., assignor to U.S. Industries, Inc., New York, N.Y.
Filed June 1, 1971, Ser. No. 149,128
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D56—4 D



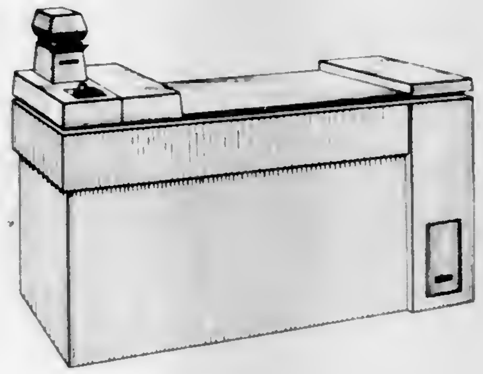
226,330
CAMERA FLASH ATTACHMENT
Peter T. Quinn, Littleton, Colo., assignor to Honeywell Inc., Minneapolis, Minn.
Continuation of design applications Ser. No. 18,974 and Ser. No. 18,981, both Sept. 3, 1969. This application June 5, 1970, Ser. No. 23,340
Term of patent 14 years
Int. Cl. D16—*07*
U.S. Cl. D61—1 F



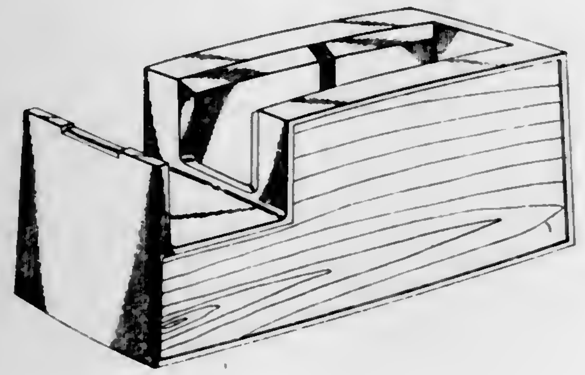
226,331
ELECTRONIC PHOTOFLASH UNIT
Robert M. Hogue, 4425 W. Dunwood Road, Brown Deer, Wis. 53223, and Donald N. Emmerich, Glendale, Wis.; said Emmerich assignor to said Hogue
Continuation of design application Ser. No. 21,768, Mar. 6, 1970. This application July 12, 1971, Ser. No. 161,377
Term of patent 14 years
Int. Cl. D16—*05*
U.S. Cl. D61—1 F



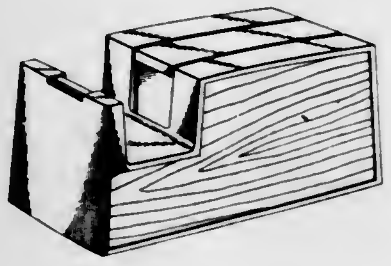
226,332
MICROFILM READER-PRINTER OR SIMILAR ARTICLE
Daniel H. Robbins, Rochester, N.Y., assignor to Itek Corporation, Lexington, Mass.
Filed Sept. 23, 1971, Ser. No. 183,296
Term of patent 14 years
Int. Cl. D16—*03*
U.S. Cl. D61—1 Q



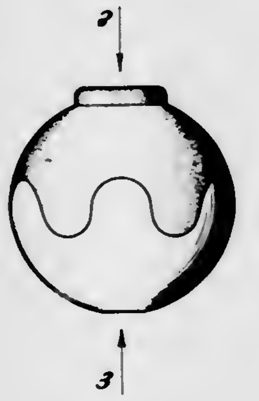
226,333
TAPE DISPENSER
Jean O. Reinecke, Pasadena, Calif., and Geno C. D'Ercoli, Park Forest, and Michael S. Joss, Skokie, Ill., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed Oct. 26, 1971, Ser. No. 192,687
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D74—1



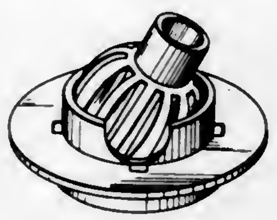
226,334
TAPE DISPENSER
Jean O. Reinecke, Pasadena, Calif., and Geno C. D'Ercoli, Park Forest, and Michael S. Joss, Skokie, Ill., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed Oct. 26, 1971, Ser. No. 192,688
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D74—1



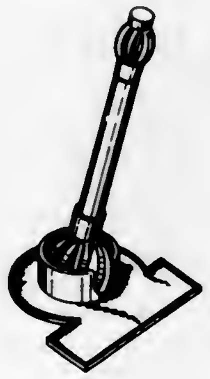
226,335
COMBINED PAPERWEIGHT AND PENHOLDER
Leon M. Levy, Chicago, and Harry J. Lemanski, Glenview, Ill., assignors to The Gillette Company, Santa Monica, Calif.
Filed June 21, 1971, Ser. No. 155,378
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D74—5 A



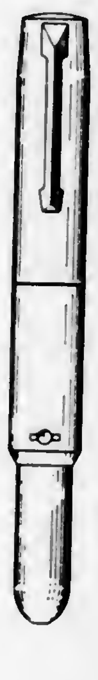
226,336
BALL JOINTED PEN HOLDER AND THE LIKE
Roland P. Longarzo, Valley Stream, N.Y., assignor to Ibex Precision Products, Inc., New York, N.Y.
Filed Nov. 15, 1971, Ser. No. 201,632
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D74—5 A



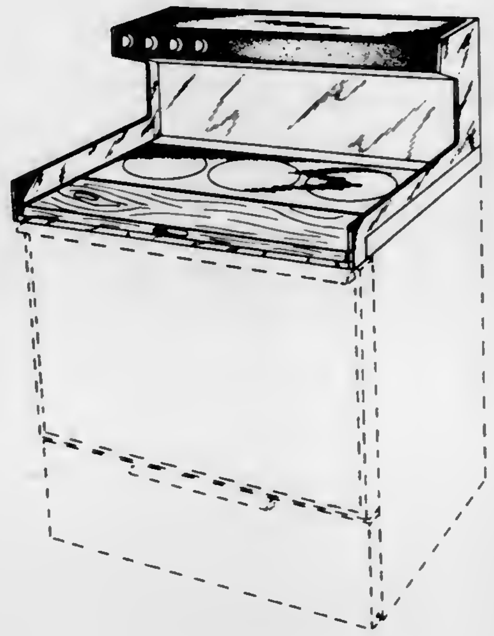
226,337
DESK SET
Roland P. Longarzo, 218 Hollywood Ave., Valley Stream, N.Y. 11580
Filed Jan. 10, 1972, Ser. No. 216,877
Term of patent 14 years
Int. Cl. D19—*06*
U.S. Cl. D74—5 B



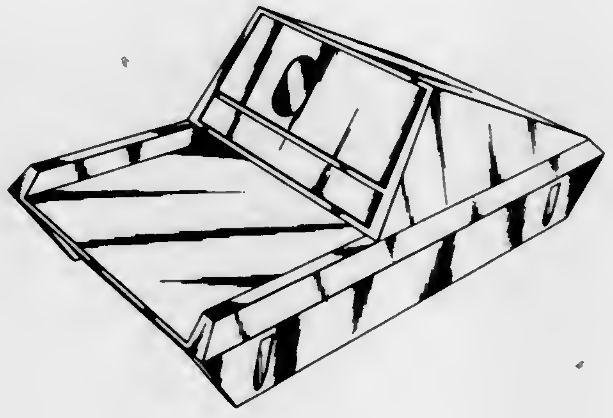
226,338
CASING FOR A WRITING INSTRUMENT
Peter L. Tailer, 323 E. 17th St., New York, N.Y. 10003
Filed Oct. 9, 1970, Ser. No. 25,415
Term of patent 14 years
Int. Cl. D19—*06*
U.S. Cl. D74—17 B



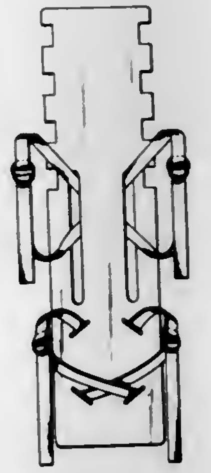
226,339
COMBINED COOKTOP AND VENTILATING HOOD WITH WARMING SHELF OR SIMILAR ARTICLE
Bohdan Hurko, Louisville, Ky., assignor to General Electric Company
Filed Feb. 16, 1971, Ser. No. 115,940
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D81—25 E



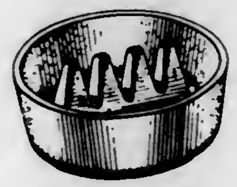
226,340
VIEWER FOR AN ELECTROPHORESIS CASSETTE
Bernard R. Danti, Lexington, and Paul E. Brefka, Southboro, Mass., assignors to Millipore Corporation, Bedford, Mass.
Filed Apr. 1, 1971, Ser. No. 130,560
Term of patent 14 years
Int. Cl. D24—*01*
U.S. Cl. D83—1



226,341
SHORT SPINE BOARD
Chester V. Rhoads, 5221 Hadley Court, Apt. 4, Shawnee Mission, Kans. 66202
Filed July 8, 1971, Ser. No. 160,965
Term of patent 14 years
Int. Cl. D24—*99*
U.S. Cl. D83—1 E

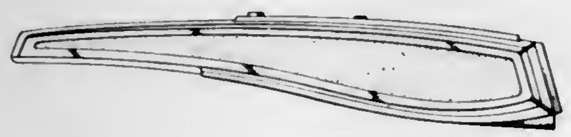


226,342
ASH TRAY OR SIMILAR ARTICLE
Frank J. Curran, 3250 S. Highland Ave., Downers Grove, Ill. 60515
Filed May 20, 1971, Ser. No. 145,592
Term of patent 14 years
Int. Cl. D27—*03*
U.S. Cl. D85—2 H



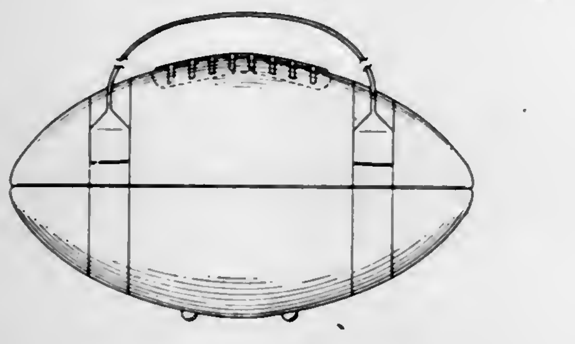
226,343
HANDLE FOR AN ELECTRIC HAIR STYLER OR THE LIKE

Denis J. Jordan, Eau Claire, Wis., assignor to National Presto Industries, Inc., Eau Claire, Wis.
Filed Aug. 26, 1971, Ser. No. 175,425
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D86—10 F



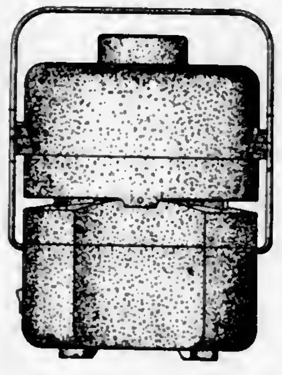
226,344
HANDBAG

Judith J. Loomis, 232 Lafayette St., Memphis, Tenn. 38111
Filed Jan. 11, 1972, Ser. No. 217,083
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D87—3 F



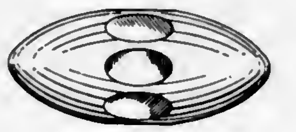
226,345
AUTOMATIC JUICE MAKER

Jurgen Greubel, Eschenbahn, Germany, assignor to Braun A.G., Frankfurt am Main, Germany
Filed Nov. 25, 1970, Ser. No. 26,153
Claims priority, application Germany July 1, 1970
Term of patent 14 years
Int. Cl. D7—*04*
U.S. Cl. D89—1 A



226,346
MAGNETIC STIRRING BAR

Alexander I. Newman, River Forest, Ill., assignor to Lab-Line Instruments, Inc., Melrose Park, Ill.
Filed Jan. 19, 1971, Ser. No. 107,877
Term of patent 14 years
Int. Cl. D24—*99*
U.S. Cl. D94—3 D



LIST OF PATENTEES
TO WHOM
PATENTS WERE ISSUED ON THE 13TH DAY OF FEBRUARY, 1973

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A-T-O Inc.: *See—*
Olliges, James R., Sr., 3,715,898.

AB Tetra Pak: *See—*
Tuma, Alex; and Hansson, Jan Ingvar, 3,716,083.

Abel's Bagels, Inc.: *See—*
Fronczak, Daniel H., 3,715,857.

Abruzzi, Pierluigi: *See—*
Vargiu, Silvio; Pezzoli, Silvestro; and Abruzzi, Pierluigi, 3,716,512.

Acker, Ellsworth; and Winyall, Milton Edward, to Grace, W. R., & Co. Process for making fine sized low density silica. 3,716,493, Cl. 252-317.000.

Ackerman, Irving. Envelope-type package for fold-over type coffee filter sheets. 3,716,131, Cl. 206-57.000.

Ackrell, Jack; Edwards, John A.; and Fried, John H., to Syntex Corporation. Novel C-16, 17 spiro-orthoester steroids and preparation. 3,716,529, Cl. 260-239.55d.

Acoustics Development Corporation: *See—*
Hannula, Leslie A., 3,716,214.

Active Garage Builders Inc.: *See—*
Monroe, Donald G., 3,715,836.

Actor, Philip P.; Parish, Roger C.; and Theodorides, Vassilios J., to Smith Klint, & French Laboratories. Coccidiostat compositions and methods using aminobenzonitriles. 3,716,641, Cl. 424-251.000.

Adams, Henry G. Data transmission system with immunity to circuit faults. 3,716,834, Cl. 340-147.00r.

Adams, Heribert: *See—*
Koenig, Walter; Adams, Heribert; and Heidjann, Franz, 3,716,104.

Addison, Frank F. Surface controlled blowout arrester. 3,716,068, Cl. 137-67.000.

Addressograph-Multigraph Corporation: *See—*
Gogola, Joseph K., 3,716,364.

Adler, Karl-Heinz; Knapp, Heinrich; and Eckert, Konrad, to Bosch, Robert, G.m.b.H. Fuel injection control apparatus for internal combustion engines. 3,716,035, Cl. 123-32.0ea.

Adler, Stuart L.: *See—*
Lange, Henry F.; and Adler, Stuart L., 3,716,258.

Adlhart, Otto J.; and Terry, Peter L., to Engelhard Minerals & Chemicals Corporation. Fuel metering device for fuel cell. 3,716,416, Cl. 136-86.00b.

Adriaan, Hendrik; and Battaerd, Jacobs, to ICI Australia Limited. Thermal regeneration ion exchange process with triallylamine polymers. 3,716,481, Cl. 210-32.000.

Advance Management Engineering & Research Co.: *See—*
Long, Larry K., 3,716,292.

Aerco Corporation: *See—*
Angelery, Henry W.; and Mohr, glenn R., 3,716,719.

Aerojet-General Corporation: *See—*
King, William M., 3,716,315.

African Wire Ropes Limited: *See—*
Reynolds, Robin Francis Norman, 3,716,069.

Aga-Aktiebolag: *See—*
Almqvist, Hans O.; and Backlund, Sigurd A., 3,716,053.

Agatsuma, Kunio: *See—*
Nakamura, Yasushi; Agatsuma, Kunio; Tanaka, Yoshihiro; and Aono, Shunji, 3,716,583.

Agfa-Gevaert Aktiengesellschaft: *See—*
Riester, Oskar, 3,716,366.

Ahern, Ronald Albert: *See—*
Molins, Desmond Walter; Ahern, Ronald Albert; and Maurice Labbe, Francis Auguste, 3,716,062.

Ahmad, Iqbal, to United States of America, Army. Process for forming composite material by electrodeposition under the influence of a centrifugal force field. 3,716,461, Cl. 204-16.000.

Ahmedabad Manufacturing and Calico Printing Co., Ltd.: *See—*
Dutta, Subodh Krishna; Shah, Krishnakant Girdharla; and Setalvad, Jagdish Ishwarlal, 3,716,326.

Air Products and Chemicals, Inc.: *See—*
Molina, Orlando G., 3,716,494.

Air Products and Chemicals, Inc., mesne: *See—*
Lindemann, Martin K.; and Volpe, Rocco P., 3,716,504.

Aircraft Mechanics, Inc.: *See—*
Pearne, Florentin J.; Pearne, Frank S.; and Robson, Frederick G., 3,716,264.

Aisin Seiki Kabushiki-Kaisha: *See—*
Kobayashi, Toyoaki; Sakakibara, Naoji; and Kondo, Toshio, 3,716,113.
Nishida, Koji, 3,716,788.

Ajinomoto Co., Inc.: *See—*
Okumura, Shinji; Yoshinaga, Fumihiro; Kubota, Koji; and Kamijo, Hirotaka, 3,716,453.

Akachi, Hisateru, to Oki Densen Kabushiki Kaisha. Communication cable. 3,715,877, Cl. 57-156.000.

Akiba, Keiichiro: *See—*
Fujinami, Akira; Ozaki, Toshiaki; Akiba, Keiichiro; Yamamoto, Sigeo; Nodera, Katsuji; Tanaka, Katsutoshi; Kameda, Nobuyuki; and Ooishi, Tadashi, 3,716,552.

Aktiebolaget Celleco: *See—*
Frykhult, Rune Helmer, 3,716,137.

Aktiebolaget Electrolux: *See—*
Eber, Nicolas, 3,715,896.

Aktieselskabet Niro Atomizer: *See—*
Masters, Keith; and Straarup, Orla, 3,716,193.

Akulov, Nikolai Sergeevich, to Otdel Fiziki Nerazrushajuschego Kontrolya Akademii Nauk BSSR. Magnetic spring-controlled winding apparatus for gauging the thickness of non-magnetic coatings on metal products. 3,716,779, Cl. 324-34.0tk.

Akutsu, Hidezo: *See—*
Mizuno, Hideo; Kimura, Sadao; Akutsu, Hidezo; Yamazaki, Haruo; Okamoto, Takio; Watarai, Yoshiaki; and Baba, Shoichi, 3,716,743.

Albers, Henry John; Riggi, Stephen Joseph; Bach, Frederick Louis; and Cohen, Elliott, to American Cyanamid Company. Hypolipidemic agents. 3,716,644, Cl. 424-308.000.

Albrecht, Rudolf; Schroder, Eberhard; and Muftic, Mahmoud, said Albrecht and said Schroder assors. to Schering A.G. 5-Nitro-furfurylidene antimicrobic agents. 3,716,531, Cl. 260-240.00a.

Alburger, William P.: *See—*
Godshalk, James B.; and Alburger, William P., 3,716,030.

Alburn, Harvey E.; and Fletcher, Horace, III, to American Home Products Corporation. 1,3-diazaspiro[4,4]non-7-ene-2,4-dione. 3,716,553, Cl. 260-309.500.

Aldrich Chemical Company, Inc.: *See—*
Hopps, Harvey B.; Jackman, Dennis; and Biel, John H., 3,716,539.

Alexandrovich, Eduard-Gely Vitalievich: *See—*
Belkin, Nikolai Vasilievich; Alexandrovich, Eduard-Gely Vitalievich; Razin, Anatoly Alexandrovich; Kanunov, Mikhail Alexeevich; Tsukerman, Veniamin Aronovich; Sloeva, Galina Nikolaevna; Tsvetkov, Leonard Vasilievich; and Dron, Ninel Alexeevna, 3,716,737.

Alfa-Laval AB: *See—*
Clark, Reginald Thomas, 3,716,376.

Alfredsson, Alf Ingvar, to Victor, Fritz. Preset diaphragm for interchangeable lenses of single-lens mirror reflex cameras. 3,715,965, Cl. 95-64.00b.

Alfrey, Turner, Jr.: *See—*
Schrenk, Walter J.; Cleereman, Kenneth J.; Chisholm, Douglas S.; and Alfrey, Turner, Jr., 3,716,612.

Allan, William L., to United States of America, Army. Aerial surveillance and fire-control system. 3,715,953, Cl. 89-36.00m.

Allegheny Ludlum Industries, Inc.: *See—*
Baybrook, Howard E.; and Chivinsky, Joseph A., 3,716,691.
Houze, Gerald L., Jr.; and Osborn, Merlin L., 3,716,763.
Reen, Orville W., 3,716,354.
Smith, George A.; Stevens, Harrison; Walker, Robert R.; and Boyd, Gilbert D., 3,716,649.

Allen, Henry W.: *See—*
Simmons, Kenneth D.; Allen, Henry W.; and Gebhardt, Ronald F., 3,716,387.

Allen-Stevens Drim Accessories Corporation: *See—*
Sanders, Murray A., 3,715,884.

Allied Chemical Corporation: *See—*
Gould, Douglas Eugene; Anderson, Lowell Ray; Young, David Edward; and Fox, William Burke, 3,716,570.
Little, Edwin D.; and Hirsch, Clarence A., 3,716,554.
Mayer, Richard Eugene, 3,716,328.

Allis-Chalmers Corporation: *See—*
Larson, Dale E., 3,716,772.

Almasi, George S.; Keefe, George E.; Lin, Yeong S.; and Thompson, David A., to International Business Machines Corporation. Magnetoresistive sensing device for detection of magnetic fields having a shape anisotropy field and uniaxial anisotropy field whichare perpendicular. 3,716,781, Cl. 324-46.000.

Almqvist, Hans O.; and Backlund, Sigurd A., to Aga-Aktiebolag. Breathing apparatus. 3,716,053, Cl. 128-142.200.

Alonso, Jose Luis, to Figueras, Alfredo, Jr. Head massage machine. 3,716,048, Cl. 128-49.000.

Altherr, Russell George, to Amsted Industries Incorporated. Slack adjuster for railway car couplers. 3,716,146, Cl. 213-75.00r.

Altshuler, Judif Markovna: *See—*
Berlin, Alfred Anisimovich; Kefeli, Tamara Yakovlevna; Marshavina, Natalia Lvovna; Strongin, Grigory Mikhailovich;

Kara-Giaur, Nikolai Vladimirovich; Kolomazov, Boris Ivanovich; Efimov, Alexei Vasilievich; Bodrova, Aglaida Nikolaevna; and Altshuler, Judif arkovna, 3,716,571.

- Amada Co., Limited: *See—*
  - Hamada, Teruma, 3,715,907.
- Amerace Esna Corporation: *See—*
  - Percich, Phillip P., 3,716,225.
- American Can Company: *See—*
  - Jensen, Stephen F.; and Meyer, William A., 3,716,435.
- American Cyanamid Company: *See—*
  - Albers, Henry John; Riggi, Stephen Joseph; Bach, Frederick Louis; and Cohen, Elliott, 3,716,644.
  - Ando, Hiei, 3,716,367.
  - Delapp, Darwin Fiske, 3,716,489.
  - Gund, Peter Herman; and Berkelhammer, Gerald, 3,716,536.
  - Padmanathan, Thurairajah, 3,716,556.
- American Express Investmant Management Company: *See—*
  - Green, Philip S., 3,716,826.
- American Filtrona Corporation, mesne: *See—*
  - Holden, Herbert K., 3,715,869.
- American Home Products Corporation: *See—*
  - Alburn, Harvey E.; and Fletcher, Horace, III, 3,716,553.
  - Thomas, Douglas W., 3,716,160.
- American Nucleonics Corporation: *See—*
  - Ghose, Rabindra N.; and Sauter, Walter A., 3,716,863.
- American Optical Corporation: *See—*
  - Deeg, Emil W.; Snitzer, Elias; and Simpson, Arnold J., 3,716,349.
- American Standard Inc.: *See—*
  - Harries, William S.; Asnani, Gul C.; and Flentie, John H., 3,716,791.
- Amerock Corporation: *See—*
  - Anderson, Lloyd L.; and Bildahl, Richard L., 3,716,279.
- AMF Incorporated: *See—*
  - Hancock, Melburn B., 3,716,375.
  - Hineline, Robert E., 3,716,442.
- Amsted Industries Incorporated: *See—*
  - Altherr, Russell George, 3,716,146.
- Anaconda Wire and Cable Company: *See—*
  - Walukonis, John S., Jr.; and Banks, Donald D., 3,716,023.
- Anderson, Amos R., to Packo, Joseph J., mesne. Compositions for sealing leaks in vessels. 3,716,384, Cl. 106-33.000.
- Anderson, Ernest Leslie, to South African Inventions Development Corporation. Purification of crystallizable material by directional freezing. 3,715,892, Cl. 62-58.000.
- Anderson, Lloyd L.; and Bildahl, Richard L., to Amerock Corporation. Universal roller bracket assembly for drawers. 3,716,279, Cl. 308-3.800.
- Anderson, Lowell Ray: *See—*
  - Gould, Douglas Eugene; Anderson, Lowell Ray; Young, David Edward; and Fox, William Burke, 3,716,570.
- Anderson, Robert James, to Rust Furnace Company. Heating furnace. 3,716,222, Cl. 432-133.000.
- Anderson, Roger Y. Aquatic sediment and pollution monitor. 3,715,913, Cl. 73-61.00r.
- Ando, Fumio; Kitahama, Hideharu; and Sugiyama, Kazuhiro, to Ibigawa Electric Industry Co., Ltd. Method of manufacturing a resinous decorative laminate having a lustrous pattern of really metallic surface. 3,716,440, Cl. 156-277.000.
- Ando, Hiei, to American Cyanamid Company. n-Succinimide additives for azide imaging systems. 3,716,367, Cl. 96-91.000.
- Andrews, David; and Saucy, Gariel, to Hoffmann-La Roche Inc. Selective allylic oxidation process. 3,716,561, Cl. 260-345.900.
- Andrews, Theodore E.; and Weller, John J., to Armstrong Cork Company, mesne. Slitting machine. 3,715,941, Cl. 83-7.000.
- Angelery, Henry W.; and Mohr, glenn R., to Aerco Corporation. Modulated output transformers. 3,716,719, Cl. 307-17.000.
- Anker-Werke AG: *See—*
  - Rethmeier, Gerhard, 3,716,694.
- Anner, Georg; and Kalvoda, Jaroslav, to Ciba-Geigy Corporation. Pharmaceutical preparations. 3,716,637, Cl. 424-243.000.
- Anner, Georg; and Kalvoda, Jaroslav, to Ciba-Geigy Corporation. 6-Methyl-19-nor-progesterone and a process of its manufacture. 3,716,638, Cl. 424-243.000.
- Aoi, Katashi. Apparatus for purifying gases. 3,715,867, Cl. 55-222.000.
- Aono, Shunji: *See—*
  - Nakamura, Yasushi; Agatsuma, Kunio; Tanaka, Yoshihiro; and Aono, Shunji, 3,716,583.
- Apotheloz, Robert, to Werkzeugmaschinenfabrik Oerlikon-Buhrle AG. Impact fuze for projectiles. 3,715,989, Cl. 102-84.000.
- Appel, Karl-Richard: *See—*
  - Ost, Walter; Thomas, Klaus; Jerchel, Dietric; and Appel, Karl-Richard, 3,716,587.
- Appleton, Arthur I. Electrical connectors. 3,716,821, Cl. 339-205.000.
- Apromat, Incorporated: *See—*
  - Giesecke, Henry A., 3,716,291.
- Aqua-Chem, Inc.: *See—*
  - Clark, George B., 3,716,143.
- Aquila, Werner: *See—*
  - Kniese, Wilhelm; Nienburg, Hans Juergen; Himmele, Walter; and Aquila, Werner, 3,716,626.
- Aranar Marketing Services, Inc.: *See—*
  - Sherman, Alan E., 3,715,900.
- Arbeitsstelle fur Molekularelektronik: *See—*
  - Springer, Reinhard; Drescher, Kurt; and Jahn, Eberhard, 3,716,296.
- Argus Chemical Corporation: *See—*
  - Brecker, Lawrence R.; and Kauder, Otto S., 3,716,568.
- Armstrong Cork Company, mesne: *See—*
  - Andrews, Theodore E.; and Weller, John J., 3,715,941.
- Armstrong, William A., to Basic Packaging Systems, Inc., mesne. Method and apparatus for automatically venting plastic bags. 3,715,855, Cl. 53-37.000.
- Arnold Engineering Company, The: *See—*
  - Hirai, Robert K.; Boomer, John H.; and Small, Edward R., 3,715,943.
- Arrey, Kelly J., to Canadian National Railway Company. Longitudinal and lateral retainer and guide assembly for containers on a vehicle bed. 3,716,268, Cl. 296-35.00a.
- Arrow Hart Inc.: *See—*
  - Hafer, Paul M., 3,716,683.
- Asam, Edward F., to Texas Instruments, Incorporated. Glideslope position detection system for use with an independent aircraft landing monitor. 3,716,855, Cl. 343-5.01a.
- Ashburn, Dillion P., to New Products Corporation. Internal combustion engine exhaust catalytic reactor. 3,716,344, Cl. 23-288.00f.
- Asnani, Gul C.: *See—*
  - Harries, William S.; Asnani, Gul C.; and Flentie, John H., 3,716,791.
- Aspland, John Richard, to Martin-Marietta Corporation. Dyeing cotton or regenerated cellulose using sulfur dyes oxidized with aqueous sodium bromite solution. 3,716,325, Cl. 8-37.000.
- Ateliers Roannais de Constructions Textile: *See—*
  - Sartori, Roland Ernest, 3,716,200.
- Atomic Energy of Canada Limited: *See—*
  - Bancroft, Allan R., 3,716,623.
  - Rae, Howard K., 3,716,622.
  - Rae, Howard Keith, 3,716,621.
- Aung, Tin; and Boyle, William M., Jr., to Dow Chemical Company, The. Delignification and bleaching of cellulose pulp with oxygen and alkali in the presence of magnesium chloride inhibitor. 3,716,447, Cl. 162-65.000.
- Auric Corporation: *See—*
  - Bick, Maurice; and Lochet, Jean A., 3,716,463.
- Automotive Products Company Limited: *See—*
  - Evered, Kenneth; and Meredith, Eric, 3,716,120.
- A.V./American Ventures, Inc.: *See—*
  - Vasilatos, Anastasios J., 3,716,013.
- Avco Corporation: *See—*
  - Bronder, Joachim C., 3,715,917.
- Avery-Hardoll Limited: *See—*
  - Petyt, Colin Roderick, 3,716,166.
- Axelrod, Robert Jay, to Du Pont de Nemours, E. I., and Company. Process rendering vinyl surfaces soil resistant. 3,716,401, Cl. 117-138.8ua.
- Ayache, Haled Bou: *See—*
  - Lynch, Ralph Sylvester; and Ayache, Haled Bou, 3,716,206.
- Ayer, James C., to Ingersoll Milling Machine Company, The. Rotary cutter with helical blades. 3,715,788, Cl. 29-103.00a.
- Ayerst, McKenna and Harrison Limited: *See—*
  - Dobson, Thomas A.; and Davis, Martin A., 3,716,541.
- Aylesworth, Perry J.; and Lesperance, Arthur J. Golf score marker. 3,716,016, Cl. 116-120.000.
- Baba, Shoichi: *See—*
  - Mizuno, Hideo; Kimura, Sadao; Akutsu, Hidezo; Yamazaki, Haruo; Okamoto, Takio; Watarai, Yoshiaki; and Baba, Shoichi, 3,716,743.
- Babcock & Wilcox Company, The: *See—*
  - Gross, Leonard B.; Johnson, Charles R.; and Nattsas, Stephen C., 3,715,914.
- Bach, Frederick Louis: *See—*
  - Albers, Henry John; Riggi, Stephen Joseph; Bach, Frederick Louis; and Cohen, Elliott, 3,716,644.
- Backlund, Sigurd A.: *See—*
  - Almqvist, Hans O.; and Backlund, Sigurd A., 3,716,053.
- Bacon, Roger: *See—*
  - Schalamon, Wesley A.; and Bacon, Roger, 3,716,331.
- Badische Anilin- & Soda-Fabrik Aktiengesellschaft: *See—*
  - Kniese, Wilhelm; Nienburg, Hans Juergen; Himmele, Walter; and Aquila, Werner, 3,716,626.
- Bailey, Ernest Arthur: *See—*
  - Smith, Alexander Steel; and Bailey, Ernest Arthur, 3,715,854.
- Bailey, John E., to Foxboro Company, The. Magnetic flowmeter apparatus. 3,715,918, Cl. 73-194.0em.
- Baker, Colin J.; Preen, Raymond C.; and Wilson, Donald W., to Email Limited. Lid latch for washing apparatus. 3,716,122, Cl. 192-136.000.
- Baker, Robert L.; and Szlosberg, Edward, to Phillips Fibers Croporation. Process for antistatically treating articles. 3,716,393, Cl. 117-47.00r.
- Balini, Andrew, to Bell & Howell Company. Frame count cuer for continuous photographic film printer. 3,716,299, Cl. 355-83.000.
- Ball, David C.: *See—*
  - Durant, Will G.; and Ball, David C., 3,715,858.
- Ballinger, Virgil R. Fire protection apparatus for a building. 3,715,843, Cl. 52-3.000.
- Baltimore and Ohio Railroad Company, The: *See—*
  - Orlik, Richard D., 3,715,993.
- Bamag Verfahrenstechnik GmbH: *See—*

Oberste-Berghaus, Gerhard; and Karau, Claus-Dieter, 3,716,625.

- Bancroft, Allan R., to Atomic Energy of Canada Limited. Extraction of deuterium from hydrogen gas using amines in a bithermal process. 3,716,623, Cl. 423-248.000.
- Banic, Carl V.: *See—*
  - Gagnon, Richard N.; Banic, Carl V.; and Grasso, Albert P., 3,716,415.
- Banks, Donald D.: *See—*
  - Walukonis, John S., Jr.; and Banks, Donald D., 3,716,023.
- Barber-Colman Company: *See—*
  - Johnson, Stuart J., 3,715,789.
- Bares, Roger, to Societe E. Lacroix. Missile fuses. 3,715,988, Cl. 102-80.000.
- Baringer, Berlyn E.: *See—*
  - Huber, John A.; Baringer, Berlyn E.; Bruns, Eilert F.; and Ulewicz, Michael R., 3,715,903.
- Barman, Rolf. Method of manufacturing toothpicks. 3,716,086, Cl. 144-326.00r.
- Barnes, Richard C.: *See—*
  - Keith, M. Robert; and Barnes, Richard C., 3,716,733.
- Barron, William J., to Graphic Electronics, Inc. Engraving machine. 3,716,668, Cl. 178-6.60b.
- Barrow, Gilbert C., to Massa Division, Dynamics Corporation of America. Piezoelectric transducer having spider-like frame structure. 3,716,681, Cl. 179-110.00a.
- Bartell, Maurice J., to Berko Hydraulics, Inc. Device for positioning liner plates upon the interior surface of a drum for securement thereto. 3,716,153, Cl. 214-91.000.
- Barth, David Edward, to Sybron Corporation. Overbed table. 3,715,997, Cl. 108-146.000.
- Bartlow, Aulden H., to Hendrick Manufacturing Company. Screen having parallel slots and method. 3,716,144, Cl. 210-499.000.
- Bartosiak, Andrzej: *See—*
  - Lambert, Francois; and Bartosiak, Andrzej, 3,716,656.
- BASF Wyandotte Corporation: *See—*
  - Cook, William H., 3,716,523.
- Basic Packaging Systems, Inc., mesne: *See—*
  - Armstrong, William A., 3,715,855.
- Baskerville, Henry; and Davis, Marshall Edwin. Time controlled dispensing mechanism for feed storage containers. 3,716,028, Cl. 119.051.110.
- Bateman, James R. Feeding arrangement for shredding and bagging device. 3,716,089, Cl. 56-501.000.
- Battaerd, Jacobs: *See—*
  - Adriaan, Hendrik; and Battaerd, Jacobs, 3,716,481.
- Battocock, Whalley Vowe, to Coal Industry (Patent) Limited. Solid fuel combustion systems. 3,716,003, Cl. 110-28.00j.
- Bauer, Donald J.; Haskett, Philip R.; and Lindstrom, Ronald E., to United States of America, Interior. Process for the production of cuprous oxide. 3,716,615, Cl. 423-35.000.
- Bauer, Hans; Holzer, Helmut; and Schmidt, Gerhard, to Sued-West-Chemie GmbH. Process of producing pigmented, a hardenable resin containing paper sheets, and products. 3,716,395, Cl. 117-68.000.
- Baybrook, Howard E.; and Chivinsky, Joseph A., to Allegheny Ludlum Industries, Inc. Shielded arc welding with austenitic stainless steel. 3,716,691, Cl. 219-137.000.
- Bayer Aktiengesellschaft: *See—*
  - Corte, Herbert; and Meyer, Alfred, 3,716,482.
  - Darsow, Gerhard; and Schnell, Hermann, 3,716,549.
- Bazett, Patrick Seymour, to Kemp Products Limited. Method of stabilizing thermo-plastic containers. 3,716,606, Cl. 264-25.000.
- Beard, Albert Le Messurier, to Honeywell Information Systems, Inc., mesne. Data processing system with selective character addressing of system store. 3,716,838, Cl. 340-172.500.
- Beasley, Max M., to Tuftco Corporation. Bobbin creel. 3,716,203, Cl. 242-131.000.
- Beattie, Stephen J.: *See—*
  - Jackson, Thomas J.; Weltsch, Dan A.; and Beattie, Stephen J., 3,715,797.
- Bechtel, Bartow; and Texas Instruments, Incorporated, to Independent aircraft landing monitor system. . 3,716,860, Cl. 343-11.00r.
- Beck & Co. (Meters) Limited: *See—*
  - Petyt, Colin Roderick, 3,716,166.
- Beck, George W., to Safety Skate Company, Inc., The. Silencer for railcar retarders. 3,716,114, Cl. 188-62.000.
- Becker, George L.: *See—*
  - Tryzna, Joseph J.; and Becker, George L., 3,716,400.
- Becker, Herbert, to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning. Mixture of a radioactive tracer substance and a propellent for marking drilling tools for deep wells and similar boreholes. 3,716,426, Cl. 149-38.000.
- Becker, Rudolf, to Knorr-Bremse GmbH. Apparatus for sorting elongated articles. 3,716,123, Cl. 193-40.000.
- Beeli, Johann Battesta, to International Telephone and Telegraph Corporation. Television camera tube having channel multiplier surrounding electron gun. 3,716,738, Cl. 313-65.00r.
- Beguin, Daniel Edmond, to International Standard Electric Corporation. Polarization adaptive MTI radar transponder. 3,716,856, Cl. 343-6.8lc.
- Belady, Laszlo Antal; Evangelisti, Carlo John; and Roth, Rogert Ingersoll, to International Business Machines Corporation. System and method for the continuous movement of a sheet having graphic subject matter thereon through a window of a display screen. ,716,842, Cl. 340-172.500.
- Belak, Steven G.; and Hall, Lewis W., Jr., to Standard Oil Company. Sealant composition. 3,716,510, Cl. 260-28.5as.
- Belard, Richard J.: *See—*
  - Rueffer, Harold F.; and Belard, Richard J., 3,716,765.
- Belgonucleaire S.A.: *See—*
  - Van de Voorde, Norbert L. C., 3,716,490.
- Beliveau, Gilles; Beliveau, Jean-Marc; and Beliveau, Victor. Variable diameter centrifugally-operated drive pulley. 3,715,930, Cl. 74-230.17e.
- Beliveau, Jean-Marc: *See—*
  - Beliveau, Gilles; Beliveau, Jean-Marc; and Beliveau, Victor, 3,715,930.
- Beliveau, Victor: *See—*
  - Beliveau, Gilles; Beliveau, Jean-Marc; and Beliveau, Victor, 3,715,930.
- Belkin, Nikolai Vasilievich; Alexandrovich, Eduard-Gely Vitalievich; Razin, Anatoly Alexandrovich; Kanunov, Mikhail Alexeevich; Tsukerman, Veniamin Aronovich; Sloeva, Galina Nikolaevna; Tsvetkov, Leonard Vasilievich; and Dron, Ninel Alexeevna. X-ray pulse ube. 3,716,737, Cl. 313-59.000.
- Bell & Howell Company: *See—*
  - Balini, Andrew, 3,716,299.
- Bell Canada-Northern Electric Research Limited: *See—*
  - Lim, Jin Twan, 3,716,680.
- Bell Telephone Laboratories, Inc.: *See—*
  - Candy, James Charles, 3,716,803.
- Bell Telephone Laboratories Incorporated: *See—*
  - Brown, Earl Franklin; and Kaminski, William, 3,716,789.
  - Cohen, Richard Lewis, 3,716,715.
  - Connor, Denis John; Limb, John Ormond; Pease, Roger Fabian Wedgwood; and Scholes, William George, 3,716,667.
  - Crowell, Merton Howard; and Gordon, Eugene Irving, 3,716,740.
  - Garbarini, Victor Charles, 3,716,390.
  - Hachenburg, Victor, 3,716,728.
  - Ketchledge, Raymond Waibel, 3,716,792.
  - Knerr, Reinhard Heinrich, 3,716,805.
  - Larsen, Arthur Bertel, 3,716,666.
  - Marek, James John, Jr.; and Taylor, George William, 3,716,675.
  - Neumann, Peter Gabriel, 3,716,851.
  - Patel, Chandra Kumar Naranbhai, 3,716,747.
  - Trimble, David Carlaw, 3,716,726.
- Beller, Zoltan: *See—*
  - Domokos, Jozsef; Benedek, Gyorgy; Kiss, Bela; Winkler, Laszlo; and Beller, Zoltan, 3,716,473.
- Bemiss, Robert P., to Robalex Inc. Boilable bakeable package and method. 3,715,853, Cl. 53-22.00a.
- Bemiss, Robert P.; and Donald, Alexander, to Robalex, Inc. Packaging. 3,716,180, Cl. 229-43.000.
- Bemiss, Robert P., to Robalex, Inc., mesne. Method of heating a package of food. 3,716,370, Cl. 99-1.000.
- Benedek, Gyorgy: *See—*
  - Domokos, Jozsef; Benedek, Gyorgy; Kiss, Bela; Winkler, Laszlo; and Beller, Zoltan, 3,716,473.
- Bennett, Charles F. Anchor bolt assembly. 3,715,851, Cl. 52-707.000.
- Bennett Pump Incorporated: *See—*
  - Mitchell, Thomas O., 3,716,309.
- Bennett Pump Incorporated, mesne: *See—*
  - Zanoni, Paul, 3,715,863.
- Benson, James A.: *See—*
  - Weinberg, Harold; Rogers, Marvin E.; Dadario, Michael G.; and Benson, James A., 3,716,835.
- Benz & Hilgers GmbH: *See—*
  - Reinecke, Gunter, 3,715,859.
- Berg, Leif; and Nes, Ragnar Jonas, to Ingeniorene Lund, Mohr & Giaever-Enger. Process of counteracting a tilting of a ship's hull during loading and unloading of comparatively heavy cargo units and a device to be used in such process. 3,716,154, Cl. 214-15.000.
- Berghezan, Aurel I., to Cabot Corporation. Nickel-aluminum composite material. 3,715,791, Cl. 29-182.500.
- Bergstrom, Theodore R.; and Takkunen, Philip D., to Minnesota Mining and Manufacturing Company. Metal parts joined with sintered powdered metal. 3,716,347, Cl. 29-182.200.
- Bergwerksverband G.m.b.H., Firma: *See—*
  - Echterhoff, Heinrich; and Herz, Wilfried, 3,716,150.
- Berkelhammer, Gerald: *See—*
  - Gund, Peter Herman; and Berkelhammer, Gerald, 3,716,536.
- Berko Hydraulics, Inc.: *See—*
  - Bartell, Maurice J., 3,716,153.
- Berlin, Alfred Anisimovich; Kefeli, Tamara Yakovlevna; Marshavina, Natalia Lvovna; Strongin, Grigory Mikhailovich; Kara-Giaur, Nikolai Vladimirovich; Kolomazov, Boris Ivanovich; Efimov, Alexei Vasilievich; Bodrova, Aglaida Nikolaevna; and Altshuler, Judif arkovna, to Institut Khimicheskoi Fiziki An SSSR. Oligocarbonate acrylates and a process for producing the same. 3,716,571, Cl. 260-463.000.
- Bernold, Jean P. Method and apparatus for building roads. 3,716,302, Cl. 404-70.000.
- Berrett, James R.; and Feulner, Roger J., to Honeywell Inc. Temperature control and supervision system for building air conditioning system. 3,716,096, Cl. 165-22.000.
- Bertellotti, Ansano; and Thayer, Robert F., to GRE Automatic Electric Laboratories, Incorporated. Printed wiring card shelf. 3,716,760, Cl. 317-10.0dh.
- Best Lock Corporation: *See—*

McCullum, Rolland Gene, 3,715,899.

Bethlehem Steel Corporation: *See*—

Chu, Vincent H. K., 3,715,764.

Lynn, James B.; and Singleton, Alan H., 3,716,619.

Betz Laboratories, Inc.: *See*—

Weisstuch, Aaron; Schell, Charles E., III; and Dryden, Paul C., 3,716,460.

Bevacqua, Louis A., to Motorola, Inc. High voltage coil boot. 3,716,038, Cl. 123-148.00a.

Beverett, James H. Abbreviated cycle coffeemaker. 3,715,974, Cl. 99-285.000.

Beyerlein, David G., to General Motors Corporation. Variable sensitivity anti-lock brake control. 3,716,273, Cl. 303-21.0cg.

Bhatt, Harshad J.; and Tuttle, James W., to Cogar Corporation. Fabrication method for making an aluminum alloy having a high resistance to electromigration. 3,716,469, Cl. 204-192.000.

Bianchi, Ralph A., to JBF Scientific Corporation. Liquid surface sweeping apparatus. 3,716,142, Cl. 210-242.000.

Bick, Maurice; and Lochet, Jean A., to Auric Corporation. Bright gold alloy electroplating bath and process. 3,716,463, Cl. 204-43.000.

Biel, John H.: *See*—

Hopps, Harvey B.; Jackman, Dennis; and Biel, John H., 3,716,539.

Bildahl, Richard L.: *See*—

Anderson, Lloyd L.; and Bildahl, Richard L., 3,716,279.

Biochemie Gesellschaft m.b.H.: *See*—

Knauseder, Franz; and Brandl, Ernst, 3,716,579.

Birchler, Robert O.; and Williams, E. R., to Texas Instruments, Incorporated. Process for encapsulating electronic components in plastic. 3,716,764, Cl. 317-234.000.

Birner, Richard A.; Kohler, Robert D.; and Lang, Stewart M., to Owens-Illinois, Inc. Inspecting articles. 3,716,136, Cl. 209-82.000.

Bixler, Donald; and Corey, Robert H. Trench shoring machine. 3,715,889, Cl. 61-41.00a.

Black and Decker Manufacturing Company, The: *See*—

Brucker, William S., 3,715,875.

Black, Ernest P.; Duling, Irl N.; Merges, John C., Jr.; and Talbot, Alfred F., to Sun Oil Company. Method for preparing laminated article of metallic, polymeric and wax impregnated cellulosic layers. 3,716,441, Cl. 156-309.000.

Bleckmann, Richard. Tubular heating element. 3,716,693, Cl. 219-553.000.

Bleha, William P., Jr.: *See*—

Scholl, Ronald F.; and Bleha, William P., Jr., 3,716,406.

Blomgren, Oscar C., Jr.: *See*—

Blomgren, Oscar C., Sr.; and Blomgren, Oscar C., Jr., 3,716,171.

Blomgren, Oscar C., Sr.; and Blomgren, Oscar C., Jr., to Tuxco Corporation. Airless hydraulic system supply. 3,716,171, Cl. 222-396.000.

Blomqvist, Nils Verner: *See*—

Croon, Ingemar Liss-Albin; and Blomqvist, Nils Verner, 3,716,430.

Blood, Alden E.; and Vinyard, Herschel T., to Eastman Kodak Company. Oxidative dehydrogenation process for preparing unsaturated organic compounds. 3,716,576, Cl. 260-486.00d.

Bloomsburg, Marvin S.; and Nazzer, Don Barkley, to Canadian General Electric Company, Limited. Tower vapour feed system. 3,716,220, Cl. 261-36.00r.

Blume, Roe C., to Du Pont de Nemours, E. I., and Company. Amide acetal initiated chloral polymerization process. 3,716,522, Cl. 260-64.000.

Bodrova, Aglaida Nikolaevna: *See*—

Berlin, Alfred Anisimovich; Kefeli, Tamara Yakovlevna; Marshavina, Natalia Lvovna; Strongin, Grigory Mikhailovich; Kara-Giaur, Nikolai Vladimirovich; Kolomazov, Boris Ivanovich; Efimov, Alexei Vasilievich; Bodrova, Aglaida Nikolaevna; and Altshuler, Judif arkovna, 3,716,571.

Boehme, Werner R.; Vuht, George; and Dawes Laboratories, Inc. Stabilized trans-diethylstilbesterol compositions. 3,716,645, Cl. 424-346.000.

Boehringer, C. H., Sohn: *See*—

Ost, Walter; Thomas, Klaus; Jerchel, Dietric; and Appel, Karl-Richard, 3,716,587.

Boehringer Mannheim GmbH: *See*—

Heerdt, Ruth; Hubner, Manfred; Schmidt, Felix Hehmut; and Weyer, Rudi, 3,716,537.

Bolger, Thomas V., to RCA Corporation. Color television recorder-reproducer system. 3,716,663, Cl. 178-5.4ac.

Bonanno, Anthony J.: *See*—

Greenfield, Charles; Casparian, Robert E.; and Bonanno, Anthony J., 3,716,458.

Boomer, John H.: *See*—

Hirai, Robert K.; Boomer, John H.; and Small, Edward R., 3,715,943.

Borel, Joseph; and Robert, Jacques, to Commissariat a l'Energie Atomique. Liquid-crystal display device. 3,716,290, Cl. 350-160.01c.

Borel, Jules & Co.: *See*—

Borel, Mark, 3,715,856.

Borel, Mark, to Borel, Jules & Co. Packaging method. 3,715,856, Cl. 53-41.000.

Borth, Anthony. Tube socket voltage limiting apparatus and method of manufacturing the same. 3,716,819, Cl. 339-143.00t.

Bosch, Robert, G.m.b.H.: *See*—

Adler, Karl-Heinz; Knapp, Heinrich; and Eckert, Konrad, 3,716,035.

Bosch, Walter; and Schwartz, Reinhard, 3,716,064.

Kobald, Walter, 3,716,308.

Passera, Walter, 3,716,071.

Schmid, Hermann, 3,716,034.

Bosch, Walter; and Schwartz, Reinhard, to Bosch, Robert, G.m.b.H. Fuel injection system with temperature-compensated control valve. 3,716,064, Cl. 137-501.000.

Botkin, Albert L. Tamper-proof closure arrangement. 3,716,162, Cl. 215-42.000.

Bottcher, Rolf, to VEB Polygraph Leipzig Kombinat fur Polygraphische Maschinen und Ausrustungen. Sheet conveying device. 3,716,227, Cl. 271-79.000.

Bottcher, Rolf, to VEB Polygraph Leipzig Kombinat fur Polygraphische Maschinen und Ausrustungen. Apparatus for connecting an uncadenced apparatus to a following cadenced apparatus for the handling of sheets. 3,716,228, Cl. 271-47.000.

Boutin, Francois Regis. Preparation of aluminum having block texture. 3,716,419, Cl. 148-11.50a.

Bowdish, Donald M.: *See*—

Wolfe, William D., Jr.; and Bowdish, Donald M., 3,716,817.

Bowes, Emmerson, to Mobil Oil Corporation. Alkylation and dealkylation of aromatics in the presence of crystalline aluminosilicates. 3,716,596, Cl. 260-671.00c.

Boyce, Walter A., to Westinghouse Electric Corporation. Method of manufacturing subminiature electric lamps. 3,716,285, Cl. 316-21.000.

Boyd, Gilbert D.: *See*—

Smith, George A.; Stevens, Harrison; Walker, Robert R.; and Boyd, Gilbert D., 3,716,649.

Boyd, Thomas H. Monorail guided electric airplane. 3,715,991, Cl. 104-23.00r.

Boyle, William M., Jr.: *See*—

Aung, Tin; and Boyle, William M., Jr., 3,716,447.

Bradam, William R.: *See*—

Zurbuchen, Louis E.; and Bradam, William R., 3,715,980.

Brady, Donnie G., to Phillips Petroleum Company. Olefin halogenation. 3,716,591, Cl. 260-648.00r.

Brady, Donnie G.; Deck, Harold R.; Jones, Faber B.; and Underwood, John H., to Phillips Petroleum Company. Poly(esters) of phthalic acid salts and di(haloalkyl) ethers as dye receptive agents. 3,716,601, Cl. 260-873.000.

Brandl, Ernst: *See*—

Knauseder, Franz; and Brandl, Ernst, 3,716,579.

Bratland, Arthur. Preparation of cheese. 3,716,377, Cl. 99-116.000.

Bratland, Arthur. Preparation of foodstuffs containing a high content of emulsified fat. 3,716,378, Cl. 99-122.00r.

Braun, Leon, to Molecular Energy Corporation. Method of making semi-conductive cathodes. 3,716,403, Cl. 117-201.000.

Braunberger, Benjamin A., to Gehl Company. Mower sickle hold-down means. 3,715,845, Cl. 56-305.000.

Breading, Robert P. Floor construction including carpeted trench headers. 3,715,844, Cl. 52-221.000.

Brecker, Lawrence R.; and Kauder, Otto S., to Argus Chemical Corporation. Reaction products of dioctyltin oxide and dioctyltin monohydric aliphatic saturated alcohol thioglycolate esters and process. 3,716,568, Cl. 260-429.700.

Bricker, Carl E., to Goodyear Tire & Rubber Company, The. Constant torque spring applied brake. 3,716,117, Cl. 188-167.000.

Bridgestone Tire Company Limited: *See*—

Iwami, Ichiro; Matsunaga, Tsutomu; Inouye, Sakae; Fujimori, Makoto; Hayashi, Noriyuki; Wada, Norio; Yoneyama, Ken; and Inaba, Hideaki, 3,716,602.

Brockhurst, Woodrow W., to Luxaire, Inc. Combustion chamber retaining means. 3,716,044, Cl. 126-151.000.

Brodsky, Marc H., to International Business Machines Corporation. Image recording on tetrahedrally coordinated amorphous films. 3,716,844, Cl. 340-173.01s.

Brodsky, Stuart A.; and Kelly, Raymond A. Vasectomy procedure and instrument for use therewith. 3,716,056, Cl. 128-303.00r.

Broekhuysen, William C., to Sola Basic Industries, Inc. Thermal switch. 3,716,814, Cl. 337-123.000.

Bronder, Joachim C., to Avco Corporation. Non-round fluid dynamometer. 3,715,917, Cl. 73-134.000.

Brooks, Robert E., to TRW Inc. Fourier transform holographic memory with random phase shifting produced by random size variations in a lens array. 3,716,287, Cl. 350-3.500.

Brossard, Cleo A. Decorative article holder. 3,715,823, Cl. 40-152.000.

Brown & Williamson Tobacco Corporation: *See*—

Litzinger, Elmer Francis, 3,716,063.

Litzinger, Elmer Francis, 3,716,500.

Brown, Alan V.; and Hochberg, Frederick, to International Business Machines Corporation. Technique for fabricating integrated incandescent displays. 3,715,785, Cl. 29-25.110.

Brown, Buck C., to Control Concepts Corporation. Time comb generator. 3,716,795, Cl. 328-63.000.

Brown, Donald R.; and Masopust, Otto T., Jr., to Western Electric Company, Incorporated. Methods and apparatus for increasing the capacitance value of a capacitor. 3,715,786, Cl. 29-25.420.

Brown, Earl Franklin; and Kaminski, William, to Bell Telephone Laboratories Incorporated. Sign redundancy reduction in differential pulse modulation systems. 3,716,789, Cl. 325-38.00a.

Brown, John A., to Esso Research and Engineering Company. Nitronium perchlorate stabilized by BF_3. 3,716,624, Cl. 423-274.000.

Brucker, William S., to Black and Decker Manufacturing Company, The. Lawn mower safety guard. 3,715,875, Cl. 56-320.100.

Brunie, Jean-Claude; and Crenne, Noel, to Rhone-Poulenc S.A. Preparation of epoxide compounds by epoxidizing olefins with preformed organoperoxyboron compounds. 3,716,563, Cl. 260-348.0sl.

Brunner, Julius, to Siemens Aktiengesellschaft, Brushless D.C. motor having permanent magnet rotor and Hall effect commutation including speed control responsive to winding voltage. 3,716,769, Cl. 318-254.000.

Bruns, Eilert F.: *See*—

Huber, John A.; Baringer, Berlyn E.; Bruns, Eilert F.; and Ulewicz, Michael R., 3,715,903.

Brush Beryllium Company, The: *See*—

Wikle, Keith Gordon; and O'Rourke, Richard George, 3,716,355.

Bruson, Herman A.; and Gould, Henry, to Milchem Incorporated. 3,716,487, Cl. 252-82.000.

Bryant, Richard W.; and Tu, George K., to Cogar Corporation. Temperature compensation for logic circuits. 3,716,722, Cl. 307-215.000.

Bryant, William G., to Park-Ohio Industries, Inc. Apparatus for setting the air gap between an inductor and a valve seat. 3,716,690, Cl. 219-10.770.

Buckman, Wayne T.: *See*—

Craig, Sam N.; Warner, Ellis R., Jr.; and Buckman, Wayne T., 3,716,197.

Buice, Hubert H. Shoe polish dispensing device. 3,716,168, Cl. 222-146.0he.

Bunker Ramo Corporation: *See*—

Simons, John Roger, 3,715,880.

Bunker-Ramo Corporation, The: *See*—

Riches, Arthur John, 3,716,815.

Burgess, James V., Jr. Mine ventilation control system. 3,715,969, Cl. 98-50.000.

Burke, Oliver W., Jr. Silica pigments and elastomer-silica pigment masterbatches and production processes relating thereto. 3,716,513, Cl. 260-33.6a0.

Burkhart, John H.; and Slick, Edward C., to GTE Sylvania Incorporated. Compositions for improved solderability of copper. 3,716,421, Cl. 148-6.14r.

Burnett, Arthur Peter, to Ney, J. M., Company, The. Rhenium containing gold alloys. 3,716,356, Cl. 75-165.000.

Butler, Frank W. Centerboard pivot for a sailboat. 3,716,011, Cl. 114-132.000.

Butler, James N.; and Cogley, David R., to United States of America, Air Force. Lithium battery electrolyte additive and method of improving discharge rate. 3,716,410, Cl. 136-6.000.

Butz, Josef. Foldable stand. 3,716,211, Cl. 248-168.000.

Byrne, Desmond J.: *See*—

Weatherly, David M.; and Byrne, Desmond J., 3,715,887.

Cabot Corporation: *See*—

Berghezan, Aurel I., 3,715,791.

Cade, James E.; and Mossuto, Frank, said Cade assor. to said Mossuto, Frank. Angularly adjustable end wrench. 3,715,937, Cl. 81-177.800.

Cain, Troy D.: *See*—

Frydenberg, Donald V.; and Cain, Troy D., 3,716,179.

Cairns, Elton J.; Kyle, Martin L.; and Shimotake, Hiroshi, to United States of America, Atomic Energy Commission. Cathodes for secondary electrochemical power-producing cells. 3,716,409, Cl. 136-6.000.

Calcagni-Frazier-Zajachowski, Architects, Inc.: *See*—

Frazier, Richard B., 3,716,270.

Calcagno, Benedetto; and Ghirga, Marcello, to Societa Italiana Resine S.p.A. Process for preparing olefin esters. 3,716,581, Cl. 260-497.00a.

Caldwell, Melvin R.: *See*—

Moore, William C.; Pilgrim, William S.; and Caldwell, Melvin R., 3,716,047.

Calvert, Rodney K., to Mead Corporation, The. Mechanism for lining shells. 3,716,321, Cl. 425-383.000.

Campbell, David H.: *See*—

Cook, Charles A.; and Campbell, David H., 3,716,434.

Campbell, Erwin A.: *See*—

Woolslayer, Homer J.; Woolslayer, Joseph R.; Jenkins, Cecil; and Campbell, Erwin A., 3,716,155.

Campbell, Robert D., to San Fernando Electric Manufacturing Co. Apparatus for automatically testing and sorting electrical elements. 3,716,134, Cl. 209-73.000.

Canadian General Electric Company, Limited: *See*—

Bloomsburg, Marvin S.; and Nazzer, Don Barkley, 3,716,220.

Canadian National Railway Company: *See*—

Arrey, Kelly J., 3,716,268.

Canadian Patents and Development Limited: *See*—

Fam, Wagih Zaki, 3,716,734.

Candy, James Charles, to Bell Telephone Laboratories, Inc. Stabilized delta modulator. 3,716,803, Cl. 332-11.00d.

Cano, Fernando. Device for enhancing gas discharge. 3,715,970, Cl. 98-70.000.

Canon Kabushiki Kaisha: *See*—

Knechtel, Wilhelm Josef; and Schaffer, Detlef, 3,715,944.

Knechtel, Wilhelm Josef; and Schaffer, Detlef, 3,716,294.

Cantella, Richard C.: *See*—

Mott, Ralph Beach, Sr.; Mott, Ralph Beach, Jr.; and Cantella, Richard C., 3,716,184.

Caprara, Giuseppe: *See*—

Pregaglia, Gianfranco; Montorsi, Giorgio; Caprara, Giuseppe; and Messina, Giuseppe, 3,716,562.

Caraculacu, Adrian, Dr.-Eng.; Petrus, Eng. Alla; and Laba, Eng. Mircea, to Process for preparing the P,P-dinitrobibenzyl. . 3,716,590, Cl. 260-645.000.

Carborundum Company, The: *See*—

Economy, James; Frechette, Francis J.; and Wohrer, Luis C., 3,716,521.

Cardiac Resuscitator Corporation: *See*—

Welborn, Warren S.; and Holznagel, Melvin A., 3,716,059.

Carding Specialists (Canada) Limited: *See*—

Varga, John Maximilian Jules, 3,716,148.

Carmet Company: *See*—

Schnellman, Oscar; and Stier, Henry Willy, 3,715,841.

Carpenter, Henry G.: *See*—

Whitehead, Eric A. N.; Carpenter, Henry G.; and Chinn, Peter D., 3,716,784.

Carrier Engineering Company Limited: *See*—

Knight, Howard Richard James, 3,716,191.

Carter, Cecil O.: *See*—

Hutson, Tom, Jr.; and Carter, Cecil O., 3,716,593.

Carter, William A.; Sievert, William C.; and Munson, James L., to Inland Steel Company. Roller coating system for one side strip coating. 3,716,019, Cl. 118-246.000.

Carver-Greenfield Corporation: *See*—

Greenfield, Charles; Casparian, Robert E.; and Bonanno, Anthony J., 3,716,458.

Case, Cecil L.; and Garrison, Harold Keith, to Hesston Corporation. Variable speed power transmission. 3,715,928, Cl. 74-218.000.

Casparian, Robert E.: *See*—

Greenfield, Charles; Casparian, Robert E.; and Bonanno, Anthony J., 3,716,458.

Cassella Farbwerke Mainkur Aktiengesellschaft: *See*—

Engelhardt, Friedrich; Heid, Christian; Gunzert, Willi; Krusche, Erwin; and Meyer, Artur, 3,716,525.

Castelli, Cesar: *See*—

Henry, Jean Claude; Henry, Georges; and Castelli, Cesar, 3,716,686.

Catalytic Technology Corporation: *See*—

Goldberger, Max, 3,716,414.

Caterpillar Tractor Company: *See*—

Papasideris, Stamos I., 3,716,159.

Caule, Elmer J., to Olin Corporation. Method of producing tarnish resistant copper an copper alloys and products thereof. 3,716,427, Cl. 156-3.000.

Caulfield, Henry John; and Perkins, Dean Roger, to Sperry Rand Corporation. Fingerprint identification apparatus. 3,716,301, Cl. 356-165.000.

Celanese Coatings Company: *See*—

Hicks, Darrell D., 3,716,402.

Celanese Corporation: *See*—

Finch, Ray N.; Mireur, John P.; and Fouts, Hollye R., 3,716,575.

Cenci, Harry J., to Rohm and Haas Company. t-Butyl alcohol/water cosolvent emulsion copolymerization of a monomeric system comprising methyl methacrylate and bicyclic methacrylate. 3,716,524, Cl. 260-78.500.

Central Glass Company, Ltd.: *See*—

Yamada, Tunehiko; Egami, Seiji; Sasatani, Harumi; Matsuoka, Hideaki; Emoto, Saburo; and Okamura, Kunio, 3,716,176.

Centre Electronique de France: *See*—

Lambert, Francois; and Bartosiak, Andrzej, 3,716,656.

Cerny, Frank J., Jr., to Motorola, Inc. Intermodulation rejection capabilities of field-effect transistor radio frequency amplifiers and mixers. 3,716,730, Cl. 307-295.000.

Ceskoslovenska akademie ved: *See*—

Musilek, Vladimir, 3,716,635.

Chaffin, John H., III, to Honeywell Inc. Optical memory with interferometer tracking. 3,716,845, Cl. 340-173.01m.

Chaft, Marc E. Intrauterine contraceptive device. 3,716,052, Cl. 128-130.000.

Chaikin, Malcolm; Rokfalussy, Desmond; and Dircks, Alexander Douglas. Apparatus for the processing of wool fibres. 3,715,780, Cl. 19-178.000.

Chaintron, Gerard, to Rhone-Poulenc S.A. Process for the purification of lactic acid. 3,716,584, Cl. 260-535.00r.

Chamberlain Manufacturing Corporation: *See*—

Willmott, Colin B., 3,716,865.

Chambers, James L. Adjustable mounting device. 3,715,850, Cl. 52-701.000.

Chandrasekaran, Santosh K.; and King, Cary Judson III, to United States of America, Agriculture. Slush-drying of liquid foods. 3,716,382, Cl. 99-205.000.

Chapman, Charles C., to Phillips Petroleum Company. Apparatus for increasing quality and quantity of product from an existing chemical apparatus operation. 3,716,343, Cl. 23-285.000.

Chapman, Richard D., to Monsanto Company. Method for producing high tenacity-66 filaments. 3,716,611, Cl. 264-290.00n.

Charlot, Lincoln H., Jr., to Minnesota Mining & Manufacturing Company. Radar detector. 3,716,854, Cl. 343-5.0pd.

Chase, Vernon Lindsay: *See*—

Kolsky, Rodger E.; and Chase, Vernon Lindsay, 3,716,488.

Chatlos, Edward S.; Schroeder, Paul G. K.; and Prinkey, Clarence O., to Chatlos Systems, Inc. Dry air system. 3,715,866, Cl. 55-179.000

Chatlos Systems, Inc.: *See*—

- Chatlos, Edward S.; Schroeder, Paul G. K.; and Prinkey, Clarence O., 3,715,866.
- Chaves, Manuel J., to Parking Company of America. Parking lot coin receptacle. 3,716,183, Cl. 232-1.00r.
- Cherry-Burrell Corporation: *See—*
  - Durant, Will G.; and Ball, David C., 3,715,858.
- Chesapeake and Ohio Railway Company, The: *See—*
  - Orlik, Richard D., 3,715,993.
- Chevron Research Company: *See—*
  - Csicsery, Sigmund M.; and Kittrell, James R., 3,716,475.
  - Jacobson, Robert L.; and Vanselow, Robert D., 3,716,477.
  - Magee, Philip S., 3,716,600.
- Chiappe, Wayne T., to Continental Can Company, Inc. Method for electrodeposition of cans. 3,716,468, Cl. 204-181.000.
- Chiba, Yoshikazu: *See—*
  - Shigaki, Masanobu; Kido, Shigehiro; and Chiba, Yoshikazu, 3,716,339.
- Chicago Musical Instrument Co.: *See—*
  - Freeman, Alfred B., 3,716,725.
- Chilcoat, Kermit E., to Eaton Corporation. Furnace humidifier. 3,716,043, Cl. 126-113.000.
- Chinn, Peter D.: *See—*
  - Whitehead, Eric A. N.; Carpenter, Henry G.; and Chinn, Peter D., 3,716,784.
- Chisholm, Douglas S.: *See—*
  - Schrenk, Walter J.; Cleereman, Kenneth J.; Chisholm, Douglas S.; and Alfrey, Turner, Jr., 3,716,612.
- Chivers, James R., to Scovill Manufacturing Company, mesne. Liquid level window for coffeemakers. 3,716,169, Cl. 222-157.000.
- Chivinsky, Joseph A.: *See—*
  - Baybrook, Howard E.; and Chivinsky, Joseph A., 3,716,691.
- Choate, William C.: *See—*
  - Masten, Michael K.; and Choate, William C., 3,716,840.
- Chorvat, Robert J.; and Pappo, Raphael, to Searle, G. D., & Co. 4-Methylen-2-oxa-3-keto androstanes and 4-methyl-delta 4 derivatives thereof. 3,716,559, Cl. 260-343.20s.
- Chramiec, Mark A.: *See—*
  - Walsh, George M.; and Chramiec, Mark A., 3,716,825.
- Christner, James Edward: *See—*
  - Fader, Marshall Lloyd; and Christner, James Edward, 3,716,632.
- Chromalloy American Corporation: *See—*
  - Prill, Arnold L.; and Tarkan, Stuart E., 3,715,792.
  - Stueber, Richard J.; and Klach, Stanley J., 3,716,398.
- Chrysler Corporation: *See—*
  - Jones, Evan L., 3,715,936.
- Chu, Vincent H. K., to Bethlehem Steel Corporation. High porosity manganese oxide pellets. 3,715,764, Cl. 423-49.000.
- Chuan, Raymond L., to Susquehanna Corporation, The. Apparatus for sensing air-borne particulate matter. 3,715,911, Cl. 73-28.000.
- Ciba-Geigy: *See—*
  - Renner, Alfred, 3,716,483.
- Ciba-Geigy AG: *See—*
  - Froehlich, Alfred; Piller, Bernhard; and Loeffel, Hansrolf, 3,716,368.
  - Meier, Max, 3,716,362.
- Ciba-Geigy Corporation: *See—*
  - Anner, Georg; and Kalvoda, Jaroslav, 3,716,637.
  - Anner, Georg; and Kalvoda, Jaroslav, 3,716,638.
  - Hall, Luther A. R.; Gurney, John A.; and Renfroe, Harris B., 3,716,595.
  - Heusler, Karl; and Woodward, Robert Burns, 3,716,465.
  - Hoegerle, Karl; and Habicht, Ernst, 3,716,639.
  - Howarth, Graham Arton; and Gainer, James, 3,716,555.
  - Komninos, John; Klemchuk, Peter; and Ham, George, 3,716,329.
  - Schindler, Walter, 3,716,640.
- Cielaszyk, Edward F., to General Time Corporation. intermittently repeating alarm mechanism. 3,715,879, Cl. 58-18.000.
- Civardi, Frank Peter; and Kuenstler, Hans-George. Treating microporous material. 3,716,397, Cl. 117-77.000.
- Clark Equipment Company: *See—*
  - Hansen, Howard C., 3,716,158.
- Clark, Eugene F.; deceased (by Clark, Ursa W.; heir), to Fieldcrest Mills, Inc. Woven pile fabrics. 3,716,078, Cl. 139-399.000.
- Clark, George B., to Aqua-Chem, Inc. Reverse osmosis separation apparatus. 3,716,143, Cl. 210-321.000.
- Clark, Reginald Thomas, to Alfa-Laval AB. Method and apparatus for making cheese. 3,716,376, Cl. 99-115.000.
- Clark, Ursa W.: *See—*
  - Clark, Eugene F., 3,716,078.
- Clarke and Smith Manufacturing Company: *See—*
  - Rayner, Wilfred H. G., 3,716,241.
- Clary Corporation: *See—*
  - Frydenberg, Donald V.; and Cain, Troy D., 3,716,179.
- Classen, Gunter, to Mannesmann-Meer Aktiengesellschaft. Injection molding machine. 3,716,323, Cl. 425-450.000.
- Cleereman, Kenneth J.: *See—*
  - Schrenk, Walter J.; Cleereman, Kenneth J.; Chisholm, Douglas S.; and Alfrey, Turner, Jr., 3,716,612.
- Clostermann, Friedrich; and Richter, Hans-Joachim, to Trilux-Lenze KG. Lamp comprising an elongated light source, particularly a rod-shaped fluorescent lamp, and shade of transparent material. 3,716,710, Cl. 240-106.00r.
- Coal Industry (Patent) Limited: *See—*
  - Battocock, Whalley Vowe, 3,716,003.
- Coates, Clarence A., Jr.: *See—*
  - Weaver, Max A.; Straley, James M.; and Coates, Clarence A., Jr., 3,716,327.
- Coates, Harry D. Educational game. 3,715,810, Cl. 35-35.00r.
- Cofer, Daniel B., to Southwire Company. Hot-formed copper-base product. 3,716,423, Cl. 148-32.000.
- Cogar Corporation: *See—*
  - Bhatt, Harshad J.; and Tuttle, James W., 3,716,469.
  - Bryant, Richard W.; and Tu, George K., 3,716,722.
  - Gearin, John M., 3,716,786.
- Cogley, David R.: *See—*
  - Butler, James N.; and Cogley, David R., 3,716,410.
- Cohen, David J. Encoded data card system. 3,716,701, Cl. 235-61.11h.
- Cohen, Elliott: *See—*
  - Albers, Henry John; Riggi, Stephen Joseph; Bach, Frederick Louis; and Cohen, Elliott, 3,716,644.
- Cohen, Richard Lewis, to Bell Telephone Laboratories, Incorporated. Thickness measurements using the Mossbauer effect. 3,716,715, Cl. 250-83.30d.
- Colby, Kenneth G.; and Riggs, Robert F., to Sperry Rand Corporation. Display system to generate symbols formed of conic sections. 3,716,749, Cl. 315-23.000.
- Colchester, John Edward, to Imperial Chemical Industries Limited. Production of bipyridylium salts and related compounds. 3,716,546, Cl. 260-295.0am.
- Cole, Edward L.: *See—*
  - Hess, Howard V.; and Cole, Edward L., 3,716,474.
- Coles, Manson Ivor, to Mancole Company Limited. Concrete pump. 3,716,304, Cl. 415-72.000.
- Coleswood Products, Inc.: *See—*
  - Crippen, Huston D., 3,716,172.
- Colgate-Palmolive Company: *See—*
  - Inamorato, Jack Thomas, 3,716,499.
- Collins Radio Company: *See—*
  - Stover, Harris A., 3,716,864.
  - Teggatz, Eugene D.; De Long, Vincent R.; and Holtzer, Dale A., 3,716,794.
- Colvert, James H.: *See—*
  - Coons, William R., Jr.; Colvert, James H.; and Nelson, Gerald V., 3,716,476.
- Comco Incorporated: *See—*
  - McGowen, Harold E., Jr.; and Tausch, Gilbert H., 3,716,101.
- Comfort, Kent B., to Mar-Com Development, Ind. Hexadecimal slide rule. 3,716,186, Cl. 235-70.00r.
- Commissariat a l'Energie Atomique: *See—*
  - Borel, Joseph; and Robert, Jacques, 3,716,290.
  - Lions, Noel, 3,716,450.
- Community Bank, The: *See—*
  - Jones, Allen Jacob, 3,716,004.
- Compagnie Generale d'Electricite: *See—*
  - Mouroux, Claude; Peres, Gerard; and Valette, Pierre, 3,716,428.
- Compagnie Internationale pour l'Informatique: *See—*
  - Valin, Jean, 3,716,847.
- Connor, Denis John; Limb, John Ormond; Pease, Roger Fabian Wedgwood; and Scholes, William George, to Bell Telephone Laboratories, Incorporated. Apparatus for detecting the moving areas in a video signal. 3,716,667, Cl. 178-6.000.
- Constable, Ronald Jack Walker, to Hirst Microwave Industries, Limited. Method and apparatus for cooking. 3,716,687, Cl. 219-10.550.
- Constructors John Brown Limited: *See—*
  - Salter, David Stanley; and Smith, David Henry, 3,716,459.
- Continental Can Company, Inc.: *See—*
  - Chiappe, Wayne T., 3,716,468.
  - Tryzna, Joseph J.; and Becker, George L., 3,716,400.
- Continental Oil Company: *See—*
  - Davis, J. Gilbert, II, 3,716,272.
- Control Concepts Corporation: *See—*
  - Brown, Buck C., 3,716,795.
- Control Graphics Company: *See—*
  - Hansen, Lindsey B., Jr.; and Hyer, Val D., 3,715,822.
- Cook, Charles A.; and Campbell, David H., to Ethyl Corporation. Seal for plastic sheeting. 3,716,434, Cl. 156-157.000.
- Cook, William H., to BASF Wyandotte Corporation. Low concentration stannous carboxylate catalysis of polyesterification. 3,716,523, Cl. 260-75.00m.
- Coons, William R., Jr.; Colvert, James H.; and Nelson, Gerald V., to Texaco Inc. Effluent cooling in a hydrocracking and hydrodesulfurizing process. 3,716,476, Cl. 208-97.000.
- Copley Press, Inc.: *See—*
  - Shimmin, Lawrence E., 3,716,178.
- Corbett, Robert Lee, Jr. Load support diffuser and method of manufacture. 3,716,223, Cl. 432-260.000.
- Corey, Albert E.; Donermeyer, Donald D.; Fantl, Joel; and Williams, Charles R., to Monsanto Company. Process for the preparation of a poly(vinyl acetate-dialkyl maleaee-acrylic acid) textile sizes. 3,716,547, Cl. 260-29.6ta.
- Corey, Robert H.: *See—*
  - Bixler, Donald; and Corey, Robert H., 3,715,889.
- Corning Glass Works: *See—*
  - Weetall, Howard H., 3,716,456.
- Corte, Herbert; and Meyer, Alfred, to Bayer Aktiengesellschaft. Anion exchanger with sponge structure and process of using same. 3,716,482, Cl. 210-37.000.
- Couland, Roger. Apparatus for tapering flexible tubes. 3,715,901, Cl. 72-58.000.

- Courtney, Donald L., to ICI America Inc. Liquid shaving composition and method of shaving. 3,715,942, Cl. 83-22.000.
- Courty, Philippe, to Institut Francais du Petrole des Carburants et Lubrifiants. Manufacture of catalysts of the iron molybdate type for use particularly in the catalytic oxidation of alcohols to aldehydes. 3,716,497, Cl. 252-470.000.
- Craig, Sam N.; Warner, Ellis R., Jr.; and Buckman, Wayne T., to Wascon Systems, Inc. Waste disposal apparatus. 3,716,197, Cl. 241-43.000.
- Crawford, David D.; and Elvington, John W. Preformed manhole body. 3,715,958, Cl. 52-21.000.
- Creagh, Linda T.; Jones, Derick; and Lu, Sun, to Texas Instruments, Incorporated. Electro-optical display devices using smectic-nematic nematic liquid crystal mixtures. 3,716,289, Cl. 350-160.01c.
- Crenne, Noel: *See—*
  - Brunie, Jean-Claude; and Crenne, Noel, 3,716,563.
- Crippen, Huston D., to Coleswood Products, Inc. Automatic feeder device. 3,716,172, Cl. 222-453.000.
- Criswell, Dick M. Pressure equalizing valve. 3,716,072, Cl. 137-510.000.
- Croon, Ingemar Liss-Albin; and Blomqvist, Nils Verner, to Mo Och Domsjo Aktiebolag. Tampon and process and apparatus for making the same. 3,716,430, Cl. 156-62.400.
- Cross, John V.: *See—*
  - Walmsley, Martin F.; and Cross, John V., 3,716,365.
- Crowell, Merton Howard; and Gordon, Eugene Irving, to Bell Telephone Laboratories, Incorporated. Diode-array photocathode with photoemitter activation. 3,716,740, Cl. 315-11.000.
- Csicsery, Sigmund M.; and Kittrell, James R., to Chevron Research Company. Hydrotreating catalyst comprising an interstratified crystalline clay-type aluminosilicate component and a crystalline zeolitic molecular sieve component and process using said catlyst. 3,716,475, Cl. 208-59.000.
- Cullen, Geoffrey Victor; Graham, John William; and Siviour, Neil Graham, to University of Melbourne. Electrode of petroleum coke and brown coal char. 3,716,471, Cl. 204-294.000.
- Currier, John W.; Gadbois, Richard T.; and Wilde, Arthur G., to Minnesota Mining and Manufacturing Company. Aircraft cleaning. 3,716,066, Cl. 134-73.000.
- Cutler-Hammer, Inc.: *See—*
  - Leavitt, Minard A., 3,716,177.
  - Robinson, Douglas Burton, 3,715,933.
- Dabrowski, Casimer J., to Seeburg Corporation of Delaware, The. Vending machine pricing control arrangement. 3,716,124, Cl. 194-1.00n.
- Daco Safety Products, Inc.: *See—*
  - Mangels, Ralph W., 3,716,170.
- Dadario, Michael G.: *See—*
  - Weinberg, Harold; Rogers, Marvin E.; Dadario, Michael G.; and Benson, James A., 3,716,835.
- Dahm, Franz-Ludwig: *See—*
  - Klebe, Hans; Meffert, Alfred; Lange, Ludwig; Fratzer, Gerhard; and Dahm, Franz-Ludwig, 3,716,628.
- Daikin Kogyo Company Limited: *See—*
  - Kawano, Toshihiko; Yamaoka, Takashi; Maruo, Keiichi; and Furutaka, Yasuhisa, 3,716,643.
- Dailing, James L.: *See—*
  - Malinowski, Stanley; Dailing, James L.; and Smith, Craig P., 3,716,808.
- Daimler-Benz Aktiengesellschaft: *See—*
  - Lamm, Heinz, 3,716,313.
- Dangschat, Rainer, to Siemens Aktiengesellschaft. High voltage resistant electrical component, in particular for color television receivers. 3,716,776, Cl. 321-8.00r.
- Daniels, Dennis: *See—*
  - Weisbeck, Ralph L.; and Daniels, Dennis, 3,715,947.
- Danno, Mituaki: *See—*
  - Kishimoto, Hiroshi; Kobayashi, Kenzo; Hamazaki, Yoshiharu; and Danno, Mituaki, 3,715,919.
- Darsow, Gerhard; and Schnell, Hermann, to Bayer Aktiengesellschaft. Pyridine-bis-(hydroxyaryl ethers) and thereof. 3,716,549, Cl. 260-297.00r.
- Davidsohn, Uryon S., to Motorola, Inc. Method of making semiconductor devices through overlapping diffusions. 3,716,425, Cl. 148-175.000.
- Davidson, Richard L., to Grav-I-Flo Corporation, The. Apparatus and method for finishing workpieces. 3,715,840, Cl. 51-163.000.
- Davis, J. Gilbert, II, to Continental Oil Company. Method of creating large diameter cylindrical cavities by solution mining. 3,716,272, Cl. 299-5.000.
- Davis, Lessel George, to Twentieth Century Blinds Pty., Limited. Machine for cutting rod-like articles into required lengths. 3,715,940, Cl. 82-63.000.
- Davis, Marshall Edwin: *See—*
  - Baskerville, Henry; and Davis, Marshall Edwin, 3,716,028.
- Davis, Martin A.: *See—*
  - Dobson, Thomas A.; and Davis, Martin A., 3,716,541.
- Davis, Paul, to Sweetheart Plastics, Inc. Capping device for containers. 3,715,865, Cl. 53-319.000.
- Dawes Laboratories, Inc.: *See—*
  - Boehme, Werner R.; Vuht, George; and Dawes Laboratories, Inc., 3,716,645.
- De Biasi, Charles P. Apparatus for pollution control of furnace gase. 3,715,868, Cl. 55-315.000.
- De Jong, Hendrik Johannes: *See—*
  - Greve, Reinhard Cornelis; and De Jong, Hendrik Johannes, 3,716,812.
- De Long, Vincent R.: *See—*
  - Teggatz, Eugene D.; De Long, Vincent R.; and Holtzer, Dale A., 3,716,794.
- de Mecquenem, Robert. Clamp with resilient gripping unit for use with overhead conductor spacers and a spacer including the same. 3,716,650, Cl. 174-42.000.
- De Ruiter, Ernest H.: *See—*
  - Lenaers, Rene; De Ruiter, Ernest H.; and Vandewalle, Jan J., 3,716,542.
- De Wit, Willem; and Hendricks, Petrus F.A.M., to Stamicarbon N.V. Apparatus for coating granules with a thin dense layer. 3,716,020, Cl. 118-303.000.
- Deakin, Stanley Thomas, to Sealectro Limited. Electrical jack plugs. 3,716,820, Cl. 339-147.00p.
- Dean, William Bruce, to Johnson & Johnson. Privacy cubicle curtain cloth. 3,716,446, Cl. 161-91.000.
- Deck, Harold R.: *See—*
  - Brady, Donnie G.; Deck, Harold R.; Jones, Faber B.; and Underwood, John H., 3,716,601.
- Deeg, Emil W.; Snitzer, Elias; and Simpson, Arnold J., to American Optical Corporation. Method for producing laser glasses having high resistance to internal damage and the product produced thereby. 3,716,349, Cl. 65-32.000.
- Deere & Company: *See—*
  - Fox, Robert Eugene, 3,716,212.
- Deering, Charles S., to E-Systems, Inc., mesne. Sequential check-out system including code comparison for circuit operation evaluation. 3,716,783, Cl. 324-73.000.
- Dehm, Henry C., to Hercules Incorporated. Method for bonding solid propellants to rocket motor casing. 3,716,604, Cl. 264-3.00r.
- Dekker, Cornelis; Joustra, Pieter Karel; and Paro, Heemskerk, to Koninklijke Nederlandsche Hoogovens en Staalfabrieken N.V. Apparatus for the application of a refractory combination therewith. 3,716,316, Cl. 425-13.000.
- Delamater, Philip G.: *See—*
  - Lincoln, Patrick A.; and Delamater, Philip G., 3,716,484.
- Delapp, Darwin Fiske, to American Cyanamid Company. Supersaturated solid solutions of photochromic materials in epoxides. 3,716,489, Cl. 252-300.000.
- Delembre, Andre Emile; and Jarrige, Georges Roger; deceased (by Jarrige, Jeannine Germaine; administrator), said Delembre and said Nguyen assors. to ITT Industries, Inc. Hermetic end seals for envelope of a metal vapor lamp. 3,716,744, Cl. 313-220.000.
- Deltrol Corporation: *See—*
  - Harris, John L., 3,716,720.
- Demco Incorporated: *See—*
  - Finley, Bruce M.; and Sturdivan, Paul G., 3,716,480.
- Demme, John P.: *See—*
  - Rehberger, Louis W.; Williams, John C.; and Demme, John P., 3,716,303.
- Dengo, Tadao: *See—*
  - Suenaga, Masanobu; Machii, Tetsuo; Sawano, Takahiro; Kobayashi, Takehiko; Dengo, Tadao; and Nakai, Tetsuzo, 3,715,802.
- Denki Onkyo Co., Ltd.: *See—*
  - Sohoma, Takeyoshi, 3,716,748.
- Denki Onkyo Company, Ltd.: *See—*
  - Sato, Hideo, 3,716,778.
- DePaolis, Potito U. Process for manufacture of soy concentrates, so isolates and related products. 3,716,372, Cl. 99-17.000.
- Depew, George N., to United States of America, Army. Liquid bearing. 3,716,278, Cl. 308-9.000.
- Deschamps, Andre; Franckowiak, Sigismond; and Renault, Philippe, to Institut Francais Du Petrole, des Carburants et Lubrifiants. Process for removing traces of hydrogen sulfide and mercaptans from gases. 3,716,620, Cl. 423-228.000.
- Deschamps, Nicholas H.; Stein, Bernard; and Mayo, Kenneth E., to Sanders Nuclear Corporation. Means and method for obtaining high temperature process fluids from low temperature energy sources. 3,716,099, Cl. 165-135.000.
- Deshayes, Philippe Marie: *See—*
  - Weber, Guy Paul; and Deshayes, Philippe Marie, 3,716,754.
- Design Elements, Inc.: *See—*
  - Fretwell, Richard D., 3,716,672.
- Desjardin, William P.: *See—*
  - Downing, Gertrude E.; and Desjardin, William P., 3,715,772.
- Detroyer, Georges D., to Wolverine-Pentronix, Inc. Fluid power eject mechanism for a powder compacting press and method of compacting. 3,715,796, Cl. 29-420.000.
- Deutsche Gold- und Silber-Scheideanstalt vormals Roessler: *See—*
  - Klebe, Hans; Meffert, Alfred; Lange, Ludwig; Fratzer, Gerhard; and Dahm, Franz-Ludwig, 3,716,628.
- Devlin, Edward J., to Glacier Ware, Inc. Drinking cup for freezing a beverage to a slush-like condition. 3,715,895, Cl. 62-457.000.
- DeZurik Corporation: *See—*
  - Ostroot, Gerald F.; and Torbarg, Robert H., 3,715,798.
- Di Rocco, James V., to Gordon Engineering Company. Sample and hold circuit. 3,716,800, Cl. 328-151.000.
- Diamond International Corporation: *See—*
  - Loeffler, Thomas V., 3,716,127.
- Diamond Shamrock Corporation: *See—*
  - Greene, Udell T., 3,716,346.
- DIEHL: *See—*

- Trimpler, Walter, 3,715,883.
- Diekman, John D.: *See—*
  - Spain, Virginia L.; and Diekman, John D., 3,716,564.
- Dippold, William L., to Stackpole Carbon Company. Electrical brush assembly. 3,716,735, Cl. 310-240.000.
- Dircks, Alexander Douglas: *See—*
  - Chaikin, Malcolm; Rokfalussy, Desmond; and Dircks, Alexander Douglas, 3,715,780.
- Dirk van der Lee, Jan Gijsbert: *See—*
  - Van Elk, Cornelis Johannes; Raatgever, Jacob Frederik; Morrien, Albertus Marinus; and Dirk van der Lee, Jan Gijsbert, 3,716,780.
- Disco Engineering, Inc.: *See—*
  - Henson, Artel R., 3,715,968.
- Display Corporation International: *See—*
  - Moore, Oliver K., 3,716,256.
- Dixon, Kenneth P., to Systems Engineering Associates, Inc. Electrical control system. 3,716,704, Cl. 235-92.0pd.
- Dobson, Thomas A.; and Davis, Martin A., to Ayerst, McKenna and Harrison Limited. Substituted derivatives of 10,11-dihydro-5, 10-(iminomethano)-5h-dibenzo cycloheptenes and preparation thereof. 3,716,541, Cl. 260-286.00r.
- Dodd, Homer C. Power driven lifting and positioning device. 3,716,151, Cl. 214-77.00r.
- Dokoshi, Noriaki: *See—*
  - Yoda, Naoya; Kurihara, Masaru; Dokoshi, Noriaki; Tanaka, Chiaki; and Eguchi, Masaomi, 3,716,519.
- Dombro, Robert A. Flame retardent compositions of matter. 3,716,516, Cl. 260-45.80a.
- Domokos, Jozsef; Benedek, Gyorgy; Kiss, Bela; Winkler, Laszlo; and Beller, Zoltan. Method and apparatus for coating metal workpieces with water soluble or colloidal coloring matter emulsified in water. 3,716,473, Cl. 204-299.000.
- Donald, Alexander: *See—*
  - Bemiss, Robert P.; and Donald, Alexander, 3,716,180.
- Donermeyer, Donald D.: *See—*
  - Corey, Albert E.; Donermeyer, Donald D.; Fantl, Joel; and Williams, Charles R., 3,716,547.
- Dong, Le Hao: *See—*
  - Francois, Raymond; Sarbach, Jacques; Dong, Le Hao; Mizoule, Jacques; and Ricci, Charles, 3,716,642.
- Dornier A.G.: *See—*
  - Hentschel, Wolfgang, 3,715,820.
- Dorr, John A.; and Gruen, Henry M., to Westinghouse Electric Corporation. Side looking sonar apparatus. 3,716,824, Cl. 340-3.00r.
- D'Ottavio, Eugene D.: *See—*
  - Grunwald, John J.; and D'Ottavio, Eugene D., 3,716,392.
- Dotto, Gianni A. Automotive apparatus. 3,716,098, Cl. 165-88.000.
- Douglas & Lomason Company: *See—*
  - Green, John F., 3,716,082.
- Dow Chemical Company, Limited: *See—*
  - Schrenk, Walter J.; Cleereman, Kenneth J.; Chisholm, Douglas S.; and Alfrey, Turner, Jr., 3,716,612.
- Dow Chemical Company, The: *See—*
  - Aung, Tin; and Boyle, William M., Jr., 3,716,447.
  - Glomski, Ronald L.; and Greminger, George K., Jr., 3,716,507.
  - Landreville, Gerald, 3,716,081.
  - Rakshys, Joseph W., Jr., 3,716,501.
  - Tomalia, Donald A., 3,716,520.
- Downing, Gertrude E.; and Desjardin, William P. Reciprocating corner and baseboard cleaning auxiliary attachment for rotary floor treatment machines. 3,715,772, Cl. 15-49.0rb.
- Drescher, Kurt: *See—*
  - Springer, Reinhard; Drescher, Kurt; and Jahn, Eberhard, 3,716,296.
- Dress, William: *See—*
  - Grimes, John Herbert; and Dress, William, 3,716,605.
- Dresser Industries, Inc.: *See—*
  - Sharki, Martin J.; and Griffin, Phil H., 3,716,707.
- Dron, Ninel Alexeevna: *See—*
  - Belkin, Nikolai Vasilievich; Alexandrovich, Eduard-Gely Vitalievich; Razin, Anatoly Alexandrovich; Kanunov, Mikhail Alexeevich; Tsukerman, Veniamin Aronovich; Sloeva, Galina Nikolaevna; Tsvetkov, Leonard Vasilievich; and Dron, Ninel Alexeevna, 3,716,737.
- Drumm, Arthur E. Rotary sweeper brush. 3,715,773, Cl. 15-183.000.
- Dryden, Paul C.: *See—*
  - Weisstuch, Aaron; Schell, Charles E., III; and Dryden, Paul C., 3,716,460.
- Du Pont de Nemours, E. I., and Company: *See—*
  - Axelrod, Robert Jay, 3,716,401.
  - Blume, Roe C., 3,716,522.
  - Haskell, Vernon Charles, 3,716,511.
  - Lyon, John B., 3,716,320.
  - Sieja, James Bernard, 3,716,534.
  - Simms, John A.; and Walus, Aloysius N., 3,716,506.
  - Vasta, Joseph A., 3,716,599.
- Dubbe, Richard F., to Minnesota Mining and Manufacturing Company. Separation color recorder system with recording on motion picture film using less than a full field of information to record each frame of film. 3,716,664, Cl. 178-5.4cd.
- Ducommun Incorporated: *See—*
  - Leeds, Donald H., 3,716,332.
- Dukats, Ilmars Z.: *See—*
  - Graham, Bruce C.; and Dukats, Ilmars Z., 3,716,492.
- Duling, Irl N.: *See—*
  - Black, Ernest P.; Duling, Irl N.; Merges, John C., Jr.; and Talbot, Alfred F., 3,716,441.
- Dunlap, Scott B.; Osterling, Peter R.; and Tepper, Charles W., to United States of America, Navy, mesne. Torque clutch for military fuzes. 3,715,986, Cl. 102-71.000.
- Dupree, Paul Montgomery: *See—*
  - Tredinnick, Bruce Charles; Gambale, James Richard; and Dupree, Paul Montgomery, 3,715,842.
- Dupuy, Harold P.: *See—*
  - Fore, Sara P.; Rayner, Eric T.; and Dupuy, Harold P., 3,715,910.
- Dura Corporation: *See—*
  - Littmann, Joseph C., 3,715,931.
- Durant, Will G.; and Ball, David C., to Cherry-Burrell Corporation. Valve bag placer. 3,715,858, Cl. 53-190.000.
- Dutta, Subodh Krishna; Shah, Krishnakant Girdharla; and Setalvad, Jagdish Ishwarlal, to Ahmedabad Manufacturing and Calico Printing Co., Ltd. Process for printing of fabrics consisting of synthetic fibers. 3,716,326, Cl. 8-62.000.
- Dynamit Nobel AG: *See—*
  - Termin, Erich; and Hauck, Gerhard, 3,716,567.
- E-Systems, Inc., mesne: *See—*
  - Deering, Charles S., 3,716,783.
- Eastman Kodak Company: *See—*
  - Blood, Alden E.; and Vinyard, Herschel T., 3,716,576.
  - Harvey, Donald M., 3,715,959.
  - Simon, Horst; and Kollgus, Heinrich, 3,715,960.
  - Weaver, Max A.; Straley, James M.; and Coates, Clarence A., Jr., 3,716,327.
- Eaton Corporation: *See—*
  - Chilcoat, Kermit E., 3,716,043.
- Eaton Yale & Towne, Inc.: *See—*
  - Pipes, George R., 3,716,147.
- Eber, Nicolas, to Aktiebolaget Electrolux. Absorption refrigeration apparatus of the inert gas type. 3,715,896, Cl. 62-490.000.
- Ebey, Edward W., to International Harvester Company. Weld fixture and axle shaft installation guide. 3,715,935, Cl. 74-607.000.
- Echterhoff, Heinrich; and Herz, Wilfried, to Bergwerksverband G.m.b.H., Firma. Device for charging coking ovens. 3,716,150, Cl. 214-35.00r.
- Eckert, Alton B., Jr.; and Jones, Howell A., Jr., to Pitney-Bowes, Inc. Method and apparatus for optical code reading. 3,716,699, Cl. 235-61.11e.
- Eckert, Konrad: *See—*
  - Adler, Karl-Heinz; Knapp, Heinrich; and Eckert, Konrad, 3,716,035.
- Economics Laboratory, Inc.: *See—*
  - Miller, Carl A., 3,716,194.
- Economos, James N.: *See—*
  - Nickerson, Robert J.; and Economos, James N., 3,715,833.
- Economy, Conatatine F.: *See—*
  - Parks, Kenneth J.; and Economy, Constatine F., 3,715,783.
- Economy, James; Frechette, Francis J.; and Wohrer, Luis C., to Carborundum Company, The. Etherified or esterified phenolic resin fibers and production thereof. 3,716,521, Cl. 260-59.000.
- Edge, Dick O.; Hammond, Raymond F.; and Sutton, Robert S., to Ex-Cell-O Corporation. Structure for and method of tool selection. 3,716,128, Cl. 198-38.000.
- Edwards, John A.: *See—*
  - Ackrell, Jack; Edwards, John A.; and Fried, John H., 3,716,529.
- Efimov, Alexei Vasilievich: *See—*
  - Berlin, Alfred Anisimovich; Kefeli, Tamara Yakovlevna; Marshavina, Natalia Lvovna; Strongin, Grigory Mikhailovich; Kara-Giaur, Nikolai Vladimirovich; Kolomazov, Boris Ivanovich; Efimov, Alexei Vasilievich; Bodrova, Aglaida Nikolaevna; and Altshuler, Judif arkovna, 3,716,571.
- Egami, Seiji: *See—*
  - Yamada, Tunehiko; Egami, Seiji; Sasatani, Harumi; Matsuoka, Hideaki; Emoto, Saburo; and Okamura, Kunio, 3,716,176.
- Egawa, Takeshi: *See—*
  - Tenkumo, Shohei; and Egawa, Takeshi, 3,715,964.
- Eguchi, Masaomi: *See—*
  - Yoda, Naoya; Kurihara, Masaru; Dokoshi, Noriaki; Tanaka, Chiaki; and Eguchi, Masaomi, 3,716,519.
- Egusa, Taku: *See—*
  - Koga, Taro; Egusa, Taku; and Miyatani, Yoshihiko, 3,715,852.
- Ehlert, Harry C. Bow-mounted arrow quiver. 3,716,174, Cl. 224-1.00b.
- Eisai Kabushiki Kaisha: *See—*
  - Kuwana, Noriaki; Kawamura, Tamio; and Fukumura, Masayuki, 3,716,454.
- Eisner, Steve, to Norton Company. Rechargeable electrochemical power supply. 3,716,413, Cl. 136-86.00a.
- Electric Power Storage Limited: *See—*
  - Peters, Kenneth, 3,716,412.
- Electrospace Corporation: *See—*
  - Meri, Kalju, 3,716,673.
- Ellanin Investments Ltd.: *See—*
  - Lowry, John D., 3,716,670.
- Elliott Brothers (London) Limited: *See—*
  - Whitehead, Eric A. N.; Carpenter, Henry G.; and Chinn, Peter D., 3,716,784.
- Elsner, Edwin C., 29% to Fink, Max,, 10% to Hahn, Floyd C. and 10% to Littlebury, Hugh W., Sr. Device for releasably gripping an elongate flexible member. 3,716,115, Cl. 188-65.100.

- Elvington, John W.: *See—*
  - Crawford, David D.; and Elvington, John W., 3,715,958.
- Email Limited: *See—*
  - Baker, Colin J.; Preen, Raymond C.; and Wilson, Donald W., 3,716,122.
- Emanuelson, Roger C.: *See—*
  - Trocciola, John C.; Luoma, Warren L.; Nickols, Richard C., Jr.; and Emanuelson, Roger C., 3,716,609.
- Emhart Corporation: *See—*
  - Gerlach, John R., 3,716,261.
- Emoto, Saburo: *See—*
  - Yamada, Tunehiko; Egami, Seiji; Sasatani, Harumi; Matsuoka, Hideaki; Emoto, Saburo; and Okamura, Kunio, 3,716,176.
- Engelhard Minerals & Chemicals Corporation: *See—*
  - Adlhart, Otto J.; and Terry, Peter L., 3,716,416.
- Engelhardt, Friedrich; Heid, Christian; Gunzert, Willi; Krusche, Erwin; and Meyer, Artur, to Cassella Farbwerke Mainkur Aktiengesellschaft. Water-soluble sulfur dyestuffs. 3,716,525, Cl. 260-128.000.
- Enterprise de Recherches et d'Activites Petrolieres: *See—*
  - Liautaud, Jean, 3,716,107.
- Environment/One Corporation: *See—*
  - Rich, Theodore A., 3,715,809.
- Erb, Edgar; Habiger, Walter; Kramer, Willi; Pfeil, Wolfgang; and Weigele, Reinhold, to Fortuna-Werke Maschinenfabrik Aktiengesellschaft. Offset printing machine. 3,715,979, Cl. 101-144.000.
- Ericson, Gene S., to Westinghouse Electric Corporation. Stator winding machine. 3,716,199, Cl. 242-1.10r.
- Erik, Carl L.; and Scott, William J., to GTE Sylvania Incorporated. Valving means for injection molding apparatus. 3,716,318, Cl. 425-245.000.
- Erlichman, Irving, to Polaroid Corporation. Reflex member positioning mechanism. 3,715,961, Cl. 95-42.000.
- Esclamadon (, Christian; Labat, Yves; and Signouret, Jean-Baptiste, to Societe Anonyme dite: Societe Nationale des Petroles d'Aquitaine. Mercapto-methyl sulphides. 3,716,588, Cl. 260-609.00r.
- Essex International, Inc.: *See—*
  - Prouty, Robert E.; and Graf, Robert D., 3,716,811.
  - Reed, Lawrence N., 3,715,934.
- Esso Research and Engineering Company: *See—*
  - Brown, John A., 3,716,624.
- Esty, Joseph J. Method of preserving perishable products. 3,715,860, Cl. 53-22.00b.
- Ethyl Corporation: *See—*
  - Cook, Charles A.; and Campbell, David H., 3,716,434.
  - Meltsner, Bernard R., 3,716,603.
- Evangelisti, Carlo John: *See—*
  - Belady, Laszlo Antal; Evangelisti, Carlo John; and Roth, Rogert Ingersoll, 3,716,842.
- Evans, David John Ivor; Fustukian, David Alan Wayne; Norris, Leon Frederick; and Fraser, Robert William, to Gordon, Sherritt, Mines Limited. Preparation of thoriated nickel-chromium alloy powder. 3,716,357, Cl. 75-.5bc.
- Evans, Harry T., to Pyco, Inc. Profile thermocouple. 3,716,417, Cl. 136-232.000.
- Evans, Jack: *See—*
  - Gould, William I., Jr.; and Evans, Jack, 3,716,869.
- Evered, Kenneth; and Meredith, Eric, to Automotive Products Company Limited. Liquid pressure locking devices for variable length strut members. 3,716,120, Cl. 188-300.000.
- Ex-Cell-O Corporation: *See—*
  - Edge, Dick O.; Hammond, Raymond F.; and Sutton, Robert S., 3,716,128.
- Exner, Emil August, to U.S. Philips Corporation. Arrangement including an electronic flash tube. 3,716,753, Cl. 315-241.00p.
- Fabrique de Ma chines Andre Bechler S. A.: *See—*
  - Leschenne, Henri, 3,715,939.
- Fader, Marshall Lloyd; and Christner, James Edward, to Miles Laboratories, Inc. Test composition and method for the in vitro determination of thyroid function. 3,716,632, Cl. 424-1.000.
- Fagan, Castle H.; and Lynn, Robert R., to Textron Inc. Energy absorbing landing gear. 3,716,208, Cl. 244-108.000.
- Fam, Wagih Zaki, to Canadian Patents and Development Limited. Parametric motor. 3,716,734, Cl. 310-72.000.
- Fannon, Robert D., Jr., to Harsco Corporation. Automatic window washer. 3,715,774, Cl. 15-302.000.
- Fantl, Joel: *See—*
  - Corey, Albert E.; Donermeyer, Donald D.; Fantl, Joel; and Williams, Charles R., 3,716,547.
- Farbwerke Hoechat Aktiengesellschaft vormals Meister Lucius & Bruning: *See—*
  - Becker, Herbert, 3,716,426.
- Farymann Diesel, Darny & Weidmann: *See—*
  - Hellwig, Karl, 3,716,244.
- Fennell, Joseph W. Subsoil aerator for depositing and detonating explosive pellets. 3,716,005, Cl. 111-1.000.
- Fennema, Everett. Berry basket and cover. 3,716,164, Cl. 220-60.00r.
- Ferranti Limited: *See—*
  - Worthington, William Douglas, 3,716,858.
- Ferro Corporation: *See—*
  - Fry, Ralph, 3,716,021.
- Feulner, Roger J.: *See—*
  - Berrett, James R.; and Feulner, Roger J., 3,716,096.
- Fiat Societa per Azioni: *See—*
  - Palazzetti, Mario, 3,716,758.
- Fiber Industries, Inc.: *See—*
  - Williams, Milton Guy, Jr.; and Rausch, Henry, Jr., 3,716,317.
- Fichtner, Rudi: *See—*
  - Giebel, Gerhard; and Fichtner, Rudi, 3,715,768.
  - Muhlbach, Anton; and Fichtner, Rudi, 3,715,767.
- Field, Thomas R., to Jenn-Air Corporation. Power roof exhauster or heat relief vent. 3,715,967, Cl. 98-42.000.
- Fieldcrest Mills, Inc.: *See—*
  - Clark, Eugene F., 3,716,078.
- Figueras, Alfredo, Jr.: *See—*
  - Alonso, Jose Luis, 3,716,048.
- Finamore, Paul V., to World of Wigs Mfg. Co., Inc. Hairpiece. 3,716,065, Cl. 132-53.500.
- Finch, Ray N.; Mireur, John P.; and Fouts, Hollye R., to Celanese Corporation. Purification of bis (2-hydroxyethyl) terephthalate. 3,716,575, Cl. 260-475.0pr.
- Fink, Max,: *See—*
  - Elsner, Edwin C., 3,716,115.
- Finkelstein, Laurence Stephen. Electrical harness with moulded sockets. 3,716,818, Cl. 339-97.001.
- Finley, Bruce M.; and Sturdivan, Paul G., to Demco Incorporated. Method and apparatus for cleaning solids coated with oil. 3,716,480, Cl. 210-22.000.
- Fischbein, Dave, Company: *See—*
  - Fischbein, Harold; Fischbein, Irving George; and Shark, Sam, 3,716,007.
- Fischbein, Harold; Fischbein, Irving George; and Shark, Sam, to Fischbein, Dave, Company. Automatic stitch-cutting mechanism for bag-closing sewing machines. 3,716,007, Cl. 112-11.000.
- Fischbein, Irving George: *See—*
  - Fischbein, Harold; Fischbein, Irving George; and Shark, Sam, 3,716,007.
- Fischer & Porter Co.: *See—*
  - Grauer, Oscar H.; Seglem, Omund A.; and Kaucher, Erwin K., 3,715,921.
- Fischer, Artur. Expansion anchor unit. 3,715,952, Cl. 85-68.000.
- Fischer, Artur. Expandible connector for fractured bones. 3,716,051, Cl. 128-92.0bb.
- Fisher, Donald E.; and Pleshko, Peter, to International Business Machines Corporation. Synchronous detector for monopulse key sampling electronic keyboard. 3,716,850, Cl. 340-365.00e.
- Flackwell, Bronislaw Radvan: *See—*
  - Gatward, Albert Peter John; and Flackwell, Bronislaw Radvan, 3,716,449.
- Flentie, John H.: *See—*
  - Harries, William S.; Asnani, Gul C.; and Flentie, John H., 3,716,791.
- Fletcher, Horace, III: *See—*
  - Alburn, Harvey E.; and Fletcher, Horace, III, 3,716,553.
- Flood, Edgar M.; and Green, William H., to Weld-Eze, Inc. Method for flexible pipe welding. 3,715,799, Cl. 29-475.000.
- Floren, Carl E.: *See—*
  - Leopold, Wilbur R.; Hackman, Frank C.; Floren, Carl E.; and Gould, Wallace E., 3,715,800.
- FMC Corporation: *See—*
  - Miller, Russell Alan, 3,716,629.
  - Weir, Stanley M., 3,716,697.
- Folley, Cranston Wesley; and Rocha, John Gonsalves, to Maremont Corporation. Machine gun gas actuating and evacuation system. 3,715,955, Cl. 89-193.000.
- Fonda, Albert G. Steering and directing mechanism. 3,716,110, Cl. 180-79.20r.
- Food Equipment, Inc.: *See—*
  - Snowden, Bryan T., 3,715,779.
- Fore, Sara P.; Rayner, Eric T.; and Dupuy, Harold P., to United States of America, Agriculture. Determination of residual solvent in oilseed meals and flours by a volatilization procedure. 3,715,910, Cl. 73-23.100.
- Fork, Werner: *See—*
  - Laucks, Rudolf; Fork, Werner; and Gross, Harald, 3,716,014.
- Fortuna-Werke Maschinenfabrik Aktiengesellschaft: *See—*
  - Erb, Edgar; Habiger, Walter; Kramer, Willi; Pfeil, Wolfgang; and Weigele, Reinhold, 3,715,979.
- Fortuyn, Koenraad Droogleever. Weight batching device for fibrous material such as shredded tobacco. 3,716,061, Cl. 131-22.00a.
- Fouts, Hollye R.: *See—*
  - Finch, Ray N.; Mireur, John P.; and Fouts, Hollye R., 3,716,575.
- Fox Products Co.: *See—*
  - Godshalk, James B.; and Alburger, William P., 3,716,030.
- Fox, Robert Eugene, to Deere & Company. Sprayer boom leveling and folding apparatus. 3,716,212, Cl. 248-278.000.
- Fox, William Burke: *See—*
  - Gould, Douglas Eugene; Anderson, Lowell Ray; Young, David Edward; and Fox, William Burke, 3,716,570.
- Foxboro Company, The: *See—*
  - Bailey, John E., 3,715,918.
- Franckowiak, Sigismond: *See—*
  - Deschamps, Andre; Franckowiak, Sigismond; and Renault, Philippe, 3,716,620.
- Francois, Raymond; Sarbach, Jacques; Dong, Le Hao; Mizoule, Jacques; and Ricci, Charles, to Institut de Recherche Scientifique (I.R.S.). Anti-inflammatory, antalgic and anti-pyretic medicament, on a pyridoxine flufenamate basis. 3,716,642, Cl. 424-263.000.
- Frank, Dale A.: *See—*
  - Koebler, William F.; and Frank, Dale A., 3,716,133.

- Frank, George A.: *See—*
  - Lewis, Sheldon N.; and Frank, George A., 3,716,508.
- Franzmeier, Alvin W. Rain trough devices. 3,716,076, Cl. 138-32.000.
- Fraser, Donald M. Tree pruning saw. 3,715,805, Cl. 30-166.000.
- Fraser, Robert William: *See—*
  - Evans, David John Ivor; Fustukian, David Alan Wayne; Norris, Leon Frederick; and Fraser, Robert William, 3,716,357.
- Fratelli Rotondi Di E. Rotondi & C. S.A.S.: *See—*
  - Godfrey, Peter James, 3,716,015.
- Fratzer, Gerhard: *See—*
  - Klebe, Hans; Meffert, Alfred; Lange, Ludwig; Fratzer, Gerhard; and Dahm, Franz-Ludwig, 3,716,628.
- Fratzke, Harold A.: *See—*
  - Gniffke, Glenn D.; and Fratzke, Harold A., 3,716,253.
- Frazier, Richard B., to Calcagni-Frazier-Zajachowski, Architects, Inc. Back support. 3,716,270, Cl. 297-377.000.
- Frechette, Francis J.: *See—*
  - Economy, James; Frechette, Francis J.; and Wohrer, Luis C., 3,716,521.
- Freeman, Alfred B., to Chicago Musical Instrument Co. Ring counter. 3,716,725, Cl. 307-223.000.
- Freeman, Edward G. Record player having a child-proof device. 3,716,240, Cl. 274-2.000.
- Fretwell, Richard D., to Design Elements, Inc. Modem CBS/CBT interface. 3,716,672, Cl. 179-2.0dp.
- Fried, John H.: *See—*
  - Ackrell, Jack; Edwards, John A.; and Fried, John H., 3,716,529.
- Fried. Krupp Gesellschaft mit beschrankter Haftung: *See—*
  - Mittler, Johannes; and Schardey, Karl, 3,716,157.
- Friedman, David, to Singer-General Precision, Inc. Apparatus to improve resolution in a scanned transparancy system. 3,716,660, Cl. 178-7.700.
- Frigger, Heinz, to ITT Industries, Inc. Antiskid sensor. 3,716,121, Cl. 188-181.00r.
- Froehlich, Alfred; Piller, Bernhard; and Loeffel, Hansrolf, to Ciba-Geigy AG. Photographic, light-sensitive material containing a trisazo dyestuff. 3,716,368, Cl. 96-99.000.
- Fronczak, Daniel H., 50% to Abel's Bagels, Inc. Bagel bagging machine. 3,715,857, Cl. 53-62.000.
- Fry, Ralph, to Ferro Corporation. Applicator mechanism for particulate material. 3,716,021, Cl. 118-308.000.
- Frydenberg, Donald V.; and Cain, Troy D., to Clary Corporation. Apparatus for fastening structural members together. 3,716,179, Cl. 227-48.000.
- Frykhult, Rune Helmer, to Aktiebolaget Celleco. Cyclone separator. 3,716,137, Cl. 209-211.000.
- Fuchs, Francis Joseph, Jr., to Western Electric Company, Incorporated. Method and apparatus for operating on a blank of material, e.g., deep drawing. 3,715,902, Cl. 72-60.000.
- Fugelso, Mark A. Impact switch. 3,715,985, Cl. 102-70.20r.
- Fuji Photo Film Co., Ltd.: *See—*
  - Fukushima, Osamu; Miyatuka, Hajime; and Honjo, Satoru, 3,716,360.
  - Ohe, Keitaro; Nishio, Daijiro; Sadamtsu, Shigeru; and Kaneko, Hiroyuki, 3,716,505.
- Fujimori, Makoto: *See—*
  - Iwami, Ichiro; Matsunaga, Tsutomu; Inouye, Sakae; Fujimori, Makoto; Hayashi, Noriyuki; Wada, Norio; Yoneyama, Ken; and Inaba, Hideaki, 3,716,602.
- Fujimoto, Keimei: *See—*
  - Itaya, Nobushige; Mizutani, Toshio; Kitamura, Shigeyoshi; Okuno, Yoshitosi; and Fujimoto, Keimei, 3,716,560.
- Fujinami, Akira; Ozaki, Toshiaki; Akiba, Keiichiro; Yamamoto, Sigeo; Nodera, Katsuji; Tanaka, Katsutoshi; Kameda, Nobuyuki; and Ooishi, Tadashi, to Sumitomo Chemical Company, Ltd. N'-alkanoyl-N"-dihalophenyl imidazolidinediones. 3,716,552, Cl. 260-309.500
- Fujitsu Limited: *See—*
  - Hara, Toshito; and Oguma, Toshiro, 3,716,810.
  - Muratani, Takuro; Okawa, Michihisa; and Nakamura, Hiroshi, 3,716,802.
  - Nakayama, Norihiko; and Osawa, Mitsuoki, 3,716,742.
- Fukuba, Hiroshi. Carpet sweeper with swing comb. 3,715,771, Cl. 15-48.000.
- Fukumura, Masayuki: *See—*
  - Kuwana, Noriaki; Kawamura, Tamio; and Fukumura, Masayuki, 3,716,454.
- Fukushima, Osamu; Miyatuka, Hajime; and Honjo, Satoru, to Fuji Photo Film Co., Ltd. Molten image transfer in electrophotography. 3,716,360, Cl. 96-1.400.
- Fukushima, Yoshikiyo; Ishihara, Yasushi; Momota, Kenzo; Usui, Yasuo; Sakumura, Tuyoshi; Sogo, Satoru; and Nunokawa, Koji, to Nippon Concrete Industries Co., Ltd. P.C. concrete pipe reinforcement structure. 3,716,210, Cl. 245-1.000.
- Fuminier, Claude, to Societe des Fonderies De Pont-A-Mousson. Casting apparatus with regulated cooling station. 3,716,094, Cl. 164-154.000.
- Furukawa Electric Company Limited, The: *See—*
  - Hosoda, Kirokuro; Kadowaki, Yoshio; Oda, Eisuke; and Hoshino, Nobuo, 3,716,391.
- Furutaka, Yasuhisa: *See—*
  - Kawano, Toshihiko; Yamaoka, Takashi; Maruo, Keiichi; and Furutaka, Yasuhisa, 3,716,643.
- Fustukian, David Alan Wayne: *See—*
  - Evans, David John Ivor; Fustukian, David Alan Wayne; Norris, Leon Frederick; and Fraser, Robert William, 3,716,357.
- G. & W. Electric Specialty Company: *See—*
  - Lusk, George E.; and Nicholas, James H., 3,716,652.
- Gach, Peter R.: *See—*
  - Julian, Randall K.; and Gach, Peter R., 3,716,161.
- Gadbois, Richard T.: *See—*
  - Currier, John W.; Gadbois, Richard T.; and Wilde, Arthur G., 3,716,066.
- Gadient, Fulvio, to Sandoz Ltd. Certain 6,11-dihydro-11-(3-alpha-tropanyloxy)-dibenzo [b,e]thiepine-5-oxides and the corresponding dioxides and derivatives thereof. 3,716,544, Cl. 260-292.000.
- Gagnon, Richard N.; Banic, Carl V.; and Grasso, Albert P., to United Aircraft Corporation. Fuel cell electrolyte concentration control. 3,716,415, Cl. 136-86.00b.
- Gainer, James: *See—*
  - Howarth, Graham Arton; and Gainer, James, 3,716,555.
- Gaines, Alvin M. Magnetic closure. 3,716,091, Cl. 150-40.000.
- Galigher Company, The: *See—*
  - Huntington, Fred R., 3,716,167.
- Gambale, James Richard: *See—*
  - Tredinnick, Bruce Charles; Gambale, James Richard; and Dupree, Paul Montgomery, 3,715,842.
- Garbarini, Victor Charles, to Bell Telephone Laboratories, Incorporated. Photoresist method and products produced thereby. 3,716,390, Cl. 117-34.000.
- Garcia, Donald J., to Schlumberger Technology Corporation. Electronic noise filter with hose reflection suppression. 3,716,830, Cl. 340-18.0ld.
- Garlinghouse Brothers: *See—*
  - Garlinghouse Leslie H., 3,716,266.
- Garlinghouse Leslie H., to Garlinghouse Brothers. Clam shell gate action. 3,716,266, Cl. 294-71.000.
- Garrison, Harold Keith: *See—*
  - Case, Cecil L.; and Garrison, Harold Keith, 3,715,928.
- Gatti, Alfred C. Refuse collection device. 3,716,263, Cl. 294-19.00r.
- Gatward, Albert Peter John; and Flackwell, Bronislaw Radvan, to Wiggins Teape Research & Development Limited. Method and apparatus for forming a non-woven fibrous web from a foamed fiber furnish. 3,716,449, Cl. 162-101.000.
- Gearin, John M., to Cogar Corporation. Module tester and sorter for use in a module test system. 3,716,786, Cl. 324-158.00f.
- Gebhardt, Ronald F.: *See—*
  - Simmons, Kenneth D.; Allen, Henry W.; and Gebhardt, Ronald F., 3,716,387.
- Gebr. Happich GmbH: *See—*
  - Herr, Gerhard; and Treber, Willy O., 3,716,269.
- Gehl Company: *See—*
  - Braunberger, Benjamin A., 3,715,845.
- Gelhaar, Erik Olov Bo. Apparatus for regulating the operation of a braking device. 3,716,118, Cl. 188-181.00t.
- Gelis, Avion Paul Lewis. Hoop-and-stick toy. 3,715,834, Cl. 46-220.000.
- General Electric Company: *See—*
  - Jones, Clifford M., 3,716,841.
  - Markovitz, Mark, 3,716,598.
  - Mason, William B., 3,716,768.
  - Millis, Walter T., 3,716,736.
  - Scace, Robert I.; and Slack, Glen A., 3,716,759.
  - Skogsholm, Einar Aasen, 3,716,775.
  - Tillma, James Earl, 3,716,732.
- General Foods Corporation: *See—*
  - Pitchon, Esra, 3,716,374.
- General Motors Corporation: *See—*
  - Beyerlein, David G., 3,716,273.
  - Klees, Gerard T., 3,716,251.
  - Widdowson, Richard E., 3,715,894.
  - Wolanin, Michael J., 3,715,909.
- General Partilion Manufacturing: *See—*
  - Straus, Albert E., 3,715,847.
- General Research Inc.: *See—*
  - Simjian, Luther G., 3,716,698.
- General Time Corporation: *See—*
  - Cielaszyk, Edward F., 3,715,879.
- General Tire & Rubber Company, The: *See—*
  - Uelzmann, Heinz, 3,716,557.
- Genuit, Luther L.: *See—*
  - Nowell, John R.; and Genuit, Luther L., 3,716,718.
- Gerberus A.G.: *See—*
  - Scheidweiler, Andreas; and Muller, Peter, 3,716,717.
- Gerlach, John R., to Emhart Corporation. Anti-violation means for lever actuated latch. 3,716,261, Cl. 292-169.230.
- Gesellschaft fur Strahlenforschung m.b.H: *See—*
  - Sansoni, Bruno Otto; and Kracke, Wolfgang Karl Heinrich, 3,716,566.
- Geuder, Winfried, to Grundig E.M.V. Elektro-Mechanische Versuchsanstalt Inh., Max Grundig. Cassette for magnetic tape or the like. 3,716,205, Cl. 242-194.000.
- Gevaert-Agfa N.V.: *See—*
  - Thiers, Robrecht Julius; Willems, Jozef Frans; and Spriet, Roger Alois, 3,716,361.
- Gewerkschaft Eisenhutte Westfalia: *See—*
  - Klimkiewicz, Bruno; and Weirich, Walter, 3,716,070.
- Ghirga, Marcello: *See—*
  - Calcagno, Benedetto; and Ghirga, Marcello, 3,716,581.

- Ghose, Rabindra N.; and Sauter, Walter A., to American Nucleonics Corporation. Instrument landing error correcting system. 3,716,863, Cl. 343s108.00r.
- Giebel, Gerhard; and Fichtner, Rudi, to USM Corporation. Support for a shoe lasting machine. 3,715,768, Cl. 12-125.000.
- Giesecke, Henry A., to Apromat, Incorporated. Lens system with selective image reversion. 3,716,291, Cl. 350-203.000.
- Gilligan, William H.; McDonnell, Chilton H.; and Jones, Orlando, to United States of America, Navy. Process for the preparation of vinyltetrazole. 3,716,550, Cl. 260-308.00d.
- Girard, Pierre, to Manufacture des Montres Rolex S.A. Display control device for timepieces. 3,715,881, Cl. 58-50.00r.
- Glacier Ware, Inc.: *See—*
  - Devlin, Edward J., 3,715,895.
- Glaxo Laboratories Limited: *See—*
  - Humber, David Cedric, 3,716,533.
- Glomski, Ronald L.; and Greminger, George K., Jr., to Dow Chemical Company, The. Hydroxypropyl methylcellulose as a protective colloid in vinyl monomer polymerization. 3,716,507, Cl. 260-17.00r.
- Gniffke, Glenn D.; and Fratzke, Harold A., to Metro Hydraulics Inc. Tractor hitch apparatus. 3,716,253, Cl. 280-415.00a.
- Godfrey, Peter James, to Fratelli Rotondi Di E. Rotondi & C. S.A.S. Measuring devices. 3,716,015, Cl. 116-115.500.
- Godigkeit, William, Jr.: *See—*
  - Ploeger, Walter Jr.; Ploeger, Walter, Sr.; and Godigkeit, William, Jr., 3,716,125.
- Godshalk, James B.; and Alburger, William P., to Fox Products Co. Animal operated watering device. 3,716,030, Cl. 119-72.500.
- Gogola, Joseph K., to Addressograph-Multigraph Corporation. Diazotype materials. 3,716,364, Cl. 96-75.000.
- Goldberger, Max, to Catalytic Technology Corporation. 100-Watt fuel cell. 3,716,414, Cl. 136-86.00r.
- Goldstein, Max, to United States of America, Army. Method of making improved nose caps for missiles and rockets. 3,716,610, Cl. 264-152.000.
- Goodyear Tire & Rubber Company, The: *See—*
  - Bricker, Carl E., 3,716,117.
  - Keck, Max H., 3,716,582.
- Gordon Engineering Company: *See—*
  - Di Rocco, James V., 3,716,800.
- Gordon, Eugene Irving: *See—*
  - Crowell, Merton Howard; and Gordon, Eugene Irving, 3,716,740.
- Gordon, Gary B., to Hewlett-Packard Company. Method and apparatus for interrupting continuous pulse trains for counter readout without information loss. 3,716,703, Cl. 235-92.0pl.
- Gordon, Sherritt, Mines Limited: *See—*
  - Evans, David John Ivor; Fustukian, David Alan Wayne; Norris, Leon Frederick; and Fraser, Robert William, 3,716,357.
  - Weir, Donald Robert; and Kofluk, Russell Peter, 3,716,618.
- Gorgie, Frank J.; and Johnson, Gene A. Brake lining condition indicator system. 3,716,832, Cl. 340-52.002.
- Gorka, Donald J.; and Laskin, Harold B., to Minnesota Mining and Manufacturing Company. Fusing device. 3,716,221, Cl. 118-60.000.
- Gorres, Thomas J., to TCI, Inc. Bogie axle. 3,716,250, Cl. 280-104.50a.
- Gorsuch, Harold F., to Westinghouse Electric Corporation. Control system for washing apparatus. 3,716,721, Cl. 307-141.400.
- Goserud, Chester O. Lawn mower cutters. 3,715,874, Cl. 56-295.000.
- Goudreau, Noel G., to Goudreau-Behan, Incorporated. Weighting device for game club including tapered shaft. 3,716,239, Cl. 273-194.00a.
- Goudreau-Behan, Incorporated: *See—*
  - Goudreau, Noel G., 3,716,239.
- Gould, Douglas Eugene; Anderson, Lowell Ray; Young, David Edward; and Fox, William Burke, to Allied Chemical Corporation. Novel hydrogen containing fluoroalkyl hypochlorites and process for the preparation thereof. 3,716,570, Cl. 260-453.00r.
- Gould, Henry: *See—*
  - Bruson, Herman A.; and Gould, Henry, 3,716,487.
- Gould, Wallace E.: *See—*
  - Leopold, Wilbur R.; Hackman, Frank C.; Floren, Carl E.; and Gould, Wallace E., 3,715,800.
- Gould, William I., Jr.; and Evans, Jack, to United States of America, National Aeronautics and Space Administration. Millimeter wave antenna system. 3,716,869, Cl. 343-779.000.
- Goytisolo Taltavull, Ignacio. Zero luminance lighting panel. 3,716,709, Cl. 240-106.100.
- Grabmaier, Josef, to Siemens Aktiengesellschaft. Czochralski crystallization of gallium arsenide using a boron oxide sealed device. 3,716,345, Cl. 23-301.0sp.
- Grace, W. R., & Co.: *See—*
  - Acker, Ellsworth; and Winyall, Milton Edward, 3,716,493.
- Graesslin, Dieter; Hils, Siegbert Friedrich; and Ropin, Kurt, to Graesslin, Dieter, Feinmechanik. Vehicle speed recording and reproducing devices. 3,716,679, Cl. 179-100.20s.
- Graesslin, Dieter, Feinmechanik: *See—*
  - Graesslin, Dieter; Hils, Siegbert Friedrich; and Ropin, Kurt, 3,716,679.
- Graf, Robert D.: *See—*
  - Prouty, Robert E.; and Graf, Robert D., 3,716,811.
- Graham, Bruce C.; and Dukats, Ilmars Z., to Magraflux Corporation. Biodegradable composition for detecting surface discontinuities. 3,716,492, Cl. 252-301.20p.
- Graham, John William: *See—*
  - Cullen, Geoffrey Victor; Graham, John William; and Siviour, Neil Graham, 3,716,471.
- Grain Processing Corporation: *See—*
  - Schweiger, Richard G., 3,716,526.
- Grant, Roger L. Gauge for indicating exhaust time of air supply for scuba divers. 3,715,927, Cl. 73-389.000.
- Graphic Electronics, Inc.: *See—*
  - Barron, William J., 3,716,668.
- Grasso, Albert P.: *See—*
  - Gagnon, Richard N.; Banic, Carl V.; and Grasso, Albert P., 3,716,415.
- Grauer, Oscar H.; Seglem, Omund A.; and Kaucher, Erwin K., to Fischer & Porter Co. End-sealed variable-area flowmeter. 3,715,921, Cl. 73-209.000.
- Grav-I-Flo Corporation, The: *See—*
  - Davidson, Richard L., 3,715,840.
- Gray, Alden J., to Howe Richardson Scale Company. Piece counting system. 3,716,706, Cl. 235-151.330.
- Gray, Virgil E. Nail driver. 3,716,088, Cl. 145-46.000.
- GRE Automatic Electric Laboratories, Incorporated: *See—*
  - Bertellotti, Ansano; and Thayer, Robert F., 3,716,760.
- Green, James H.: *See—*
  - Wilson, William G.; Green, James H.; and White, William D., 3,716,010.
- Green, John F., to Douglas & Lomason Company. Pressure type bag filling machine. 3,716,082, Cl. 141-68.000.
- Green, Philip S., to American Express Investmant Management Company. Acoustic to optical image converter. 3,716,826, Cl. 340-5.00h.
- Green, William H.: *See—*
  - Flood, Edgar M.; and Green, William H., 3,715,799.
- Greenberg, Hoyne E.; and Wexler, Max L., to Hoyne Industries, Inc. Process of making a mirror backed picture unit. 3,715,795, Cl. 29-412.000.
- Greene, Leonard M., to Safe Flight Instrument Corporation. Actuating and control system for gas-operated fog horn. 3,716,017, Cl. 116-137.000.
- Greene, Udell T., to Diamond Shamrock Corporation. Method of dissolving liquefied chlorine in an aqueous solvent. 3,716,346, Cl. 23-312.000.
- Greenfield, Charles; Casparian, Robert E.; and Bonanno, Anthony J., to Carver-Greenfield Corporation. Process and apparatus for recovering clean water from dilute solutions of waste solids. 3,716,458, Cl. 203-11.000.
- Greeson, James C., Jr., to International Business Machines Corporation. Cathode ray tube module. 3,716,661, Cl. 178-7.800.
- Greminger, George K., Jr.: *See—*
  - Glomski, Ronald L.; and Greminger. George K., Jr., 3,716,507.
- Greve, Reinhard Cornelis; and De Jong, Hendrik Johannes, to U.S. Philips Corporation. Bistable ball-armature contact. 3,716,812, Cl. 335-179.000.
- Griffin, Phil H.: *See—*
  - Sharki, Martin J.; and Griffin, Phil H., 3,716,707.
- Griffith, William Earl, to Jarco Services Ltd. Rotary jar. 3,716,109, Cl. 175-297.000.
- Grimes, John Herbert; and Dress, William, to United Kingdom Atomic Energy Authority. Precipitation processes for metal-containing materials. 3,716,605, Cl. 264-.500.
- Groberman, Leslie J.; and Wuori, Edward R., to Honeywell Inc. Apparatus for determining the damping ratio of a second order vibration system. 3,715,920, Cl. 73-194.00b.
- Groschwitz, Eberhard, to Siemens Aktiengesellschaft. Integrated optical-electronic solid state system. 3,716,804, Cl. 332-7.510.
- Gross, Harald: *See—*
  - Laucks, Rudolf; Fork, Werner; and Gross, Harald, 3,716,014.
- Gross, Leonard B.; Johnson, Charles R.; and Nattsas, Stephen C., to Babcock & Wilcox Company, The. On site pressure vessel inspection device. 3,715,914, Cl. 73-67.700.
- Gross, Max, to Werkzeugmaschinenfabrik Oerlikon-Buhrle AG. Device for holding a workpiece. 3,716,224, Cl. 269-48.100.
- Gross, William R. Apparatus for raising and harvesting fish. 3,716,026, Cl. 119-3.000.
- Gruen, Henry M.: *See—*
  - Dorr, John A.; and Gruen, Henry M., 3,716,824.
- Grundig E.M.V. Elektro-Mechanische Versuchsanstalt Inh., Max Grundig: *See—*
  - Geuder, Winfried, 3,716,205.
- Grunwald, John J.; and D'Ottavio, Eugene D., to McDermid Incorporated. Compositions for and methods of improving adhesion of plated metal on plastic substrates. 3,716,392, Cl. 117-47.00a.
- GTE Laboratories Incorporated: *See—*
  - Ruggerio, Paul A., 3,716,363.
- GTE Sylvania Incorporated: *See—*
  - Burkhart, John H.; and Slick, Edward C., 3,716,421.
  - Erik, Carl L.; and Scott, William J., 3,716,318.
  - Johnson, Alfred D., 3,716,662.
  - Say, Donald L., 3,716,739.
  - Zelenz, Martin L., 3,716,806.
- Guenther, William Dieter, to Gun Web Limited. Direct drive ball piston compressor. 3,716,310, Cl. 417-552.000.
- Gulbransen, Earl: *See—*
  - Yannopoulos, Lymperios N.; Jansson, Sven A.; and Gulbransen, Earl, 3,716,491.
- Gun Web Limited: *See—*
  - Guenther, William Dieter, 3,716,310.

Gund, Peter Herman; and Berkelhammer, Gerald, to American Cysnamid Company. Method of preparing benzoguanamines. 3,716,536, Cl. 260-249.900.

Gunnerman, Robert J.: *See—*

Hartzell, George W.; and Gunnerman, Robert J., 3,716,084.

Gunzert, Willi: *See—*

Engelhardt, Friedrich; Heid, Christian; Gunzert, Willi; Krusche, Erwin; and Meyer, Artur, 3,716,525.

Gurney, John A.: *See—*

Hall, Luther A. R.; Gurney, John A.; and Renfroe, Harris B., 3,716,595.

Gustin, Arnold J.: *See—*

Kelso, Francis; and Gustin, Arnold J., 3,715,972.

Gutierrez, Julian. Record holding structure. 3,716,145, Cl. 211-40.000.

Guzick, Lawrence L. Orifice and filter assembly. 3,715,870, Cl. 55-466.000.

Haass, Guenther; and Reinhardt, Dieter, to Siemens Aktiengesellschaft. Circuit arrangement for interference-free recognition of the zero crossings of sine-like signals. 3,716,799, Cl. 328-150.000.

Habicht, Ernst: *See—*

Hoegerle, Karl; and Habicht, Ernst, 3,716,639.

Habiger, Walter: *See—*

Erb, Edgar; Habiger, Walter; Kramer, Willi; Pfeil, Wolfgang; and Weigele, Reinhold, 3,715,979.

Habisohn, Victor J., to Reliamatic, Inc. Slow start-stop motor control system. 3,716,770, Cl. 318-259.000.

Hachenburg, Victor, to Bell Telephone Laboratories, Incorporated. Minimum delay data transfer arrangement. 3,716,728, Cl. 307-291.000.

Hackman, Frank C.: *See—*

Leopold, Wilbur R.; Hackman, Frank C.; Floren, Carl E.; and Gould, Wallace E., 3,715,800.

Hackman, Frank C.; and Roos, Robert R., to Mueller Co. Push-in fitting for plastic pipe. 3,716,257, Cl. 285-210.000.

Hadam, Wilhelm, to Stoll, H., and Company. Flat bed knitting machine. 3,715,897, Cl. 66-75.00r.

Hafer, Paul M., to Arrow Hart Inc. Plug unit for use with plug-in bus duct. 3,716,683, Cl. 200-50.00r.

Hafner, Raimund: *See—*

Volckari, Peter; Lehmann, Hartmut; and Hafner, Raimund, 3,716,846.

Hagedorn, Fritz: *See—*

Peuschel, Gerd; and Hagedorn, Fritz, 3,716,333.

Hahn, Floyd C.: *See—*

Elsner, Edwin C., 3,716,115.

Haines, Kenneth A.: *See—*

St. John, Daniel S.; and Haines, Kenneth A., 3,716,286.

Halkey-Roberts Corporation: *See—*

Mackal, Henry H.; and Lardner, George E., 3,716,438.

Hall, Floyd V., to Liggett & Myers Incorporated. Apparatus for compacting filter tip assemblies. 3,715,957, Cl. 93-1.00c.

Hall, John B., to International Flavors & Fragrances Inc. Novel fragrance compositions. 3,716,498, Cl. 252-522.000.

Hall, John B., to International Flavors and Fragrances Inc. C_{10}-C_{15} hydrocarbyl substituted pyridine compounds. 3,716,543, Cl. 260-290.00v.

Hall, Lewis W., Jr.: *See—*

Belak, Steven G.; and Hall, Lewis W., Jr., 3,716,510.

Hall, Luther A. R.; Gurney, John A.; and Renfroe, Harris B., to Ciba-Geigy Corporation. Polysubstituted dihydropyrenes. 3,716,595, Cl. 260-666.0py.

Hallam, E. C., Company: *See—*

Hallam, Edwin Carey, 3,716,105.

Hallam, Edwin Carey, to Hallam, E. C., Company. Grading attachment for a vehicle. 3,716,105, Cl. 172-780.000.

Hallamore Homes, Inc.: *See—*

Hallamore, Lloyd G., 3,715,777.

Hallamore, Lloyd G., to Hallamore Homes, Inc. Heavy duty hinge. 3,715,777, Cl. 16-162.000.

Ham, George: *See—*

Komninos, John; Klemchuk, Peter; and Ham, George, 3,716,329.

Hamada, Teruma, to Amada Co., Limited. Apparatus for supporting sheet materials in bending presses. 3,715,907, Cl. 72-419.000.

Hamaphet Hama, K.G. Hanke & Thomas: *See—*

Hanke, Rudolph, 3,716,444.

Hamazaki, Yoshiharu: *See—*

Kishimoto, Hiroshi; Kobayashi, Kenzo; Hamazaki, Yoshiharu; and Danno, Mituaki, 3,715,919.

Hamel, Michael T. Security gate apparatus. 3,715,837, Cl. 49-380.000.

Hamilton, Charles L. Collapsible fishing net. 3,715,829, Cl. 43-12.000.

Hamilton Tool Company, The: *See—*

Huffman, Harold W., 3,715,981.

Hammond, Peter W., to Westinghouse Air Brake Company. Apparatus for monitoring speed utilizing a tuned circuit whose phase changes in proportional to speed. 3,716,787, Cl. 324-173.000.

Hammond, Raymond F.: *See—*

Edge, Dick O.; Hammond, Raymond F.; and Sutton, Robert S., 3,716,128.

Hancock, Melburn B., to AMF Incorporated. Continuous brew fermentation. 3,716,375, Cl. 99-90.0cb.

Hanke, Rudolph, to Hamaphet Hama, K.G. Hanke & Thomas. Apparatus for use in splicing together the ends of two strips. 3,716,444, Cl. 156-505.000.

Hannula, Leslie A., to Acoustics Development Corporation. Telephone directory holder. 3,716,214, Cl. 248-447.000.

Hansen, Howard C., to Clark Equipment Company. Load equalizing system for lift trucks. 3,716,158, Cl. 214-730.000.

Hansen, Lindsey B., Jr.; and Hyer, Val D., to Control Graphics Company. Display system. 3,715,822, Cl. 40-130.00k.

Hansen, Richard R., to KMS Industries, Inc. Venturi head for vacuum systems. 3,716,307, Cl. 417-191.000.

Hanson, Richard M., to McGraw-Edison Company. Press head construction. 3,715,819, Cl. 38-16.000.

Hansson, Jan Ingvar: *See—*

Tuma, Alex; and Hansson, Jan Ingvar, 3,716,083.

Hara, Satoshi: *See—*

Mochizuki, Takashi; Komatsuzaki, Yoshinori; Hara, Satoshi; Nojima, Hideo; Shimizu, Tamio; and Suzuki, Shigeo, 3,715,945.

Hara, Toshito; and Oguma, Toshiro, to Fujitsu Limited. Reed switch. 3,716,810, Cl. 335-154.000.

Hardinge Brothers, Inc.: *See—*

Peterson, Anders Adolf, 3,716,246.

Harna, Hyacint E., to Zenith Radio Corporation. Semi-random pulse generator. 3,716,796, Cl. 328-63.000.

Harries, William S.; Asnani, Gul C.; and Flentie, John H., to American Standard Inc. Flag alarm system applicable to a vor receiver. 3,716,791, Cl. 325-363.000.

Harris, Alva F., to Monsanto Company. Method for agglomerating and stabilizing rubbery polymer latices. 3,716,509, Cl. 260-23.07a.

Harris, John L., to Deltrol Corporation. Condition control device and system. 3,716,720, Cl. 307-141.000.

Harsco Corporation: *See—*

Fannon, Robert D., Jr., 3,715,774.

Hartzell, George W.; and Gunnerman, Robert J., to Hartzell Industries, Inc., mesne. Sawmill off bearer. 3,716,084, Cl. 143-157.00d.

Hartzell Industries, Inc., mesne: *See—*

Hartzell, George W.; and Gunnerman, Robert J., 3,716,084.

Harvey, Donald M., to Eastman Kodak Company. Apparatus for providing shutter release and for indicating end of a controlled time exposure. 3,715,959, Cl. 95-10.0ct.

Hashimoto, Saburo, to Union Oil Company of California. Applying urea in the molten state to crops. 3,716,350, Cl. 71-28.000.

Haskell, Vernon Charles, to Du Pont de Nemours, E. I., and Company. Coating composition of an aqueous dispersion of copolymeric vinylidene chloride. 3,716,511, Cl. 260-29.6ta.

Haskett, Philip R.: *See—*

Bauer, Donald J.; Haskett, Philip R.; and Lindstrom, Ronald E., 3,716,615.

Hauck, Gerhard: *See—*

Termin, Erich; and Hauck, Gerhard, 3,716,567.

Hauger, Josef, to Kienzle Apparate GmbH. Keyboard locking arrangement. 3,716,695, Cl. 235-26.000.

Hauser, Raimund: *See—*

Konigslehner, Franz; and Plihal, Hanns, 3,715,929.

Hawes, Edward L. Vehicle sign. 3,715,821, Cl. 40-129.00c.

Hayashi, Noriyuki: *See—*

Iwami, Ichiro; Matsunaga, Tsutomu; Inouye, Sakae; Fujimori, Makoto; Hayashi, Noriyuki; Wada, Norio; Yoneyama, Ken; and Inaba, Hideaki, 3,716,602.

Hayashibara Co., Ltd.: *See—*

Ueda, Seinosuke; Nanri, Nobuya; and Hongo, Motoyoshi, 3,716,455.

Hayes, Arthur F.; and Schultz, Robert L., to Honeywell Inc. Projectile stream display apparatus. 3,716,696, Cl. 235-61.50e.

Hayes, Harvey C.; and Trent, Horace M. Pressure arming device. 3,715,982, Cl. 102-18.000.

Hazemag Hartzerkleinerungs- und Zement-Maschinenbau-Gesellschaft m.b.H.: *See—*

Motek, Herbert; and Jobkes, Jakob, 3,716,196.

Heard, Alan Clifford: *See—*

Scaddan, Ernest Victor; and Heard, Alan Clifford, 3,716,080.

Hedrick, Geoffrey S., to Lear Siegler, Inc. Dual mode altimeter. 3,715,926, Cl. 73-387.000.

Heerdt, Ruth; Hubner, Manfred; Schmidt, Felix Hehmut; and Weyer, Rudi, to Boehringer Mannheim GmbH. Certain thenoyl derivatives of benzenesulfonylaminopyrimidines. 3,716,537, Cl. 260-256.50r.

Heesemann, Karl. Grinding device for the radiused chamfering of an edge of a workpiece. 3,715,839, Cl. 51-58.000.

Heffer, Frederick R. Archery bow sight. 3,715,807, Cl. 33-265.000.

Heid, Christian: *See—*

Engelhardt, Friedrich; Heid, Christian; Gunzert, Willi; Krusche, Erwin; and Meyer, Artur, 3,716,525.

Heidjann, Franz: *See—*

Koenig, Walter; Adams, Heribert; and Heidjann, Franz, 3,716,104.

Heimo Geratebau Gesellschaft mit beschrankter Haftung: *See—*

Locher, Otto, 3,716,189.

Helfenberger, Hans, to Sandoz Ltd. Acetic acid anhydride as a stabilizer for N-methyl-N-formyl amide of O,O-dimethyl dithiophosphoryl acetic acid. 3,716,636, Cl. 424-211.000.

Hellwig, Karl, to Farymann Diesel, Darny & Weidmann. Shaft seal. 3,716,244, Cl. 277-65.000.

Hendrick Manufacturing Company: *See—*

Bartlow, Aulden H., 3,716,144.

Hendricks, Petrus F.A.M.: *See—*

De Wit, Willem; and Hendricks, Petrus F.A.M., 3,716,020.

Hendrickson, Melvin C.; Merrell, Richard G.; and Parisoe, Wilbert, to Zenith Radio Corporation. Real time remote use metering for broadcast receivers. 3,716,654, Cl. 178-5.100.

Hendrickson, Melvin C.; and Merrell, Richard G., to Zenith Radio Corporation. Inhibitable random pulse generator. 3,716,797, Cl. 328-63.000.

Hendrix, Robert E.: *See—*

Webb, William R.; Jones, William S.; and Hendrix, Robert E., 3,716,859.

Henisch, Heinz K.: *See—*

Roy, Rustum; Henisch, Heinz K.; and White, William B., 3,716,741.

Henrick, Clive A.; and Siddall, John B., to Zeocon Corporation. 3,4-Allenic fatty acid esters. 3,716,565, Cl. 260-410.90r.

Henry, Georges: *See—*

Henry, Jean Claude; Henry, Georges; and Castelli, Cesar, 3,716,686.

Henry, Jean Claude; Henry, Georges; and Castelli, Cesar, to Merlin Gerin. Compressed-gas multi-break circuit-interrupter having cylindrical chambers with eccentric contacts. 3,716,686, Cl. 200-148.00r.

Henry, John J., to United States of America, Atomic Energy Commission. Capacitance gage for measuring small distances. 3,716,782, Cl. 324-61.00r.

Henson, Artel R., to Disco Engineering, Inc. Air curtain structure. 3,715,968, Cl. 98-36.000.

Hentschel, Wolfgang, to Dornier A.G. Ironing press. 3,715,820, Cl. 38-17.000.

Hercules Incorporated: *See—*

Dehm, Henry C., 3,716,604.

Kim, Charles W., 3,715,878.

Herlein, Robert J. Hold-open latch. 3,716,260, Cl. 22-103.000.

Herpin, Ivey. Fuel additive inductor for internal combustion engine. 3,716,040, Cl. 123-198.00a.

Herr, Gerhard; and Treber, Willy O., to Gebr. Happich GmbH. Sunvisor, especially for motor driven vehicles. 3,716,269, Cl. 296-97.00h.

Hershenson, Fred M., to Searle, G. E., & Co. 2-(chloropyridylamino)-1-pyrrolines. 3,716,548, Cl. 260-296.00r.

Herz, Wilfried: *See—*

Echterhoff, Heinrich; and Herz, Wilfried, 3,716,150.

Hess, Howard V.; and Cole, Edward L., to Texaco Inc. High pressure thermal treatment of waste oil-containing sludges. 3,716,474, Cl. 208-13.000.

Hesse, James E.: *See—*

Porter, William I.; Hindsley, Frank W.; and Hesse, James E., 3,716,054.

Hesston Corporation: *See—*

Case, Cecil L.; and Garrison, Harold Keith, 3,715,928.

Heuner, Robert Charles; and Niemiec, Stanley Joseph, to RCA Corporation. Data translating circuit. 3,716,723, Cl. 307-221.00c.

Heusler, Karl; and Woodward, Robert Burns, to Ciba-Geigy Corporation. Process for the manufacture of thiazacyclic hydroxy compounds. 3,716,465, Cl. 204-158.00r.

Hewlett-Packard Company: *See—*

Gordon, Gary B., 3,716,703.

Hicks, Darrell D., to Celanese Coatings Company. Film forming compositions from polycarboxylic acids and adducts of polyeopxides and amines. 3,716,402, Cl. 117-161.0ln.

Hill, Eric John: *See—*

Young, Gideon Maurice; Silman, Harold; and Hill, Eric John, 3,715,838.

Hillyard, Peter Thomas, to Lucas, Joseph, (Industries) Limited. Ignition coils. 3,716,813, Cl. 336-60.000.

Hils, Siegbert Friedrich: *See—*

Graesslin, Dieter; Hils, Siegbert Friedrich; and Ropin, Kurt, 3,716,679.

Himmele, Walter: *See—*

Kniese, Wilhelm; Nienburg, Hans Juergen; Himmele, Walter; and Aquila, Werner, 3,716,626.

Hindsley, Frank W.: *See—*

Porter, William I.; Hindsley, Frank W.; and Hesse, James E., 3,716,054.

Hineline, Robert E., to AMF Incorporated. Off-the-road tire building method and apparatus. 3,716,442, Cl. 156-397.000.

Hirai, Robert K.; Boomer, John H.; and Small, Edward R., to Arnold Engineering Company, The. Method of stamping laminations. 3,715,943, Cl. 83-50.000.

Hirai, Shoichi: *See—*

Nagata, Wataru; and Hirai, Shoichi, 3,716,528.

Hirao, Motohisa; and Takeda, Yutaka, to Hitachi, Ltd. Process for doping with impurities a gas-phase-grown layer of III-V compound semiconductor. 3,716,404, Cl. 117-201.000.

Hirsch, Clarence A.: *See—*

Little, Edwin D.; and Hirsch, Clarence A., 3,716,554.

Hirst Microwave Industries, Limited: *See—*

Constable, Ronald Jack Walker, 3,716,687.

Hiscocks, Frank: *See—*

Potasek, Chester J.; and Hiscocks, Frank, 3,716,001.

Hitachi, Ltd.: *See—*

Hirao, Motohisa; and Takeda, Yutaka, 3,716,404.

Kuriyama, Sigeru; and Kikuchi, Seiki, 3,716,767.

Matsumoto, Koichi; and Ishikawa, Makoto, 3,716,300.

Nakada, Kusuo; and Oguro, Tomokatsu, 3,716,750.

Hochberg, Frederick: *See—*

Brown, Alan V.; and Hochberg, Frederick, 3,715,785.

Hockenberger, Lothar: *See—*

Wilhelm, Gerhard; Hockenberger, Lothar; and Soyka, Manfred, 3,716,515.

Hoegerle, Karl; and Habicht, Ernst, to Ciba-Geigy Corporation. Anorexigenic tetrahydrobenzazepines. 3,716,639, Cl. 424-244.000.

Hofer, Kurt; and Kessler, Rudolf, to Sandoz Ltd.; a/k/a Sandoz AG. 2-hydroxy-3,di-(tert. butyl)-benzophenones. 3,716,586, Cl. 260-591.000.

Hoffmann-La Roche Inc.: *See—*

Andrews, David; and Saucy, Gariel, 3,716,561.

Krubiner, Alan Martin; and Oliveto, Eugene Paul, 3,716,530.

Holden, Herbert K., to American Filtrona Corporation, mesne. Filter. 3,715,869, Cl. 55-387.000.

Holden, James D., to Rees-Memphis, Inc. Burner device. 3,716,000, Cl. 110-7.00a.

Holloway, Robert M.: *See—*

Ludington, Robert L.; and Holloway, Robert M., 3,716,119.

Holotron Corporation: *See—*

St. John, Daniel S.; and Haines, Kenneth A., 3,716,286.

Holtzer, Dale A.: *See—*

Teggatz, Eugene D.; De Long, Vincent R.; and Holtzer, Dale A., 3,716,794.

Holzer, Helmut: *See—*

Bauer, Hans; Holzer, Helmut; and Schmidt, Gerhard, 3,716,395.

Holzman, Allen L.: *See—*

Matthews, Donald R.; and Holzman, Allen L., 3,716,342.

Holznagel, Melvin A.: *See—*

Welborn, Warren S.; and Holznagel, Melvin A., 3,716,059.

Honeywell Inc.: *See—*

Berrett, James R.; and Feulner, Roger J., 3,716,096.

Chaffin, John H., III, 3,716,845.

Groberman, Leslie J.; and Wuori, Edward R., 3,715,920.

Hayes, Arthur F.; and Schultz, Robert L., 3,716,696.

Kefalas, John H.; and Loycano, Joseph A., 3,715,793.

Lux, William J., 3,716,613.

Nelson, Lorne W., 3,715,924.

Honeywell Information System: *See—*

Nowell, John R.; and Genuit, Luther L., 3,716,718.

Honeywell Information Systems, Inc., mesne: *See—*

Beard, Albert Le Messurier, 3,716,838.

Hongo, Motoyoshi: *See—*

Ueda, Seinosuke; Nanri, Nobuya; and Hongo, Motoyoshi, 3,716,455.

Honjo, Satoru: *See—*

Fukushima, Osamu; Miyatuka, Hajime; and Honjo, Satoru, 3,716,360.

Hook, Edwin O., to Moleculon Research Corporation. Thioester cross-linking agents. 3,716,466, Cl. 204-159.170.

Hoover Ball and Bearing Company: *See—*

Slominski, Walter V., 3,715,766.

Hopcroft, Francis J. Multi-parameter converting slide rule. 3,716,702, Cl. 235-70.00r.

Hopps, Harvey B.; Jackman, Dennis; and Biel, John H., to Aldrich Chemical Company, Inc. 1 (2-Dibenzofuryl) 4-piperazino butanols. 3,716,539, Cl. 260-268.0tr.

Hornbaker, David R.; and Rall, Dieter L. Temperature measuring method and apparatus. 3,715,923, Cl. 73-361.000.

Hoshino, Nobuo: *See—*

Hosoda, Kirokuro; Kadowaki, Yoshio; Oda, Eisuke; and Hoshino, Nobuo, 3,716,391.

Hoshino, Yutaka; Matsukawa, Koshiro; Nakada, Akira; and Uno, Kazuo, to Nippon Soda Co., Ltd. Process for the production of living oligomer. 3,716,594, Cl. 260-665.00r.

Hosoda, Kirokuro; Kadowaki, Yoshio; Oda, Eisuke; and Hoshino, Nobuo, to Furukawa Electric Company Limited, The. Process for graft polymerization onto organic macromolecular materials. 3,716,391, Cl. 117-47.00a.

Hosono, Hiroo: *See—*

Tatematsu, Kenzo; Hosono, Hiroo; Katagiri, Toshio; Nishikiori, Akira; and Minato, Takashi, 3,716,676.

Houtman, Ary Cornelis: *See—*

Steggerda, Jan Frederik; and Houtman, Ary Cornelis, 3,716,631.

Houze, Gerald L., Jr.; and Osborn, Merlin L., to Allegheny Ludlum Industries, Inc. Method for reducing core losses in silicon steels and the like. 3,716,763, Cl. 317-157.500.

Howard, John; and McIntosh, Terence D., to Rayonier Incorporated. Pure crystalline plicatic acid tetrahydrate and the methyl ester thereof. 3,716,574, Cl. 260-473.00f.

Howarth, Graham Arton; and Gainer, James, to Ciba-Geigy Corporation. 5-Nitrofuryl derivatives. 3,716,555, Cl. 260-310.00r.

Howe Richardson Scale Company: *See—*

Gray, Alden J., 3,716,706.

Howell, Robert B. Presser foot with sideways adjustment. 3,716,008, Cl. 112-240.000.

Hoyne Industries, Inc.: *See—*

Greenberg, Hoyne E.; and Wexler, Max L., 3,715,795.

Hoyt Wire Cloth Company: *See—*

Lumsden, Alexander D., 3,716,138.

Hsieh, Henry L., to Phillips Petroleum Company. Polymerization initiator composition and use thereof. 3,716,495, Cl. 252-431.001.

Huber, John A.; Baringer, Berlyn E.; Bruns, Eilert F.; and Ulewicz, Michael R., to P.A.S.-Artco, Inc. Strip stock uncoiler and straightening device. 3,715,903, Cl. 72-183.000.

- Hubner, Manfred: *See—*
  - Heerdt, Ruth; Hubner, Manfred; Schmidt, Felix Hehmut; and Weyer, Rudi, 3,716,537.
- Hudson, Arthur Franklin. Kinetic energy device for forming work pieces. 3,715,787, Cl. 29-76.000.
- Huffman, Harold W., to Hamilton Tool Company, The. Fluid actuator and lock for printing plate cylinders. 3,715,981, Cl. 101-415.100.
- Hughes Aircraft Company: *See—*
  - Rueffer, Harold F.; and Belard, Richard J., 3,716,765.
  - Scholl, Ronald F.; and Bleha, William P., Jr., 3,716,406.
- Hughes, John Joseph: *See—*
  - Napoli, Louis Sebastian; and Hughes, John Joseph, 3,716,429.
- Humber, David Cedric, to Glaxo Laboratories Limited. N-Deformylation of 3-halomethyl-7b- formamidocephalosporin-1-oxides. 3,716,533, Cl. 260-243.00c.
- Hunt, Martin: *See—*
  - Master, Harvey M.; Nugent, John L.; Hunt, Martin; and Peters, James, 3,716,785.
- Hunter, Don L.: *See—*
  - Strong, Philip L.; Hunter, Don L.; and LeFevre, Cecil W., 3,716,585.
- Hunter, Edwin J., to Moist O'Matic; division of Toro Manufacturing Corporation. Extended range sprinkler head. 3,716,192, Cl. 239-205.000.
- Huntington, Fred R., to Galigher Company, The. Rotary sample collector. 3,716,167, Cl. 222-63.000.
- Hutson, Tom, Jr.; and Carter, Cecil O., to Phillips Petroleum Company. Hydrogen fluoride recovery method. 3,716,593, Cl. 260-653.600.
- Hycel, Inc.: *See—*
  - Moran, John J., 3,716,338.
- Hyer, Val D.: *See—*
  - Hansen, Lindsey B., Jr.; and Hyer, Val D., 3,715,822.
- Hytek International Corporation: *See—*
  - Robertson, Richard G., 3,716,485.
- Ibigawa Electric Industry Co., Ltd.: *See—*
  - Ando, Fumio; Kitahama, Hideharu; and Sugiyama, Kazuhiro, 3,716,440.
- ICI America Inc.: *See—*
  - Courtney, Donald L., 3,715,942.
  - Markiewitz, Kenneth H., 3,716,535.
- ICI Australia Limited: *See—*
  - Adriaan, Hendrik; and Battaerd, Jacobs, 3,716,481.
- Iida, Tadashi: *See—*
  - Kitano, Naohiko; Kamanaka, Akira; Katsuragi, Mamoru; Kobayashi, Tatsuo; and Iida, Tadashi, 3,716,293.
- Ikegami, Yoshisuke: *See—*
  - Matsudo, Kazuo; Osawa, Koichi; and Ikegami, Yoshisuke, 3,716,420.
- Illinois Tool Works Inc.: *See—*
  - Serewicz, Aubrey J., 3,716,092.
- Ilmonen, Leo, to Valmet Oy. Cartridge case ejector in a firearm to be opened by breaking. 3,715,825, Cl. 42-47.000.
- Imperial Chemical Industries Limited: *See—*
  - Colchester, John Edward, 3,716,546.
- Inaba, Hideaki: *See—*
  - Iwami, Ichiro; Matsunaga, Tsutomu; Inouye, Sakae; Fujimori, Makoto; Hayashi, Noriyuki; Wada, Norio; Yoneyama, Ken; and Inaba, Hideaki, 3,716,602.
- Inamine, Shigeo: *See—*
  - Ueno, Ryuzo; Miyazaki, Tetsuya; and Inamine, Shigeo, 3,716,381.
- Inamorato, Jack Thomas, to Colgate-Palmolive Company. Ternary foam control composition and built anionic detergent composition containing same. 3,716,499, Cl. 252-524.000.
- Independent aircraft landing monitor system: *See—*
  - Bechtel, Bartow; and Texas Instruments, Incorporated, 3,716,860.
- Industrial Science & Technology, Agency of: *See—*
  - Kotanigawa, Takeshi; Yamamoto, Mitsuyoshi; and Shimokawa, Katsuyoshi, 3,716,589.
- Industrial Science and Technology, Agency of: *See—*
  - Kamogawa, Hiroyoshi, 3,716,467.
  - Kodera, Yoshihide; Kato, Jun; Shimada, Kazuo; Suzuki, Morio; Ohse, Hidetaka; Ohshima, Satoshi; and Kiriki, Yasunori, 3,716,478.
- Ing, David W.; and Pogge, Hans B., to International Business Machines Corporation. Method of growing an epitaxial layer by controlling autodoping. 3,716,422, Cl. 148-175.000.
- Ingeniorene Lund, Mohr & Giaever-Enger: *See—*
  - Berg, Leif; and Nes, Ragnar Jonas, 3,716,154.
- Ingersoll Milling Machine Company, The: *See—*
  - Ayer, James C., 3,715,788.
- Inland Steel Company: *See—*
  - Carter, William A.; Sievert, William C.; and Munson, James L., 3,716,019.
- Inmont Corporation: *See—*
  - Loew, Frederic Christian, 3,716,502.
- Inouye, Sakae: *See—*
  - Iwami, Ichiro; Matsunaga, Tsutomu; Inouye, Sakae; Fujimori, Makoto; Hayashi, Noriyuki; Wada, Norio; Yoneyama, Ken; and Inaba, Hideaki, 3,716,602.
- Institut de Recherche Scientifique (I.R.S.): *See—*
  - Francois, Raymond; Sarbach, Jacques; Dong, Le Hao; Mizoule, Jacques; and Ricci, Charles, 3,716,642.
- Institut Francais du Petrole des Carburants et Lubrifiants: *See—*
  - Courty, Philippe, 3,716,497.
  - Deschamps, Andre; Franckowiak, Sigismond; and Renault, Philippe, 3,716,620.
  - Lavergne, Michel, 3,716,111.
- Institut Khimicheskoi Fiziki An SSSR: *See—*
  - Berlin, Alfred Anisimovich; Kefeli, Tamara Yakovlevna; Marshavina, Natalia Lvovna; Strongin, Grigory Mikhailovich; Kara-Giaur, Nikolai Vladimirovich; Kolomazov, Boris Ivanovich; Efimov, Alexei Vasilievich; Bodrova, Aglaida Nikolaevna; and Altshuler, Judif arkovna, 3,716,571.
- Instrument Specialties Company, Inc.: *See—*
  - Stickney, Fernald S., 3,715,916.
- Integrated Air Systems, Inc.: *See—*
  - Kelso, Francis; and Gustin, Arnold J., 3,715,972.
- International Business Machines Corporation: *See—*
  - Almasi, George S.; Keefe, George E.; Lin, Yeong S.; and Thompson, David A., 3,716,781.
  - Belady, Laszlo Antal; Evangelisti, Carlo John; and Roth, Rogert Ingersoll, 3,716,842.
  - Brodsky, Marc H., 3,716,844.
  - Brown, Alan V.; and Hochberg, Frederick, 3,715,785.
  - Fisher, Donald E.; and Pleshko, Peter, 3,716,850.
  - Greeson, James C., Jr., 3,716,661.
  - Ing, David W.; and Pogge, Hans B., 3,716,422.
  - Kovac, Zlata; and Olsen, Judith D., 3,716,464.
  - Lynch, George W.; and Zarowin, Charles B., 3,716,777.
  - Parrish, James T.; Spampinato, Dominic P.; and Terman, Lewis M., 3,716,724.
  - Raider, Jerry W., 3,715,978.
  - Sha, Richard T.; and Tang, Donald T., 3,716,807.
  - Waddell, James M., 3,716,837.
- International Flavors & Fragrances Inc.: *See—*
  - Hall, John B., 3,716,498.
- International Flavors and Fragrances Inc.: *See—*
  - Hall, John B., 3,716,543.
- International Harvester Company: *See—*
  - Ebey, Edward W., 3,715,935.
- International Paper Company: *See—*
  - Roymoulik, Sunanada K., 3,716,448.
- International Standard Electric Corporation: *See—*
  - Beguin, Daniel Edmond, 3,716,856.
  - Scaddan, Ernest Victor; and Heard, Alan Clifford, 3,716,080.
- International Telephone and Telegraph Corporation: *See—*
  - Beeli, Johann Battesta, 3,716,738.
  - LeGrand, Jesse S., 3,716,857.
  - Schlatter, Gerald Lance, 3,715,912.
- Irving, Putter, to Merck & Co., Inc. Deuterated l-amino acid mixture. 3,716,551, Cl. 260-309.000.
- Ishihara, Yasushi: *See—*
  - Fukushima, Yoshikiyo; Ishihara, Yasushi; Momota, Kenzo; Usui, Yasuo; Sakumura, Tuyoshi; Sogo, Satoru; and Nunokawa, Koji, 3,716,210.
- Ishikawa, Makoto: *See—*
  - Matsumoto, Koichi; and Ishikawa, Makoto, 3,716,300.
- Itaya, Nobushige; and Mizutani, Toshio, to Sumitomo Chemical Company Ltd. 5-Propargyl thenyl alcohols. 3,716,558, Cl. 260-332.30r.
- Itaya, Nobushige; Mizutani, Toshio; Kitamura, Shigeyoshi; Okuno, Yoshitosi; and Fujimoto, Keimei, to Sumitomo Chemical Company, Ltd. 4,5-Tetramethylene furfuryl and 4,5-tetramethylene- 3-furylmethyl chrysanthemates. 3,716,560, Cl. 260-346.200.
- Itek Corporation: *See—*
  - La Follette, Robert J., 3,716,853.
- ITT Industries, Inc.: *See—*
  - Delembre, Andre Emile; and Jarrige, Georges Roger (said Delembre and said Nguyen assors. to), 3,716,744.
  - Frigger, Heinz, 3,716,121.
- Iwami, Ichiro; Matsunaga, Tsutomu; Inouye, Sakae; Fujimori, Makoto; Hayashi, Noriyuki; Wada, Norio; Yoneyama, Ken; and Inaba, Hideaki, to Bridgestone Tire Company Limited. Heat resistant elastomer compositions. 3,716,602, Cl. 260-889.000.
- Iwata, Hiroshi, to West Electric Co., Ltd. Electronic flash intensity control circuits. 3,716,752, Cl. 315-151.000.
- Iwatsu Electric Company, Ltd.: *See—*
  - Wakabayashi, Hajime, 3,716,297.
- Jackman, Dennis: *See—*
  - Hopps, Harvey B.; Jackman, Dennis; and Biel, John H., 3,716,539.
- Jackson, Thomas J.; Weltsch, Dan A.; and Beattie, Stephen J., to Wik-It Electronics Corporation. Method for solder removal. 3,715,797, Cl. 29-426.000.
- Jacobs, Christopher A. Capacitive discharge ignition system. 3,716,037, Cl. 123-148.00e.
- Jacobson, Robert L.; and Vanselow, Robert D., to Chevron Research Company. Low pressure regenerative reforming process. 3,716,477, Cl. 208-139.000.
- Jacquet, Raymond, to Thomson-CSF. Data code conversion for remote signalling and control systems. 3,716,836, Cl. 340-167.00r.
- Jahn, Eberhard: *See—*
  - Springer, Reinhard; Drescher, Kurt; and Jahn, Eberhard, 3,716,296.
- Janeke, Charl E., to Tracoustics, Inc. Apparatus and method for rotationally inducing and measuring nystagmus. 3,716,046, Cl. 128-2.10r.
- Jansson, Sven A.: *See—*
  - Yannopoulos, Lymperios N.; Jansson, Sven A.; and Gulbransen, Earl, 3,716,491.
- Japs, Alfred: *See—*
  - Schweikl, Ludwig; and Japs, Alfred, 3,716,207.

- Jarco Services Ltd.: *See—*
  - Griffith, William Earl, 3,716,109.
- Jarrige, Georges Roger: *See—*
  - Delembre, Andre Emile; and Jarrige, Georges Roger, 3,716,744.
- Jarrige, Jeannine Germaine: *See—*
  - Delembre, Andre Emile; and Jarrige, Georges Roger, 3,716,744.
- Jasaitis, Tadas K.: *See—*
  - Pall, David B.; and Jasaitis, Tadas K., 3,716,436.
- JBF Scientific Corporation: *See—*
  - Bianchi, Ralph A., 3,716,142.
- JENer Glaswerke Schatt & Gen.: *See—*
  - Ritze, Willy, 3,716,385.
- Jenkins, Cecil: *See—*
  - Woolslayer, Homer J.; Woolslayer, Joseph R.; Jenkins, Cecil; and Campbell, Erwin A., 3,716,155.
- Jenkins, Terry Allen: *See—*
  - Sherman, James Webster; and Jenkins, Terry Allen, 3,716,077.
- Jenn-Air Corporation: *See—*
  - Field, Thomas R., 3,715,967.
- Jensen, Darwin P. Copper plating on zinc and its alloys. 3,716,462, Cl. 204-38.00b.
- Jensen, Stephen F.; and Meyer, William A., to American Can Company. Method of making a container body. 3,716,435, Cl. 156-195.000.
- Jerchel, Dietric: *See—*
  - Ost, Walter; Thomas, Klaus; Jerchel, Dietric; and Appel, Karl-Richard, 3,716,587.
- Jobkes, Jakob: *See—*
  - Motek, Herbert; and Jobkes, Jakob, 3,716,196.
- Johnk, Poul, to Novo Terapeutisk Laboratorium A/S. Hexahydrophenanthrene derivatives. 3,716,578, Cl. 260-488.0cd.
- Johns-Manville Corporation: *See—*
  - Sherman, James Webster; and Jenkins, Terry Allen, 3,716,077.
- Johnson & Johnson: *See—*
  - Dean, William Bruce, 3,716,446.
- Johnson, Alfred D., to GTE Sylvania Incorporated. Support and high voltage protective means for a cathode ray tube. 3,716,662, Cl. 178-7.800.
- Johnson, Charles R.: *See—*
  - Gross, Leonard B.; Johnson, Charles R.; and Nattsas, Stephen C., 3,715,914.
- Johnson, Clarence S.; and Langguth, Arthur F., to United States of America, Navy. Anti-shark drogue dart. 3,715,828, Cl. 43-6.000.
- Johnson, Donald A.; Milani, Louis V.; and Massini, Anthony L., to Micron Research and Development Corporation. Exercise apparatus for attachment to an overhead frame. 3,716,232, Cl. 272-63.000.
- Johnson, Gene A.: *See—*
  - Gorgie, Frank J.; and Johnson, Gene A., 3,716,832.
- Johnson, Leroy J., to Kidde, Walter, & Company, Inc. Dual position hydraulic outrigger assembly. 3,716,252, Cl. 280-150.500.
- Johnson, Ray M., to Microdry Corporation, mesne. Reflector and waveguide applicator. 3,716,688, Cl. 219-10.550.
- Johnson, Stuart J., to Barber-Colman Company. Hob. 3,715,789, Cl. 29-103.00b.
- Johnson, William, Jr. Coupling for securing a lamp in a lampholder. 3,716,816, Cl. 339-53.000.
- Johnston, Furnie W. Olecranon plate. 3,716,050, Cl. 128-92.00d.
- Johnston, John, to Scholl, Inc. Stabilized surgical adhesive. 3,716,503, Cl. 260-3.000.
- Jones, Allen Jacob, to Community Bank, The. Refractory damper for high temperature or corrosive gases. 3,716,004, Cl. 110-163.000.
- Jones, Benjamin; and Jones, Rosetta M. Smog eliminator. 3,715,871, Cl. 55-227.000.
- Jones, Clifford M., to General Electric Company. Line feed-print inhibit system. 3,716,841, Cl. 340-172.500.
- Jones, Derick: *See—*
  - Creagh, Linda T.; Jones, Derick; and Lu, Sun, 3,716,289.
- Jones, Evan L., to Chrysler Corporation. Differential bearing preload lock. 3,715,936, Cl. 74-713.000.
- Jones, Faber B.: *See—*
  - Brady, Donnie G.; Deck, Harold R.; Jones, Faber B.; and Underwood, John H., 3,716,601.
- Jones, Howell A., Jr.: *See—*
  - Eckert, Alton B., Jr.; and Jones, Howell A., Jr., 3,716,699.
- Jones, Orlando: *See—*
  - Gilligan, William H.; McDonnell, Chilton H.; and Jones, Orlando, 3,716,550.
- Jones, Rosetta M.: *See—*
  - Jones, Benjamin; and Jones, Rosetta M., 3,715,871.
- Jones, William J., to Westinghouse Electric Corporation. Gas monitoring apparatus. 3,716,337, Cl. 23-254.00e.
- Jones, William S.: *See—*
  - Webb, William R.; Jones, William S.; and Hendrix, Robert E., 3,716,859.
- Jonsson, Dan Olof; deceased (by Jonsson, Kajsa Greta; administratrix). Tape calculator. 3,716,187, Cl. 235-71.00a.
- Jonsson, Kajsa Greta: *See—*
  - Jonsson, Dan Olof, 3,716,187.
- Jordan, Paul. Multiple layer outside wall of a building or th like. 3,715,848, Cl. 52-235.000.
- Joustra, Pieter Karel: *See—*
  - Dekker, Cornelis; Joustra, Pieter Karel; and Paro, Heemskerk, 3,716,316.
- Julian, Randall K.; and Gach, Peter R., to Sunbeam Plastics Corporation. Safety closure for a medicine bottle or the like. 3,716,161, Cl. 215-9.000.
- Kabushiki Kaisha Morita Seisakusho: *See—*
  - Sato, Kenzo, 3,716,247.
- Kadowaki, Yoshio: *See—*
  - Hosoda, Kirokuro; Kadowaki, Yoshio; Oda, Eisuke; and Hoshino, Nobuo, 3,716,391.
- Kahn, Manfred, to Sprague Electric Company. Electrical device having ohmic or low loss contacts. 3,716,407, Cl. 117-224.000.
- Kali-Chemie A.G.: *See—*
  - Peuschel, Gerd; and Hagedorn, Fritz, 3,716,333.
- Kalle Aktiengesellschaft: *See—*
  - Marx, Gerhard, 3,716,755.
- Kaltenbach, Dieter. Feed control apparatus for a rotary tool. 3,715,946, Cl. 83-72.000.
- Kalvoda, Jaroslav: *See—*
  - Anner, Georg; and Kalvoda, Jaroslav, 3,716,637.
  - Anner, Georg; and Kalvoda, Jaroslav, 3,716,638.
- Kamachi, Shin-Ichi: *See—*
  - Totsuka, Yasushi; and Kamachi, Shin-Ichi, 3,716,839.
- Kamanaka, Akira: *See—*
  - Kitano, Naohiko; Kamanaka, Akira; Katsuragi, Mamoru; Kobayashi, Tatsuo; and Iida, Tadashi, 3,716,293.
- Kameda, Nobuyuki: *See—*
  - Fujinami, Akira; Ozaki, Toshiaki; Akiba, Keiichiro; Yamamoto, Sigeo; Nodera, Katsuji; Tanaka, Katsutoshi; Kameda, Nobuyuki; and Ooishi, Tadashi, 3,716,552.
- Kameoka, Akio; and Nakamura, Shinichi, to Tokyo Shibaura Electric Co., Ltd. Musical sound generating system with burst signals. 3,716,647, Cl. 84-1.110.
- Kamijo, Hirotaka: *See—*
  - Okumura, Shinji; Yoshinaga, Fumihiro; Kubota, Koji; and Kamijo, Hirotaka, 3,716,453.
- Kaminski, William: *See—*
  - Brown, Earl Franklin; and Kaminski, William, 3,716,789.
- Kamogawa, Hiroyoshi, to Industrial Science and Technology, Agency of. Process for the radiation insolubilization of N-(vinyl) phenylacrylamide. 3,716,467, Cl. 204-159.180.
- Kaneko, Hiroyuki: *See—*
  - Ohe, Keitaro; Nishio, Daijiro; Sadamtsu, Shigeru; and Kaneko, Hiroyuki, 3,716,505.
- Kaneko, Tatsuhiko: *See—*
  - Kitamura, Kunpei; Kaneko, Tatsuhiko; Yamamoto, Yasushi; and Kuroiwa, Yoshiro, 3,716,452.
- Kannenberg, Arnold H., to Lemco Plastics, Inc. Reflector for marking driveways and the like. 3,716,288, Cl. 350-97.000.
- Kanunov, Mikhail Alexeevich: *See—*
  - Belkin, Nikolai Vasilievich; Alexandrovich, Eduard-Gely Vitalievich; Razin, Anatoly Alexandrovich; Kanunov, Mikhail Alexeevich; Tsukerman, Veniamin Aronovich; Sloeva, Galina Nikolaevna; Tsvetkov, Leonard Vasilievich; and Dron, Ninel Alexeevna, 3,716,737.
- Kaplan, Mitchell M. Therapeutic traction apparatus. 3,716,049, Cl. 128-75.000.
- Kara-Giaur, Nikolai Vladimirovich: *See—*
  - Berlin, Alfred Anisimovich; Kefeli, Tamara Yakovlevna; Marshavina, Natalia Lvovna; Strongin, Grigory Mikhailovich; Kara-Giaur, Nikolai Vladimirovich; Kolomazov, Boris Ivanovich; Efimov, Alexei Vasilievich; Bodrova, Aglaida Nikolaevna; and Altshuler, Judif arkovna, 3,716,571.
- Karau, Claus-Dieter: *See—*
  - Oberste-Berghaus, Gerhard; and Karau, Claus-Dieter, 3,716,625.
- Karr, Earl C., to Motorola, Inc. Speaker housing. 3,716,671, Cl. 179-1.00e.
- Kasuya, Kazuhiko: *See—*
  - Ohta, Wasaburo; and Kasuya, Kazuhiko, 3,716,018.
- Katagiri, Toshio: *See—*
  - Tatematsu, Kenzo; Hosono, Hiroo; Katagiri, Toshio; Nishikiori, Akira; and Minato, Takashi, 3,716,676.
- Kato, Jun: *See—*
  - Kodera, Yoshihide; Kato, Jun; Shimada, Kazuo; Suzuki, Morio; Ohse, Hidetaka; Ohshima, Satoshi; and Kiriki, Yasunori, 3,716,478.
- Katsuragi, Mamoru: *See—*
  - Kitano, Naohiko; Kamanaka, Akira; Katsuragi, Mamoru; Kobayashi, Tatsuo; and Iida, Tadashi, 3,716,293.
- Kaucher, Erwin K.: *See—*
  - Grauer, Oscar H.; Seglem, Omund A.; and Kaucher, Erwin K., 3,715,921.
- Kauder, Otto S.: *See—*
  - Brecker, Lawrence R.; and Kauder, Otto S., 3,716,568.
- Kausche, Helmold, to Siemens Aktiengesellschaft. Cathode atomization apparatus. 3,716,472, Cl. 204-298.000.
- Kawai, Yasutaka: *See—*
  - Takei, Toru; Kawai, Yasutaka; and Matsushima, Takeshi, 3,716,751.
- Kawamura, Tamio: *See—*
  - Kuwana, Noriaki; Kawamura, Tamio; and Fukumura, Masayuki, 3,716,454.
- Kawano, Toshihiko; Yamaoka, Takashi; Maruo, Keiichi; and Furutaka, Yasuhisa, to Daikin Kogyo Company Limited. Antimicrobially active substances and their production. 3,716,643, Cl. 424-286.000.
- Kawasaki Steel Corporation: *See—*

  - Ooi, Hiroshi; and Nakato, Hakaru, 3,716,352.
- Kawase, Kouzo: *See—*
  - Nagasawa, Taro; Kawashima, Takuji; Suzuki, Kiyoshi; and Kawase, Kouzo, 3,716,408.
- Kawashima, Takuji: *See—*
  - Nagasawa, Taro; Kawashima, Takuji; Suzuki, Kiyoshi; and Kawase, Kouzo, 3,716,408.
- Kaye, Gordon E., to Mallory, P. R., & Co., Inc. Flashlight with reserve cell. 3,716,708, Cl. 240-10.60r.
- Keating, Richard T. Cooking fat filter with fast start-up. 3,716,140, Cl. 210-167.000.
- Keck, Max H., to Goodyear Tire & Rubber Company, The. Sulfophenylindan dicarboxylic acid and derivatives thereof. 3,716,582, Cl. 260-507.00r.
- Keefe, George E.: *See—*
  - Almasi, George S.; Keefe, George E.; Lin, Yeong S.; and Thompson, David A., 3,716,781.
- Kefalas, John H.; and Loycano, Joseph A., to Honeywell Inc. Plated super-coat and electrolyte. 3,715,793, Cl. 29-194.000.
- Kefeli, Tamara Yakovlevna: *See—*
  - Berlin, Alfred Anisimovich; Kefeli, Tamara Yakovlevna; Marshavina, Natalia Lvovna; Strongin, Grigory Mikhailovich; Kara-Giaur, Nikolai Vladimirovich; Kolomazov, Boris Ivanovich; Efimov, Alexei Vasilievich; Bodrova, Aglaida Nikolaevna; and Altshuler, Judif arkovna, 3,716,571.
- Keith, M. Robert; and Barnes, Richard C., to Stone Industrial Corporation. Electric motor with corrugated plastic protective covering on the lead wires. 3,716,733, Cl. 310-71.000.
- Kelch, Heinz; and Schuh, Eduard, to Kienzle Apparate G.m.b.H. Taximeter drive with constant time drive speed. 3,716,185, Cl. 235-30.00r.
- Kelch, Heinz; Krickl, Josef; Schuh, Eduard; and Spauszus, Siegfried, to Kienzle Apparate GmbH. Instrument for automatically making evaluations from recording charts. 3,716,700, Cl. 235-61.60a.
- Kelley, Elmer G. Free fulcrumed lever action for the cutting wheel pipe cutter. 3,715,804, Cl. 30-102.000.
- Kelley, James O.: *See—*
  - Propst, Robert L.; and Kelley, James O., 3,716,282.
- Kelly, Raymond A.: *See—*
  - Brodsky, Stuart A.; and Kelly, Raymond A., 3,716,056.
- Kelp, Fritz; and Pohl, Hans-Heinrich, to Kraftwerk Union Aktiengesellschaft. Air condensation plant. 3,716,097, Cl. 165-39.000.
- Kelso, Francis; and Gustin, Arnold J., to Integrated Air Systems, Inc. Clean work station. 3,715,972, Cl. 98-115.0lh.
- Kemp Products Limited: *See—*
  - Bazett, Patrick Seymour, 3,716,606.
- Kempster, Edward, to National Research Development. Process for dispersing fiber in an aqueous mix. 3,716,386, Cl. 106-90.000.
- Kenway Engineering Inc., mesne: *See—*
  - Park, Richard J., 3,715,992.
- Kessler, Rudolf: *See—*
  - Hofer, Kurt; and Kessler, Rudolf, 3,716,586.
- Ketchledge, Raymond Waibel, to Bell Telephone Laboratories, Incorporated. Selective oscillator mixer for a superheterodyne receiver. 3,716,792, Cl. 325-438.000.
- Kidde, Walter, & Company, Inc.: *See—*
  - Johnson, Leroy J., 3,716,252.
- Kido, Shigehiro: *See—*
  - Shigaki, Masanobu; Kido, Shigehiro; and Chiba, Yoshikazu, 3,716,339.
- Kienzle Apparate GmbH: *See—*
  - Hauger, Josef, 3,716,695.
  - Kelch, Heinz; and Schuh, Eduard, 3,716,185.
  - Kelch, Heinz; Krickl, Josef; Schuh, Eduard; and Spauszus, Siegfried, 3,716,700.
  - Volckari, Peter; Lehmann, Hartmut; and Hafner, Raimund, 3,716,846.
- Kikuchi, Seiki: *See—*
  - Kuriyama, Sigeru; and Kikuchi, Seiki, 3,716,767.
- Kim, Charles W., to Hercules Incorporated. Process for making chenille-type yarn. 3,715,878, Cl. 57-156.000.
- Kimura, Sadao: *See—*
  - Mizuno, Hideo; Kimura, Sadao; Akutsu, Hidezo; Yamazaki, Haruo; Okamoto, Takio; Watarai, Yoshiaki; and Baba, Shoichi, 3,716,743.
- King, Cary Judson III: *See—*
  - Chandrasekaran, Santosh K.; and King, Cary Judson III, 3,716,382.
- King, Leonard Tony, to Speedine Partnership. Food heating device. 3,715,975, Cl. 99-331.000.
- King, William M., to Aerojet-General Corporation. Apparatus for the production of anhydrous spherical ammonium perchlorate useful in rocket propellants. 3,716,315, Cl. 18-2.600.
- Kinoshita, Kazuhisa: *See—*
  - Mimino, Tohru; Kinoshita, Kazuhisa; Tanaka, Ryohei; and Shinoda, Takayuki, 3,716,353.
- Kiriki, Yasunori: *See—*
  - Kodera, Yoshihide; Kato, Jun; Shimada, Kazuo; Suzuki, Morio; Ohse, Hidetaka; Ohshima, Satoshi; and Kiriki, Yasunori, 3,716,478.
- Kirin Beer Kabushiki Kaisha; a/k/a Kirin Brewery Co., Ltd.: *See—*
  - Kitamura, Kunpei; Kaneko, Tatsuhiko; Yamamoto, Yasushi; and Kuroiwa, Yoshiro, 3,716,452.
- Kirkpatrick, George A. Method and apparatus for lifting one end of a roll of carpeting or the like. 3,716,216, Cl. 254-139.100.
- Kishimoto, Hiroshi; Kobayashi, Kenzo; Hamazaki, Yoshiharu; and Danno, Mituaki, to Mitsubishi Denki Kabushiki Kaisha. Method and apparatus for measuring the flow rate of electrically conductive fluids. 3,715,919, Cl. 73-194.00e.
- Kiss, Bela: *See—*
  - Domokos, Jozsef; Benedek, Gyorgy; Kiss, Bela; Winkler, Laszlo; and Beller, Zoltan, 3,716,473.
- Kistner, Hermann, to Maschinebau Oppenweiler GmbH. Sheet feeder. 3,716,226, Cl. 271-31.000.
- Kitahama, Hideharu: *See—*
  - Ando, Fumio; Kitahama, Hideharu; and Sugiyama, Kazuhiro, 3,716,440.
- Kitamura, Kazuo; Takabayashi, Fumiki; and Shibata, Fumio, to Teijin Limited. Dyeing synthetics using roller coated molten dye compositions. 3,716,330, Cl. 8-169.000.
- Kitamura, Kunpei; Kaneko, Tatsuhiko; Yamamoto, Yasushi; and Kuroiwa, Yoshiro, to Kirin Beer Kabushiki Kaisha; a/k/a Kirin Brewery Co., Ltd. Lysis of yeast cell walls. 3,716,452, Cl. 195-2.000.
- Kitamura, Shigeyoshi: *See—*
  - Itaya, Nobushige; Mizutani, Toshio; Kitamura, Shigeyoshi; Okuno, Yoshitosi; and Fujimoto, Keimei, 3,716,560.
- Kitano, Naohiko; Kamanaka, Akira; Katsuragi, Mamoru; Kobayashi, Tatsuo; and Iida, Tadashi, to Minolta Camera Kabushiki Kaisha. Film transport device for a projector. 3,716,293, Cl. 353-103.000.
- Kittrell, James R.: *See—*
  - Csicsery, Sigmund M.; and Kittrell, James R., 3,716,475.
- Klach, Stanley J.: *See—*
  - Stueber, Richard J.; and Klach, Stanley J., 3,716,398.
- Klebe, Hans; Meffert, Alfred; Lange, Ludwig; Fratzer, Gerhard; and Dahm, Franz-Ludwig, to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. Process for the production of chlorine. 3,716,628, Cl. 423-507.000.
- Klees, Gerard T., to General Motors Corporation. Vehicle pitch control device. 3,716,251, Cl. 280-124.00f.
- Klemchuk, Peter: *See—*
  - Komninos, John; Klemchuk, Peter; and Ham, George, 3,716,329.
- Klimkiewicz, Bruno; and Weirich, Walter, to Gewerkschaft Eisenhutte Westfalia. Non-return valve devices. 3,716,070, Cl. 137-484.200.
- Klingbeil, Donald L. Wire spool and support with inherent drag brake. 3,716,204, Cl. 242-156.000.
- Klockner-Humboldt-Deutz Aktiengesellschaft: *See—*
  - Koenig, Walter; Adams, Heribert; and Heidjann, Franz, 3,716,104.
  - Oberlander, Georg, 3,716,305.
- KMS Industries, Inc.: *See—*
  - Hansen, Richard R., 3,716,307.
- Knapp, Heinrich: *See—*
  - Adler, Karl-Heinz; Knapp, Heinrich; and Eckert, Konrad, 3,716,035.
- Knapp, Weber, Company: *See—*
  - Little, Carl H., 3,716,283.
- Knauseder, Franz; and Brandl, Ernst, to Biochemie Gesellschaft m.b.H. Ester derivatives of pleuromutilin. 3,716,579, Cl. 260-488.00b.
- Knechtel, Wilhelm Josef; and Schaffer, Detlef, to Canon Kabushiki Kaisha. Photocopying apparatus. 3,715,944, Cl. 83-58.000.
- Knechtel, Wilhelm Josef; and Schaffer, Detlef, to Canon Kabushiki Kaisha. Electrostatic quick copying apparatus. 3,716,294, Cl. 355-3.000.
- Knerr, Reinhard Heinrich, to Bell Telephone Laboratories, Incorporated. Delta connected lumped element circulator. 3,716,805, Cl. 333-1.100.
- Kniese, Wilhelm; Nienburg, Hans Juergen; Himmele, Walter; and Aquila, Werner, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Separation of metal carbonyl catalysts from oxo reaction mixtures. 3,716,626, Cl. 423-418.000.
- Knight, Benjamin Henry: *See—*
  - White, David John; and Knight, Benjamin Henry, 3,715,817.
- Knight, Howard Richard James, to Carrier Engineering Company Limited. Liquid spraying guns. 3,716,191, Cl. 239-112.000.
- Knorr-Bremse GmbH: *See—*
  - Becker, Rudolf, 3,716,123.
- Knudtson, John P.: *See—*
  - Voskuil, Donald J.; Knudtson, John P.; and Krupp, Myron J., 3,716,389.
- Kobald, Walter, to Bosch, Robert, G.m.b.H. Hydraulic system. 3,716,308, Cl. 417-286.000.
- Kobayashi, Kenzo: *See—*
  - Kishimoto, Hiroshi; Kobayashi, Kenzo; Hamazaki, Yoshiharu; and Danno, Mituaki, 3,715,919.
- Kobayashi, Takehiko: *See—*
  - Suenaga, Masanobu; Machii, Tetsuo; Sawano, Takahiro; Kobayashi, Takehiko; Dengo, Tadao; and Nakai, Tetsuzo, 3,715,802.
- Kobayashi, Tatsuo: *See—*
  - Kitano, Naohiko; Kamanaka, Akira; Katsuragi, Mamoru; Kobayashi, Tatsuo; and Iida, Tadashi, 3,716,293.
- Kobayashi, Toyoaki; Sakakibara, Naoji; and Kondo, Toshio, to Aisin Seiki Kabushiki Kaisha. Warning device for indicating wear of friction pads in disk brake. 3,716,113, Cl. 188-1.00a.
- Kochavi, Jacob. Method of making a casting having an oxidized surface layer intended for use as a dental restoration. 3,716,418, Cl. 148-6.300.
- Kodera, Yoshihide; Kato, Jun; Shimada, Kazuo; Suzuki, Morio; Ohse, Hidetaka; Ohshima, Satoshi; and Kiriki, Yasunori, to Industrial Science and Technology, Agency of. Hydrogenation treatment of hydrocarbon oil. 3,716,478, Cl. 208-152.000.

- Koebler, William F.; and Frank, Dale A., to Salsbury Laboratories. Package for frangible articles. 3,716,133, Cl. 206-65.00a.
- Koenig, Walter; Adams, Heribert; and Heidjann, Franz, to Klockner-Humboldt-Deutz Aktiengesellschaft. Control device for the power lifting installation of a tractor. 3,716,104, Cl. 172-7.000.
- Kofluk, Russell Peter: *See—*
  - Weir, Donald Robert; and Kofluk, Russell Peter, 3,716,618.
- Koga, Taro; Egusa, Taku; and Miyatani, Yoshihiko, to Mitsubishi Jukogyo Kabushiki Kaisha. Method of erecting tower-like structure. 3,715,852, Cl. 52-745.000.
- Kohler, Robert D.: *See—*
  - Birner, Richard A.; Kohler, Robert D.; and Lang, Stewart M., 3,716,136.
- Kokusai Denshin Denwa Co., Ltd.: *See—*
  - Muratani, Takuro; Okawa, Michihisa; and Nakamura, Hiroshi, 3,716,802.
- Kollgus, Heinrich: *See—*
  - Simon, Horst; and Kollgus, Heinrich, 3,715,960.
- Kolomazov, Boris Ivanovich: *See—*
  - Berlin, Alfred Anisimovich; Kefeli, Tamara Yakovlevna; Marshavina, Natalia Lvovna; Strongin, Grigory Mikhailovich; Kara-Giaur, Nikolai Vladimirovich; Kolomazov, Boris Ivanovich; Efimov, Alexei Vasilievich; Bodrova, Aglaida Nikolaevna; and Altshuler, Judif arkovna, 3,716,571.
- Kolsky, Rodger E.; and Chase, Vernon Lindsay, to Stevens, J. P., & Co., Inc. Textile fabric cleaning compositions. 3,716,488, Cl. 252-155.000.
- Komatsuzaki, Yoshinori: *See—*
  - Mochizuki, Takashi; Komatsuzaki, Yoshinori; Hara, Satoshi; Nojima, Hideo; Shimizu, Tamio; and Suzuki, Shigeo, 3,715,945.
- Komninos, John; Klemchuk, Peter; and Ham, George, to Ciba-Geigy Corporation. Dyeing polyacrylonitrile with basic dyestuff and alkoxymethyl quaternary ammonium compounds. 3,716,329, Cl. 8-169.000.
- Kondo, Toshio: *See—*
  - Kobayashi, Toyoaki; Sakakibara, Naoji; and Kondo, Toshio, 3,716,113.
- Konigslehner, Franz; and Plihal, Hanns, to Vockenhuber, Karl and Hauser, Raimund. Cam barrel for holding at least one displaceable lens element. 3,715,929, Cl. 74-567.000.
- Koninklijke Nederlandsche Hoogovens en Staalfabrieken N.V.: *See—*
  - Dekker, Cornelis; Joustra, Pieter Karel; and Paro, Heemskerk, 3,716,316.
- Korn, Meyer. Combination bag and closure. 3,716,182, Cl. 229-62.000.
- Kornblum, Saul S.: *See—*
  - Lopez, Benito; and Kornblum, Saul S., 3,716,388.
- Korpel, Adrianus, to Zenith Radio Corporation. Frequency domain image processing apparatus. 3,716,659, Cl. 178-7.30d.
- Kotanigawa, Takeshi; Yamamoto, Mitsuyoshi; and Shimokawa, Katsuyoshi, to Industrial Science & Technology, Agency of. Process for the synthesis of 2,6-dimethylphenols. 3,716,589, Cl. 260-621.00r.
- Koterwas, Donald J.; and Koterwas, Theodore L. Game apparatus. 3,716,233, Cl. 273-1.00l.
- Koterwas, Theodore L.: *See—*
  - Koterwas, Donald J.; and Koterwas, Theodore L., 3,716,233.
- Kovac, Zlata; and Olsen, Judith D., to International Business Machines Corporation. Method for electrodeposition of alloy film of a given composition from a given solution. 3,716,464, Cl. 204-43.000.
- Kracke, Wolfgang Karl Heinrich: *See—*
  - Sansoni, Bruno Otto; and Kracke, Wolfgang Karl Heinrich, 3,716,566.
- Kraftwerk Union Aktiengesellschaft: *See—*
  - Kelp, Fritz; and Pohl, Hans-Heinrich, 3,716,097.
- Krakowski, John F., to Mark 7 Seafood and Industries, Inc., mesne. Commercial food fryer and method of cleaning. 3,715,976, Cl. 99-404.000.
- Kramer, Willi: *See—*
  - Erb, Edgar; Habiger, Walter; Kramer, Willi; Pfeil, Wolfgang; and Weigele, Reinhold, 3,715,979.
- Kratzert, Friedrich, to Windmoller & Holscher. Apparatus for flattening and taking away blown tubing of plastics material. 3,716,322, Cl. 425-392.000.
- Kraus, Artur, to Siemens Aktiengesellschaft. Klystron. 3,716,746, Cl. 315-5.350.
- Krickl, Josef: *See—*
  - Kelch, Heinz; Krickl, Josef; Schuh, Eduard; and Spauszus, Siegfried, 3,716,700.
- Krubiner, Alan Martin; and Oliveto, Eugene Paul, to Hoffmann-La Roche Inc. Halogenation of steroids. 3,716,530, Cl. 260-239.55c.
- Kruger, Hermann, to Volkswagenwerk Aktiengesellschaft. Valve actuating assembly. 3,716,036, Cl. 123-90.430.
- Kruger, Wilfried: *See—*
  - Ritzmann, Horst; and Kruger, Wilfried, 3,716,095.
- Krupp, Myron J.: *See—*
  - Voskuil, Donald J.; Knudtson, John P.; and Krupp, Myron J., 3,716,389.
- Krusche, Erwin: *See—*
  - Engelhardt, Friedrich; Heid, Christian; Gunzert, Willi; Krusche, Erwin; and Meyer, Artur, 3,716,525.
- Krusling, Kenneth R.: *See—*
  - Runge, John N.; and Krusling, Kenneth R., 3,716,756.
- Kubota, Koji: *See—*
  - Okumura, Shinji; Yoshinaga, Fumihiro; Kubota, Koji; and Kamijo, Hirotaka, 3,716,453.
- Kuenstler, Hans-George: *See—*
  - Civardi, Frank Peter; and Kuenstler, Hans-George, 3,716,397.
- Kunkel, Donald H.; and Seymour, Donald E. Algaecide composition having improved stability. 3,716,351, Cl. 71-67.000.
- Kuraray Co., Ltd.: *See—*
  - Shirano, Kenji; and Yoshitake, Toshihiko, 3,716,396.
- Kureha Kagaku Kogyo Kabushiki Kaisha: *See—*
  - Otani, Sugio, 3,716,607.
- Kurihara, Masaru: *See—*
  - Yoda, Naoya; Kurihara, Masaru; Dokoshi, Noriaki; Tanaka, Chiaki; and Eguchi, Masaomi, 3,716,519.
- Kuriyama, Sigeru; and Kikuchi, Seiki, to Hitachi, Ltd. Control device for electric automobiles including accelerator position and current feedback. 3,716,767, Cl. 318-139.000.
- Kuroiwa, Yoshiro: *See—*
  - Kitamura, Kunpei; Kaneko, Tatsuhiko; Yamamoto, Yasushi; and Kuroiwa, Yoshiro, 3,716,452.
- Kurz, Firma, GmbH: *See—*
  - Kurz, Rudolf, 3,716,271.
- Kurz, Rudolf, to Kurz, Firma, GmbH. Folding-furniture piece. 3,716,271, Cl. 297-457.000.
- Kuwana, Noriaki; Kawamura, Tamio; and Fukumura, Masayuki, to Eisai Kabushiki Kaisha. Process for the production of α-aminobenzylphenicillin. 3,716,454, Cl. 195-30.000.
- Kyle, Martin L.: *See—*
  - Cairns, Elton J.; Kyle, Martin L.; and Shimotake, Hiroshi, 3,716,409.
- La Follette, Robert J., to Itek Corporation. Airborne radar detecting and recording system. 3,716,853, Cl. 343-5.0pr.
- Laba, Eng. Mircea: *See—*
  - Caraculacu, Adrian, Dr.-Eng.; Petrus, Eng. Alla; and Laba, Eng. Mircea, 3,716,590.
- Labat, Yves: *See—*
  - Esclamadon (, Christian; Labat, Yves; and Signouret, Jean-Baptiste, 3,716,588.
- Labatt, John Limited: *See—*
  - Walmsley, Martin F.; and Cross, John V., 3,716,365.
- Lace, Melvin A., to Motorola, Inc. Vehicle power supply system with boltage regulator load compensation. 3,716,774, Cl. 320-64.000.
- Lacey, Robert R., to Universal Oil Products Company. Vehicle seats having resilient mountings. 3,716,213, Cl. 248-399.000.
- Lake, Clarence R. Collapsible sawhorse. 3,716,112, Cl. 182-155.000.
- Lambert, Francois; and Bartosiak, Andrzej, to Centre Electronique de France. Colour television system for elimination of phase errors. 3,716,656, Cl. 178-5.20r.
- Lamm, Heinz, to Daimler-Benz Aktiengesellschaft. Rotary piston internal combustion engine. 3,716,313, Cl. 418-121.000.
- Lanaro, Clara M. Music teaching aid. 3,715,951, Cl. 84-470.000.
- Lancellotti, Joseph J. Basketball equipment support with carrying case. 3,716,234, Cl. 273-1.50r.
- Landreville, Gerald, to Dow Chemical Company, The. Apparatus and method for tamping particulate materials into a container. 3,716,081, Cl. 141-12.000.
- Lang, Stewart M.: *See—*
  - Birner, Richard A.; Kohler, Robert D.; and Lang, Stewart M., 3,716,136.
- Lange, Henry F.; and Adler, Stuart L. Turnbuckle body. 3,716,258, Cl. 287-60.000.
- Lange, Ludwig: *See—*
  - Klebe, Hans; Meffert, Alfred; Lange, Ludwig; Fratzer, Gerhard; and Dahm, Franz-Ludwig, 3,716,628.
- Langguth, Arthur F.: *See—*
  - Johnson, Clarence S.; and Langguth, Arthur F., 3,715,828.
- Langner, Carl G., to Shell Oil Company. Mooring system for pipelaying barges. 3,715,890, Cl. 61-72.300.
- Lardner, George E.: *See—*
  - Mackal, Henry H.; and Lardner, George E., 3,716,438.
- Larsen, Arthur Bertel, to Bell Telephone Laboratories, Incorporated. Optical spatial frequency filter. 3,716,666, Cl. 178-5.4st.
- Larson, Dale E., to Allis-Chalmers Corporation. Tapered current limit protection for D.C. motor. 3,716,772, Cl. 318-332.000.
- Laskin, Harold B.: *See—*
  - Gorka, Donald J.; and Laskin, Harold B., 3,716,221.
- Laucks, Rudolf; Fork, Werner; and Gross, Harald, to Voith, J. M., GmbH, Firma. Ship propulsion system having separate propulsion units for cruise and slow speeds. 3,716,014, Cl. 115-35.000.
- Laurenz, Frank R. Selective animal gate. 3,716,032, Cl. 119-155.000.
- Lautzenheiser, Robert D., to Red Cross Manufacturing, Corporation, The. Garden shredder with variable position loading chute. 3,716,090, Cl. 146-501.000.
- Lautzenheiser, Robert D., to Red Cross Manufacturing Corporation, The. Shredder. 3,716,198, Cl. 241-188.00r.
- Lavergne, Michel, to Institut Francais du Petrole des Carburants et Lubrifiants. Method for inducing shear waves in the earth and device therefor. 3,716,111, Cl. 181-.5rc.
- Lawson, Buford Bernard. Vertical tank system for fish rearing. 3,716,025, Cl. 119-3.000.
- Le Cover, Maurice. Film take-up magazine and attachment assembly therefor. 3,715,963, Cl. 95-31.00c.
- Lear Siegler, Inc.: *See—*
  - Hedrick, Geoffrey S., 3,715,926.

Leavitt, Minard A., to Cutler-Hammer, Inc. Film transport. 3,716,177, Cl. 226n1.000.

Ledergerber Alfred; and Plassmeier, Walter, to Werkzeugmaschinenfabrik Gildemeister & Comp. Aktiengesellschaft. Method of controlling a cycle of operations for machining a rotary workpiece. 3,715,938, Cl. 82-1.00c.

Leeds, Donald H., to Ducommun Incorporated. Carbonization of wool. 3,716,332, Cl. 423-447.000.

LeFevre, Cecil W.: *See—*
Strong, Philip L.; Hunter, Don L.; and LeFevre, Cecil W., 3,716,585.

LeGrand, Jesse S., to International Telephone and Telegraph Corporation. Navigation system utilizing pulse timing. 3,716,857, Cl. 343-6.8lc.

Lehmann, Hartmut: *See—*
Volckari, Peter; Lehmann, Hartmut; and Hafner, Raimund, 3,716,846.

Leibensperger, Robert Lee; and Norris, Glen Ray, to Timken Company, The. Bearing construction with preload compensation. 3,716,280, Cl. 308-207.00a.

Lemco Plastics, Inc.: *See—*
Kannenberg, Arnold H., 3,716,288.

Lemelson, Jerome H. Reflex reflective sheeting. 3,716,445, Cl. 161-2.000.

Lenaers, Rene; De Ruiter, Ernest H.; and Vandewalle, Jan J., to Union Carbide Corporation. Process for the preparation of isocarbostyrils. 3,716,542, Cl. 260-289.00r.

Leopold, Wilbur R.; Hackman, Frank C.; Floren, Carl E.; and Gould, Wallace E., to Mueller Co. Method of making a coupling joint. 3,715,800, Cl. 29-506.000.

Lepine, Rene. Rotary internal combustion engine. 3,716,033, Cl. 123-8.410.

Les Usines Fabelty Societe Anonyme: *See—*
Van Der Cleyen, Rafael J. J.; and Ribbens, Wilfried F., 3,716,229.

Leschenne, Henri, to Fabrique de Ma chines Andre Bechler S. A. Automatic lathe. 3,715,939, Cl. 82-21.00b.

Lesko, Frank J., to Reynolds Metals Company. Die assembly. 3,715,904, Cl. 72-276.000.

Lesperance, Arthur J.: *See—*
Aylesworth, Perry J.; and Lesperance, Arthur J., 3,716,016.

Levin, Nathan D., to Varian Associates. Input screen for image devices having reduced sensitivity in the central region. 3,716,713, Cl. 250-80.000.

Lewis, Eugene W.: *See—*
Warden, Fuller; Lewis, Eugene W.; McNickle, Bernard F.; and Mills, Jack H., 3,715,806.

Lewis, Robert B. Learning center. 3,715,815, Cl. 35-60.000.

Lewis, Sheldon N.; and Frank, George A., to Rohm and Haas Company. Air-dried coatings compositions comprising polyester resins and a saturated aliphatic aldehyde. 3,716,508, Cl. 260-22.00a.

Lewyckyj, Roman, to Scott Paper Company. Thread-reinforced laminated structure having lines of weakness and method and apparatus for creating lines of weakness. 3,716,132, Cl. 206-58.000.

Liautaud, Jean, to Enterprise de Recherches et d'Activites Petrolieres. Device for obtaining earth samples. 3,716,107, Cl. 175-248.000.

Licentia Patent-Verwaltungs-G.m.b.H.: *See—*
Minner, Willy, 3,716,801.

Liepins, Janis. Mechanical power assist apparatus. 3,715,948, Cl. 83-573.000.

Lieser, Karl, to Werner, Hermann, Firma. Machine tool for cutting longitudinal groove in cylindrical work piece. 3,715,956, Cl. 90-20.000.

Liggett & Myers Incorporated: *See—*
Hall, Floyd V., 3,715,957.

Lim, Jin Twan, to Bell Canada-Northern Electric Research Limited. Negative impedance converters suitable for bilateral gain repeaters. 3,716,680, Cl. 179-170.00g.

Lim, Mahn-Jick, to Western Electric Company Incorporated. Vapor transport method for growing crystals. 3,716,405, Cl. 117-201.000.

Limb, John Ormond: *See—*
Connor, Denis John; Limb, John Ormond; Pease, Roger Fabian Wedgwood; and Scholes, William George, 3,716,667.

Lin, Kuang-Hui, to United States of America, Atomic Energy Commission. Process for decontamination of neutron-irradiated beryllium. 3,716,616, Cl. 423-134.000.

Lin, Yeong S.: *See—*
Almasi, George S.; Keefe, George E.; Lin, Yeong S.; and Thompson, David A., 3,716,781.

Lincoln, Patrick A.; and Delamater, Philip G., to Michigan Chemical Corporation. Process for substantial removal of phosphates from wastewaters. 3,716,484, Cl. 210-52.000.

Lindemann, Martin K.; and Volpe, Rocco P., to Air Products and Chemicals, Inc., mesne. Paper coating compositions and products formed therefrom. 3,716,504, Cl. 260-8.000.

Lindlof, James A., to Minnesota Mining and Manufacturing Company. Atomizing method. 3,716,190, Cl. 239-2.00s.

Lindsay, Frederick H. Unified floor-frame assembly with skirt for a mobile building. 3,716,267, Cl. 296-23.00r.

Lindstrom, Ronald E.: *See—*
Bauer, Donald J.; Haskett, Philip R.; and Lindstrom, Ronald E., 3,716,615.

Link, Waldemar. Artificial limb for the knee joint. 3,715,763, Cl. 3-1.000.

Lions, Noel, to Commissariat a l'Energie Atomique. Device for remote positioning of thermocouples in a nuclear reactor. 3,716,450, Cl. 176-19.00r.

Little, Carl H., to Knapp, Weber, Company. Drawer front construction. 3,716,283, Cl. 312-330.000.

Little, Edwin D.; and Hirsch, Clarence A., to Allied Chemical Corporation. n-(Chlorophenoxyacetyl) ethylene urea herbicide. 3,716,554, Cl. 260-309.700.

Littlebury, Hugh W., Sr.: *See—*
Elsner, Edwin C., 3,716,115.

Littmann, Joseph C., to Dura Corporation. Gear mounted drive arm adapted to flex as cantilever beam. 3,715,931, Cl. 74-411.000.

Litton Systems, Inc.: *See—*
Phillips, Robert Matthews, 3,716,745.

Litzinger, Elmer Francis, to Brown & Williamson Tobacco Corporation. Selective gas phase filter material. 3,716,063, Cl. 131-267.000.

Litzinger, Elmer Francis, to Brown & Williamson Tobacco Corporation. Tobacco smoke filter material. 3,716,500, Cl. 260-2.10c.

Locher, Otto, to Heimo Geratebau Gesellschaft mit beschrankter Haftung. Method of and apparatus for atomizing liquid droplets in the spray jet of a spraying device. 3,716,189, Cl. 239-8.000.

Locher, Richard E. Plural rotatable disc information display device. 3,716,237, Cl. 273-142.00h.

Lochet, Jean A.: *See—*
Bick, Maurice; and Lochet, Jean A., 3,716,463.

Loeffel, Hansrolf: *See—*
Froehlich, Alfred; Piller, Bernhard; and Loeffel, Hansrolf, 3,716,368.

Loeffler, Thomas V., to Diamond International Corporation. Compound motion egg channeling device. 3,716,127, Cl. 198-30.000.

Loew, Frederic Christian, to Inmont Corporation. Elastomeric thermoplastic polyester polyurethane compositions stabilized against hydrolysis. 3,716,502, Cl. 260-2.5ay.

Loftis, James B.; Moody, David L.; and Phillips, James H., to Robbins Machinery Company. Apparatus for settling drill dust. 3,716,108, Cl. 175-205.000.

Londahl, Dickey S.: *See—*
Martin, Thomas B., Sr.; and Londahl, Dickey S., 3,716,306.

Long, Larry K., to Advance Management Engineering & Research Co. Film advancing device. 3,716,292, Cl. 353-91.000.

Lopez, Benito; and Kornblum, Saul S., to Sandoz-Wander, Inc. Coloring compositions. 3,716,388, Cl. 106-289.000.

Lorain Electronics Corporation: *See—*
Romoser, Paul E., 3,716,790.

Lowry, John D., to Ellanin Investments Ltd. Comb effect elimination. 3,716,670, Cl. 178-6.70a.

Loycano, Joseph A.: *See—*
Kefalas, John H.; and Loycano, Joseph A., 3,715,793.

Lu, Sun: *See—*
Creagh, Linda T.; Jones, Derick; and Lu, Sun, 3,716,289.

Lucas, Joseph, (Industries) Limited: *See—*
Hillyard, Peter Thomas, 3,716,813.

Ludington, Robert L.; and Holloway, Robert M. Brake mechanisms. 3,716,119, Cl. 188-195.000.

Lumsden, Alexander D., to Hoyt Wire Cloth Company. Screen. 3,716,138, Cl. 209-401.000.

Luoma, Warren L.: *See—*
Trocciola, John C.; Luoma, Warren L.; Nickols, Richard C., Jr.; and Emanuelson, Roger C., 3,716,609.

Lusk, George E.; and Nicholas, James H., to G. & W. Electric Specialty Company. System for dynamically cooling a high voltage cable termination. 3,716,652, Cl. 174-15.00r.

Lux, William J., to Honeywell Inc. Method of providing axially aligned molded parts in non-aligned apertured walls of a performed member. 3,716,613, Cl. 264-254.000.

Luxaire, Inc.: *See—*
Brockhurst, Woodrow W., 3,716,044.

Lynch, George W.; and Zarowin, Charles B., to International Business Machines Corporation. Inverter power supply employing series connected multi-transistor switches. 3,716,777, Cl. 321-27.00r.

Lynch, Ralph Sylvester; and Ayache, Haled Bou, to RCA Corporation. Nutation damper. 3,716,206, Cl. 244-15.00a.

Lynn, James B.; and Singleton, Alan H., to Bethlehem Steel Corporation. Process for recovering carvon monoxide from fuel gas. 3,716,619, Cl. 423-247.000.

Lynn, Robert R.: *See—*
Fagan, Castle H.; and Lynn, Robert R., 3,716,208.

Lyon, John B., to Du Pont de Nemours, E. I., and Company. Apparatus for producing flat film from thermoplastic material. 3,716,320, Cl. 425-326.000.

M & T Chemicals, Inc.: *See—*
Waggoner, Terry B.; and Seyb, Edgar J., Jr., 3,716,394.

Machii, Tetsuo: *See—*
Suenaga, Masanobu; Machii, Tetsuo; Sawano, Takahiro; Kobayashi, Takehiko; Dengo, Tadao; and Nakai, Tetsuzo, 3,715,802.

Mackal, Henry H.; and Lardner, George E., to Halkey-Roberts Corporation. Grommet sealing apparatus and method. 3,716,438, Cl. 156-253.000.

Mackenzie, John, 1/2 to Sinclair, Jack. Juice extracting device. 3,715,977, Cl. 100-117.000.

Mackie, Robin William: *See—*
Schick, Rudolf; Mackie, Robin William; and Royston, Alan Lindsay, 3,716,692.

Maeda, Sanetaka, to Omron Tateisii Electronics Co. Method of manufacturing cards. 3,716,439, Cl. 156-269.000.

Magee, Philip S., to Chevron Research Company. N-acyl derivatives of phosphoroamidothioates. 3,716,600, Cl. 260-959.000.

Magne, Frank c.: *See—*
Mod, Robert R.; Magne, Frank c.; and Skau, Evald L., 3,716,540.

Magraflux Corporation: *See—*
Graham, Bruce C.; and Dukats, Ilmars Z., 3,716,492.

Maier, Ludwig. Functional tertiary phosphine oxides. 3,716,580, Cl. 260-488.00j.

Malinowski, Stanley; Dailing, James L.; and Smith, Craig P., to Motorola, Inc. Bandpass filter including monolithic crystal elements with resonating portions selected for symmetrical response. 3,716,808, Cl. 333-72.000.

Mallory, P. R., & Co., Inc.: *See—*
Kaye, Gordon E., 3,716,708.

Mancole Company Limited: *See—*
Coles, Manson Ivor, 3,716,304.

Mangels, Ralph W., to Daco Safety Products, Inc. Chemical ejecting flashlight. 3,716,170, Cl. 222-162.000.

Mannesmann-Meer Aktiengesellschaft: *See—*
Classen, Gunter, 3,716,323.

Manos, George, to Porta Systems Corporated. Variable timing automatic interrupter circuit for common telephone sender equipment. 3,716,674, Cl. 179-18.0fa.

Manufacture des Montres Rolex S.A.: *See—*
Girard, Pierre, 3,715,881.

Mar-Com Development, Ind.: *See—*
Comfort, Kent B., 3,716,186.

Marantette, Ruth B.: *See—*
Marantette, William F.; and Marantette, Ruth B., 3,716,716.

Marantette, William F.; and Marantette, Ruth B. Photoelectric two axis positioning system. 3,716,716, Cl. 250-203.00r.

Marcel, Henri. Stoppers for pressurized containers. 3,716,163, Cl. 215-47.000.

Marek, James John, Jr.; and Taylor, George William, to Bell Telephone Laboratories, Incorporated. Flexible translator. 3,716,675, Cl. 179-18.0et.

Maremont Corporation: *See—*
Folley, Cranston Wesley; and Rocha, John Gonsalves, 3,715,955.
Wiegand, John A., 3,715,813.
Wiegand, John A., 3,715,814.

Mark, Morris. Exercising cot. 3,716,230, Cl. 272-58.000.

Mark 7 Seafood and Industries, Inc., mesne: *See—*
Krakowski, John F., 3,715,976.

Markiewitz, Kenneth H., to ICI America Inc. Trimerization of isocyanates. 3,716,535, Cl. 260-248.0ns.

Markovitz, Mark, to General Electric Company. Hardenable epoxy resin compositions. 3,716,598, Cl. 260-831.000.

Marshall, Frank J. Wire splicing device. 3,716,079, Cl. 140-120.000.

Marshavina, Natalia Lvovna: *See—*
Berlin, Alfred Anisimovich; Kefeli, Tamara Yakovlevna; Marshavina, Natalia Lvovna; Strongin, Grigory Mikhailovich; Kara-Giaur, Nikolai Vladimirovich; Kolomazov, Boris Ivanovich; Efimov, Alexei Vasilievich; Bodrova, Aglaida Nikolaevna; and Altshuler, Judif arkovna, 3,716,571.

Martell & Co.: *See—*
Ponthoreau, Marcel Maximilien; and Rozen, Claude Yves Marie, 3,716,324.

Martin, Robert M. User controlled exerciser frame. 3,716,231, Cl. 272-58.000.

Martin, Thomas B., Sr.; and Londahl, Dickey S., to Micropump Corporation. Gear pump construction. 3,716,306, Cl. 417-44.000.

Martin, Walter Harper, to Refrigeration Engineering Corporation. Poultry freezing process. 3,715,891, Cl. 62-63.000.

Martin-Marietta Corporation: *See—*
Aspland, John Richard, 3,716,325.
Simmons, Kenneth D.; Allen, Henry W.; and Gebhardt, Ronald F., 3,716,387.

Maruo, Keiichi: *See—*
Kawano, Toshihiko; Yamaoka, Takashi; Maruo, Keiichi; and Furutaka, Yasuhisa, 3,716,643.

Maruyama, Yoshio, to Pioneer Electronic Corporation. Tape drive reversal mechanism for tape recorder. 3,716,242, Cl. 274-4.00d.

Marx, Gerhard, to Kalle Aktiengesellschaft. Electrostatic charging and discharging apparatus. 3,716,755, Cl. 317-2.00f.

Maschinebau Oppenweiler GmbH: *See—*
Kistner, Hermann, 3,716,226.

Mason, Glenn E. Method and apparatus for harvesting fish. 3,715,831, Cl. 43-4.500.

Mason, James S., to Texas Instruments, Incorporated. Real-world perspective display for use with an independent aircraft landing monitor system. 3,716,866, Cl. 343-525.000.

Mason, William B., to General Electric Company. Control arrangement for electrically propelled traction vehicle. 3,716,768, Cl. 318-139.000.

Masopust, Otto T., Jr.: *See—*
Brown, Donald R.; and Masopust, Otto T., Jr., 3,715,786.

Massa Division, Dynamics Corporation: *See—*
Massa, Frank, 3,716,828.

Massa Division, Dynamics Corporation of America: *See—*
Barrow, Gilbert C., 3,716,681.
Massa, Frank, 3,716,827.

Massa, Frank, to Massa Division Dynamics Corporation of America. Mounting structure for spherical shaped underwater transducer. 3,716,827, Cl. 340-8.00s.

Massa, Frank, to Massa Division, Dynamics Corporation. Electroacoustic transducer with improved shock resistance. 3,716,828, Cl. 340-10.000.

Massachusetts Institute of Technology: *See—*
Wilson, Gerald L., 3,716,685.

Massie, Stephen N., to Universal Oil Products Company. Hybride rocket. 3,715,888, Cl. 60-251.000.

Massini, Anthony L.: *See—*
Johnson, Donald A.; Milani, Louis V.; and Massini, Anthony L., 3,716,232.

Masten, Michael K.; and Choate, William C., to Texas Instruments, Incorporated. Multimodal search. 3,716,840, Cl. 340-172.500.

Master, Harvey M.; Nugent, John L.; Hunt, Martin; and Peters, James, to Westinghouse Electric Corporation. Digitally controlled wave analyzer. 3,716,785, Cl. 324-77.00b.

Masters, Keith; and Straarup, Orla, to Aktieselskabet Niro Atomizer. Liquid distributor for feeding liquid to a rotating atomizer wheel. 3,716,193, Cl. 239-222.000.

Matsudo, Kazuo; Osawa, Koichi; and Ikegami, Yoshisuke, to Nippon Kokan Kabushiki Kaisha. Hot rolled steel sheets for extra deep drawing. 3,716,420, Cl. 148-12.000.

Matsukawa, Koshiro: *See—*
Hoshino, Yutaka; Matsukawa, Koshiro; Nakada, Akira; and Uno, Kazuo, 3,716,594.

Matsumoto, Koichi; and Ishikawa, Makoto, to Hitachi, Ltd. Spectrophotometer. 3,716,300, Cl. 356-97.000.

Matsunaga, Tsutomu: *See—*
Iwami, Ichiro; Matsunaga, Tsutomu; Inouye, Sakae; Fujimori, Makoto; Hayashi, Noriyuki; Wada, Norio; Yoneyama, Ken; and Inaba, Hideaki, 3,716,602.

Matsuoka, Hideaki: *See—*
Yamada, Tunehiko; Egami, Seiji; Sasatani, Harumi; Matsuoka, Hideaki; Emoto, Saburo; and Okamura, Kunio, 3,716,176.

Matsushima, Takeshi: *See—*
Takei, Toru; Kawai, Yasutaka; and Matsushima, Takeshi, 3,716,751.

Matsushita Electric Industrial Co., Ltd.: *See—*
Nakajima, Yasutaka; Yamaguchi, Isao; and Onishi, Masaru, 3,716,295.
Ogawa, Hiromichi; Ohira, Tsukasa; Murakami, Kaoru; and Yokoyama, Takao, 3,716,411.
Takei, Toru; Kawai, Yasutaka; and Matsushima, Takeshi, 3,716,751.
Tanaka, Takashi; and Yanagiuchi, Yukihiro, 3,716,677.
Tatematsu, Kenzo; Hosono, Hiroo; Katagiri, Toshio; Nishikiori, Akira; and Minato, Takashi, 3,716,676.

Matsushita Electronics Corporation: *See—*
Mizuno, Hideo; Kimura, Sadao; Akutsu, Hidezo; Yamazaki, Haruo; Okamoto, Takio; Watarai, Yoshiaki; and Baba, Shoichi, 3,716,743.

Matthews, Donald R.; and Holzman, Allen L., to United Aircraft Corporation. Generation of carbon dioxide having a population inversion. 3,716,342, Cl. 23-281.000.

Maurice Labbe, Francis Auguste: *See—*
Molins, Desmond Walter; Ahern, Ronald Albert; and Maurice Labbe, Francis Auguste, 3,716,062.

Mayer, Richard Eugene, to Allied Chemical Corporation. Anthraquinone dyed nylon stabilized with butylidene bis(butyl cresol) and polyhydroxyethyl-octadecylamines. 3,716,328, Cl. 8-165.000.

Mayes, Paul E.; and Poggio, Andrew J. Wire antenna multiply-loaded with active element impedances. 3,716,867, Cl. 343-701.000.

Mayflower Electronic Devices, Inc.: *See—*
Meenen. Raymond P., 3,716,689.

Maynard, John T. DC motor speed control with motor voltage and current sensing means. 3,716,771, Cl. 318-331.000.

Mayo, Kenneth E.: *See—*
Deschamps, Nicholas H.; Stein, Bernard; and Mayo, Kenneth E., 3,716,099.

McCollum, Robert L., to Strickland, Thomas M. Removal tool for automotive radiator hose. 3,715,794, Cl. 29-235.000.

McComas, Hall R.; and Staehlin, John H., to Westinghouse Electric Corporation. Broadband slotted waveguide antenna array. 3,716,868, Cl. 343-768.000.

McCord, Philip B. Grape harvester and flexible bar. 3,715,876, Cl. 56-330.000.

McCullum, Rolland Gene, to Best Lock Corporation. Rim cylinder lock mechanism. 3,715,899, Cl. 70-369.000.

McDermid Incorporated: *See—*
Grunwald, John J.; and D'Ottavio, Eugene D., 3,716,392.

McDonald Douglas Corporation: *See—*
Wolfe, William D., Jr.; and Bowdish, Donald M., 3,716,817.

McDonnell, Chilton H.: *See—*
Gilligan, William H.; McDonnell, Chilton H.; and Jones, Orlando, 3,716,550.

McGowen, Harold E., Jr.; and Tausch, Gilbert H., to Comco Incorporated. Heat actuated well packer. 3,716,101, Cl. 166-60.000.

McGraw-Edison Company: *See—*
Hanson, Richard M., 3,715,819.

McIntosh, Terence D.: *See—*
Howard, John; and McIntosh, Terence D., 3,716,574.

McKinzie, Preston V., to Michaels of Oregon Co. Magazine tube mounting for sling swivel. 3,715,827, Cl. 42-85.000.
McLaughlin Gormley King Company: *See—*
  Wells, Frank E., 3,716,634.
McMillen, James W.; and Rhodes, Glenn E., to Westinghouse Electric Corporation. Portable circuit breaker levering device for metal-clad switchgear. 3,716,684, Cl. 200-50.0aa.
McNickle, Bernard F.: *See—*
  Warden, Fuller; Lewis, Eugene W.; McNickle, Bernard F.; and Mills, Jack H., 3,715,806.
Mead Corporation, The: *See—*
  Calvert, Rodney K., 3,716,321.
Meenen, Raymond P., to Mayflower Electronic Devices, Inc. High frequency dielectric heating process and apparatus. 3,716,689, Cl. 219-10.610.
Meffert, Alfred: *See—*
  Klebe, Hans; Meffert, Alfred; Lange, Ludwig; Fratzer, Gerhard; and Dahm, Franz-Ludwig, 3,716,628.
Mefina S.A.: *See—*
  Morel, Rene; and Simmen, Robert, 3,715,987.
Meier, Max, to Ciba-Geigy AG. Process for the removal of metallic silver from photographic material. 3,716,362, Cl. 96-60.00r.
Meltsner, Bernard R., to Ethyl Corporation. Tris(3,5-dihydrocarbyl 4-hydroxy phenyl) phosphates. 3,716,603, Cl. 260-953.000.
Menge, Kurt, to Siemens Aktiengesellschaft. Color pyrometer. 3,715,922, Cl. 73-355.0em.
Merck & Co., Inc.: *See—*
  Irving, Putter, 3,716,551.
  Pives, Seemon H., 3,716,573.
Meredith, Eric: *See—*
  Evered, Kenneth; and Meredith, Eric, 3,716,120.
Merges, John C., Jr.: *See—*
  Black, Ernest P.; Duling, Irl N.; Merges, John C., Jr.; and Talbot, Alfred F., 3,716,441.
Meri, Kalju, to Electrospace Corporation. Answering machine telephone line coupling device. 3,716,673, Cl. 179-6.00r.
Meridian Industries, Inc.: *See—*
  Wizemann, Werner O., 3,716,682.
Merlin Gerin: *See—*
  Henry, Jean Claude; Henry, Georges; and Castelli, Cesar, 3,716,686.
Merrell, Richard G.: *See—*
  Hendrickson, Melvin C.; Merrell, Richard G.; and Parisoe, Wilbert, 3,716,654.
  Hendrickson, Melvin C., and Merrell, Richard G., 3,716,797.
Messina, Giuseppe: *See—*
  Pregaglia, Gianfranco; Montorsi, Giorgio; Caprara, Giuseppe; and Messina, Giuseppe, 3,716,562.
Metcalf, Eric, to Solartron Electronic Group Limited, The. Integrating measurements with noise reduction. 3,716,849, Cl. 340-347.0nt.
Metro Hydraulics Inc.: *See—*
  Gniffke, Glenn D.; and Fratzke, Harold A., 3,716,253.
Meyer, Alfred: *See—*
  Corte, Herbert; and Meyer, Alfred, 3,716,482.
Meyer, Artur: *See—*
  Engelhardt, Friedrich; Heid, Christian; Gunzert, Willi; Krusche, Erwin; and Meyer, Artur, 3,716,525.
Meyer, William A.: *See—*
  Jensen, Stephen F.; and Meyer, William A., 3,716,435.
Michaels of Oregon Co.: *See—*
  McKinzie, Preston V., 3,715,827.
Michalko, Edwards: *See—*
  Mitsche, Roy T.; and Michalko, Edwards, 3,716,597.
Michigan Chemical Corporation: *See—*
  Lincoln, Patrick A.; and Delamater, Philip G., 3,716,484.
Microdry Corporation, mesne: *See—*
  Johnson, Ray M., 3,716,688.
Micron Research and Development Corporation: *See—*
  Johnson, Donald A.; Milani, Louis V.; and Massini, Anthony L., 3,716,232.
Micropump Corporation: *See—*
  Martin, Thomas B., Sr.; and Londahl, Dickey S., 3,716,306.
Microsystems International Limited: *See—*
  Rotast, Nikita L., 3,716,761.
Middelhoek, Servaas, to N.V. Hollandse Metallurgische Industrie Billiton. Process for the preparation of vanadium carbide. 3,716,627, Cl. 423-440.000.
Mietla, Walter F., to Portec, Inc. Low clearance vehicle tiedown windlass mechanism. 3,715,994, Cl. 105-368.00t.
Miettinen, Tuure Tapio. Lapping anticondensation ventilation for windows of vehicles. 3,715,966, Cl. 98-2.180.
Milani, Louis V.: *See—*
  Johnson, Donald A.; Milani, Louis V.; and Massini, Anthony L., 3,716,232.
Milchem Incorporated: *See—*
  Bruson, Herman A.; and Gould, Henry, 3,716,487.
  Perricone, Alphonse C., 3,716,486.
Miles Laboratories, Inc.: *See—*
  Fader, Marshall Lloyd; and Christner, James Edward, 3,716,632.
  Schut, Robert Norman, 3,716,538.
Miller, Carl A., to Economics Laboratory, Inc. Combination high pressure venturi and spray forming nozzle. 3,716,194, Cl. 239-318.000.
Miller, Ernest W. Miniature recording altimeter. 3,715,925, Cl. 73-384.000.
Miller, Eugene J. Roller align drive. 3,716,219, Cl. 259-177.00r.
Miller, Herman, Inc.: *See—*
  Propst, Robert L.; and Kelley, James O., 3,716,282.
Miller, Russell Alan, to FMC Corporation. Process for preparing potassium peroxydisulfate. 3,716,629, Cl. 423-513.000.
Millis, Walter T., to General Electric Company. Electron discharge device. 3,716,736, Cl. 313-39.000.
Mills, Jack H.: *See—*
  Warden, Fuller; Lewis, Eugene W.; McNickle, Bernard F.; and Mills, Jack H., 3,715,806.
Mima, Koichiro: *See—*
  Morio, Minoru; and Mima, Koichiro, 3,716,665.
Mimino, Tohru; Kinoshita, Kazuhisa; Tanaka, Ryohei; and Shinoda, Takayuki, to Nippon Kokan Kabushiki Kaisha. Austenitic heat resisting steel. 3,716,353, Cl. 75-128.00g.
Minaguchi, Hotaka: *See—*
  Wamura, Soichi; Minaguchi, Hotaka; and Murasaki, Keisuke, 3,716,655.
Minato, Takashi: *See—*
  Tatematsu, Kenzo; Hosono, Hiroo; Katagiri, Toshio; Nishikiori, Akira; and Minato, Takashi, 3,716,676.
Minneapolis Gas Company: *See—*
  Potasek, Chester J.; and Hiscocks, Frank, 3,716,001.
Minner, Willy, to Licentia Patent-Verwaltungs-G.m.b.H. Amplifier with improved AVC circuit. 3,716,801, Cl. 330-29.000.
Minnesota Mining & Manufacturing Company: *See—*
  Charlot, Lincoln H., Jr., 3,716,854.
Minnesota Mining and Manufacturing Company: *See—*
  Bergstrom, Theodore R.; and Takkunen, Philip D., 3,716,347.
  Currier, John W.; Gadbois, Richard T.; and Wilde, Arthur G., 3,716,066.
  Dubbe, Richard F., 3,716,664.
  Gorka, Donald J.; and Laskin, Harold B., 3,716,221.
  Lindlof, James A., 3,716,190.
Minolta Camera Kabushiki Kaisha: *See—*
  Kitano, Naohiko; Kamanaka, Akira; Katsuragi, Mamoru; Kobayashi, Tatsuo; and Iida, Tadashi, 3,716,293.
  Tenkumo, Shohei; and Egawa, Takeshi, 3,715,964.
Mireur, John P.: *See—*
  Finch, Ray N.; Mireur, John P.; and Fouts, Hollye R., 3,716,575.
Mississippi State University Development Foundation, Inc.: *See—*
  Thomas, Charles C., 3,716,202.
Mitchell, Errol S.: *See—*
  Van Sickel, Alfred L.; Mitchell, Errol S.; and Rigamonti, Gianfranco, 3,716,451.
Mitchell, Thomas O., to Bennett Pump Incorporated. Submersible motor and pump unit. 3,716,309, Cl. 417-422.000.
Mitsche, Roy T.; and Michalko, Edwards, to Universal Oil Products Company. Process for alkylating aromatic hydrocarbons. 3,716,597, Cl. 260-671.00c.
Mitsubishi Denki Kabushiki Kaisha: *See—*
  Kishimoto, Hiroshi; Kobayashi, Kenzo; Hamazaki, Yoshiharu; and Danno, Mituaki, 3,715,919.
Mitsubishi Jukogyo Kabushiki Kaisha: *See—*
  Koga, Taro; Egusa, Taku; and Miyatani, Yoshihiko, 3,715,852.
Mitsui & Co. Ltd.: *See—*
  Tanaka, Masatoshi, 3,715,776.
Mittler, Johannes; and Schardey, Karl, to Fried. Krupp Gesellschaft mit beschrankter Haftung. Apparatus for loading of cargo onto and unloading cargo from a vehicle. 3,716,157, Cl. 214-505.000.
Miyatani, Yoshihiko: *See—*
  Koga, Taro; Egusa, Taku; and Miyatani, Yoshihiko, 3,715,852.
Miyatuka, Hajime: *See—*
  Fukushima, Osamu; Miyatuka, Hajime; and Honjo, Satoru, 3,716,360.
Miyazaki, Tetsuya: *See—*
  Ueno, Ryuzo; Miyazaki, Tetsuya; and Inamine, Shigeo, 3,716,381.
Mizoule, Jacques: *See—*
  Francois, Raymond; Sarbach, Jacques; Dong, Le Hao; Mizoule, Jacques; and Ricci, Charles, 3,716,642.
Mizuguchi, Shunji: *See—*
  Okamoto, Miyoshi; Mizuguchi, Shunji; and Watanabe, Koji, 3,716,614.
Mizuno, Hideo; Kimura, Sadao; Akutsu, Hidezo; Yamazaki, Haruo; Okamoto, Takio; Watarai, Yoshiaki; and Baba, Shoichi, to Matsushita Electronics Corporation. High-pressure metal-vapour discharge tube. 3,716,743, Cl. 313-220.000.
Mizutani, Toshio: *See—*
  Itaya, Nobushige; and Mizutani, Toshio, 3,716,558.
  Itaya, Nobushige; Mizutani, Toshio; Kitamura, Shigeyoshi; Okuno, Yoshitosi; and Fujimoto, Keimei, 3,716,560.
Mo Och Domsjo Aktiebolag: *See—*
  Croon, Ingemar Liss-Albin; and Blomqvist, Nils Verner, 3,716,430.
Mobil Oil Corporation: *See—*
  Bowes, Emmerson, 3,716,596.
  Rosinski, Edward J., 3,715,983.
  Ruehle, William H., 3,716,829.
  Weisz, Paul B.; and Silvestri, Anthony J., 3,716,479.
Mochizuki, Takashi; Komatsuzaki, Yoshinori; Hara, Satoshi; Nojima, Hideo; Shimizu, Tamio; and Suzuki, Shigeo, to Muto Industrial Company. Automatic cutting machine. 3,715,945, Cl. 83-71.000.
Mod, Robert R.; Magne, Frank c.; and Skau, Evald L., to United States of America, Agriculture. Hexachloropentadiene adducts of unsaturated piperazine amides. 3,716,540, Cl. 260-268.00c.

Mohr, glenn R.: *See—*
  Angelery, Henry W.; and Mohr, glenn R., 3,716,719.
Moist O'Matic; division of Toro Manufacturing Corporation: *See—*
  Hunter, Edwin J., 3,716,192.
Molecular Energy Corporation: *See—*
  Braun, Leon, 3,716,403.
Moleculon Research Corporation: *See—*
  Hook, Edwin O., 3,716,466.
Molina, Orlando G., 1/2 to North American Rockwell Corporation and 1/2 to Air Products and Chemicals, Inc. Dye penetrant remover. 3,716,494, Cl. 252-408.000.
Molins, Desmond Walter; Ahern, Ronald Albert; and Maurice Labbe, Francis Auguste, to Molins Limited. Cigarette-making machines of the continuous-rod type. 3,716,062, Cl. 131-110.000.
Molins Limited: *See—*
  Molins, Desmond Walter; Ahern, Ronald Albert; and Maurice Labbe, Francis Auguste, 3,716,062.
Molins Machine Company Limited: *See—*
  Preston, Edward George, 3,716,443.
Momota, Kenzo: *See—*
  Fukushima, Yoshikiyo; Ishihara, Yasushi; Momota, Kenzo; Usui, Yasuo; Sakumura, Tuyoshi; Sogo, Satoru; and Nunokawa, Koji, 3,716,210.
Monroe, Donald G., to Active Garage Builders Inc. Method of building construction. 3,715,836, Cl. 52-741.000.
Monsanto Company: *See—*
  Chapman, Richard D., 3,716,611.
  Corey, Albert E.; Donermeyer, Donald D.; Fantl, Joel; and Williams, Charles R., 3,716,547.
  Harris, Alva F., 3,716,509.
Montecatini Edison S.p.A.: *See—*
  Pregaglia, Gianfranco; Montorsi, Giorgio; Caprara, Giuseppe; and Messina, Giuseppe, 3,716,562.
Montorsi, Giorgio: *See—*
  Pregaglia, Gianfranco; Montorsi, Giorgio; Caprara, Giuseppe; and Messina, Giuseppe, 3,716,562.
Moody, David L.: *See—*
  Loftis, James B.; Moody, David L.; and Phillips, James H., 3,716,108.
Moore, Donald R.; and Tesoro, Giuliana C., to Stevens, J. P., & Co., Inc. Aryl carbonates of polyols. 3,716,572, Cl. 260-463.000.
Moore, Lee C., Corporation: *See—*
  Woolslayer, Homer J.; Woolslayer, Joseph R.; Jenkins, Cecil; and Campbell, Erwin A., 3,716,155.
Moore, Oliver K., to Display Corporation International. Book binding. 3,716,256, Cl. 281-29.000.
Moore, William C.; Pilgrim, William S.; and Caldwell, Melvin R., to Welch Allyn Inc. Disposable light-conductive speculum. 3,716,047, Cl. 128-18.000.
Moran, John J., to Hycel, Inc. Sample fluid dispensing apparatus for chemical testing apparatus. 3,716,338, Cl. 23-259.000.
Morel, Rene; and Simmen, Robert, to Mefina S.A. Fuze for a non-gyratory projectile. 3,715,987, Cl. 102-74.000.
Morello, Edwin F., to Standard Oil Company. Polyamide-imide compositions containing guanidine salts of weak acids as bonding agents. 3,716,514, Cl. 260-33.40p.
Mori, Kunio; and Shirage, Yoshio, to Nippon Kokan Kabushiki Kaisha. Slidable mobile bridge. 3,715,769, Cl. 14-71.000.
Morinaga Milk Industry Co., Ltd.: *See—*
  Nagasawa, Taro; Kawashima, Takuji; Suzuki, Kiyoshi; and Kawase, Kouzo, 3,716,408.
Morio, Minoru; and Mima, Koichiro, to Sony Corporation. Color television receiver. 3,716,665, Cl. 178-5.40p.
Morrien, Albertus Marinus: *See—*
  Van Elk, Cornelis Johannes; Raatgever, Jacob Frederik; Morrien, Albertus Marinus; and Dirk van der Lee, Jan Gijsbert, 3,716,780.
Morris, Billy R. Removable trailer hitch. 3,716,255, Cl. 280-491.00e.
Morris, John M., to Rex Chainbelt Inc. Variable voltage resilient connecting rod drive. 3,716,130, Cl. 198-220.0da.
Morrison, John R. Method of making decorative articles employing strips of flexible material. 3,716,432, Cl. 156-63.000.
Mossuto, Frank: *See—*
  Cade, James E.; and Mossuto, Frank, 3,715,937.
Motek, Herbert; and Jobkes, Jakob, to Hazemag Hartzerkleinerungs- und Zement-Maschinenbau-Gesellschaft m.b.H. Method of operating an impact comminutor. 3,716,196, Cl. 241-27.000.
Motoren- und Turbinen-Union Muenchen GmbH: *See—*
  Schweikl, Ludwig; and Japs, Alfred, 3,716,207.
Motorola, Inc.: *See—*
  Bevacqua, Louis A., 3,716,038.
  Cerny, Frank J., Jr., 3,716,730.
  Davidsohn, Uryon S., 3,716,425.
  Karr, Earl C., 3,716,671.
  Lace, Melvin A., 3,716,774.
  Malinowski, Stanley; Dailing, James L.; and Smith, Craig P., 3,716,808.
  O'Neal, Donald V., 3,716,243.
Mott, Ralph Beach, Jr.: *See—*
  Mott, Ralph Beach, Sr.; Mott, Ralph Beach, Jr.; and Cantella, Richard C., 3,716,184.
Mott, Ralph Beach, Sr.; Mott, Ralph Beach, Jr.; and Cantella, Richard C., to Reserv-A-Roll Co. Trash receptacle. 3,716,184, Cl. 232-43.100.
Mouroux, Claude; Peres, Gerard; and Valette, Pierre, to Compagnie Generale d'Electricite. Method of etching a metal which can be passivated. 3,716,428, Cl. 156-3.000.
Moyer, Lillian R. Hot air register. 3,715,971, Cl. 98-110.000.
Mueller Co.: *See—*
  Hackman, Frank C.; and Roos, Robert R., 3,716,257.
  Leopold, Wilbur R.; Hackman, Frank C.; Floren, Carl E.; and Gould, Wallace E., 3,715,800.
Muftic, Mahmoud: *See—*
  Albrecht, Rudolf; Schroder, Eberhard; and Muftic, Mahmoud, 3,716,531.
Muhlbach, Anton; and Fichtner, Rudi, to USM Corporation. Control mechanism for shoe lasting pincers. 3,715,767, Cl. 12-14.500.
Muller, Peter: *See—*
  Scheidweiler, Andreas; and Muller, Peter, 3,716,717.
Munson, James L.: *See—*
  Carter, William A.; Sievert, William C.; and Munson, James L., 3,716,019.
Murakami, Kaoru: *See—*
  Ogawa, Hiromichi; Ohira, Tsukasa; Murakami, Kaoru; and Yokoyama, Takao, 3,716,411.
Murasaki, Keisuke: *See—*
  Wamura, Soichi; Minaguchi, Hotaka; and Murasaki, Keisuke, 3,716,655.
Muratani, Takuro; Okawa, Michihisa; and Nakamura, Hiroshi, to Kokusai Denshin Denwa Co., Ltd. and Fujitsu Limited. Phase locked loop with rapid phase pull-in circuit. 3,716,802, Cl. 331-8.000.
Murray, Dudley Charles, to Pains-Wessex Limited. Pyrotechnic devices. 3,715,984, Cl. 102-34.200.
Musilek, Vladimir, to Ceskoslovenska akademie ved. Antifungal antibiotic obtained from basidimycete oudemansiella mucida and process of making the same. 3,716,635, Cl. 424-122.000.
Muto Industrial Company: *See—*
  Mochizuki, Takashi; Komatsuzaki, Yoshinori; Hara, Satoshi; Nojima, Hideo; Shimizu, Tamio; and Suzuki, Shigeo, 3,715,945.
Nagasawa, Taro; Kawashima, Takuji; Suzuki, Kiyoshi; and Kawase, Kouzo, to Morinaga Milk Industry Co., Ltd. Process for preparing a lactulose powder. 3,716,408, Cl. 127-46.00r.
Nagata, Wataru; and Hirai, Shoichi, to Shionagi & Co., Ltd. Derivatives of ibogamine, ibogaine and ibogaline lactams. 3,716,528, Cl. 260-239.30p.
Nakada, Akira: *See—*
  Hoshino, Yutaka; Matsukawa, Koshiro; Nakada, Akira; and Uno, Kazuo, 3,716,594.
Nakada, Kusuo; and Oguro, Tomokatsu, to Hitachi, Ltd. Magnetrons. 3,716,750, Cl. 315-39.710.
Nakai, Tetsuzo: *See—*
  Suenaga, Masanobu; Machii, Tetsuo; Sawano, Takahiro; Kobayashi, Takehiko; Dengo, Tadao; and Nakai, Tetsuzo, 3,715,802.
Nakajima, Yasutaka; Yamaguchi, Isao; and Onishi, Masaru, to Matsushita Electric Industrial Co., Ltd. Electrostatic micro copying apparatus including film cutting, slitting, and inserting means for aperture cards. 3,716,295, Cl. 355-3.000.
Nakamura, Hiroshi: *See—*
  Muratani, Takuro; Okawa, Michihisa; and Nakamura, Hiroshi, 3,716,802.
Nakamura, Shinichi: *See—*
  Kameoka, Akio; and Nakamura, Shinichi, 3,716,647.
Nakamura, Yasushi; Agatsuma, Kunio; Tanaka, Yoshihiro; and Aono, Shunji, to Sumitomo Chemical Company, Ltd. Phenoxy carboxylic acid derivative. 3,716,583, Cl. 260-520.000.
Nakato, Hakaru: *See—*
  Ooi, Hiroshi; and Nakato, Hakaru, 3,716,352.
Nakayama, Norihiko; and Osawa, Mitsuoki, to Fujitsu Limited. Display device utilization gas discharge. 3,716,742, Cl. 313-182.000.
Nanri, Nobuya: *See—*
  Ueda, Seinosuke; Nanri, Nobuya; and Hongo, Motoyoshi, 3,716,455.
Napoli, Louis Sebastian; and Hughes, John Joseph, to RCA Corporation. Method of making semiconductor devices. 3,716,429, Cl. 156-17.000.
National Cash Register Company, The: *See—*
  Zurbuchen, Louis E.; and Bradam, William R., 3,715,980.
National Research Development: *See—*
  Kempster, Edward, 3,716,386.
Nattsas, Stephen C.: *See—*
  Gross, Leonard B.; Johnson, Charles R.; and Nattsas, Stephen C., 3,715,914.
Nazzer, Don Barkley: *See—*
  Bloomsburg, Marvin S.; and Nazzer, Don Barkley, 3,716,220.
Nederlandse Organisatie Voor Toegepast-Natuurwetenschappelijk Onderzoek Ten: *See—*
  van Staveren, Pieter, 3,715,886.
Nelson, Bobby H., to Vetco Offshore Industries, Inc. Apparatus for aligning and connecting flowlines. 3,716,100, Cl. 166-.600.
Nelson, Gerald V.: *See—*
  Coons, William R., Jr.; Colvert, James H.; and Nelson, Gerald V., 3,716,476.
Nelson, Lorne W., to Honeywell Inc. Fluid expandable temperature apparatus having excessive temperature relief apparatus. 3,715,924, Cl. 73-368.000.
Nemag N.V.: *See—*
  van Huuksloot, Leendert, 3,716,265.

Nes, Ragnar Jonas: *See—*
Berg, Leif; and Nes, Ragnar Jonas, 3,716,154.
Neumann, Gunter: *See—*
Neumann, Gunter, 3,716,608.
Neumann, Gunter, to Neumann, Gunter. Method for restoring railway ties. 3,716,608, Cl. 264-36.000.
Neumann, Peter Gabriel, to Bell Telephone Laboratories, Incorporated. Self-synchronizing sequential encoding systems. 3,716,851, Cl. 340-347.0dd.
New Products Corporation: *See—*
Ashburn, Dillion P., 3,716,344.
Newell, E. Strohm. Device for securing a line. 3,715,782, Cl. 24-116.000.
Newell, Richard M., to Zeta Research, Inc. Pattern generator and method. 3,716,705, Cl. 235-151.000.
Newman, Nicholas S.; and Satas, Donatas. Base for adhesive tapes. 3,716,437, Cl. 156-244.000.
Ney, J. M., Company, The: *See—*
Burnett, Arthur Peter, 3,716,356.
Nicholas, James H.: *See—*
Lusk, George E.; and Nicholas, James H., 3,716,652.
Nickelson, Robert W., to Sunbeam Corporation. Vacuum cleaner. 3,715,775, Cl. 15-410.000.
Nickerson, Economos and Noonan: *See—*
Nickerson, Robert J.; and Economos, James N., 3,715,833.
Nickerson, Robert J.; and Economos, James N., to Nickerson, Economos and Noonan. Glider toy. 3,715,833, Cl. 46-79.000.
Nickols, Richard C., Jr.: *See—*
Trocciola, John C.; Luoma, Warren L.; Nickols, Richard C., Jr.; and Emanuelson, Roger C., 3,716,609.
Niemiec, Stanley Joseph: *See—*
Heuner, Robert Charles; and Niemiec, Stanley Joseph, 3,716,723.
Niemyer, Le Roy L., Jr., to Westinghouse Electric Corporation. Apparatus for increasing signal to noise ratio in television low light level scenes. 3,716,657, Cl. 178-7.200.
Nienburg, Hans Juergen: *See—*
Kniese, Wilhelm; Nienburg, Hans Juergen; Himmele, Walter; and Aquila, Werner, 3,716,626.
Niewold, Andreas; and Pon, Judith Q., to Varian Associates. X-ray image tube having an oxidized vanadium barrier interposed between the scintillator and photocathode. 3,716,714, Cl. 250-83.300.
Nilsson, Sven Walter, to SKF Industrial Trading and Development Co. N.V. Arrangement for rectilinear guiding of a machine member along a beam. 3,716,731, Cl. 310-13.000.
Nippon Concrete Industries Co., Ltd.: *See—*
Fukushima, Yoshikiyo; Ishihara, Yasushi; Momota, Kenzo; Usui, Yasuo; Sakumura, Tuyoshi; Sogo, Satoru; and Nunokawa, Koji, 3,716,210.
Nippon Electric Company, Limited: *See—*
Sawai, Akira, 3,716,852.
Nippon Gakki Seizo Kabushiki Kaisha: *See—*
Takeuchi, Akihiko, 3,715,949.
Takeyama, Akihisa, 3,716,648.
Nippon Hoso Kyokai: *See—*
Wamura, Soichi; Minaguchi, Hotaka; and Murasaki, Keisuke, 3,716,655.
Nippon Kokan Kabushiki Kaisha: *See—*
Matsudo, Kazuo; Osawa, Koichi; and Ikegami, Yoshisuke, 3,716,420.
Mimino, Tohru; Kinoshita, Kazuhisa; Tanaka, Ryohei; and Shinoda, Takayuki, 3,716,353.
Mori, Kunio; and Shirage, Yoshio, 3,715,769.
Nippon Soda Co., Ltd.: *See—*
Hoshino, Yutaka; Matsukawa, Koshiro; Nakada, Akira; and Uno, Kazuo, 3,716,594.
Nippondenso Co., Ltd.: *See—*
Suzuki, Motoji, 3,716,766.
Nishida, Koji, to Aisin Seiki Kabushiki Kaisha. Tachometer generator. 3,716,788, Cl. 324-174.000.
Nishikiori, Akira: *See—*
Tatematsu, Kenzo; Hosono, Hiroo; Katagiri, Toshio; Nishikiori, Akira; and Minato, Takashi, 3,716,676.
Nishio, Daijiro: *See—*
Ohe, Keitaro; Nishio, Daijiro; Sadamtsu, Shigeru; and Kaneko, Hiroyuki, 3,716,505.
Nissan Motor Company, Limited: *See—*
Takahashi, Koichi, 3,716,314.
Nitto Chemical Industry Co., Ltd.: *See—*
Yoshino, Takachika; Saito, Shigeru; and Sasaki, Yutaka, 3,716,496.
Nitzsche, Siegfried; Pirson, Ewald; and Roth, Michael, to Wacker-Chemie G.m.b.H. Water-repellent composition for treating building materials. 3,716,399, Cl. 117-123.00d.
Niwa, Kenji: *See—*
Oku, Tsurumi; Suzuki, Akio; Tawara, Nobuyoshi; and Niwa, Kenji, 3,716,617.
Nodera, Katsuji: *See—*
Fujinami, Akira; Ozaki, Toshiaki; Akiba, Keiichiro; Yamamoto, Sigeo; Nodera, Katsuji; Tanaka, Katsutoshi; Kameda, Nobuyuki; and Ooishi, Tadashi, 3,716,552.
Nojima, Hideo: *See—*
Mochizuki, Takashi; Komatsuzaki, Yoshinori; Hara, Satoshi; Nojima, Hideo; Shimizu, Tamio; and Suzuki, Shigeo, 3,715,945.
Noonan, Walter F., to Westlake Plastics Company. Electroplating barrel constructed from two disparate plastics. 3,716,470, Cl. 204-213.000.
Nordquist, Albert W., to Pratt-Read Corporation. Key construction for keyboard instruments. 3,715,950, Cl. 84-433.000.
Norman, Harold E. Apparatus for forming the crust of a pie. 3,716,319, Cl. 425-293.000.
Norris, Glen Ray: *See—*
Leibensperger, Robert Lee; and Norris, Glen Ray, 3,716,280.
Norris, Leon Frederick: *See—*
Evans, David John Ivor; Fustukian, David Alan Wayne; Norris, Leon Frederick; and Fraser, Robert William, 3,716,357.
North American Rockwell Corporation: *See—*
Molina, Orlando G., 3,716,494.
Northern Electric Company Limited: *See—*
Pieczyk, Bernhard Peter, 3,716,712.
Norton Company: *See—*
Eisner, Steve, 3,716,413.
Nouvel, Lucien. Bactericidal composition and methods employing methylene-2,2'-bis-(4-chlorothymol). 3,716,646, Cl. 424-347.000.
Novak, Lorna Beth. Color coded pronunciation symbol system. 3,715,812, Cl. 35-35.00j.
Novo Terapeutisk Laboratorium A/S: *See—*
Johnk, Poul, 3,716,578.
Nowell, John R.; and Genuit, Luther L., to Honeywell Information System. Loss of phase detector for a polyphase power system. 3,716,718, Cl. 307-13.000.
Nugent, John L.: *See—*
Master, Harvey M.; Nugent, John L.; Hunt, Martin; and Peters, James, 3,716,785.
Nunokawa, Koji: *See—*
Fukushima, Yoshikiyo; Ishihara, Yasushi; Momota, Kenzo; Usui, Yasuo; Sakumura, Tuyoshi; Sogo, Satoru; and Nunokawa, Koji, 3,716,210.
N.V. Hollandse Metallurgische Industrie Billiton: *See—*
Middelhoek, Servaas, 3,716,627.
Oberlander, Georg, to Klockner-Humboldt-Deutz Aktiengesellschaft. Gas turbine power plant. 3,716,305, Cl. 417-2.000.
Oberste-Berghaus, Gerhard; and Karau, Claus-Dieter, to Bamag Verfahrenstechnik GmbH. Process for the production of nitric acid with a concentration of over 70% by weight. 3,716,625, Cl. 23-161.000.
Obregon-Gonez, Carlos F. Washing apparatus. 3,715,770, Cl. 15-23.000.
Oda, Eisuke: *See—*
Hosoda, Kirokuro; Kadowaki, Yoshio; Oda, Eisuke; and Hoshino, Nobuo, 3,716,391.
Odelberg, Stig Axel. wrapping machine for wrapping cylindrical objects. 3,715,861, Cl. 53-211.000.
Ogawa, Hiromichi; Ohira, Tsukasa; Murakami, Kaoru; and Yokoyama, Takao, to Matsushita Electric Industrial Co., Ltd. Rechargeable alkaline manganese cell. 3,716,411, Cl. 136-30.000.
Oguma, Toshiro: *See—*
Hara, Toshito; and Oguma, Toshiro, 3,716,810.
Oguro, Tomokatsu: *See—*
Nakada, Kusuo; and Oguro, Tomokatsu, 3,716,750.
Ohde, Harold Herman. Clock cabinet. 3,715,882, Cl. 58-53.000.
Ohe, Keitaro; Nishio, Daijiro; Sadamtsu, Shigeru; and Kaneko, Hiroyuki, to Fuji Photo Film Co., Ltd. Process for suspension polymerization. 3,716,505, Cl. 260-17.00a.
Ohira, Tsukasa: *See—*
Ogawa, Hiromichi; Ohira, Tsukasa; Murakami, Kaoru; and Yokoyama, Takao, 3,716,411.
Ohse, Hidetaka: *See—*
Kodera, Yoshihide; Kato, Jun; Shimada, Kazuo; Suzuki, Morio; Ohse, Hidetaka; Ohshima, Satoshi; and Kiriki, Yasunori, 3,716,478.
Ohshima, Satoshi: *See—*
Kodera, Yoshihide; Kato, Jun; Shimada, Kazuo; Suzuki, Morio; Ohse, Hidetaka; Ohshima, Satoshi; and Kiriki, Yasunori, 3,716,478.
Ohta, Wasaburo; and Kasuya, Kazuhiko, to Ricoh Co., Ltd. Device for heating and fixing toner images upon a recording medium. 3,716,018, Cl. 118-101.000.
Oka, Akira. Colloid metallurgy. 3,716,358, Cl. 75-225.000.
Okamoto, Miyoshi; Mizuguchi, Shunji; and Watanabe, Koji, to Toray Industries, Inc. Process of manufacturing collagen fiber-like synthetic superfine filament bundles. 3,716,614, Cl. 264-344.000.
Okamoto, Takio: *See—*
Mizuno, Hideo; Kimura, Sadao; Akutsu, Hidezo; Yamazaki, Haruo; Okamoto, Takio; Watarai, Yoshiaki; and Baba, Shoichi, 3,716,743.
Okamura, Kunio: *See—*
Yamada, Tunehiko; Egami, Seiji; Sasatani, Harumi; Matsuoka, Hideaki; Emoto, Saburo; and Okamura, Kunio, 3,716,176.
Okawa, Michihisa: *See—*
Muratani, Takuro; Okawa, Michihisa; and Nakamura, Hiroshi, 3,716,802.
Oki Densen Kabushiki Kaisha: *See—*
Akachi, Hisateru, 3,715,877.
Oku, Tsurumi; Suzuki, Akio; Tawara, Nobuyoshi; and Niwa, Kenji, to Sumitomo Chemical Co., Ltd. Process for producing alumina. 3,716,617, Cl. 423-121.000.

Okumura, Shinji; Yoshinaga, Fumihiro; Kubota, Koji; and Kamijo, Hirotaka, to Ajinomoto Co., Inc. Method of producing L-histidine by fermentation. 3,716,453, Cl. 195-29.
Okuno, Yoshitosi: *See—*
Itaya, Nobushige; Mizutani, Toshio; Kitamura, Shigeyoshi; Okuno, Yoshitosi; and Fujimoto, Keimei, 3,716,560.
Olesen, Bernhardt D., to United States of America, Navy. Water level gauge using neutron source. 3,716,711, Cl. 250-43.500.
Olin Corporation: *See—*
Caule, Elmer J., 3,716,427.
Oliveto, Eugene Paul: *See—*
Krubiner, Alan Martin; and Oliveto, Eugene Paul, 3,716,530.
Olliges, James R., Sr., to A-T-O Inc. Washing machine. 3,715,898, Cl. 68-145.000.
O'Loughlin, James P., to Raytheon Company. Anticipatory charging regulator. 3,716,798, Cl. 328-67.000.
Olsen, Judith D.: *See—*
Kovac, Zlata; and Olsen, Judith D., 3,716,464.
Olympus Optical Co., Ltd.: *See—*
Totsuka, Yasushi; and Kamachi, Shin-Ichi, 3,716,839.
Omron Tateisii Electronics Co.: *See—*
Maeda, Sanetaka, 3,716,439.
O'Neal, Donald V., to Motorola, Inc. Cartridge locking mechanism. 3,716,243, Cl. 274-413.000.
Onishi, Masaru: *See—*
Nakajima, Yasutaka; Yamaguchi, Isao; and Onishi, Masaru, 3,716,295.
Onuki, Hiroshi: *See—*
Tanaka, Jun; and Onuki, Hiroshi, 3,716,103.
Ooi, Hiroshi; and Nakato, Hakaru, to Kawasaki Steel Corporation. Sintered desulfurizer for off-furnace use. 3,716,352, Cl. 75-58.000.
Ooishi, Tadashi: *See—*
Fujinami, Akira; Ozaki, Toshiaki; Akiba, Keiichiro; Yamamoto, Sigeo; Nodera, Katsuji; Tanaka, Katsutoshi; Kameda, Nobuyuki; and Ooishi, Tadashi, 3,716,552.
Orlik, Richard D., to Chesapeake and Ohio Railway Company, The and Baltimore and Ohio Railroad Company, The. Cable reel car. 3,715,993, Cl. 105-36.700.
O'Rourke, Richard George: *See—*
Wikle, Keith Gordon; and O'Rourke, Richard George, 3,716,355.
Osawa, Koichi: *See—*
Matsudo, Kazuo; Osawa, Koichi; and Ikegami, Yoshisuke, 3,716,420.
Osawa, Mitsuoki: *See—*
Nakayama, Norihiko; and Osawa, Mitsuoki, 3,716,742.
Osborn, Merlin L.: *See—*
Houze, Gerald L., Jr.; and Osborn, Merlin L., 3,716,763.
Osmonics, Inc.: *See—*
Spatz, Donald Dean, 3,716,141.
Ost, Walter; Thomas, Klaus; Jerchel, Dietric; and Appel, Karl-Richard, to Boehringer, C. H., Sohn. N-(phenyl or benzyl)-N,N'-bis-(1-amido-2,2',2-trichloro)-ethyl) alkyleniamines. 3,716,587, Cl. 260-562.00p.
Osterling, Peter R.: *See—*
Dunlap, Scott B.; Osterling, Peter R.; and Tepper, Charles W., 3,715,986.
Ostroot, Gerald F.; and Torbarg, Robert H., to DeZurik Corporation. Assembling bellows damper unit. 3,715,798, Cl. 29-454.000.
Ota, Hiroshi. Grindstone dressing tool protection device. 3,716,041, Cl. 125-11.000.
Otani, Sugio, to Kureha Kagaku Kogyo Kabushiki Kaisha. Heat treatment of molten carbonaceous material prior to its conversion to carbon fibers and other shapes. 3,716,607, Cl. 264-29.000.
Otdel Fiziki Nerazrushajuschego Kontrolya Akademii Nauk BSSR: *See—*
Akulov, Nikolai Sergeevich, 3,716,779.
Otto, C., Dr., & Comp. G.m.b.H.: *See—*
Schon, Erich F., 3,716,457.
Outboard Marine Corporation: *See—*
Von Seggern, Robert D., 3,716,116.
Owens-Illinois, Inc.: *See—*
Birner, Richard A.; Kohler, Robert D.; and Lang, Stewart M., 3,716,136.
Perry, Jack I.; and Schmader, Bernard A., 3,716,126.
Ozaki, Toshiaki: *See—*
Fujinami, Akira; Ozaki, Toshiaki; Akiba, Keiichiro; Yamamoto, Sigeo; Nodera, Katsuji; Tanaka, Katsutoshi; Kameda, Nobuyuki; and Ooishi, Tadashi, 3,716,552.
Packo, Joseph J., mesne: *See—*
Anderson, Amos R., 3,716,384.
Padmanathan, Thurairajah, to American Cyanamid Company. 1,3,2-oxazaborinides and method for preparing the same. 3,716,556, Cl. 260-326.300.
Paginton, Philip Norman: *See—*
Washbourn, Jack; and Paginton, Philip Norman, 3,716,215.
Pains-Wessex Limited: *See—*
Murray, Dudley Charles, 3,715,984.
Palazzetti, Mario, to Fiat Societa per Azioni. Thyristor ignition control device. 3,716,758, Cl. 317-96.000.
Pall Corporation: *See—*
Pall, David B.; and Jasaitis, Tadas K., 3,716,436.
Pall, David B.; and Jasaitis, Tadas K., to Pall Corporation. Process for making a back pressure resistant filter element. 3,716,436, Cl. 156-218.000.
Palmer Chemical and Equipment Company, Inc.: *See—*
Palmer, Harold C., 3,715,990.
Palmer, Harold C., to Palmer Chemical and Equipment Company, Inc. Liquid or powder dispensing dart. 3,715,990, Cl. 102-92.000.
Pangborn, Wayne O. Dice apparatus for practicing bidding and play in contract bridge. 3,716,236, Cl. 273-138.00r.
Panhard, Jean, to Societe de Constructions Mecahiques Panhard & Levassor. Rotors for rotary piston engines. 3,716,312, Cl. 418-94.000.
Papasideris, Stamos I., to Caterpillar Tractor Company. Automatic valve control mechanism for vehicle mounted implements. 3,716,159, Cl. 214-762.000.
Pappo, Raphael: *See—*
Chorvat, Robert J.; and Pappo, Raphael, 3,716,559.
Paramonoff, Elpidifor, to Standum Inc. Part feed for apparatus such as metallic can body formers. 3,715,905, Cl. 72-349.000.
Parekh, Chandra Kant, to Squibb, E. R., & Sons, Inc. Method for determining procainamide levels in blood or urine. 3,716,336, Cl. 23-230.00b.
Parish, Roger C.: *See—*
Actor, Philip P.; Parish, Roger C.; and Theodorides, Vassilios J., 3,716,641.
Parisoe, Wilbert: *See—*
Hendrickson, Melvin C.; Merrell, Richard G.; and Parisoe, Wilbert, 3,716,654.
Park, Richard J., to Kenway Engineering Inc., mesne. Material handling system transfer assembly. 3,715,992, Cl. 104-88.000.
Park-Ohio Industries, Inc.: *See—*
Bryant, William G., 3,716,690.
Parker, Louis W. Amplitude modulation detector for radio receivers. 3,716,793, Cl. 325-487.000.
Parker-Hannifin Corporation: *See—*
Paul, John C., 3,716,075.
Parking Company of America: *See—*
Chaves, Manuel J., 3,716,183.
Parks, Kenneth J.; and Economy, Constatine F. Fastener attachment device for flexible sheet. 3,715,783, Cl. 24-265.00r.
Paro, Heemskerk: *See—*
Dekker, Cornelis; Joustra, Pieter Karel; and Paro, Heemskerk, 3,716,316.
Parrish, James T.; Spampinato, Dominic P.; and Terman, Lewis M., to International Business Machines Corporation. Shift register incorporating complementary field effect transistors. 3,716,724, Cl. 307-221.00c.
Parsons, George B.: *See—*
Weill, Robert L.; and Parsons, George B., 3,716,259.
P.A.S.-Artco, Inc.: *See—*
Huber, John A.; Baringer, Berlyn E.; Bruns, Eilert F.; and Ulewicz, Michael R., 3,715,903.
Pasero, Regine: *See—*
Viout, Andre; and Pasero, Regine, 3,716,633.
Passera, Walter, to Bosch, Robert, G.m.b.H. Fluidic logic device. 3,716,071, Cl. 137-594.000.
Patel, Chandra Kumar Naranbhai, to Bell Telephone Laboratories Incorporated. Television camera tube utilizing light beam scanning. 3,716,747, Cl. 315-10.000.
Patrick, William A., to Polyvend, Inc. Merchandising dispensing module for vending machines. 3,716,165, Cl. 221-85.000.
Paul, John C., to Parker-Hannifin Corporation. Power assist mechanism for fluid control valves. 3,716,075, Cl. 137-625.630.
Pawlikowski, Eugene J.: *See—*
Schonholtz, George J.; and Pawlikowski, Eugene J., 3,716,848.
Pearne, Florentin J.; Pearne, Frank S.; and Robson, Frederick G., to Aircraft Mechanics, Inc. Inflatable grippers for brick making machines or the like. 3,716,264, Cl. 294-63.00a.
Pearne, Frank S.: *See—*
Pearne, Florentin J.; Pearne, Frank S.; and Robson, Frederick G., 3,716,264.
Pease, Roger Fabian Wedgwood: *See—*
Connor, Denis John; Limb, John Ormond; Pease, Roger Fabian Wedgwood; and Scholes, William George, 3,716,667.
Pelton, Norman R. Encapsulating tree seedling root systems. 3,715,835, Cl. 47-58.000.
Pentapco, Inc.: *See—*
Snyder, Benjamin L., 3,716,006.
Pepkins, Garry R. Method of forming abrasion-resistant self-lubricating coating on ferrous metals and aluminum and resulting articles. 3,716,348, Cl. 29-195.000.
Percich, Phillip P., to Amerace Esna Corporation. Hose straightening fixture. 3,716,225, Cl. 269-269.000.
Peres, Gerard: *See—*
Mouroux, Claude; Peres, Gerard; and Valette, Pierre, 3,716,428.
Perkins, Dean Roger: *See—*
Caulfield, Henry John; and Perkins, Dean Roger, 3,716,301.
Perlman, Sol J. Process for cooking foods in polyalkylene teraphalate film bag. 3,716,369, Cl. 99-1.000.
Perricone, Alphonse C., to Milchem Incorporated. Brine drilling fluid lubricant and process for drilline subterranean wells with same. 3,716,486, Cl. 11-24-72.
Perry, Donald R. Hand-starting auxiliary device for internal combustion engines. 3,716,039, Cl. 123-185.00a.
Perry, Jack I.; and Schmader, Bernard A., to Owens-Illinois, Inc. Ninety degree sweepout with automatic phasing control. 3,716,126, Cl. 198-24.000.

Peters, Clifford M. Combination high and low pressure cutoff control valve. 3,716,074, Cl. 137-625.600.
Peters, James: *See—*
  Master, Harvey M.; Nugent, John L.; Hunt, Martin; and Peters, James, 3,716,785.
Peters, Kenneth, to Electric Power Storage Limited. Electric storage batteries. 3,716,412, Cl. 136-34.000.
Peterson, Anders Adolf, to Hardinge Brothers, Inc. Expanding collet and work gripping adaptor therefor. 3,716,246, Cl. 279-2.000.
Peterson, Earl A. Constantly slipping clutch control for rotary drilling. 3,716,106, Cl. 173-1.000.
Petrik, Albert V. Vertical alignment gauge. 3,715,808, Cl. 33-347.000.
Petrolite Corporation: *See—*
  Redmore, Derek; and Welge, Frederick T., 3,716,569.
Petrus, Eng. Alla: *See—*
  Caraculacu, Adrian, Dr.-Eng.; Petrus, Eng. Alla; and Laba, Eng. Mircea, 3,716,590.
Petyt, Colin Roderick, to Avery-Hardoll Limited and Beck & Co. (Meters) Limited. Liquid dispensing apparatus. 3,716,166, Cl. 222-15.000.
Peuschel, Gerd; and Hagedorn, Fritz, to Kali-Chemie A.G. Process of and apparatus for therometric analysis. 3,716,333, Cl. 23-230.00r.
Pezzoli, Silvestro: *See—*
  Vargiu, Silvio; Pezzoli, Silvestro; and Abruzzi, Pierluigi, 3,716,512.
Pfeil, Wolfgang: *See—*
  Erb, Edgar; Habiger, Walter; Kramer, Willi; Pfeil, Wolfgang; and Weigele, Reinhold, 3,715,979.
Phelan, Louis A. M.: *See—*
  Werner, Bernfried M., 3,715,893.
Phillips Fibers Croporation: *See—*
  Baker, Robert L.; and Szlosberg, Edward, 3,716,393.
Phillips, James H.: *See—*
  Loftis, James B.; Moody, David L.; and Phillips, James H., 3,716,108.
Phillips Petroleum Company: *See—*
  Brady, Donnie G., 3,716,591.
  Brady, Donnie G.; Deck, Harold R.; Jones, Faber B.; and Underwood, John H., 3,716,601.
  Chapman, Charles C., 3,716,343.
  Hsieh, Henry L., 3,716,495.
  Hutson, Tom, Jr.; and Carter, Cecil O., 3,716,593.
  Ripley, Dennis L., 3,716,545.
  Venable, Charles R., Jr., 3,716,340.
Phillips, Robert Matthews, to Litton Systems, Inc. Double octave broadband traveling wave tube. 3,716,745, Cl. 315-3.600.
Pichler, Richard: *See—*
  Tscharner, Christopher; Schwarz, Maurice; and Pichler, Richard, 3,716,532.
Pieczyk, Bernhard Peter, to Northern Electric Company Limited. Apparatus for and method of orienting crystal wafers. 3,716,712, Cl. 250-51.500.
Pier, Jerome R., to Westinghouse Air Brake Company. Combined electronic and fluid pressure brake control apparatus. 3,716,274, Cl. 303-20.000.
Pierce, Donald, to United Kingdom of Great Britain and Northern Ireland, Minister of Technology in Her Britannic Majesty's Government of the. Fluid dynamic lift generating or control force generating structures. 3,716,209, Cl. 244-123.000.
Pierson, Gerald Pierre, to Societe Carrier. Device for spraying an electrified powdered material onto a structure. 3,716,024, Cl. 118-630.000.
Pilgrim, William S.: *See—*
  Moore, William C.; Pilgrim, William S.; and Caldwell, Melvin R., 3,716,047.
Piller, Bernhard: *See—*
  Froehlich, Alfred; Piller, Bernhard; and Loeffel, Hansrolf, 3,716,368.
Pillsbury, Charles H., Jr. Animal exercising device. 3,716,029, Cl. 119-29.000.
Pioneer Electronic Corporation: *See—*
  Maruyama, Yoshio, 3,716,242.
Pipes, George R., to Eaton Yale & Towne, Inc. Stacker crane order picker. 3,716,147, Cl. 214-1.0bt.
Pirson, Ewald: *See—*
  Nitzsche, Siegfried; Pirson, Ewald; and Roth, Michael, 3,716,399.
Pitchon, Esra, to General Foods Corporation. Method of increasing solubility of food acidulents. 3,716,374, Cl. 99-78.000.
Pitney-Bowes, Inc.: *See—*
  Eckert, Alton B., Jr.; and Jones, Howell A., Jr., 3,716,699.
Pittman, Allen G.; and Wasley, William L. Siloxane polymers for soil-repellent and soil-release textile finishes. 3,716,517, Cl. 260-46.540.
Pittman, Allen G.; and Wasley, William L., to United States of America, Agriculture. Siloxane polymers for soil-repellent and soil-release textile finishes. 3,716,518, Cl. 260-46.50y.
Pittman, Allen G.; and Wasley, William L., to United States of America, Agriculture. Preparation of fluorinated esters. 3,716,577, Cl. 260-486.00h.
Pives, Seemon H., to Merck & Co., Inc. Preparation of amino acid derivatives. 3,716,573, Cl. 260-471.00a.
Plassmeier, Walter: *See—*
  Ledergerber Alfred; and Plassmeier, Walter, 3,715,938.
Plastronics, Inc.: *See—*
  Schultze, Wolfram M., 3,716,055.
Pleshko, Peter: *See—*
  Fisher, Donald E.; and Pleshko, Peter, 3,716,850.
Plihal, Hanns: *See—*
  Konigslehner, Franz; and Plihal, Hanns, 3,715,929.
Ploeger, Walter Jr.; Ploeger, Walter, Sr.; and Godigkeit, William, Jr. Three component printing ribbon and method of making same. 3,716,125, Cl. 197-172.000.
Ploeger, Walter, Sr.: *See—*
  Ploeger, Walter Jr.; Ploeger, Walter, Sr.; and Godigkeit, William, Jr., 3,716,125.
Plummer, Walter A. Method of equipping a tool handle or hand grip with a tough adherent protective layer with enhanced gripping properties. 3,716,433, Cl. 156-85.000.
Pogge, Hans B.: *See—*
  Ing, David W.; and Pogge, Hans B., 3,716,422.
Poggio, Andrew J.: *See—*
  Mayes, Paul E.; and Poggio, Andrew J., 3,716,867.
Pohl, Hans-Heinrich: *See—*
  Kelp, Fritz; and Pohl, Hans-Heinrich, 3,716,097.
Polaroid Corporation: *See—*
  Erlichman, Irving, 3,715,961.
Polysius AG: *See—*
  Ritzmann, Horst; and Kruger, Wilfried, 3,716,095.
Polyvend, Inc.: *See—*
  Patrick, William A., 3,716,165.
Pon, Judith Q.: *See—*
  Niewold, Andreas; and Pon, Judith Q., 3,716,714.
Pont, Michel, to Rhone-Poulenc S.A. Determination of elements in organic compounds. 3,716,334, Cl. 23-230.0pc.
Ponthoreau, Marcel Maximilien; and Rozen, Claude Yves Marie, to Martell & Co. High-intensity burner for combustible gas. 3,716,324, Cl. 431-185.000.
Porta Systems Corporated: *See—*
  Manos, George, 3,716,674.
Portec, Inc.: *See—*
  Mietla, Walter F., 3,715,994.
Porter, Brooks W. Method of prearranging playing cards for educational and entertainment purposes. 3,716,238, Cl. 273-149.00p.
Porter, Stuart M.; Weimer, Ervin C.; and Shideler, Harold W., to Stearns-Roger Corporation. Solid waste disposal method and apparatus. 3,716,002, Cl. 110-14.000.
Porter, William A.: *See—*
  Porter, William I.; Hindsley, Frank W.; and Hesse, James E., 3,716,054.
Porter, William I.; Hindsley, Frank W.; and Hesse, James E., to Porter, William A. Apparatus for applying medication to teeth and body tissue. 3,716,054, Cl. 128-172.100.
Post Office, The: *See—*
  Rollett, John Mortimer, 3,716,729.
Potasek, Chester J.; and Hiscocks, Frank, to Minneapolis Gas Company. Recirculating incinerator. 3,716,001, Cl. 110-8.00a.
PPG Industries: *See—*
  Voskuil, Donald J.; Knudtson, John P.; and Krupp, Myron J., 3,716,389.
Pratt-Read Corporation: *See—*
  Nordquist, Albert W., 3,715,950.
Preen, Raymond C.: *See—*
  Baker, Colin J.; Preen, Raymond C.; and Wilson, Donald W., 3,716,122.
Pregaglia, Gianfranco; Montorsi, Giorgio; Caprara, Giuseppe; and Messina, Giuseppe, to Montecatini Edison S.p.A. Process for preparing olefin oxides. 3,716,562, Cl. 260-348.50v.
Preston, Edward George, to Molins Machine Company Limited. Continuous rod making machines. 3,716,443, Cl. 156-441.000.
Price, Benjamin W. Self-propelled fishing lure. 3,715,830, Cl. 43-26.200.
Prill, Arnold L.; and Tarkan, Stuart E., to Chromalloy American Corporation. Powder metallurgy sintered corrosion and wear resistant high chromium refractory carbide alloy. 3,715,792, Cl. 29-182.700.
Prinkey, Clarence O.: *See—*
  Chatlos, Edward S.; Schroeder, Paul G. K.; and Prinkey, Clarence O., 3,715,866.
Process for preparing the P,P-dinitrobibenzyl: *See—*
  Caraculacu, Adrian, Dr.-Eng.; Petrus, Eng. Alla; and Laba, Eng. Mircea, 3,716,590.
Propst, Robert L.; and Kelley, James O., to Miller, Herman, Inc. Drawer, tray-shelf and supporting structures therefor. 3,716,282, Cl. 312-322.000.
Prouty, Robert E.; and Graf, Robert D., to Essex International, Inc. Double solenoid with interlock. 3,716,811, Cl. 335-160.000.
Pyco, Inc.: *See—*
  Evans, Harry T., 3,716,417.
R-K Electric Co., Inc.: *See—*
  Runge, John N.; and Krusling, Kenneth R., 3,716,756.
Raatgever, Jacob Frederik: *See—*
  Van Elk, Cornelis Johannes; Raatgever, Jacob Frederik; Morrien, Albertus Marinus; and Dirk van der Lee, Jan Gijsbert, 3,716,780.
Rackman, Michael I. Liquid-crystal television display system. 3,716,658, Cl. 178-7.30d.
Rae, Howard K., to Atomic Energy of Canada Limited. Extraction of deuterium from ammonia synthesis gas. 3,716,622, Cl. 423-248.000.
Rae, Howard Keith, to Atomic Energy of Canada Limited. Extraction of Deuterium-hydrogen monothermal exchange. 3,716,621, Cl. 423-248.000.

Raider, Jerry W., to International Business Machines Corporation. Printer hammer mechanism. 3,715,978, Cl. 101-93.00c.
Rakshys, Joseph W., Jr., to Dow Chemical Company, The. Stable carbonium ion resins and method for preparation. 3,716,501, Cl. 260-2.10e.
Rall, Dieter L.: *See—*
  Hornbaker, David R.; and Rall, Dieter L., 3,715,923.
Rausch, Henry, Jr.: *See—*
  Williams, Milton Guy, Jr.; and Rausch, Henry, Jr., 3,716,317.
Rayburn, Charles C. Method of making a miniature metallized capacitor. 3,715,784, Cl. 29-25.420.
Rayner, Eric T.: *See—*
  Fore, Sara P.; Rayner, Eric T.; and Dupuy, Harold P., 3,715,910.
Rayner, Wilfred H. G., to Clarke and Smith Manufacturing Company. Drive apparatus for tape playback apparatus. 3,716,241, Cl. 274-4.00d.
Rayonier Incorporated: *See—*
  Howard, John; and McIntosh, Terence D., 3,716,574.
Raytheon Company: *See—*
  O'Loughlin, James P., 3,716,798.
  Walsh, George M.; and Chramiec, Mark A., 3,716,825.
Razin, Anatoly Alexandrovich: *See—*
  Belkin, Nikolai Vasilievich; Alexandrovich, Eduard-Gely Vitalievich; Razin, Anatoly Alexandrovich; Kanunov, Mikhail Alexeevich; Tsukerman, Veniamin Aronovich; Sloeva, Galina Nikolaevna; Tsvetkov, Leonard Vasilievich; and Dron, Ninel Alexeevna, 3,716,737.
RCA Corporation: *See—*
  Bolger, Thomas V., 3,716,663.
  Heuner, Robert Charles; and Niemiec, Stanley Joseph, 3,716,723.
  Lynch, Ralph Sylvester; and Ayache, Haled Bou, 3,716,206.
  Napoli, Louis Sebastian; and Hughes, John Joseph, 3,716,429.
Reardon, Edward A. Photographic enlarger. 3,716,298, Cl. 355-71.000.
Red Cross Manufacturing, Corporation, The: *See—*
  Lautzenheiser, Robert D., 3,716,090.
  Lautzenheiser, Robert D., 3,716,198.
Redmore, Derek; and Welge, Frederick T., to Petrolite Corporation. Silicon-containing aminomethyl phosphonates. 3,716,569, Cl. 260-448.80n.
Reed, Lawrence N., to Essex International, Inc. Accelerator pedal. 3,715,934, Cl. 74-560.000.
Reeder, Thomas M.; and Smith, W. Richard, to United States of America, Air Force. Acoustic surface wave resonator. 3,716,809, Cl. 333-82.00r.
Reen, Orville W., to Allegheny Ludlum Industries, Inc. High alloy steel. 3,716,354, Cl. 75-128.00w.
Rees-Memphis, Inc.: *See—*
  Holden, James D., 3,716,000.
Refrigeration Engineering Corporation: *See—*
  Martin, Walter Harper, 3,715,891.
Rehberger, Louis W.; Williams, John C.; and Demme, John P., to United States of America, Army. Epoxy fixturing. 3,716,303, Cl. 48-3.000.
Reinberger, William C., to TRW Inc. Method of reinforcing piston ring grooves. 3,715,790, Cl. 29-156.50r.
Reinecke, Gunter, to Benz & Hilgers GmbH. Apparatus for wrapping up of disc-shaped food and table luxuries, as cheese discs, chocolate bars or the like. 3,715,859, Cl. 53-209.000.
Reinhardt, Dieter: *See—*
  Haass, Guenther; and Reinhardt, Dieter, 3,716,799.
Reliamatic, Inc.: *See—*
  Habisohn, Victor J., 3,716,770.
Reliance Electric Company: *See—*
  Sharp, Theo F., 3,715,932.
Remillard, Roland G.: *See—*
  Sears, Noel C.; and Remillard, Roland G., 3,716,135.
Renault, Philippe: *See—*
  Deschamps, Andre; Franckowiak, Sigismond; and Renault, Philippe, 3,716,620.
Renfroe, Harris B.: *See—*
  Hall, Luther A. R.; Gurney, John A.; and Renfroe, Harris B., 3,716,595.
Renner, Alfred, to Ciba-Geigy. Process for removing organic substances from water. 3,716,483, Cl. 210-40.000.
Research Corporation: *See—*
  Watanabe, Kantaro, 3,716,669.
Reserv-A-Roll Co.: *See—*
  Mott, Ralph Beach, Sr.; Mott, Ralph Beach, Jr.; and Cantella, Richard C., 3,716,184.
Rethmeier, Gerhard, to Anker-Werke AG. Blocking device for registering business machines. 3,716,694, Cl. 235-7.00r.
Rex Chainbelt Inc.: *See—*
  Morris, John M., 3,716,130.
Reynolds Metals Company: *See—*
  Lesko, Frank J., 3,715,904.
  Vickstrom, Donald E.; and Swenck, George F., 3,716,027.
Reynolds, Robin Francis Norman, to African Wire Ropes Limited. Valves. 3,716,069, Cl. 137-244.000.
Rheinmetall G.m.b.H.: *See—*
  Seifried, Paul, 3,715,826.
Rhodes, David; and Watridge, Derek. Process for agglomerating instant coffee. 3,716,373, Cl. 99-71.000.
Rhodes, Glenn E.: *See—*
  McMillen, James W.; and Rhodes, Glenn E., 3,716,684.
Rhone-Poulenc S.A.: *See—*
  Brunie, Jean-Claude; and Crenne, Noel, 3,716,563.
  Chaintron, Gerard, 3,716,584.
  Pont, Michel, 3,716,334.
Ribbens, Wilfried F.: *See—*
  Van Der Cleyen, Rafael J. J.; and Ribbens, Wilfried F., 3,716,229.
Ricci, Charles: *See—*
  Francois, Raymond; Sarbach, Jacques; Dong, Le Hao; Mizoule, Jacques; and Ricci, Charles, 3,716,642.
Rich, Theodore A., to Environment/One Corporation. Educational atmospheric particle detector. 3,715,809, Cl. 35-19.00b.
Riches, Arthur John, to Bunker-Ramo Corporation, The. Electrical connectors. 3,716,815, Cl. 339-44.00m.
Richter, Hans-Joachim: *See—*
  Clostermann, Friedrich; and Richter, Hans-Joachim, 3,716,710.
Ricoh Co., Ltd.: *See—*
  Ohta, Wasaburo; and Kasuya, Kazuhiko, 3,716,018.
Riester, Oskar, to Agfa-Gevaert Aktiengesellschaft. Bis-pyridinium salt and a phenyl borante as photosensitive combination. 3,716,366, Cl. 96-88.000.
Rigamonti, Gianfranco: *See—*
  Van Sickel, Alfred L.; Mitchell, Errol S.; and Rigamonti, Gianfranco, 3,716,451.
Riggi, Stephen Joseph: *See—*
  Albers, Henry John; Riggi, Stephen Joseph; Bach, Frederick Louis; and Cohen, Elliott, 3,716,644.
Riggs, Robert F.: *See—*
  Colby, Kenneth G.; and Riggs, Robert F., 3,716,749.
Rikard, Bobby G.: *See—*
  Rikard, Jackie D.; and Rikard, Bobby G., 3,716,831.
Rikard, Jackie D.; and Rikard, Bobby G. Worn brake indicator. 3,716,831, Cl. 340-52.00a.
Ripley, Dennis L., to Phillips Petroleum Company. Oxidative conversion including dehydrogenation. 3,716,545, Cl. 260-290.00v.
Risney, Donald R. Boat transporter. 3,716,156, Cl. 214-450.000.
Ritze, Willy, to JENer Glaswerke Schatt & Gen. Optical glasses comprising alf having a varying partial dispersion. 3,716,385, Cl. 106-47.00q.
Ritzmann, Horst; and Kruger, Wilfried, to Polysius AG. Process for heat treatment of fine granular material. 3,716,095, Cl. 165-1.000.
Robalex Inc.: *See—*
  Bemiss, Robert P., 3,715,853.
  Bemiss, Robert P.; and Donald, Alexander, 3,716,180.
Robalex, Inc., mesne: *See—*
  Bemiss, Robert P., 3,716,370.
Robbins Machinery Company: *See—*
  Loftis, James B.; Moody, David L.; and Phillips, James H., 3,716,108.
Robert, Jacques: *See—*
  Borel, Joseph; and Robert, Jacques, 3,716,290.
Robertson, Richard G., to Hytek International Corporation. Process and apparatus for destroying hexavalent chromium in solution. 3,716,485, Cl. 210-50.000.
Robinson, Douglas Burton, to Cutler-Hammer, Inc. Joy-stick operator for pushbutton switch. 3,715,933, Cl. 74-471.0xy.
Robson, Frederick G.: *See—*
  Pearne, Florentin J.; Pearne, Frank S.; and Robson, Frederick G., 3,716,264.
Rocha, John Gonsalves: *See—*
  Folley, Cranston Wesley; and Rocha, John Gonsalves, 3,715,955.
Rochman, Arnold. Front loading variable depth picture frame. 3,715,824, Cl. 40-152.000.
Rodriguez, Arturo Perez. Circuit breaker with thermal tripping device. 3,716,757, Cl. 317-40.00r.
Rogers, Marvin E.: *See—*
  Weinberg, Harold; Rogers, Marvin E.; Dadario, Michael G.; and Benson, James A., 3,716,835.
Rohm and Haas Company: *See—*
  Cenci, Harry J., 3,716,524.
  Lewis, Sheldon N.; and Frank, George A., 3,716,508.
Rokfalussy, Desmond: *See—*
  Chaikin, Malcolm; Rokfalussy, Desmond; and Dircks, Alexander Douglas, 3,715,780.
Roleshus, Rudolph L. Collapsible support member. 3,715,996, Cl. 108-144.000.
Rollett, John Mortimer, to Post Office, The. All-pass and low-pass filters comprised of active element circulators. 3,716,729, Cl. 307-295.000.
Romoser, Paul E., to Lorain Electronics Corporation. Single sideband system utilizing two tone modulation. 3,716,790, Cl. 325-49.000.
Roos, Robert R.: *See—*
  Hackman, Frank C.; and Roos, Robert R., 3,716,257.
Root, John J. Serpentine antenna mounted on a rotatable capacitive coupler. 3,716,861, Cl. 343-741.000.
Roper, Ralph E., to Wallace Expanding Machines, Inc. Method and apparatus for forming a shadow mask frame. 3,715,906, Cl. 72-354.000.
Ropin, Kurt: *See—*
  Graesslin, Dieter; Hils, Siegbert Friedrich; and Ropin, Kurt, 3,716,679.
Rosinski, Edward J., to Mobil Oil Corporation. Explosive fragementation of porous solids. 3,715,983, Cl. 241-1.000.
Rotast, Nikita L., to Microsystems International Limited. Universal interconnection structure for microelectronic devices. 3,716,761, Cl. 317-101.00b.

Roth, Irving, to Sperry Rand Corporation. Vehicle height clearance indicating apparatus. 3,716,833, Cl. 340-61.000.

Roth, Michael: *See—*
Nitzsche, Siegfried; Pirson, Ewald; and Roth, Michael, 3,716,399.

Roth, Rogert Ingersoll: *See—*
Belady, Laszlo Antal; Evangelisti, Carlo John; and Roth, Rogert Ingersoll, 3,716,842.

Rowburg, Dale A.: *See—*
Rowbury, Dayton J., 3,716,031.

Rowbury, Dayton J., to Rowburg, Dale A. Quick release lariat honda. 3,716,031, Cl. 119-153.000.

Roy, Rustum; Henisch, Heinz K.; and White, William B. Methods of stimulating luminescence in phosphor. 3,716,741, Cl. 313-108.00r.

Roymoulik, Sunanada K., to International Paper Company. Single stage delignification and bleaching of chemical pulp with oxygen in the presence of a protector. 3,716,448, Cl. 162-65.000.

Royston, Alan Lindsay: *See—*
Schick, Rudolf; Mackie, Robin William; and Royston, Alan Lindsay, 3,716,692.

Rozen, Claude Yves Marie: *See—*
Ponthoreau, Marcel Maximilien; and Rozen, Claude Yves Marie, 3,716,324.

Rubin, Frank F. Guarded dorsal osteotome with stabilizer. 3,716,057, Cl. 128-305.00r.

Rudder, James M., Jr. Security display case. 3,716,281, Cl. 312-114.000.

Rude, Edward T., Jr., to United States of America, Army, mesne. Firing mechanism for a multi-purpose firearm. 3,715,954, Cl. 89-127.000.

Rueffer, Harold F.; and Belard, Richard J., to Hughes Aircraft Company. Semiconductor device with protective glass sealing. 3,716,765, Cl. 317-234.00r.

Ruehle, William H., to Mobil Oil Corporation. Apparatus for and method of treating seismic data having attenuated high frequencies. 3,716,829, Cl. 340-15.5dp.

Ruggerio, Paul A., to GTE Laboratories Incorporated. Method of making photomasks of the type used in the fabricationn of microelectronic circuits. 3,716,363, Cl. 96-66.00r.

Runge, John N.; and Krusling, Kenneth R., to R-K Electric Co., Inc. Recycle prevention control circuit. 3,716,756, Cl. 317-13.00a.

Rushin, Eugene. Smog pulverizing machine. 3,715,864, Cl. 55-213.000.

Rust Furnace Company: *See—*
Anderson, Robert James, 3,716,222.

Rutgerswerke Aktiengesellschaft: *See—*
Wilhelm, Gerhard; Hockenberger, Lothar; and Soyka, Manfred, 3,716,515.

Sadamtsu, Shigeru: *See—*
Ohe, Keitaro; Nishio, Daijiro; Sadamtsu, Shigeru; and Kaneko, Hiroyuki, 3,716,505.

Sadler, Albert Corneil, Jr. Accumulating live roller conveyor. 3,716,129, Cl. 198-127.000.

Safe Flight Instrument Corporation: *See—*
Greene, Leonard M., 3,716,017.

Safety Skate Company, Inc., The: *See—*
Beck, George W., 3,716,114.

Saito, Shigeru: *See—*
Yoshino, Takachika; Saito, Shigeru; and Sasaki, Yutaka, 3,716,496.

Sakakibara, Naoji: *See—*
Kobayashi, Toyoaki; Sakakibara, Naoji; and Kondo, Toshio, 3,716,113.

Sakumura, Tuyoshi: *See—*
Fukushima, Yoshikiyo; Ishihara, Yasushi; Momota, Kenzo; Usui, Yasuo; Sakumura, Tuyoshi; Sogo, Satoru; and Nunokawa, Koji, 3,716,210.

Salsbury Laboratories: *See—*
Koebler, William F.; and Frank, Dale A., 3,716,133.

Salter, David Stanley; and Smith, David Henry, to Constructors John Brown Limited. Electrochemical processes. 3,716,459, Cl. 204-1.00r.

Salvatori, Derald M. Button assembly. 3,715,781, Cl. 24-90.0ha.

San Fernando Electric Manufacturing Co.: *See—*
Campbell, Robert D., 3,716,134.

Sanders Associates, Inc.: *See—*
Schmitt, Joseph W.; and Starkey, Donald L., 3,716,843.

Sanders, Murray A., to Allen-Stevens Drim Accessories Corporation. Drum scraping chain. 3,715,884, Cl. 59-78.000.

Sanders Nuclear Corporation: *See—*
Deschamps, Nicholas H.; Stein, Bernard; and Mayo, Kenneth E., 3,716,099.

Sandoz Ltd.: *See—*
Gadient, Fulvio, 3,716,544.
Helfenberger, Hans, 3,716,636.

Sandoz Ltd.; a/k/a Sandoz AG: *See—*
Hofer, Kurt; and Kessler, Rudolf, 3,716,586.

Sandoz-Wander, Inc.: *See—*
Lopez, Benito; and Kornblum, Saul S., 3,716,388.

Sanford, Chester E.: *See—*
Townsend, john K.; and Sanford, Chester E., 3,716,431.

Sanne, Odmund. Means for construction of collapsible railings. 3,716,218, Cl. 256-64.000.

Sansoni, Bruno Otto; and Kracke, Wolfgang Karl Heinrich, to Gesellschaft fur Strahlenforschung m.b.H. Method of decomposition and/or wet incineration of organic material, especially biological substances. 3,716,566, Cl. 260-412.800.

Sarbach, Jacques: *See—*
Francois, Raymond; Sarbach, Jacques; Dong, Le Hao; Mizoule, Jacques; and Ricci, Charles, 3,716,642.

Sartori, Roland Ernest, to Ateliers Roannais de Constructions Textile. Apparatus for reciprocating a traveller. 3,716,200, Cl. 242-43.000.

Sasaki, Yutaka: *See—*
Yoshino, Takachika; Saito, Shigeru; and Sasaki, Yutaka, 3,716,496.

Sasatani, Harumi: *See—*
Yamada, Tunehiko; Egami, Seiji; Sasatani, Harumi; Matsuoka, Hideaki; Emoto, Saburo; and Okamura, Kunio, 3,716,176.

Sassman, James E. Method and apparatus for pressing fabrics. 3,715,818, Cl. 38-15.000.

Satas, Donatas: *See—*
Newman, Nicholas S.; and Satas, Donatas, 3,716,437.

Sato, Hideo, to Denki Onkyo Company, Ltd. High voltage generating apparatus. 3,716,778, Cl. 323-8.000.

Sato, Kenzo, to Kabushiki Kaisha Morita Seisakusho. Metal chuck for use in a dental handpiece. 3,716,247, Cl. 279-1.0sg.

Sato, Makoto: *See—*
Sato, Yoshikazu; and Sato, Makoto, 3,715,801.

Sato, Yoshikazu; and Sato, Makoto. Tool changer for machine tool. 3,715,801, Cl. 29-568.000.

Saucy, Gariel: *See—*
Andrews, David; and Saucy, Gariel, 3,716,561.

Sauer, Otto, Achsenfabrik: *See—*
Schaeff, Friedrich, 3,716,249.

Sauter, Walter A.: *See—*
Ghose, Rabindra N.; and Sauter, Walter A., 3,716,863.

Sawai, Akira, to Nippon Electric Company, Limited. Code conversion circuit for a two-level to multi-level code converter. 3,716,852, Cl. 340-347.0dd.

Sawano, Takahiro: *See—*
Suenaga, Masanobu; Machii, Tetsuo; Sawano, Takahiro; Kobayashi, Takehiko; Dengo, Tadao; and Nakai, Tetsuzo, 3,715,802.

Say, Donald L., to GTE Sylvania Incorporated. Electron gun support and shielding means. 3,716,739, Cl. 313-82.00r.

Scace, Robert I.; and Slack, Glen A., to General Electric Company. Electronic device with thermally conductive dielectric barrier. 3,716,759, Cl. 317-100.000.

Scaddan, Ernest Victor; and Heard, Alan Clifford, to International Standard Electric Corporation. Wiring dressing tool. 3,716,080, Cl. 140-124.000.

Scaggs, Orville C. Apparatus for pipe handling. 3,716,149, Cl. 214-2.500.

Schaeff, Friedrich, to Sauer, Otto, Achsenfabrik. Arrangement for stabilizing trailing vehicle axles. 3,716,249, Cl. 280-81.00a.

Schaffer, Detlef: *See—*
Knechtel, Wilhelm Josef; and Schaffer, Detlef, 3,715,944.
Knechtel, Wilhelm Josef; and Schaffer, Detlef, 3,716,294.

Schalamon, Wesley A.; and Bacon, Roger, to Union Carbide Corporation. Process for producing carbon fibers having a high Young's modulus of elasticity. 3,716,331, Cl. 423-447.000.

Schardey, Karl: *See—*
Mittler, Johannes; and Schardey, Karl, 3,716,157.

Scheidweiler, Andreas; and Muller, Peter, to Gerberus A.G. Flame detector and electrical detection circuit. 3,716,717, Cl. 250-217.00f.

Schell, Charles E., III: *See—*
Weisstuch, Aaron; Schell, Charles E., III; and Dryden, Paul C., 3,716,460.

Schering A.G.: *See—*
Albrecht, Rudolf; Schroder, Eberhard; and Muftic, Mahmoud (said Albrecht and said Schroder assors. to), 3,716,531.

Schick, Rudolf; Mackie, Robin William; and Royston, Alan Lindsay. Temperature controlled soldering irons. 3,716,692, Cl. 219-241.000.

Schindler, Walter, to Ciba-Geigy Corporation. 10-Oxo-10,11-dihydro-5H-dibenz 6,f azepine-5-carboxamide in the treating of epilepsy. 3,716,640, Cl. 424-244.000.

Schlatter, Gerald Lance, to International Telephone and Telegraph Corporation. Densitometer. 3,715,912, Cl. 73-32.000.

Schloemann Aktiengesellschaft: *See—*
Schussler, Ludwig, 3,715,908.

Schlumberger Technology Corporation: *See—*
Garcia, Donald J., 3,716,830.

Schmader, Bernard A.: *See—*
Perry, Jack I.; and Schmader, Bernard A., 3,716,126.

Schmid, Hermann, to Bosch, Robert, G.m.b.H. Temperature-dependent time-delay switch. 3,716,034, Cl. 123-32.0ea.

Schmidt, Felix Hehmut: *See—*
Heerdt, Ruth; Hubner, Manfred; Schmidt, Felix Hehmut; and Weyer, Rudi, 3,716,537.

Schmidt, Gerhard: *See—*
Bauer, Hans; Holzer, Helmut; and Schmidt, Gerhard, 3,716,395.

Schmidt, Otto, to Siemens Aktiengesellschaft. Crucible-free zone melting device having an angled heating coil. 3,716,341, Cl. 23-273.0sp.

Schmitt, Joseph W.; and Starkey, Donald L., to Sanders Associates, Inc. Modular signal processor. 3,716,843, Cl. 340-172.500.

Schneider, Richard S.: *See—*
Ullman, Edwin F.; and Schneider, Richard S., 3,716,335.

Schnell, Hermann: *See—*

Darsow, Gerhard; and Schnell, Hermann, 3,716,549.

Schnellman, Oscar; and Stier, Henry Willy, to Carmet Company. Automatic profile grinding machine with an indexing mechanism. 3,715,841, Cl. 51-165.880.

Schohl, Paul. Automatic bagger of groceries sundries. 3,715,862, Cl. 53-390.000.

Scholes, William George: *See—*
Connor, Denis John; Limb, John Ormond; Pease, Roger Fabian Wedgwood; and Scholes, William George, 3,716,667.

Scholl, Inc.: *See—*
Johnston, John, 3,716,503.

Scholl, Ronald F.; and Bleha, William P., Jr., to Hughes Aircraft Company. Method for making a cadmium sulfide thin film sustained conductivity device. 3,716,406, Cl. 117-217.000.

Schon, Erich F., to Otto, C., Dr., & Comp. G.m.b.H. Apparatus for preventing air pollution during coke oven discharge. 3,716,457, Cl. 202-263.000.

Schonholtz, George J.: *See—*
Schonholtz, George J.; and Pawlikowski, Eugene J. (said Pawlikowski assor. to said), 3,716,848.

Schonholtz, George J.; and Pawlikowski, Eugene J., said Pawlikowski assor. to said Schonholtz, George J. Small portable paging receiver with audio recording and reproducing facilities. 3,716,848, Cl. 340-311.000.

Schoolar, Richard B., to United States of America, Navy. Method of preparation of lead sulfide PN junction diodes. 3,716,424, Cl. 148-175.000.

Schrenk, Walter J.; Cleereman, Kenneth J.; Chisholm, Douglas S.; and Alfrey, Turner, Jr., to Dow Chemical Company, Limited. Method for the formation of composite plastic bodies. 3,716,612, Cl. 264-241.000.

Schroder, Eberhard: *See—*
Albrecht, Rudolf; Schroder, Eberhard; and Muftic, Mahmoud, 3,716,531.

Schroeder, Paul G. K.: *See—*
Chatlos, Edward S.; Schroeder, Paul G. K.; and Prinkey, Clarence O., 3,715,866.

Schuh, Eduard: *See—*
Kelch, Heinz; and Schuh, Eduard, 3,716,185.
Kelch, Heinz; Krickl, Josef; Schuh, Eduard; and Spauszus, Siegfried, 3,716,700.

Schultz, Robert L.: *See—*
Hayes, Arthur F.; and Schultz, Robert L., 3,716,696.

Schultze, Wolfram M., to Plastronics, Inc. Support apparatus for a bedside drainage bag. 3,716,055, Cl. 128-275.000.

Schur, George O. Heat vapor differential engine. 3,715,885, Cl. 60-25.000.

Schussler, Ludwig, to Schloemann Aktiengesellschaft. Forging manipulators. 3,715,908, Cl. 72-420.000.

Schut, Robert Norman, to Miles Laboratories, Inc. Aminomethylphenylbicyclononenols. 3,716,538, Cl. 260-268.0bc.

Schwartz, Reinhard: *See—*
Bosch, Walter; and Schwartz, Reinhard, 3,716,064.

Schwarz, Maurice: *See—*
Tscharner, Christopher; Schwarz, Maurice; and Pichler, Richard, 3,716,532.

Schweiger, Richard G., to Grain Processing Corporation. Refining of hemicelluloses. 3,716,526, Cl. 260-212.000.

Schweikl, Ludwig; and Japs, Alfred, to Motoren- und Turbinen-Union Muenchen GmbH. Aircraft with one or several turbojet engines housed in the fuselage aft section or in pods provided with thrust-reversing devices. 3,716,207, Cl. 244-53.00r.

Scott, Daniel G.: *See—*
Wilson, Richard L.; and Scott, Daniel G., 3,716,276.

Scott Paper Company: *See—*
Lewyckyj, Roman, 3,716,132.

Scott, William J.: *See—*
Erik, Carl L.; and Scott, William J., 3,716,318.

Scovill Manufacturing Company, mesne: *See—*
Chivers, James R., 3,716,169.

Sealectro Limited: *See—*
Deakin, Stanley Thomas, 3,716,820.

Searle, G. D., & Co.: *See—*
Chorvat, Robert J.; and Pappo, Raphael, 3,716,559.

Searle, G. E., & Co.: *See—*
Hershenson, Fred M., 3,716,548.

Sears, Noel C.; and Remillard, Roland G., to Sprague Electric Company. Sorting device. 3,716,135, Cl. 209-74.000.

Security Patent Anchor Company Limited, The: *See—*
Wright, Kenneth L., 3,716,012.

Seeburg Corporation of Delaware, The: *See—*
Dabrowski, Casimer J., 3,716,124.

Seglem, Omund A.: *See—*
Grauer, Oscar H.; Seglem, Omund A.; and Kaucher, Erwin K., 3,715,921.

Seifried, Paul, to Rheinmetall G.m.b.H. Firearm magazine releasing lever and trigger safety. 3,715,826, Cl. 42-70.00e.

Senju Metal Industry Co., Ltd.: *See—*
Tanaka, Jun; and Onuki, Hiroshi, 3,716,103.

Serewicz, Aubrey J., to Illinois Tool Works Inc. Panel insert and method of installation. 3,716,092, Cl. 151-41.700.

Setalvad, Jagdish Ishwarlal: *See—*
Dutta, Subodh Krishna; Shah, Krishnakant Girdharla; and Setalvad, Jagdish Ishwarlal, 3,716,326.

Seyb, Edgar J., Jr.: *See—*
Waggoner, Terry B.; and Seyb, Edgar J., Jr., 3,716,394.

Seymour, Donald E.: *See—*
Kunkel, Donald H.; and Seymour, Donald E., 3,716,351.

Sha, Richard T.; and Tang, Donald T., to International Business Machines Corporation. Recursive automatic equalizer and method of operation therefore. 3,716,807, Cl. 333-18.000.

Shah, Krishnakant Girdharla: *See—*
Dutta, Subodh Krishna; Shah, Krishnakant Girdharla; and Setalvad, Jagdish Ishwarlal, 3,716,326.

Shark, Sam: *See—*
Fischbein, Harold; Fischbein, Irving George; and Shark, Sam, 3,716,007.

Sharki, Martin J.; and Griffin, Phil H., to Dresser Industries, Inc. Pneumatic ratemeter and counter. 3,716,707, Cl. 235-200.000.

Sharp, Theo F., to Reliance Electric Company. Speed reducer. 3,715,932, Cl. 74-42.00s.

Shell Oil Company: *See—*
Langner, Carl G., 3,715,890.

Sheridon, Nicholas K., to Xerox Corporation. Cyclic recording system by the use of an elastomer in an electric field. 3,716,359, Cl. 96-1.100.

Sherman, Alan E., to Aranar Marketing Services, Inc. Key retainer. 3,715,900, Cl. 70-456.00r.

Sherman, James Webster; and Jenkins, Terry Allen, to Johns-Manville Corporation. Flexible duct connection. 3,716,077, Cl. 138-134.000.

Shibata, Fumio: *See—*
Kitamura, Kazuo; Takabayashi, Fumiki; and Shibata, Fumio, 3,716,330.

Shideler, Harold W.: *See—*
Porter, Stuart M.; Weimer, Ervin C.; and Shideler, Harold W., 3,716,002.

Shigaki, Masanobu; Kido, Shigehiro; and Chiba, Yoshikazu, to Takuma Kikan Mfg. Co. Hydrogen chloride recovery incinerator for plastics containing hydrogen and chlorine. 3,716,339, Cl. 23-262.000.

Shimada, Kazuo: *See—*
Kodera, Yoshihide; Kato, Jun; Shimada, Kazuo; Suzuki, Morio; Ohse, Hidetaka; Ohshima, Satoshi; and Kiriki, Yasunori, 3,716,478.

Shimizu, Tamio: *See—*
Mochizuki, Takashi; Komatsuzaki, Yoshinori; Hara, Satoshi; Nojima, Hideo; Shimizu, Tamio; and Suzuki, Shigeo, 3,715,945.

Shimmin, Lawrence E., to Copley Press, Inc. Web guiding and corner folding apparatus. 3,716,178, Cl. 226-11.000.

Shimokawa, Katsuyoshi: *See—*
Kotanigawa, Takeshi; Yamamoto, Mitsuyoshi; and Shimokawa, Katsuyoshi, 3,716,589.

Shimotake, Hiroshi: *See—*
Cairns, Elton J.; Kyle, Martin L.; and Shimotake, Hiroshi, 3,716,409.

Shinoda, Takayuki: *See—*
Mimino, Tohru; Kinoshita, Kazuhisa; Tanaka, Ryohei; and Shinoda, Takayuki, 3,716,353.

Shionagi & Co., Ltd.: *See—*
Nagata, Wataru; and Hirai, Shoichi, 3,716,528.

Shirage, Yoshio: *See—*
Mori, Kunio; and Shirage, Yoshio, 3,715,769.

Shirano, Kenji; and Yoshitake, Toshihiko, to Kuraray Co., Ltd. Process for producing polyesters of improved rubber adhesion and product. 3,716,396, Cl. 117-76.00t.

Shirk, Brian Thomas, to Stackpole Carbon Company. Hard magnetic ferrites. 3,716,630, Cl. 423-594.000.

Shrader, Delworth. Meter power distribution apparatus for mobile homes with a detachable front panel for power outlet fitting. 3,716,762, Cl. 317-107.000.

Shulz, Robert J., to Vischer Products Company. Steam generator control. 3,716,188, Cl. 236-92.000.

Shwayder, Benjamin H., to Shwayder Chemical & Metallurgy Corporation. Drill proof plates. 3,715,999, Cl. 109-82.000.

Shwayder Chemical & Metallurgy Corporation: *See—*
Shwayder, Benjamin H., 3,715,999.

Siddall, John B.: *See—*
Henrick, Clive A.; and Siddall, John B., 3,716,565.

Siegener Aktiengesellschaft: *See—*
Vollhardt, Forhmut, 3,716,045.

Sieja, James Bernard, to Du Pont de Nemours, E. I., and Company. Thiadiazoles [3,4-d] pyridazines. 3,716,534, Cl. 260-250.00a.

Siemens Aktiengesellschaft: *See—*
Brunner, Julius, 3,716,769.
Dangschat, Rainer, 3,716,776.
Grabmaier, Josef, 3,716,345.
Groschwitz, Eberhard, 3,716,804.
Haass, Guenther; and Reinhardt, Dieter, 3,716,799.
Kausche, Helmold, 3,716,472.
Kraus, Artur, 3,716,746.
Menge, Kurt, 3,715,922.
Schmidt, Otto, 3,716,341.

Sievert, William C.: *See—*
Carter, William A.; Sievert, William C.; and Munson, James L., 3,716,019.

Signouret, Jean-Baptiste: *See—*
Esclamadon (, Christian; Labat, Yves; and Signouret, Jean-Baptiste, 3,716,588.

Silbert, Leonard S., to United States of America, Agriculture. Process for the preparation of alkyl, perfluoroalkyl and aryl iodides. 3,716,592, Cl. 260-650.00r.

- Silman, Harold: *See—*
  - Young, Gideon Maurice; Silman, Harold; and Hill, Eric John, 3,715,838.
- Silva, George E. Extension hand sprayer device. 3,716,195, Cl. 239-375.000.
- Silvestri, Anthony J.: *See—*
  - Weisz, Paul B.; and Silvestri, Anthony J., 3,716,479.
- Simjian, Luther G., to General Research Inc. Control and recording apparatus. 3,716,698, Cl. 235-61.100.
- Simmen, Robert: *See—*
  - Morel, Rene; and Simmen, Robert, 3,715,987.
- Simmons, Kenneth D.; Allen, Henry W.; and Gebhardt, Ronald F., to Martin-Marietta Corporation. Cement clinker production. 3,716,387, Cl. 106-100.000.
- Simms, John A.; and Walus, Aloysius N., to Du Pont de Nemours, E. I., and Company. Process for preparing aziridiny 1 alkyl-acrylate or methacrylate graft copolymers. 3,716,506, Cl. 260-22.0cb.
- Simon, Horst; and Kollgus, Heinrich, to Eastman Kodak Company. Camera mechanism adapted to fire mechanically-actuable flash units. 3,715,960, Cl. 95-11.50r.
- Simons, John Roger, to Bunker Ramo Corporation. Battery clock wind device. 3,715,880, Cl. 58-41.000.
- Simpson, Arnold J.: *See—*
  - Deeg, Emil W.; Snitzer, Elias; and Simpson, Arnold J., 3,716,349.
- Sims, David S.: *See—*
  - Thompson, John H.; and Sims, David S., 3,716,823.
- Sinclair, Jack: *See—*
  - Mackenzie, John, 3,715,977.
- Singer-General Precision, Inc.: *See—*
  - Friedman, David, 3,716,660.
- Singleton, Alan H.: *See—*
  - Lynn, James B.; and Singleton, Alan H., 3,716,619.
- Siviour, Neil Graham: *See—*
  - Cullen, Geoffrey Victor; Graham, John William; and Siviour, Neil Graham, 3,716,471.
- Skau, Evald L.: *See—*
  - Mod, Robert R.; Magne, Frank c.; and Skau, Evald L., 3,716,540.
- SKF Industrial Trading and Development Co. N.V.: *See—*
  - Nilsson, Sven Walter, 3,716,731.
- Skogsholm, Einar Aasen, to General Electric Company. Short circuit protection means for power circuits. 3,716,775, Cl. 321-5.000.
- Skoog, Folke E. Invalid support. 3,716,067, Cl. 135-45.00a.
- Skoyles, Derek Robert, to U.S. Philips Corporation. Anti-lock brake systems for wheeled vehicles. 3,716,275, Cl. 303-21.0af.
- Skydyne, Inc.: *See—*
  - Weill, Robert L.; and Parsons, George B., 3,716,259.
- Slack, Glen A.: *See—*
  - Scace, Robert I.; and Slack, Glen A., 3,716,759.
- Slick, Edward C.: *See—*
  - Burkhart, John H.; and Slick, Edward C., 3,716,421.
- Sloeva, Galina Nikolaevna: *See—*
  - Belkin, Nikolai Vasilievich; Alexandrovich, Eduard-Gely Vitalievich; Razin, Anatoly Alexandrovich; Kanunov, Mikhail Alexeevich; Tsukerman, Veniamin Aronovich; Sloeva, Galina Nikolaevna; Tsvetkov, Leonard Vasilievich; and Dron, Ninel Alexeevna, 3,716,737.
- Slominski, Walter V., to Hoover Ball and Bearing Company. Connector and stiffener member for intersecting wires. 3,715,766, Cl. 5-247.000.
- Sloter, James W. Vehicle towing means. 3,716,152, Cl. 214-86.00a.
- Small, Edward R.: *See—*
  - Hirai, Robert K.; Boomer, John H.; and Small, Edward R., 3,715,943.
- Smith, Alexander Steel; and Bailey, Ernest Arthur. Bags and bag-supplying apparatus. 3,715,854, Cl. 53-29.000.
- Smith, Craig P.: *See—*
  - Malinowski, Stanley; Dailing, James L.; and Smith, Craig P., 3,716,808.
- Smith, David Henry: *See—*
  - Salter, David Stanley; and Smith, David Henry, 3,716,459.
- Smith, Floyd Reed. Stook invertor. 3,716,175, Cl. 214-768.000.
- Smith, George A.; Stevens, Harrison; Walker, Robert R.; and Boyd, Gilbert D., to Allegheny Ludlum Industries, Inc. Grounding rod and coupler therefor. 3,716,649, Cl. 174-7.000.
- Smith Klint, & French Laboratories: *See—*
  - Actor, Philip P.; Parish, Roger C.; and Theodorides, Vassilios J., 3,716,641.
- Smith, Leslie V. Conical radiant orchard heater. 3,716,042, Cl. 126-59.500.
- Smith, W. Richard: *See—*
  - Reeder, Thomas M.; and Smith, W. Richard, 3,716,809.
- Snitzer, Elias: *See—*
  - Deeg, Emil W.; Snitzer, Elias; and Simpson, Arnold J., 3,716,349.
- Snowden, Bryan T., to Food Equipment, Inc. Fowl singeing system utilizing oscillating flames. 3,715,779, Cl. 17-11.000.
- Snyder, Benjamin L., to Pentapco, Inc. Attachment for the button clamp of button sewing machines, for holding a shank tube to be sewn on together with the button. 3,716,006, Cl. 112-114.000.
- Societa Italiana Resine S.p.A.: *See—*
  - Calcagno, Benedetto; and Ghirga, Marcello, 3,716,581.
  - Vargiu, Silvio; Pezzoli, Silvestro; and Abruzzi, Pierluigi, 3,716,512.
- Societe Anonyme dite: L'Oreal: *See—*
  - Viout, Andre; and Pasero, Regine, 3,716,633.
- Societe Anonyme dite: Societe Nationale des Petroles d'Aquitaine: *See—*
  - Esclamadon (, Christian; Labat, Yves; and Signouret, Jean-Baptiste, 3,716,588.
- Societe Carrier: *See—*
  - Pierson, Gerald Pierre, 3,716,024.
- Societe d'Assistance Technique pour Produits Nestle S.A.: *See—*
  - Van Pottelsberghe de La Potterie, Pierre Joseph, 3,716,379.
  - Van Pottelsberghe de La Potterie, Pierre Joseph, 3,716,380.
- Societe de Constructions Mecahiques Panhard & Levassor: *See—*
  - Panhard, Jean, 3,716,312.
- Societe des Fonderies De Pont-A-Mousson: *See—*
  - Fuminier, Claude, 3,716,094.
- Societe E. Lacroix: *See—*
  - Bares, Roger, 3,715,988.
- Sogo, Satoru: *See—*
  - Fukushima, Yoshikiyo; Ishihara, Yasushi; Momota, Kenzo; Usui, Yasuo; Sakumura, Tuyoshi; Sogo, Satoru; and Nunokawa, Koji, 3,716,210.
- Sohoma, Takeyoshi, to Denki Onkyo Co., Ltd. Saturable reactor for correcting raster distortion. 3,716,748, Cl. 315-27.0sr.
- Sola Basic Industries, Inc.: *See—*
  - Broekhuysen, William C., 3,716,814.
- Solartron Electronic Group Limited, The: *See—*
  - Metcalf, Eric, 3,716,849.
- Sonex, Inc.: *See—*
  - Weinberg, Harold; Rogers, Marvin E.; Dadario, Michael G.; and Benson, James A., 3,716,835.
- Sony Corporation: *See—*
  - Morio, Minoru; and Mima, Koichiro, 3,716,665.
- South African Inventions Development Corporation: *See—*
  - Anderson, Ernest Leslie, 3,715,892.
- Southwire Company: *See—*
  - Cofer, Daniel B., 3,716,423.
- Soyka, Manfred: *See—*
  - Wilhelm, Gerhard; Hockenberger, Lothar; and Soyka, Manfred, 3,716,515.
- Spain, Virginia L.; and Diekman, John D., to Zoecon Corporation. Aza aliphatic esters. 3,716,564, Cl. 260-404.000.
- Spampinato, Dominic P.: *See—*
  - Parrish, James T.; Spampinato, Dominic P.; and Terman, Lewis M., 3,716,724.
- Spatz, Donald Dean, to Osmonics, Inc. Solvent separating apparatus. 3,716,141, Cl. 210-194.000.
- Spauszus, Siegfried: *See—*
  - Kelch, Heinz; Krickl, Josef; Schuh, Eduard; and Spauszus, Siegfried, 3,716,700.
- Speakman, Edwin L., to Standard Brands Incorporated. Process for producing formaldehyde-treated starch free of unreacted or free formaldehyde. 3,716,527, Cl. 260-233.30a.
- Spectral Data Corporation: *See—*
  - Yost, Edward F., Jr., 3,715,962.
- Speedine Partnership: *See—*
  - King, Leonard Tony, 3,715,975.
- Spence, Hilton W.: *See—*
  - Stehlin, Robert A.; and Spence, Hilton W., 3,716,727.
- Sperry Rand Corporation: *See—*
  - Caulfield, Henry John; and Perkins, Dean Roger, 3,716,301.
  - Colby, Kenneth G.; and Riggs, Robert F., 3,716,749.
  - Roth, Irving, 3,716,833.
- Sprague Electric Company: *See—*
  - Kahn, Manfred, 3,716,407.
  - Sears, Noel C.; and Remillard, Roland G., 3,716,135.
- Spriet, Roger Alois: *See—*
  - Thiers, Robrecht Julius; Willems, Jozef Frans; and Spriet, Roger Alois, 3,716,361.
- Springer, Reinhard; Drescher, Kurt; and Jahn, Eberhard, to Arbeitsstelle fur Molekularelektronik. Method and electronic circuit arrangement for producing photomasks. 3,716,296, Cl. 355-53.000.
- Squibb, E. R., & Sons, Inc.: *See—*
  - Parekh, Chandra Kant, 3,716,336.
- St. Denis, Andrew Raoul. Digital control device for strip metal feeder. 3,716,773, Cl. 318-600.000.
- St. John, Daniel S.; and Haines, Kenneth A., to Holotron Corporation. Holographic television record system. 3,716,286, Cl. 350-3.500.
- Staar, Marcel Jules Helene. Apparatus for controlling advance of a record support and transverse displacement of a sensing head. 3,716,678, Cl. 179-100.20t.
- Stackpole Carbon Company: *See—*
  - Dippold, William L., 3,716,735.
  - Shirk, Brian Thomas, 3,716,630.
- Staehlin, John H.: *See—*
  - McComas, Hall R.; and Staehlin, John H., 3,716,868.
- Stamicarbon N.V.: *See—*
  - De Wit, Willem; and Hendricks, Petrus F.A.M., 3,716,020.
- Standard Brands Incorporated: *See—*
  - Speakman, Edwin L., 3,716,527.
- Standard Oil Company: *See—*
  - Belak, Steven G.; and Hall, Lewis W., Jr., 3,716,510.
  - Morello, Edwin F., 3,716,514.
- Standum Inc.: *See—*
  - Paramonoff, Elpidifor, 3,715,905.
- Stanley Works, The: *See—*
  - West, Robert F., 3,716,201.

- Starkey, Donald L.: *See—*
  - Schmitt, Joseph W.; and Starkey, Donald L., 3,716,843.
- Stearns-Roger Corporation: *See—*
  - Porter, Stuart M.; Weimer, Ervin C.; and Shideler, Harold W., 3,716,002.
- Steggerda, Jan Frederik; and Houtman, Ary Cornelis, to U.S. Philips Corporation. Use of radioactive compounds to determine fat absorption. 3,716,631, Cl. 424-1.000.
- Stehlin, Robert A.; and Spence, Hilton W., to Texas Instruments, Incorporated. Switched amplification system having radiation compensation circuitry. 3,716,727, Cl. 307-243.000.
- Stein, Bernard: *See—*
  - Deschamps, Nicholas H.; Stein, Bernard; and Mayo, Kenneth E., 3,716,099.
- Stephens, Harvey. Air brake release. 3,716,277, Cl. 303-70.000.
- Stevens, Harrison: *See—*
  - Smith, George A.; Stevens, Harrison; Walker, Robert R.; and Boyd, Gilbert D., 3,716,649.
- Stevens, J. P., & Co., Inc.: *See—*
  - Kolsky, Rodger E.; and Chase, Vernon Lindsay, 3,716,488.
  - Moore, Donald R.; and Tesoro, Giuliana C., 3,716,572.
- Stickney, Fernald S., to Instrument Specialties Company, Inc. Grips for holding specimens. 3,715,916, Cl. 73-103.000.
- Stier, Henry Willy: *See—*
  - Schnellman, Oscar; and Stier, Henry Willy, 3,715,841.
- Stoll, H., and Company: *See—*
  - Hadam, Wilhelm, 3,715,897.
- Stone & Webster Engineering Corporation: *See—*
  - Van Sickel, Alfred L.; Mitchell, Errol S.; and Rigamonti, Gianfranco, 3,716,451.
- Stone Industrial Corporation: *See—*
  - Keith, M. Robert; and Barnes, Richard C., 3,716,733.
- Stover, Harris A., to Collins Radio Company. ILS receiver for aircraft with distortion warning or elimination. 3,716,864, Cl. 343-108.00r.
- Straarup, Orla: *See—*
  - Masters, Keith; and Straarup, Orla, 3,716,193.
- Straley, James M.: *See—*
  - Weaver, Max A.; Straley, James M.; and Coates, Clarence A., Jr., 3,716,327.
- Strassle, Marcel Rudolf. Building construction. 3,715,849, Cl. 52-646.000.
- Straus, Albert E., to General Partilion Manufacturing. Panel and extrusion combination. 3,715,847, Cl. 52-400.000.
- Strickland, Alvah T., to United States of America, Navy. Variable buoyancy control system. 3,716,009, Cl. 114-16.00e.
- Strickland, Thomas M.: *See—*
  - McCollum, Robert L., 3,715,794.
- Strong, Philip L.; Hunter, Don L.; and LeFevre, Cecil W., to United States Borax & Chemical Corporation. Alkoxy trifluoromethylaniline compounds. 3,716,585, Cl. 260-574.000.
- Strongin, Grigory Mikhailovich: *See—*
  - Berlin, Alfred Anisimovich; Kefeli, Tamara Yakovlevna; Marshavina, Natalia Lvovna; Strongin, Grigory Mikhailovich; Kara-Giaur, Nikolai Vladimirovich; Kolomazov, Boris Ivanovich; Efimov, Alexei Vasilievich; Bodrova, Aglaida Nikolaevna; and Altshuler, Judif arkovna, 3,716,571.
- Stueber, Richard J.; and Klach, Stanley J., to Chromalloy American Corporation. Impact resistant coatings for nickel-base and cobalt-base superalloys and the like. 3,716,398, Cl. 117-107.20p.
- Sturdivan, Paul G.: *See—*
  - Finley, Bruce M.; and Sturdivan, Paul G., 3,716,480.
- Sued-West-Chemie GmbH: *See—*
  - Bauer, Hans; Holzer, Helmut; and Schmidt, Gerhard, 3,716,395.
- Suenaga, Masanobu; Machii, Tetsuo; Sawano, Takahiro; Kobayashi, Takehiko; Dengo, Tadao; and Nakai, Tetsuzo, to Tokyo Shibaura Electric Co., Ltd. Semiconductor apparatus and method for manufacturing the same. 3,715,802, Cl. 29-588.000.
- Sugiyama, Kazuhiro: *See—*
  - Ando, Fumio; Kitahama, Hideharu; and Sugiyama, Kazuhiro, 3,716,440.
- Sukup, Eugene G. Apparatus for heating grain or the like. 3,715,973, Cl. 99-8.000.
- Sullhofer, Heinz. Self-supporting insulating elements. 3,715,846, Cl. 52-309.000.
- Sumitomo Chemical Co., Ltd.: *See—*
  - Oku, Tsurumi; Suzuki, Akio; Tawara, Nobuyoshi; and Niwa, Kenji, 3,716,617.
- Sumitomo Chemical Company, Ltd.: *See—*
  - Fujinami, Akira; Ozaki, Toshiaki; Akiba, Keiichiro; Yamamoto, Sigeo; Nodera, Katsuji; Tanaka, Katsutoshi; Kameda, Nobuyuki; and Ooishi, Tadashi, 3,716,552.
  - Itaya, Nobushige; and Mizutani, Toshio, 3,716,558.
  - Itaya, Nobushige; Mizutani, Toshio; Kitamura, Shigeyoshi; Okuno, Yoshitosi; and Fujimoto, Keimei, 3,716,560.
  - Nakamura, Yasushi; Agatsuma, Kunio; Tanaka, Yoshihiro; and Aono, Shunji, 3,716,583.
- Sun Oil Company: *See—*
  - Black, Ernest P.; Duling, Irl N.; Merges, John C., Jr.; and Talbot, Alfred F., 3,716,441.
- Sun, Shan C.: *See—*
  - Thompson, Francis T.; and Sun, Shan C., 3,715,811.
- Sunbeam Corporation: *See—*
  - Nickelson, Robert W., 3,715,775.
- Sunbeam Plastics Corporation: *See—*
  - Julian, Randall K.; and Gach, Peter R., 3,716,161.
- Susquehanna Corporation, The: *See—*
  - Chuan, Raymond L., 3,715,911.
- Sutton, Robert S.: *See—*
  - Edge, Dick O.; Hammond, Raymond F.; and Sutton, Robert S., 3,716,128.
- Suzue, Miyoshi. Concave for taking off rachis branch in threshing machine for combined harvester-threshers. 3,716,060, Cl. 130-27.00k.
- Suzuki, Akio: *See—*
  - Oku, Tsurumi; Suzuki, Akio; Tawara, Nobuyoshi; and Niwa, Kenji, 3,716,617.
- Suzuki, Kiyoshi: *See—*
  - Nagasawa, Taro; Kawashima, Takuji; Suzuki, Kiyoshi; and Kawase, Kouzo, 3,716,408.
- Suzuki, Morio: *See—*
  - Kodera, Yoshihide; Kato, Jun; Shimada, Kazuo; Suzuki, Morio; Ohse, Hidetaka; Ohshima, Satoshi; and Kiriki, Yasunori, 3,716,478.
- Suzuki, Motoji, to Nippondenso Co., Ltd. Cooperative system of windshield washer and wiper with intermittent wiper operating mechanism. 3,716,766, Cl. 318-102.000.
- Suzuki, Shigeo: *See—*
  - Mochizuki, Takashi; Komatsuzaki, Yoshinori; Hara, Satoshi; Nojima, Hideo; Shimizu, Tamio; and Suzuki, Shigeo, 3,715,945.
- Sweetheart Plastics, Inc.: *See—*
  - Davis, Paul, 3,715,865.
- Swenck, George F.: *See—*
  - Vickstrom, Donald E.; and Swenck, George F., 3,716,027.
- Sybron Corporation: *See—*
  - Barth, David Edward, 3,715,997.
- Syntex Corporation: *See—*
  - Ackrell, Jack; Edwards, John A.; and Fried, John H., 3,716,529.
- Systems Engineering Associates, Inc.: *See—*
  - Dixon, Kenneth P., 3,716,704.
- Syva Corporation: *See—*
  - Ullman, Edwin F.; and Schneider, Richard S., 3,716,335.
- Szczepanski, Harry. Automatic spray-painting machine. 3,716,022, Cl. 118-326.000.
- Szlosberg, Edward: *See—*
  - Baker, Robert L.; and Szlosberg, Edward, 3,716,393.
- Takabayashi, Fumiki: *See—*
  - Kitamura, Kazuo; Takabayashi, Fumiki; and Shibata, Fumio, 3,716,330.
- Takahashi, Koichi, to Nissan Motor Company, Limited. Rotary motion device. 3,716,314, Cl. 418-150.000.
- Takeda, Yutaka: *See—*
  - Hirao, Motohisa; and Takeda, Yutaka, 3,716,404.
- Takei, Toru; Kawai, Yasutaka; and Matsushima, Takeshi, to Matsushita Electric Industrial Co., Ltd. Starter device for a discharge lamp. 3,716,751, Cl. 315-106.000.
- Takeuchi, Akihiko, to Nippon Gakki Seizo Kabushiki Kaisha. Musical instrument using a fluid powered tone generator for generating sonic energy. 3,715,949, Cl. 84-330.000.
- Takeyama, Akihisa, to Nippon Gakki Seizo Kabushiki Kaisha. Electronic musical instruments provided with a circuit for generating a tremolo effect. 3,716,648, Cl. 84-1.250.
- Takkunen, Philip D.: *See—*
  - Bergstrom, Theodore R.; and Takkunen, Philip D., 3,716,347.
- Takuma Kikan Mfg. Co.: *See—*
  - Shigaki, Masanobu; Kido, Shigehiro; and Chiba, Yoshikazu, 3,716,339.
- Talbot, Alfred F.: *See—*
  - Black, Ernest P.; Duling, Irl N.; Merges, John C., Jr.; and Talbot, Alfred F., 3,716,441.
- Tanaka, Chiaki: *See—*
  - Yoda, Naoya; Kurihara, Masaru; Dokoshi, Noriaki; Tanaka, Chiaki; and Eguchi, Masaomi, 3,716,519.
- Tanaka, Jun; and Onuki, Hiroshi, to Senju Metal Industry Co., Ltd. Sprinkler head. 3,716,103, Cl. 169-42.000.
- Tanaka, Katsutoshi: *See—*
  - Fujinami, Akira; Ozaki, Toshiaki; Akiba, Keiichiro; Yamamoto, Sigeo; Nodera, Katsuji; Tanaka, Katsutoshi; Kameda, Nobuyuki; and Ooishi, Tadashi, 3,716,552.
- Tanaka, Masatoshi, to Mitsui & Co. Ltd. Curtain box. 3,715,776, Cl. 16-94.00d.
- Tanaka, Ryohei: *See—*
  - Mimino, Tohru; Kinoshita, Kazuhisa; Tanaka, Ryohei; and Shinoda, Takayuki, 3,716,353.
- Tanaka, Takashi; and Yanagiuchi, Yukihiro, to Matsushita Electric Industrial Co., Ltd. Multi-channel magnetic head. 3,716,677, Cl. 179-100.20c.
- Tanaka, Yoshihiro: *See—*
  - Nakamura, Yasushi; Agatsuma, Kunio; Tanaka, Yoshihiro; and Aono, Shunji, 3,716,583.
- Tang, Donald T.: *See—*
  - Sha, Richard T.; and Tang, Donald T., 3,716,807.
- Tanner, James C., Jr. Barbed suture. 3,716,058, Cl. 128-337.000.
- Tarkan, Stuart E.: *See—*
  - Prill, Arnold L.; and Tarkan, Stuart E., 3,715,792.
- Tarvin, Edward M. Detachable folding camper steps. 3,716,254, Cl. 280-166.000.
- Tatematsu, Kenzo; Hosono, Hiroo; Katagiri, Toshio; Nishikiori, Akira; and Minato, Takashi, to Matsushita Electric Industrial Co., Ltd. Automatic telephone diales utilizing magnetic tape storage with improved indexing means. 3,716,676, Cl. 179-90.0bb.

- Tausch, Gilbert H.: *See—*
  - McGowen, Harold E., Jr.; and Tausch, Gilbert H., 3,716,101.
- Tawara, Nobuyoshi: *See—*
  - Oku, Tsurumi; Suzuki, Akio; Tawara, Nobuyoshi; and Niwa, Kenji, 3,716,617.
- Taylor, George William: *See—*
  - Marek, James John, Jr.; and Taylor, George William, 3,716,675.
- TCI, Inc.: *See—*
  - Gorres, Thomas J., 3,716,250.
- Teggatz, Eugene D.; De Long, Vincent R.; and Holtzer, Dale A., to Collins Radio Company. Frequency dividing apparatus. 3,716,794, Cl. 328-39.000.
- Teijin Limited: *See—*
  - Kitamura, Kazuo; Takabayashi, Fumiki; and Shibata, Fumio, 3,716,330.
- Teleky, Walter. Wall safe. 3,715,998, Cl. 109-58.000.
- Tenkumo, Shohei; and Egawa, Takeshi, to Minolta Camera Kabushiki Kaisha. Lens shutter control mechanism for a single lens reflex camera. 3,715,964, Cl. 95-42.000.
- Tepper, Charles W.: *See—*
  - Dunlap, Scott B.; Osterling, Peter R.; and Tepper, Charles W., 3,715,986.
- Terman, Lewis M.: *See—*
  - Parrish, James T.; Spampinato, Dominic P.; and Terman, Lewis M., 3,716,724.
- Termin, Erich; and Hauck, Gerhard, to Dynamit Nobel AG. Simultaneous production of alcoholates and trivalent titanium complexes of beta-diketones. 3,716,567, Cl. 260-429.500.
- Terry, Peter L.: *See—*
  - Adlhart, Otto J.; and Terry, Peter L., 3,716,416.
- Terwilliger, H. Alan. Rotary plug shut-off valve assembly. 3,716,073, Cl. 187-613.000.
- Terzuoki, Dominick. Paper bag construction. 3,716,181, Cl. 229-57.000.
- Tesoro, Giuliana C.: *See—*
  - Moore, Donald R.; and Tesoro, Giuliana C., 3,716,572.
- Texaco Inc.: *See—*
  - Coons, William R., Jr.; Colvert, James H.; and Nelson, Gerald V., 3,716,476.
  - Hess, Howard V.; and Cole, Edward L., 3,716,474.
- Texas Instruments, Incorporated: *See—*
  - Asam, Edward F., 3,716,855.
  - Bechtel, Bartow; and Texas Instruments, Incorporated, 3,716,860.
  - Birchler, Robert O.; and Williams, E. R., 3,716,764.
  - Creagh, Linda T.; Jones, Derick; and Lu, Sun, 3,716,289.
  - Mason, James S., 3,716,866.
  - Masten, Michael K.; and Choate, William C., 3,716,840.
  - Stehlin, Robert A.; and Spence, Hilton W., 3,716,727.
- Textron Inc.: *See—*
  - Fagan, Castle H.; and Lynn, Robert R., 3,716,208.
- Thayer, Robert F.: *See—*
  - Bertellotti, Ansano; and Thayer, Robert F., 3,716,760.
- Theodorides, Vassilios J.: *See—*
  - Actor, Philip P.; Parish, Roger C.; and Theodorides, Vassilios J., 3,716,641.
- Thiers, Robrecht Julius; Willems, Jozef Frans; and Spriet, Roger Alois, to Gevaert-Agfa N.V. Process of forming silver transfer images. 3,716,361, Cl. 96-29.00r.
- Thomas, Charles C., to Mississippi State University Development Foundation, Inc. Magnetically attracted bobbins. 3,716,202, Cl. 242-118.700.
- Thomas, Douglas W., to American Home Products Corporation. Safety closure device. 3,716,160, Cl. 215-9.000.
- Thomas, Klaus: *See—*
  - Ost, Walter; Thomas, Klaus; Jerchel, Dietric; and Appel, Karl-Richard, 3,716,587.
- Thomas, Morton I. Overbed table. 3,715,995, Cl. 108-10.000.
- Thompson, David A.: *See—*
  - Almasi, George S.; Keefe, George E.; Lin, Yeong S.; and Thompson, David A., 3,716,781.
- Thompson, Francis T.; and Sun, Shan C., to Westinghouse Electric Corporation. Remedial branching teaching system. 3,715,811, Cl. 35-48.000.
- Thompson, John H.; and Sims, David S., to United States of America, Navy, mesne. Polychromatic sonar object identification system. 3,716,823, Cl. 340-3.00r.
- Thompson, Philip, Jr. Mowing apparatus. 3,715,872, Cl. 56-10.400.
- Thomson-CSF: *See—*
  - Jacquet, Raymond, 3,716,836.
- Tillma, James Earl, to General Electric Company. Vertical induction motor. 3,716,732, Cl. 310-61.000.
- Timken Company, The: *See—*
  - Leibensperger, Robert Lee; and Norris, Glen Ray, 3,716,280.
- Tizon Chemical Corporation: *See—*
  - Tredinnick, Bruce Charles; Gambale, James Richard; and Dupree, Paul Montgomery, 3,715,842.
- Tokyo Shibaura Electric Co., Ltd.: *See—*
  - Kameoka, Akio; and Nakamura, Shinichi, 3,716,647.
  - Suenaga, Masanobu; Machii, Tetsuo; Sawano, Takahiro; Kobayashi, Takehiko; Dengo, Tadao; and Nakai, Tetsuzo, 3,715,802.
- Tomalia, Donald A., to Dow Chemical Company, The. Composition of an epoxy resin and 2,2-alkyline bis-2-oxazoline as curing agent. 3,716,520, Cl. 260-47.0en.
- Toray Industries, Inc.: *See—*
  - Okamoto, Miyoshi; Mizuguchi, Shunji; and Watanabe, Koji, 3,716,614.
  - Yoda, Naoya; Kurihara, Masaru; Dokoshi, Noriaki; Tanaka, Chiaki; and Eguchi, Masaomi, 3,716,519.
- Torbarg, Robert H.: *See—*
  - Ostroot, Gerald F.; and Torbarg, Robert H., 3,715,798.
- Torres, Orazio Giovacchino Giacomo. Body carried simulated auto toy. 3,715,832, Cl. 46-1.00b.
- Totsuka, Yasushi; and Kamachi, Shin-Ichi, to Olympus Optical Co., Ltd. Automatic measuring and recording device. 3,716,839, Cl. 340-172.500.
- Townsend, john K.; and Sanford, Chester E., to Vistron Corporation. Process for preparing striped sheet material continuously. 3,716,431, Cl. 156-62.400.
- Tracoustics, Inc.: *See—*
  - Janeke, Charl E., 3,716,046.
- Treber, Willy O.: *See—*
  - Herr, Gerhard; and Treber, Willy O., 3,716,269.
- Tredinnick, Bruce Charles; Gambale, James Richard; and Dupree, Paul Montgomery, to Tizon Chemical Corporation. Silica polishing compositions having a reduced tendency to scratch silicon and germanium surfaces. 3,715,842, Cl. 51-281.000.
- Trent, Horace M.: *See—*
  - Hayes, Harvey C.; and Trent, Horace M., 3,715,982.
- Trilux-Lenze KG: *See—*
  - Clostermann, Friedrich; and Richter, Hans-Joachim, 3,716,710.
- Trimble, David Carlaw, to Bell Telephone Laboratories, Incorporated. Center clipper. 3,716,726, Cl. 307-237.000.
- Trimpler, Walter, to DIEHL. Synchronous alarm clock. 3,715,883, Cl. 58-21.150.
- Trocciola, John C.; Luoma, Warren L.; Nickols, Richard C., Jr.; and Emanuelson, Roger C., to United Aircraft Corporation. Process for preparing molded structure from polyphenylene sulfide resin and filler. 3,716,609, Cl. 264-111.000.
- TRW Inc.: *See—*
  - Brooks, Robert E., 3,716,287.
  - Reinberger, William C., 3,715,790.
- Tryzna, Joseph J.; and Becker, George L., to Continental Can Company, Inc. Coating process for metal containers. 3,716,400, Cl. 117-132.0be.
- Tscharner, Christopher; Schwarz, Maurice; and Pichler, Richard. Process for preparing crystalline forms of 4,4'-bis [(4-anilino-6-morpholino-1,3,5-triazin-2'-yl)-amino]-stilbene-2,2'-disulfonic acid. 3,716,532, Cl. 260-240.100.
- Tsuchiya, Shozo. Wheels for rolling stock. 3,716,093, Cl. 152-330.000.
- Tsukerman, Veniamin Aronovich: *See—*
  - Belkin, Nikolai Vasilievich; Alexandrovich, Eduard-Gely Vitalievich; Razin, Anatoly Alexandrovich; Kanunov, Mikhail Alexeevich; Tsukerman, Veniamin Aronovich; Sloeva, Galina Nikolaevna; Tsvetkov, Leonard Vasilievich; and Dron, Ninel Alexeevna, 3,716,737.
- Tsuruta, Yasuo. Method and device for detecting relative speed by using supersonic wave. 3,716,822, Cl. 340-1.00r.
- Tsvetkov, Leonard Vasilievich: *See—*
  - Belkin, Nikolai Vasilievich; Alexandrovich, Eduard-Gely Vitalievich; Razin, Anatoly Alexandrovich; Kanunov, Mikhail Alexeevich; Tsukerman, Veniamin Aronovich; Sloeva, Galina Nikolaevna; Tsvetkov, Leonard Vasilievich; and Dron, Ninel Alexeevna, 3,716,737.
- Tu, George K.: *See—*
  - Bryant, Richard W.; and Tu, George K., 3,716,722.
- Tubbs, Howard A. Well system seal. 3,716,102, Cl. 166-88.000.
- Tuftco Corporation: *See—*
  - Beasley, Max M., 3,716,203.
- Tuma, Alex; and Hansson, Jan Ingvar, to AB Tetra Pak. Equipment for, cleansing and/or sterilising the filler tube in packaging machines. 3,716,083, Cl. 141-90.000.
- Turner, Abner B., to Westinghouse Electric Corporation. Waste treatment system. 3,716,139, Cl. 210-104.000.
- Turolla, Marco. Ring seal. 3,716,245, Cl. 277-176.000.
- Tuttle, James W.: *See—*
  - Bhatt, Harshad J.; and Tuttle, James W., 3,716,469.
- Tuuha, Rolf Erik. Lock gate of the removal end of a barking drum. 3,716,087, Cl. 144-208.00b.
- Tuxco Corporation: *See—*
  - Blomgren, Oscar C., Sr.; and Blomgren, Oscar C., Jr., 3,716,171.
- Twentieth Century Blinds Pty., Limited: *See—*
  - Davis, Lessel George, 3,715,940.
- Tyler, Tracy B. Rotary dry shaver with tiltable shear plates. 3,715,803, Cl. 30-43.500.
- Ueda, Seinosuke; Nanri, Nobuya; and Hongo, Motoyoshi, to Hayashibara Co., Ltd. Method for producing isoamylase by fermentation. 3,716,455, Cl. 195-66.00r.
- Uelzmann, Heinz, to General Tire & Rubber Company, The. 1,2-epithio-3-(β-cyanoethoxy) propane. 3,716,557, Cl. 260-327.00e.
- Ueno Pharmaceutical Co., Ltd.: *See—*
  - Ueno, Ryuzo; Miyazaki, Tetsuya; and Inamine, Shigeo, 3,716,381.
- Ueno, Ryuzo; Miyazaki, Tetsuya; and Inamine, Shigeo, to Ueno Pharmaceutical Co., Ltd. Method of preserving meat and fish with a granular sorbic acid food preservative. 3,716,381, Cl. 99-157.000.
- Ulewicz, Michael R.: *See—*
  - Huber, John A.; Baringer, Berlyn E.; Bruns, Eilert F.; and Ulewicz, Michael R., 3,715,903.

- Ullman, Edwin F.; and Schneider, Richard S., to Syva Corporation. Assaying with change in electron spin resonance spectrum based on chirality. 3,716,335, Cl. 23-230.00r.
- Underwood, John H.: *See—*
  - Brady, Donnie G.; Deck, Harold R.; Jones, Faber B.; and Underwood, John H., 3,716,601.
- Union Carbide Corporation: *See—*
  - Lenaers, Rene; De Ruiter, Ernest H.; and Vandewalle, Jan J., 3,716,542.
  - Schalamon, Wesley A.; and Bacon, Roger, 3,716,331.
- Union Oil Company of California: *See—*
  - Hashimoto, Saburo, 3,716,350.
- Unipunch Products, Inc.: *See—*
  - Weisbeck, Ralph L.; and Daniels, Dennis, 3,715,947.
- United Aircraft Corporation: *See—*
  - Gagnon, Richard N.; Banic, Carl V.; and Grasso, Albert P., 3,716,415.
  - Matthews, Donald R.; and Holzman, Allen L., 3,716,342.
  - Trocciola, John C.; Luoma, Warren L.; Nickols, Richard C., Jr.; and Emanuelson, Roger C., 3,716,609.
- United Kingdom Atomic Energy Authority: *See—*
  - Grimes, John Herbert; and Dress, William, 3,716,605.
- United Kingdom of Great Britain and Northern Ireland, Minister of Technology in Her Britannic Majesty's Government of the: *See—*
  - Pierce, Donald, 3,716,209.
- United States Borax & Chemical Corporation: *See—*
  - Strong, Philip L.; Hunter, Don L.; and LeFevre, Cecil W., 3,716,585.
- United States of America
  - Agriculture: *See—*
    - Chandrasekaran, Santosh K.; and King, Cary Judson III, 3,716,382.
    - Fore, Sara P.; Rayner, Eric T.; and Dupuy, Harold P., 3,715,910.
    - Mod, Robert R.; Magne, Frank c.; and Skau, Evald L., 3,716,540.
    - Pittman, Allen G.; and Wasley, William L., 3,716,518.
    - Pittman, Allen G.; and Wasley, William L., 3,716,577.
    - Silbert, Leonard S., 3,716,592.
  - Air Force: *See—*
    - Butler, James N.; and Cogley, David R., 3,716,410.
    - Reeder, Thomas M.; and Smith, W. Richard, 3,716,809.
  - Army: *See—*
    - Ahmad, Iqbal, 3,716,461.
    - Allan, William L., 3,715,953.
    - Depew, George N., 3,716,278.
    - Goldstein, Max, 3,716,610.
    - Rehberger, Louis W.; Williams, John C.; and Demme, John P., 3,716,303.
  - Army, mesne: *See—*
    - Rude, Edward T., Jr., 3,715,954.
  - Atomic Energy Commission: *See—*
    - Cairns, Elton J.; Kyle, Martin L.; and Shimotake, Hiroshi, 3,716,409.
    - Henry, John J., 3,716,782.
    - Lin, Kuang-Hui, 3,716,616.
  - Interior: *See—*
    - Bauer, Donald J.; Haskett, Philip R.; and Lindstrom, Ronald E., 3,716,615.
  - National Aeronautics and Space Administration: *See—*
    - Gould, William I., Jr.; and Evans, Jack, 3,716,869.
    - Williams, Jerry G., 3,715,915.
  - Navy: *See—*
    - Gilligan, William H.; McDonnell, Chilton H.; and Jones, Orlando, 3,716,550.
    - Johnson, Clarence S.; and Langguth, Arthur F., 3,715,828.
    - Olesen, Bernhardt D., 3,716,711.
    - Schoolar, Richard B., 3,716,424.
    - Strickland, Alvah T., 3,716,009.
    - Wilson, William G.; Green, James H.; and White, William D., 3,716,010.
  - Navy, mesne: *See—*
    - Dunlap, Scott B.; Osterling, Peter R.; and Tepper, Charles W., 3,715,986.
    - Thompson, John H.; and Sims, David S., 3,716,823.
- Universal Oil Products Company: *See—*
  - Lacey, Robert R., 3,716,213.
  - Massie, Stephen N., 3,715,888.
  - Mitsche, Roy T.; and Michalko, Edwards, 3,716,597.
- University of Adelaide, The: *See—*
  - Willoughby, Eric O., 3,716,862.
- University of Melbourne: *See—*
  - Cullen, Geoffrey Victor; Graham, John William; and Siviour, Neil Graham, 3,716,471.
- Uno, Kazuo: *See—*
  - Hoshino, Yutaka; Matsukawa, Koshiro; Nakada, Akira; and Uno, Kazuo, 3,716,594.
- U.S. Philips Corporation: *See—*
  - Exner, Emil August, 3,716,753.
  - Greve, Reinhard Cornelis; and De Jong, Hendrik Johannes, 3,716,812.
  - Skoyles, Derek Robert, 3,716,275.
  - Steggerda, Jan Frederik; and Houtman, Ary Cornelis, 3,716,631.
  - Van Elk, Cornelis Johannes; Raatgever, Jacob Frederik; Morrien, Albertus Marinus; and Dirk van der Lee, Jan Gijsbert, 3,716,780.
- USM Corporation: *See—*
  - Giebel, Gerhard; and Fichtner, Rudi, 3,715,768.
  - Muhlbach, Anton; and Fichtner, Rudi, 3,715,767.
- Usui Kokusai Sangyo Kabushiki-Kaisha: *See—*
  - Watabe, Masahiro, 3,716,217.
- Usui, Yasuo: *See—*
  - Fukushima, Yoshikiyo; Ishihara, Yasushi; Momota, Kenzo; Usui, Yasuo; Sakumura, Tuyoshi; Sogo, Satoru; and Nunokawa, Koji, 3,716,210.
- Vacu-Blast Limited: *See—*
  - Young, Gideon Maurice; Silman, Harold; and Hill, Eric John, 3,715,838.
- Valette, Pierre: *See—*
  - Mouroux, Claude; Peres, Gerard; and Valette, Pierre, 3,716,428.
- Valin, Jean, to Compagnie Internationale pour l'Informatique. Mirror utilized in magneto-optical readout system to eliminate Fresnel effect. 3,716,847, Cl. 340-174.0yc.
- Valmet Oy: *See—*
  - Ilmonen, Leo, 3,715,825.
- Van de Voorde, Norbert L. C., to Belgonucleaire S.A. Treatment of radioactive liquids. 3,716,490, Cl. 252-401.10w.
- Van Der Cleyen, Rafael J. J.; and Ribbens, Wilfried F., to Les Usines Fabelty Societe Anonyme. Recreational apparatus. 3,716,229, Cl. 272-57.00e.
- Van Elk, Cornelis Johannes; Raatgever, Jacob Frederik; Morrien, Albertus Marinus; and Dirk van der Lee, Jan Gijsbert, to U.S. Philips Corporation. System for the accurate reproduction of pulse code modulation signals received as an unpavourable signal-to-nise ratio. 3,716,780, Cl. 325-324.000.
- van Huuksloot, Leendert, to Nemag N.V. Grab. 3,716,265, Cl. 294-70.000.
- Van Pottelsberghe de La Potterie, Pierre Joseph, to Societe d'Assistance Technique pour Produits Nestle S.A. Preparation of beef and chicken flavouring agents. 3,716,379, Cl. 99-140.00n.
- Van Pottelsberghe de La Potterie, Pierre Joseph, to Societe d'Assistance Technique pour Produits Nestle S.A. Beef flavour. 3,716,380, Cl. 99-140.00n.
- Van Sickel, Alfred L.; Mitchell, Errol S.; and Rigamonti, Gianfranco, to Stone & Webster Engineering Corporation. Nuclear reactor power plant structural support system. 3,716,451, Cl. 176-65.000.
- van Staveren, Pieter, to Nederlandse Organisatie Voor Toegepast-Natuurwetenschappelijk Onderzoek Ten. Gas turbine installation with a centrifugal fluid vanes compressor. 3,715,886, Cl. 60-39.18r.
- Vandewalle, Jan J.: *See—*
  - Lenaers, Rene; De Ruiter, Ernest H.; and Vandewalle, Jan J., 3,716,542.
- Vanselow, Robert D.: *See—*
  - Jacobson, Robert L.; and Vanselow, Robert D., 3,716,477.
- Varga, John Maximilian Jules, to Carding Specialists (Canada) Limited. Splitting and blending of fibrous bales. 3,716,148, Cl. 214-8.50c.
- Vargiu, Silvio; Pezzoli, Silvestro; and Abruzzi, Pierluigi, to Societa' Italiana Resine S.p.A. Foundry mold composition. 3,716,512, Cl. 260-29.300.
- Varian Associates: *See—*
  - Levin, Nathan D., 3,716,713.
  - Niewold, Andreas; and Pon, Judith Q., 3,716,714.
- Vasilatos, Anastasios J., to A.V./American Ventures, Inc. Buoyant powered swimming device. 3,716,013, Cl. 115-6.100.
- Vasta, Joseph A., to Du Pont de Nemours, E. I., and Company. Acrylic fluorocarbon coating compositions. 3,716,599, Cl. 260-859.00r.
- VEB Polygraph Leipzig Kombinat fur Polygraphische Maschinen und Ausrustungen: *See—*
  - Bottcher, Rolf, 3,716,227.
  - Bottcher, Rolf, 3,716,228.
- Venable, Charles R., Jr., to Phillips Petroleum Company. Carbon black reactor. 3,716,340, Cl. 23-259.500.
- Vetco Offshore Industries, Inc.: *See—*
  - Nelson, Bobby H., 3,716,100.
- Vickstrom, Donald E.; and Swenck, George F., to Reynolds Metals Company. Floor construction and member for making same. 3,716,027, Cl. 119-28.000.
- Victor, Fritz: *See—*
  - Alfredsson, Alf Ingvar, 3,715,965.
- Vinyard, Herschel T.: *See—*
  - Blood, Alden E.; and Vinyard, Herschel T., 3,716,576.
- Viout, Andre; and Pasero, Regine, to Societe Anonyme dite: L'Oreal. Vinyl acetate-crotonic acid-unsaturated ester or ether polymers in hair lacquers and setting lotions. 3,716,633, Cl. 424-47.000.
- Vischer Products Company: *See—*
  - Shulz, Robert J., 3,716,188.
- Vistron Corporation: *See—*
  - Townsend, john K.; and Sanford, Chester E., 3,716,431.
- Vockenhuber, Karl: *See—*
  - Konigslehner, Franz; and Plihal, Hanns, 3,715,929.
- Vogt, James B. Vertically-adjustable drawer suspension. 3,716,284, Cl. 312-339.000.
- Voith, J. M., GmbH, Firma: *See—*
  - Laucks, Rudolf; Fork, Werner; and Gross, Harald, 3,716,014.

- Volckari, Peter; Lehmann, Hartmut; and Hafner, Raimund, to Kienzle Apparate GmbH. Connector sheet with contacts on opposite sides. 3,716,846, Cl. 340-174.00m.
- Volkswagenwerk Aktiengesellschaft: *See—*
  - Kruger, Hermann, 3,716,036.
- Vollhardt, Forhmut, to Siegener Aktiengesellschaft. Heat exchanger. 3,716,045, Cl. 126-360.00a.
- Volpe, Rocco P.: *See—*
  - Lindemann, Martin K.; and Volpe, Rocco P., 3,716,504.
- Von Seggern, Robert D., to Outboard Marine Corporation. Automatic hydraulically operated seat brake. 3,716,116, Cl. 188-109.000.
- Voskuil, Donald J.; Knudtson, John P.; and Krupp, Myron J., to PPG Industries. Pigment composition and its use in electrodeposition. 3,716,389, Cl. 106-309.000.
- Vuht, George: *See—*
  - Boehme, Werner R.; Vuht, George; and Dawes Laboratories, Inc., 3,716,645.
- Wacker-Chemie G.m.b.H.: *See—*
  - Nitzsche, Siegfried; Pirson, Ewald; and Roth, Michael, 3,716,399.
- Wada, Norio: *See—*
  - Iwami, Ichiro; Matsunaga, Tsutomu; Inouye, Sakae; Fujimori, Makoto; Hayashi, Noriyuki; Wada, Norio; Yoneyama, Ken; and Inaba, Hideaki, 3,716,602.
- Waddell, James M., to International Business Machines Corporation. Interrupt handling. 3,716,837, Cl. 340-172.500.
- Waggoner, Terry B.; and Seyb, Edgar J., Jr., to M & T Chemicals, Inc. Process of metal plating hydrohalogen polymer surface. 3,716,394, Cl. 117-47.00a.
- Wakabayashi, Hajime, to Iwatsu Electric Company, Ltd. Brightness compensating system of display apparatus. 3,716,297, Cl. 355-67.000.
- Walker, Robert R.: *See—*
  - Smith, George A.; Stevens, Harrison; Walker, Robert R.; and Boyd, Gilbert D., 3,716,649.
- Wallace Expanding Machines, Inc.: *See—*
  - Roper, Ralph E., 3,715,906.
- Walmsley, Martin F.; and Cross, John V., to Labatt, John Limited. Process for making a brewers' wort. 3,716,365, Cl. 99-51.000.
- Walsh, George M.; and Chramiec, Mark A., to Raytheon Company. Contour measuring apparatus especially for use in a sea bottom elevation measurement. 3,716,825, Cl. 340-3.00r.
- Walukonis, John S., Jr.; and Banks, Donald D., to Anaconda Wire and Cable Company. Latex applicator. 3,716,023, Cl. 118-420.000.
- Walus, Aloysius N.: *See—*
  - Simms, John A.; and Walus, Aloysius N., 3,716,506.
- Wamura, Soichi; Minaguchi, Hotaka; and Murasaki, Keisuke, to Nippon Hoso Kyokai. Recording and reproducing system of a color television signal by using monochromic recording film. 3,716,655, Cl. 178-5.4cd.
- Warden, Fuller; Lewis, Eugene W.; McNickle, Bernard F.; and Mills, Jack H. Disposable dental appliance and method for preparing and placing silver amalgam fillings. 3,715,806, Cl. 32-60.000.
- Warner, Ellis R., Jr.: *See—*
  - Craig, Sam N.; Warner, Ellis R., Jr.; and Buckman, Wayne T., 3,716,197.
- Wascon Systems, Inc.: *See—*
  - Craig, Sam N.; Warner, Ellis R., Jr.; and Buckman, Wayne T., 3,716,197.
- Washbourn, Jack; and Paginton, Philip Norman, to Westinghouse Brake & Signal Company, Ltd. Valve assembly. 3,716,215, Cl. 251-358.000.
- Wasley, William L.: *See—*
  - Pittman, Allen G.; and Wasley, William L., 3,716,517.
  - Pittman, Allen G.; and Wasley, William L., 3,716,518.
  - Pittman, Allen G.; and Wasley, William L., 3,716,577.
- Watabe, Masahiro, to Usui Kokusai Sangyo Kabushiki Kaisha. Trailer capable of lifting and lowering boats or the like. 3,716,217, Cl. 254-139.100.
- Watanabe, Kantaro, to Research Corporation. Mapping rectifier for generating polar-sterographic maps from satellite scan signals. 3,716,669, Cl. 178-6.70r.
- Watanabe, Koji: *See—*
  - Okamoto, Miyoshi; Mizuguchi, Shunji; and Watanabe, -Koji, 3,716,614.
- Watarai, Yoshiaki: *See—*
  - Mizuno, Hideo; Kimura, Sadao; Akutsu, Hidezo; Yamazaki, Haruo; Okamoto, Takio; Watarai, Yoshiaki; and Baba, Shoichi, 3,716,743.
- Watridge, Derek: *See—*
  - Rhodes, David; and Watridge, Derak, 3,716,373.
- Weatherly, D. M., Company, The: *See—*
  - Weatherly, David M.; and Byrne, Desmond J., 3,715,887.
- Weatherly, David M.; and Byrne, Desmond J., to Weatherly, D. M., Company, The. Multiple stage gas compression apparatus and method. 3,715,887, Cl. 60-59.00t.
- Weaver, Max A.; Straley, James M.; and Coates, Clarence A., Jr., to Eastman Kodak Company. Polyester fiber dyed with monoazo compound containing an acylamidotetrahydroquinoline group. 3,716,327, Cl. 8-41.00c.
- Webb, William R.; Jones, William S.; and Hendrix, Robert E., to Westinghouse Electric Corporation. Time multiplexer for high PRF pulse doppler radar. 3,716,859, Cl. 343-7.700.
- Weber, Guy Paul; and Deshayes, Philippe Marie. Method and apparatus for de-electrifying insulative materials. 3,716,754, Cl. 317-2.00f.
- Weetall, Howard H., to Corning Glass Works. Anion monitoring system. 3,716,456, Cl. 195-103.50r.
- Weigele, Reinhold: *See—*
  - Erb, Edgar; Habiger, Walter; Kramer, Willi; Pfeil, Wolfgang; and Weigele, Reinhold, 3,715,979.
- Weill, Robert L.; and Parsons, George B., to Skydyne, Inc. Bonded construction. 3,716,259, Cl. 287-189.36d.
- Weimer, Ervin C.: *See—*
  - Porter, Stuart M.; Weimer, Ervin C.; and Shideler, Harold W., 3,716,002.
- Weinberg, Harold; Rogers, Marvin E.; Dadario, Michael G.; and Benson, James A., to Sonex, Inc. Personal stock quotation system. 3,716,835, Cl. 340-154.000.
- Weir, Donald Robert; and Kofluk, Russell Peter, to Gordon, Sherritt, Mines Limited. Separation of cobalt from nickel and cobalt bearing ammonical solutions. 3,716,618, Cl. 423-143.000.
- Weir, Stanley M., to FMC Corporation. Automatic marketing system. 3,716,697, Cl. 235-61.90r.
- Weirich, Walter: *See—*
  - Klimkiewicz, Bruno; and Weirich, Walter, 3,716,070.
- Weisbeck, Ralph L.; and Daniels, Dennis, to Unipunch Products, Inc. Perforating device. 3,715,947, Cl. 83-140.000.
- Weisstuch, Aaron; Schell, Charles E., III; and Dryden, Paul C., to Betz Laboratories, Inc. Method for determining corrosion rate meter therefor. 3,716,460, Cl. 204-1.00t.
- Weisz, Paul B.; and Silvestri, Anthony J., to Mobil Oil Corporation. Demetalation of hydrocarbon charge stocks. 3,716,479, Cl. 208-211.000.
- Welborn, Warren S.; and Holznagel, Melvin A., to Cardiac Resuscitator Corporation. Cardiac resuscitator. 3,716,059, Cl. 128-419.00d.
- Welch Allyn Inc.: *See—*
  - Moore, William C.; Pilgrim, William S.; and Caldwell, Melvin R., 3,716,047.
- Weld-Eze, Inc.: *See—*
  - Flood, Edgar M.; and Green, William H., 3,715,799.
- Welge, Frederick T.: *See—*
  - Redmore, Derek; and Welge, Frederick T., 3,716,569.
- Weller, John J.: *See—*
  - Andrews, Theodore E.; and Weller, John J., 3,715,941.
- Wells, Frank E., to McLaughlin Gormley King Company. Insect virus compositions and process. 3,716,634, Cl. 424-93.000.
- Weltsch, Dan A.: *See—*
  - Jackson, Thomas J.; Weltsch, Dan A.; and Beattie, Stephen J., 3,715,797.
- Werkzeugmaschinenfabrik Gildemeister & Comp. Aktiengesellschaft: *See—*
  - Ledergerber Alfred; and Plassmeier, Walter, 3,715,938.
- Werkzeugmaschinenfabrik Oerlikon-Buhrle AG: *See—*
  - Apotheloz, Robert, 3,715,989.
  - Gross, Max, 3,716,224.
- Werner, Ardwin. Minimum wire box and device adapters. 3,716,651, Cl. 174-53.000.
- Werner, Bernfried M., to Phelan, Louis A. M. Temperature control system for freezers. 3,715,893, Cl. 62-135.000.
- Werner, Hermann, Firma: *See—*
  - Lieser, Karl, 3,715,956.
- West Electric Co., Ltd.: *See—*
  - Iwata, Hiroshi, 3,716,752.
- West, Robert F., to Stanley Works, The. Coilable rule and replacement cartridge therefor. 3,716,201, Cl. 242-107.000.
- Western Electric Company, Incorporated: *See—*
  - Brown, Donald R.; and Masopust, Otto T., Jr., 3,715,786.
  - Fuchs, Francis Joseph, Jr., 3,715,902.
  - Lim, Mahn-Jick, 3,716,405.
- Westinghouse Air Brake Company: *See—*
  - Hammond, Peter W., 3,716,787.
  - Pier, Jerome R., 3,716,274.
  - Wilson, Richard L.; and Scott, Daniel G., 3,716,276.
- Westinghouse Brake & Signal Company, Ltd.: *See—*
  - Washbourn, Jack; and Paginton, Philip Norman, 3,716,215.
- Westinghouse Electric Corporation: *See—*
  - Boyce, Walter A., 3,716,285.
  - Dorr, John A.; and Gruen, Henry M., 3,716,824.
  - Ericson, Gene S., 3,716,199.
  - Gorsuch, Harold F., 3,716,721.
  - Jones, William J., 3,716,337.
  - Master, Harvey M.; Nugent, John L.; Hunt, Martin; and Peters, James, 3,716,785.
  - McComas, Hall R.; and Staehlin, John H., 3,716,868.
  - McMillen, James W.; and Rhodes, Glenn E., 3,716,684.
  - Niemyer, Le Roy L., Jr., 3,716,657.
  - Thompson, Francis T.; and Sun, Shan C., 3,715,811.
  - Turner, Abner B., 3,716,139.
  - Webb, William R.; Jones, William S.; and Hendrix, Robert E., 3,716,859.
- Westlake Plastics Company: *See—*
  - Noonan, Walter F., 3,716,470.
- Wexler, Max L.: *See—*
  - Greenberg, Hoyne E.; and Wexler, Max L., 3,715,795.
- Weyer, Rudi: *See—*

  - Heerdt, Ruth; Hubner, Manfred; Schmidt, Felix Hehmut; and Weyer, Rudi, 3,716,537.
- White, David John; and Knight, Benjamin Henry, to White Knight Products Limited. Shoe studs. 3,715,817, Cl. 36-67.00d.
- White, Earle A. Amusement book for children. 3,715,816, Cl. 35-73.000.
- White Knight Products Limited: *See—*
  - White, David John; and Knight, Benjamin Henry, 3,715,817.
- White, William B.: *See—*
  - Roy, Rustum; Henisch, Heinz K.; and White, William B., 3,716,741.
- White, William D.: *See—*
  - Wilson, William G.; Green, James H.; and White, William D., 3,716,010.
- Whitehead, Eric A. N.; Carpenter, Henry G.; and Chinn, Peter D., to Elliott Brothers (London) Limited. Data handling arrangements. 3,716,784, Cl. 324-77.00b.
- Wickenberg, Chester H. Concealed latching mechanism. 3,716,262, Cl. 292-218.000.
- Widdowson, Richard E., to General Motors Corporation. Air conditioning bypass control. 3,715,894, Cl. 62-196.000.
- Wiegand, John A., to Maremont Corporation. Shock absorber demonstration stand. 3,715,813, Cl. 35-49.000.
- Wiegand, John A., to Maremont Corporation. Shock absorber demonstration stand. 3,715,814, Cl. 35-49.000.
- Wiggins Teape Research & Development Limited: *See—*
  - Gatward, Albert Peter John; and Flackwell, Bronislaw Radvan, 3,716,449.
- Wik-It Electronics Corporation: *See—*
  - Jackson, Thomas J.; Weltsch, Dan A.; and Beattie, Stephen J., 3,715,797.
- Wikle, Keith Gordon; and O'Rourke, Richard George, to Brush Beryllium Company, The. Aluminum base alloy. 3,716,355, Cl. 75-142.000.
- Wilde, Arthur G.: *See—*
  - Currier, John W.; Gadbois, Richard T.; and Wilde, Arthur G., 3,716,066.
- Wiley, Philip K. Tension adjustable releasable ski binding and method. 3,716,248, Cl. 280-11.35t.
- Wilhelm, Gerhard; Hockenberger, Lothar; and Soyka, Manfred, to Rutgerswerke Aktiengesellschaft. process of making shelf-stable mixtures of thiol, oxidizer and accelerator precursor. 3,716,515, Cl. 260-37.00r.
- Willems, Jozef Frans: *See—*
  - Thiers, Robrecht Julius; Willems, Jozef Frans; and Spriet, Roger Alois, 3,716,361.
- Williams, Charles R.: *See—*
  - Corey, Albert E.; Donermeyer, Donald D.; Fantl, Joel; and Williams, Charles R., 3,716,547.
- Williams, E. R.: *See—*
  - Birchler, Robert O.; and Williams, E. R., 3,716,764.
- Williams, Jerry G., to United States of America, National Aeronautics and Space Administration. Light intensity strain analysis. 3,715,915, Cl. 73-88.00a.
- Williams, John C.: *See—*
  - Rehberger, Louis W.; Williams, John C.; and Demme, John P., 3,716,303.
- Williams, Milton Guy, Jr.; and Rausch, Henry, Jr., to Fiber Industries, Inc. Pack for spinning heterofilament fibers. 3,716,317, Cl. 425-198.000.
- Willmarth, Charles T. Wire splice guage and connector. 3,716,653, Cl. 174-87.000.
- Willmott, Colin B., to Chamberlain Manufacturing Corporation. Radio controlled system for garage door opener. 3,716,865, Cl. 343-225.000.
- Willoughby, Eric O., to University of Adelaide, The. Generation of navigating planes for aircraft landing utilizing parabolic cheese aerial. 3,716,862, Cl. 343-108.000.
- Wilson, Donald W.: *See—*
  - Baker, Colin J.; Preen, Raymond C.; and Wilson, Donald W., 3,716,122.
- Wilson, Gerald L., to Massachusetts Institute of Technology. Magnetic circuit breaker. 3,716,685, Cl. 200-147.00r.
- Wilson, Harry C. Self latching hinge. 3,715,778, Cl. 16-180.000.
- Wilson, Richard L.; and Scott, Daniel G., to Westinghouse Air Brake Company. Quick service valve device. 3,716,276, Cl. 303-82.000.
- Wilson, William G.; Green, James H.; and White, William D., to United States of America, Navy. Snap acting ballast release device. 3,716,010, Cl. 114-22.000.
- Windmoller & Holscher: *See—*
  - Kratzert, Friedrich, 3,716,322.
- Wing, Albert L. Router template attachment. 3,716,085, Cl. 144-144.00r.
- Winkler, Laszlo: *See—*
  - Domokos, Jozsef; Benedek, Gyorgy; Kiss, Bela; Winkler, Laszlo; and Beller, Zoltan, 3,716,473.
- Winyall, Milton Edward: *See—*
  - Acker, Ellsworth; and Winyall, Milton Edward, 3,716,493.
- Wizemann, Werner O., to Meridian Industries, Inc. Turn signal switch. 3,716,682, Cl. 200-61.270.
- Wohrer, Luis C.: *See—*
  - Economy, James; Frechette, Francis J.; and Wohrer, Luis C., 3,716,521.
- Wolanin, Michael J., to General Motors Corporation. Method and apparatus for determining bearing preload in a gear train. 3,715,909, Cl. 73-9.000.
- Wolfe, William D., Jr.; and Bowdish, Donald M., to McDonald Douglas Corporation. Electrical connectors. 3,716,817, Cl. 339-74.00r.
- Wolverine-Pentronix, Inc.: *See—*
  - Detroyer, Georges D., 3,715,796.
- Woodling, George V. Independent-control means for fluid pressure device. 3,716,311, Cl. 418-61.000.
- Woodward, Robert Burns: *See—*
  - Heusler, Karl; and Woodward, Robert Burns, 3,716,465.
- Woolslayer, Homer J.; Woolslayer, Joseph R.; Jenkins, Cecil; and Campbell, Erwin A., to Moore, Lee C., Corporation. Method of handling drill pipe. 3,716,155, Cl. 214-152.000.
- Woolslayer, Joseph R.: *See—*
  - Woolslayer, Homer J.; Woolslayer, Joseph R.; Jenkins, Cecil; and Campbell, Erwin A., 3,716,155.
- World of Wigs Mfg. Co., Inc.: *See—*
  - Finamore, Paul V., 3,716,065.
- Worthington, William Douglas, to Ferranti Limited. Distance measuring system. 3,716,858, Cl. 343-7.300.
- Wright, Kenneth L., to Security Patent Anchor Company Limited, The. Anchors for marine use. 3,716,012, Cl. 114-207.000.
- Wuori, Edward R.: *See—*
  - Groberman, Leslie J.; and Wuori, Edward R., 3,715,920.
- Xerox Corporation: *See—*
  - Sheridon, Nicholas K., 3,716,359.
- Yadro, Frank G. Deodorizer. 3,715,765, Cl. 4-228.000.
- Yamada, Tunehiko; Egami, Seiji; Sasatani, Harumi; Matsuoka, Hideaki; Emoto, Saburo; and Okamura, Kunio, to Central Glass Company, Ltd. Method for cutting glass sheets. 3,716,176, Cl. 225-96.500.
- Yamaguchi, Isao: *See—*
  - Nakajima, Yasutaka; Yamaguchi, Isao; and Onishi, Masaru, 3,716,295.
- Yamamoto, Mitsuyoshi: *See—*
  - Kotanigawa, Takeshi; Yamamoto, Mitsuyoshi; and Shimokawa, Katsuyoshi, 3,716,589.
- Yamamoto, Sigeo: *See—*
  - Fujinami, Akira; Ozaki, Toshiaki; Akiba, Keiichiro; Yamamoto, Sigeo; Nodera, Katsuji; Tanaka, Katsutoshi; Kameda, Nobuyuki; and Ooishi, Tadashi, 3,716,552.
- Yamamoto, Yasushi: *See—*
  - Kitamura, Kunpei; Kaneko, Tatsuhiko; Yamamoto, Yasushi; and Kuroiwa, Yoshiro, 3,716,452.
- Yamamura, Koji. Apparatus for the production of snack food. 3,716,383, Cl. 99-353.000.
- Yamaoka, Takashi: *See—*
  - Kawano, Toshihiko; Yamaoka, Takashi; Maruo, Keiichi; and Furutaka, Yasuhisa, 3;716,643.
- Yamazaki, Haruo: *See—*
  - Mizuno, Hideo; Kimura, Sadao; Akutsu, Hidezo; Yamazaki, Haruo; Okamoto, Takio; Watarai, Yoshiaki; and Baba, Shoichi, 3,716,743.
- Yanagiuchi, Yukihiro: *See—*
  - Tanaka, Takashi; and Yanagiuchi, Yukihiro, 3,716,677.
- Yannopoulos, Lymperios N.; Jansson, Sven A.; and Gulbransen, Earl. Yttrium-hydrogen isotope compositions for radiochemical reactions. 3,716,491, Cl. 252-301.10r.
- Yasso, George H. Dispensing device. 3,716,173, Cl. 222-455.000.
- Yerkie, John W., Jr. Ball practice device. 3,716,235, Cl. 273-26.00e.
- Yoda, Naoya; Kurihara, Masaru; Dokoshi, Noriaki; Tanaka, Chiaki; and Eguchi, Masaomi, to Toray Industries, Inc. Method for producing a polyamideimide and product of said method. 3,716,519, Cl. 260-47.0cb.
- Yokoyama, Takao: *See—*
  - Ogawa, Hiromichi; Ohira, Tsukasa; Murakami, Kaoru; and Yokoyama, Takao, 3,716,411.
- Yoneyama, Ken: *See—*
  - Iwami, Ichiro; Matsunaga, Tsutomu; Inouye, Sakae; Fujimori, Makoto; Hayashi, Noriyuki; Wada, Norio; Yoneyama, Ken; and Inaba, Hideaki, 3,716,602.
- Yoshinaga, Fumihiro: *See—*
  - Okumura, Shinji; Yoshinaga, Fumihiro; Kubota, Koji; and Kamijo, Hirotaka, 3,716,453.
- Yoshino, Takachika; Saito, Shigeru; and Sasaki, Yutaka, to Nitto Chemical Industry Co., Ltd. Catalyst composition for the oxidation and the oxidative dehydrogenation of olefins. 3,716,496, Cl. 252-439.000.
- Yoshitake, Toshihiko: *See—*
  - Shirano, Kenji; and Yoshitake, Toshihiko, 3,716,396.
- Yost, Edward F., Jr., to Spectral Data Corporation. Spectral-zonal color reconnaissance system. 3,715,962, Cl. 95-12.500.
- Young, David Edward: *See—*
  - Gould, Douglas Eugene; Anderson, Lowell Ray; Young, David Edward; and Fox, William Burke, 3,716,570.
- Young, Gideon Maurice; Silman, Harold; and Hill, Eric John, to Vacu-Blast Limited. Apparatus for correcting misprinted matter on sheet material. 3,715,838, Cl. 51-12.000.
- Zanoni, Paul, to Bennett Pump Incorporated, mesne. Compact pump/air separator apparatus. 3,715,863, Cl. 55-204.000.
- Zarowin, Charles B.: *See—*
  - Lynch, George W.; and Zarowin, Charles B., 3,716,777.

Zelenz, Martin L., to GTE Sylvania Incorporated. Signal coupling apparatus utilizing hybrid transformer. 3,716,806, Cl. 333-10.000.
Zenith Radio Corporation: *See—*
  Harna, Hyacint E., 3,716,796.
  Hendrickson, Melvin C.; Merrell, Richard G.; and Parisoe, Wilbert, 3,716,654.
  Hendrickson, Melvin C.; and Merrell, Richard G., 3,716,797.
  Korpel, Adrianus, 3,716,659.
Zeocon Corporation: *See—*
  Henrick, Clive A.; and Siddall, John B., 3,716,565.
Zeta Research, Inc.: *See—*
  Newell, Richard M., 3,716,705.
Zoecon Corporation: *See—*
  Spain, Virginia L.; and Diekman, John D., 3,716,564.
Zurbuchen, Louis E.; and Bradam, William R., to National Cash Register Company, The. Reinking mechanism. 3,715,980, Cl. 101-333.000.
Zweegers, Petrus Wilhelmus. Harvesting and ensilage cutting apparatus. 3,715,873, Cl. 56-13.400.

LIST OF PLANT PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 13TH DAY OF FEBRUARY, 1973

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Armstrong, David L., to Armstrong Nurseries, Inc. Rose plant. 3,302, 2–13–73, Cl. 27.
Armstrong, David L., to Armstrong Nurseries, Inc. Rose plant. 3,303, 2–13–73, Cl. 21.
Armstrong Nurseries, Inc.: *See—*
  Armstrong, David L. 3,302.
  Armstrong, David L. 3,303.
Carnefix, Francis W. Spur-type sour cherry tree. 3,304, 2–13–73, Cl. 37.
Quinn, Vincent P. Carnation. 3,305, 2–13–73, Cl. 70.

LIST OF DESIGN PATENTEES

Aiuppa, David. Combined checker and chessboard. 226,321, 2–13–73, Cl. D34—5.
American Playground Device Co.: *See—*
  Henning, Steven A., and Miller. 226,318.
American Standard, Inc.: *See—*
  Tompkins, Melvin W., and Retz. 226,302.
Anchor Hocking Corp.: *See—*
  Wilkes, Lawrence T. 226,305.
Anderson, Eldon L., Jr., to General Electric Co. Luminaire. 226,326, 2–13–73, Cl. D48—31.
Anderson, Eldon L., Jr., to General Electric Co. Luminaire. 226,327, 2–13–73, Cl. D48—31.
Anderson, Robert F. Storage rack for a set of machine tools. 226,298, 2–13–73, Cl. D6—125.
Braun A.G.: *See—*
  Greubel, Jurgen. 226,345.
Brefka, Paul E.: *See—*
  Danti, Bernard R. and Brefka. 226,340.
Burwood Products Co.: *See—*
  Wills, Franklin M. 226,322.
Cannon Mills Co.: *See—*
  Clementi, Leonard C. 226,300.
Clementi, Leonard C., to Cannon Mills Co. Textile fabric. 226,300, 2–13–73, Cl. D6—265.
Conroy, Robert, K. Fleming, B. Hirsch, R. Redel, and J. B. Steinhilber; assignors to Fred Meyer of California. Artificial hearth fire. 226,314, 2–13–73. Cl. D23—94.
Creative Creations, Inc.: *See—*
  Feuer, Perry. 226,320.
Curran, Frank J. Ash tray or similar article. 226,342, 2–13–73, Cl. D85—2.
Dann, Stanley F., to World Commerce. Simulated coil. 226,317, 2–13–73, Cl. D29—11.
Danti, Bernard R., and P. E. Brefka, to Millipore Corp. Viewer for an electrophoresis cassette. 226,340, 2–13–73, Cl. D83—1.
Denski, David: *See—*
  Patton, Milburn P., and Denski. 226,328.
D'Ercoli, Geno C.: *See—*
  Reinecke, Jean O., D'Ercoli, and Joss. 226,333.
  Reinecke, Jean O., D'Ercoli, and Joss. 226,334.
DuBois, Ralph L. Cover for lavatory spout. 226,313, 2–13–73, Cl. D23—32.
Dushane, Raymond N., Jr. Sliding door handle. 226,301, 2–13–73, Cl. D8—151.
Emmerich, Donald N.: *See—*
  Hogue, Robert M., and Emmerich. 226,331.
Etablissements Carpano et Pons: *See—*
  Lemery, Jean-Paul. 226,309.
  Lemery, Jean-Paul. 226,310.
  Lemery, Jean-Paul. 226,311.
Feuer, Perry, to Creative Creations, Inc. Toy locomotive. 226,320, 2–13–73, Cl. D34—15.
Fleming, Kellogg: *See—*
  Conroy, Robert, Fleming, Hirsch, Redel, and Steinhilber. 226,314.
General Electric Co.: *See—*
  Anderson, Eldon L., Jr. 226,326.
  Anderson, Eldon L., Jr. 226,327.
  Hurko, Bohdan. 226,339.
Gielow, Robert L. Trouser hanger. 226,299, 2–13–73, Cl. D6—252.
Gillette Co., The: *See—*
  Levy, Leon M., and Lemanski. 226,335.
Greubel, Jurgen, to Braun A.G. Automatic juice maker. 226,345, 2–13–73, Cl. D89—1.
Henning, Steven A., and P. G. Miller, to American Playground Device Co. Playground climbing bars. 226,318, 2–13–73, Cl. D34—5.
Hirsch, Burton: *See—*
  Conroy, Robert, Fleming, Hirsch, Redel, and Steinhilber. 226,314.
Hogue, Robert M., and D. N. Emmerich; said Emmerich assignor to said Hogue. Electronic photo flash unit. 226,331, 2–13–73, Cl. D61—1.
Honeywell Inc.: *See—*
  Quinn, Peter T. 226,330.
Hurko, Bohdan, to General Electric Co. Combined cooktop and ventilating hood with warming shelf or similar article. 226,339, 2–13–73, Cl. D81—25.
Ibex Precision Products, Inc.: *See—*
  Longarzo, Roland P. 226,336.
Itek Corp.: *See—*
  Robbins, Daniel H. 226,332.
Jordan, Denis J., to National Presto Industries, Inc. Handle for an electric hair styler or the like. 226,343, 2–13–73, Cl. D86—10.
Joss, Michael S.: *See—*
  Reinecke, Jean O., D'Ercoli, and Joss. 226,333.
  Reinecke, Jean O., D'Ercoli, and Joss. 226,334.
Katayama, Masaharu, F. Ohta, and K. Yanagisawa, to Matsushita Electric Industrial Co., Ltd. Combined television controller and sound recording unit. 226,315, 2–13–73, Cl. D26—5.
Kretz, Edward J. Bottle. 226,303, 2–13–73, Cl. D9—66.
Lab-Line Instruments, Inc.: *See—*
  Newman, Alexander I. 226,346.
Lemanski, Harry J.: *See—*
  Levy, Leon M., and Lemanski. 226,335.
Lemery, Jean-Paul, to Etablissements Carpano et Pons. Fly casting fishing reel. 226,309, 2–13–73, Cl. D22—25.
Lemery, Jean-Paul, to Etablissements Carpano et Pons. Fly casting fishing reel. 226,310, 2–13–73, Cl. D22—25.
Lemery, Jean-Paul, to Etablissements Carpano et Pons. Fly casting fishing reel. 226,311, 2–13–73, Cl. D22—25.
Levy, Leon M., and H. J. Lemanski, to The Gillette Co. Combined paperweight and penholder. 226,335, 2–13–73, Cl. D74—5.
Longarzo, Roland P., to Ibex Precision Products, Inc. Ball jointed pen holder and the like. 226,336, 2–13–73, Cl. D74—5.
Longarzo, Roland P. Desk set. 226,337, 2–13–73, Cl. D74—5.
Longato, Giuseppe. Table lamp. 226,324, 2–13–73, Cl. D48—20.
Loomis, Judith [illegible]. Handbag. 226,344, 2–13–73, Cl. D87—3.
Marier, Gaston. Hood for snowmobile. 226,307, 2–13–73, Cl. D14—24.
Marsh, Robert E. Brine cabinet inner bottom. 226,312, 2–13–73, Cl. D23—3.
Matrangelo, Victor A. Pair of slacks or similar article. 226,295, 2–13–73, Cl. D2—28.
Matsushita Electric Industrial Co., Ltd.: *See—*
  Katayama, Masaharu, Ohta, and Yanagisawa. 226,315.
Meyer, Fred, of California: *See—*
  Conroy, Robert, Fleming, Hirsch, Redel, and Steinhilber. 226,314.
Miller, Philip G.: *See—*
  Henning, Steven A., and Miller. 226,318.
Millipore Corp.: *See—*
  Danti, Bernard R., and Brefka. 226,340.
Minnesota Mining and Mfg. Co.: *See—*
  Reinecke, Jean O., D'Ercoli, and Joss. 226,333.
  Reinecke, Jean O., D'Ercoli, and Joss. 226,334.
National Presto Industries, Inc.: *See—*
  Jordan, Denis J. 226,343.
Newman, Alexander I., to Lab-Line Instruments, Inc. Magnetic stirring bar. D226,346, 2–13–73, Cl. D94—3.
Ohta, Fumiharu: *See—*
  Katayama, Masaharu, Ohta, and Yanagisawa. 226,315.
Owens-Illinois, Inc.: *See—*
  Weckman, Richard L. 226,304.
Patton, Milburn P., and D. Denski. Cover for trash receptacle. 226,328, 2–13–73, Cl. D49—35.
Pinti, Patrick R.: *See—*
  Pinti, Ross A. and P. R. 226,308.
Pinti, Ross A. and P. R. Arrow release device. 226,308, 2–13–73, Cl. D22—5.
Poff, Richard B. Lighting fixture. 226,325, 2–13–73, Cl. D48—23.
Quinn, Peter T., to Honeywell Inc. Camera flash attachment. 226,330, 2–13–73, Cl. D61—1.
Redel, Ray: *See—*
  Conroy, Robert, Fleming, Hirsch, Redel, and Steinhilber. 226,314.

Reinecke, Jean O., G. C. D'Ercoli, and M. S. Joss, to Minnesota Mining and Mfg. Co. Tape dispenser. 226,333, 2-13-73, Cl. D74—1.

Reinecke, Jean O., G. C. D'Ercoli, and M. S. Joss, to Minnesota Mining and Mfg. Co. Tape dispenser. 226,334, 2-13-73, Cl. D74—1.

Retz, George F.: *See*—
  Tompkins, Melvin W., and Retz. 226,302.

Rhoads, Chester V. Short spine board. 226,341, 2-13-73, Cl. D83—1.

Robbins, Daniel H., to Itek Corp. Microfilm reader-printer or similar article. 226,332, 2-13-73, Cl. D61—1.

Roegner, George P., to U.S. Industries, Inc. Portable television receiver or similar article. 226,329, 2-13-73, Cl. D56—4.

Ruskin, Asa P. Can resealer or the like. 226,306, 2-13-73, Cl. D9—282.

Sanders, Ronald D. Golf putter head. 226,319, 2-13-73, Cl. D34—5.

Seiden, Stanford, to Sunair Electronics, Inc. Casing for portable radio transceiver. D226,316, 2-13-73, Cl. D26—14.

Shames, Harold: *See*—
  Shames, Sidney J. and H. 226,296.
  Shames, Sidney J. and H. 226,297.

Shames, Sidney J. and H. Support bracket for a bathroom fixture or the like. 226,296, 2-13-73, Cl. D2—86.

Shames, Sidney J. and H. Escutcheon plate for a bathroom fixture or the like. 226,297, 2-13-73, Cl. D6—86.

Steinhilber, J. B.: *See*—
  Conroy, Robert, Fleming, Hirsch, Redel, and Steinhilber. 226,314.

Sunair Electronics, Inc.: *See*—
  Seiden, Stanford. 226,316.

Tailer, Peter L. Casing for a writing instrument. 226,338, 2-13-73, Cl. D74—17.

Tompkins, Melvin W., and G. F. Retz, to American Standard, Inc. Corner insert for ceiling tracks. 226,302, 2-13-73, Cl. D8—225.

U.S. Industries, Inc.: *See*—
  Roegner, George P. 226,329.

Weckman, Richard L., to Owens-Illinois, Inc. 226,304, 2-13-73, Cl. D9—125.

Wilkes, Lawrence T., to Anchor Hocking Corp. Packaging tray. 226,305, 2-13-73, Cl. D9—188.

Wills, Franklin M., to Burwood Products Co. Combined clock and perpetual calendar. 226,322, 2-13-73, Cl. D42—7.

Wilton Brass Co.: *See*—
  Wilton, Ralph P. 226,323.

Wilton, Ralph P., to Wilton Brass Co. Food serving dish. 226,323, 2-13-73, Cl. D44—10.

World Commerce: *See*—
  Dann, Stanley F. 226,317.

Yanagisawa, Kumi: *See*—
  Katayama, Masaharu, Ohta, and Yanagisawa. 226,315.

CLASSIFICATION OF PATENTS

ISSUED FEBRUARY 13, 1973

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 3	
1	3,715,763
CLASS 4	
228	3,715,765
CLASS 5	
247	3,715,766
CLASS 8	
37	3,716,325
41C	3,716,327
62	3,716,326
165	3,716,328
169	3,716,329
	3,716,330
CLASS 12	
14.5	3,715,767
125	3,715,768
CLASS 14	
71	3,715,769
CLASS 15	
23	3,715,770
48	3,715,771
49RB	3,715,772
183	3,715,773
302	3,715,774
410	3,715,775
CLASS 16	
94D	3,715,776
162	3,715,777
180	3,715,778
CLASS 17	
11	3,715,779
CLASS 19	
128	3,715,780
CLASS 23	
230PC	3,716,334
230B	3,716,336
230R	3,716,333
	3,716,335
254E	3,716,337
259	3,716,338
259.5	3,716,340
262	3,716,339
273SP	3,716,341
281	3,716,342
285	3,716,343
288F	3,716,344
301SP	3,716,345
312	3,716,346
CLASS 24	
90HA	3,715,781
116	3,715,782
265R	3,715,783
CLASS 29	
25.11	3,715,785
25.42	3,715,784
	3,715,786
76	3,715,787
103A	3,715,788
103B	3,715,789
156.5R	3,715,790
182.2	3,716,347
182.5	3,715,791
182.7	3,715,792
194	3,715,793
195	3,716,348
235	3,715,794
412	3,715,795
420	3,715,796
426	3,715,797
454	3,715,798
475	3,715,799
506	3,715,800
568	3,715,801
588	3,715,802
CLASS 30	
43.5	3,715,803
102	3,715,804
166	3,715,805
CLASS 32	
60	3,715,806
CLASS 33	
265	3,715,807
347	3,715,808
CLASS 35	
19B	3,715,809
35J	3,715,812
35R	3,715,810
48	3,715,811
49	3,715,813
	3,715,814
60	3,715,815
73	3,715,816
CLASS 36	
67D	3,715,817
CLASS 38	
15	3,715,818
16	3,715,819
17	3,715,820
CLASS 40	
129C	3,715,821
130K	3,715,822
152	3,715,823
	3,715,824
CLASS 42	
47	3,715,825
70E	3,715,826
85	3,715,827
CLASS 43	
4.5	3,715,831
6	3,715,828
12	3,715,829
26.2	3,715,830
CLASS 46	
1B	3,715,832
79	3,715,833
220	3,715,834
CLASS 47	
58	3,715,835
CLASS 48	
3	3,716,303
CLASS 49	
380	3,715,837
CLASS 51	
12	3,715,838
58	3,715,839
163	3,715,840
165.88	3,715,841
281	3,715,842
CLASS 52	
3	3,715,843
21	3,715,958
221	3,715,844
235	3,715,848
309	3,715,846
400	3,715,847
646	3,715,849
701	3,715,850
707	3,715,851
741	3,715,836
745	3,715,852
CLASS 53	
22A	3,715,853
22B	3,715,860
29	3,715,854
37	3,715,855
41	3,715,856
62	3,715,857
190	3,715,858
209	3,715,859
211	3,715,861
319	3,715,865
390	3,715,862
CLASS 55	
179	3,715,866
204	3,715,863
213	3,715,864
222	3,715,867
227	3,715,871
315	3,715,868
387	3,715,869
466	3,715,870
CLASS 56	
10.4	3,715,872
13.4	3,715,873
295	3,715,874
305	3,715,845
320.1	3,715,875
330	3,715,876
501	3,716,089
CLASS 57	
156	3,715,877
	3,715,878
CLASS 58	
18	3,715,879
21.15	3,715,883
41	3,715,880
50R	3,715,881
53	3,715,882
CLASS 59	
78	3,715,884
CLASS 60	
25	3,715,885
39.18R	3,715,886
59T	3,715,887
251	3,715,888
CLASS 61	
41A	3,715,889
72.3	3,715,890
CLASS 62	
58	3,715,892
63	3,715,891
135	3,715,893
196	3,715,894
457	3,715,895
490	3,715,896
CLASS 65	
32	3,716,349
CLASS 66	
75R	3,715,897
CLASS 68	
145	3,715,898
CLASS 70	
369	3,715,899
456R	3,715,900
CLASS 71	
28	3,716,350
67	3,716,351
CLASS 72	
58	3,715,901
60	3,715,902
183	3,715,903
276	3,715,904
349	3,715,905
354	3,715,906
419	3,715,907
420	3,715,908
CLASS 73	
9	3,715,909
23.1	3,715,910
28	3,715,911
32	3,715,912
61R	3,715,913
67.7	3,715,914
88A	3,715,915
103	3,715,916
134	3,715,917
194EM	3,715,918
194B	3,715,920
194E	3,715,919
209	3,715,921
355EM	3,715,922
361	3,715,923
368	3,715,924
384	3,715,925
387	3,715,926
389	3,715,927
CLASS 74	
42S	3,715,932
218	3,715,928
230.17E	3,715,930
411	3,715,931
471XY	3,715,933
560	3,715,934
567	3,715,929
607	3,715,935
713	3,715,936
CLASS 75	
.5BC	3,716,357
58	3,716,352
128G	3,716,353
128W	3,716,354
142	3,716,355
165	3,716,356
225	3,716,358
CLASS 81	
177.8	3,715,937
CLASS 82	
1C	3,715,938
21B	3,715,939
63	3,715,940
CLASS 83	
7	3,715,941
22	3,715,942
50	3,715,943
58	3,715,944
71	3,715,945
72	3,715,946
140	3,715,947
573	3,715,948
CLASS 84	
1.11	3,716,647
1.25	3,716,648
330	3,715,949
433	3,715,950
470	3,715,951
CLASS 85	
68	3,715,952
CLASS 89	
36L	3,715,953
127	3,715,954
193	3,715,955
CLASS 90	
20	3,715,956
CLASS 93	
1C	3,715,957
CLASS 95	
10CT	3,715,959
11.5R	3,715,960
12.5	3,715,962
31C	3,715,963
42	3,715,961
	3,715,964
64B	3,715,965
CLASS 96	
1.1	3,716,359
1.4	3,716,360
29R	3,716,361
60R	3,716,362
66R	3,716,363
75	3,716,364
88	3,716,366
91N	3,716,367
99	3,716,368
CLASS 98	
2.18	3,715,966
36	3,715,968
42	3,715,967
50	3,715,969
70	3,715,970
110	3,715,971
115LH	3,715,972
CLASS 99	
1	3,716,369
	3,716,370
4	3,716,371
8	3,715,973
17	3,716,372
51	3,716,365
71	3,716,373
78	3,716,374
90CB	3,716,375
115	3,716,376
116	3,716,377
122R	3,716,378
140N	3,716,379
	3,716,380
157	3,716,381
205	3,716,382
285	3,715,974
331	3,715,975
353	3,716,383
404	3,715,976
CLASS 100	
117	3,715,977
CLASS 101	
93C	3,715,978
144	3,715,979
333	3,715,980
415.1	3,715,981
CLASS 102	
18	3,715,982
34.2	3,715,984
70.2R	3,715,985
71	3,715,986
74	3,715,987
80	3,715,988
84	3,715,989
92	3,715,990
CLASS 104	
23R	3,715,991
88	3,715,992
CLASS 105	
367	3,715,993
368T	3,715,994
CLASS 106	
33	3,716,384
47O	3,716,385
90	3,716,386
100	3,716,387
289	3,716,388
309	3,716,389
CLASS 108	
10	3,715,995
144	3,715,996
146	3,715,997
CLASS 109	
58	3,715,998
82	3,715,999
CLASS 110	
7A	3,716,000
8A	3,716,001
14	3,716,002
28J	3,716,003
163	3,716,004
CLASS 111	
1	3,716,005
CLASS 112	
11	3,716,007
114	3,716,006
240	3,716,008
CLASS 114	
16E	3,716,009
22	3,716,010
132	3,716,011
207	3,716,012
CLASS 115	
6.1	3,716,013
35	3,716,014
CLASS 116	
115.5	3,716,015
120	3,716,016
137	3,716,017
CLASS 117	
34	3,716,390
47A	3,716,391
	3,716,392
	3,716,394
47R	3,716,393
68	3,716,395
76T	3,716,396
77	3,716,397
107.2P	3,716,398
123D	3,716,399
132BE	3,716,400
138.8UA	3,716,401
161LN	3,716,402
201	3,716,403
	3,716,404
	3,716,405
217	3,716,406
224	3,716,407
CLASS 118	
60	3,716,221
101	3,716,018
246	3,716,019
303	3,716,020
308	3,716,021
326	3,716,022
420	3,716,023
630	3,716,024
CLASS 119	
3	3,716,025
	3,716,026
28	3,716,027
29	3,716,029
51.11	3,716,028
72.5	3,716,030
153	3,716,031
155	3,716,032
CLASS 123	
8.41	3,716,033
32EA	3,716,034
	3,716,035
90.43	3,716,036
148A	3,716,038
148E	3,716,037
185A	3,716,039
198A	3,716,040
CLASS 125	
11R	3,716,041
CLASS 126	
59.5	3,716,042
113	3,716,043
151	3,716,044
360A	3,716,045
CLASS 127	
46R	3,716,408
CLASS 128	
2.1R	3,716,046
18	3,716,047
49	3,716,048
75	3,716,049
92BB	3,716,051
92D	3,716,050
130	3,716,052
142.2	3,716,053
172.1	3,716,054
275	3,716,055
303R	3,716,056
305R	3,716,057
337	3,716,058
419D	3,716,059
CLASS 130	
27K	3,716,060
CLASS 131	
22A	3,716,061
110	3,716,062
267	3,716,063
CLASS 132	
53	3,716,065
CLASS 135	
45A	3,716,067
CLASS 136	
6	3,716,409
	3,716,410
30	3,716,411
34	3,716,412
86A	3,716,413
86B	3,716,415
	3,716,416
86R	3,716,414
232	3,716,417
CLASS 137	
67	3,716,068
244	3,716,069
484.2	3,716,070
501	3,716,064
510	3,716,072
594	3,716,071
625.6	3,716,074
625.63	3,716,075
CLASS 138	
32	3,716,076
134	3,716,077
CLASS 139	
399	3,716,078
CLASS 140	
120	3,716,079
124	3,716,080
CLASS 141	
12	3,716,081
68	3,716,082
90	3,716,083
CLASS 143	
157D	3,716,084

CLASS 144
144R 3,716,085
208B 3,716,087
326R 3,716,086

CLASS 145
46 3,716,088

CLASS 146
192 3,716,090

CLASS 148
6.14R 3,716,421
6.3 3,716,418
11.5A 3,716,419
12 3,716,420
32 3,716,423
175 3,716,422
3,716,424
3,716,425

CLASS 149
38 3,716,426

CLASS 150
40 3,716,091

CLASS 151
41.75 3,716,092

CLASS 152
330 3,716,093

CLASS 156
3 3,716,427
3,716,428
17 3,716,429
62.4 3,716,430
3,716,431
63 3,716,432
85 3,716,433
157 3,716,434
195 3,716,435
218 3,716,436
244 3,716,437
253 3,716,438
269 3,716,439
277 3,716,440
309 3,716,441
397 3,716,442
441 3,716,443
505 3,716,444

CLASS 161
2 3,716,445
91 3,716,446

CLASS 162
65 3,716,447
3,716,448
101 3,716,449

CLASS 164
154 3,716,094

CLASS 165
1 3,716,095
22 3,716,096
39 3,716,097
80 3,716,098
135 3,716,099

CLASS 166
.6 3,716,100
60 3,716,101
88 3,716,102

CLASS 169
42 3,716,103

CLASS 172
7 3,716,104
780 3,716,105

CLASS 173
1 3,716,106

CLASS 174
7 3,716,649
15R 3,716,652
42 3,716,650
53 3,716,651
87 3,716,653

CLASS 175
205 3,716,108
248 3,716,107
297 3,716,109

CLASS 176
19R 3,716,450
65 3,716,451

CLASS 178
5.1 3,716,654
5.2R 3,716,656
5.4AC 3,716,663
5.4CD 3,716,655
3,716,664
5.4ST 3,716,666
5.4P 3,716,665
6 3,716,667
6.6B 3,716,668
6.7A 3,716,670
6.7R 3,716,669
7.2 3,716,657
7.3D 3,716,658
3,716,659
7.7 3,716,660
7.8 3,716,661
3,716,662

CLASS 179
1E 3,716,671
2DP 3,716,672
6R 3,716,673
18ET 3,716,675
18FA 3,716,674
90BB 3,716,676
100.2C 3,716,677
100.2S 3,716,679
100.2T 3,716,678
110A 3,716,681
170G 3,716,680

CLASS 180
79.2R 3,716,110

CLASS 181
.5EC 3,716,111

CLASS 182
155 3,716,112

CLASS 187
613 3,716,073

CLASS 188
1A 3,716,113
62 3,716,114
65.1 3,716,115
109 3,716,116
167 3,716,117
181R 3,716,121
181T 3,716,118
195 3,716,119
300 3,716,120

CLASS 192
136 3,716,122

CLASS 193
40 3,716,123

CLASS 194
1N 3,716,124

CLASS 195
2 3,716,452
29 3,716,453
30 3,716,454
66R 3,716,455
103.5R 3,716,456

CLASS 197
172 3,716,125

CLASS 198
24 3,716,126
30 3,716,127
38 3,716,128
127 3,716,129
220DA 3,716,130

CLASS 200
50AA 3,716,684
50R 3,716,683
61.27 3,716,682
147R 3,716,685
148R 3,716,686

CLASS 202
263 3,716,457

CLASS 203
11 3,716,458

CLASS 204
1R 3,716,459
1T 3,716,460
16 3,716,461
38B 3,716,462
43 3,716,463
3,716,464
158R 3,716,465
159.17 3,716,466
159.18 3,716,467
181 3,716,468
192 3,716,469
213 3,716,470
294 3,716,471
298 3,716,472
299 3,716,473

CLASS 206
57 3,716,131
58 3,716,132
65A 3,716,133

CLASS 208
13 3,716,474
59 3,716,475
97 3,716,476
139 3,716,477
152 3,716,478
211 3,716,479

CLASS 209
73 3,716,134
74 3,716,135
82 3,716,136
211 3,716,137
401 3,716,138

CLASS 210
22 3,716,480
32 3,716,481
37 3,716,482
40 3,716,483
50 3,716,485
52 3,716,484
104 3,716,139
167 3,716,140
194 3,716,141
242 3,716,142
321 3,716,143
499 3,716,144

CLASS 211
40 3,716,145

CLASS 213
75R 3,716,146

CLASS 214
1BT 3,716,147
2.5 3,716,149
8.5C 3,716,148
35R 3,716,150
77R 3,716,151
86A 3,716,152
91 3,716,153
152 3,716,154
3,716,155
450 3,716,156
505 3,716,157
730 3,716,158
762 3,716,159
768 3,716,175

CLASS 215
9 3,716,160
3,716,161
42 3,716,162
47 3,716,163

CLASS 219
10.55 3,716,687
3,716,688
10.61 3,716,689
10.77 3,716,690
137 3,716,691
241 3,716,692
553 3,716,693

CLASS 220
60R 3,716,164

CLASS 221
85 3,716,165

CLASS 222
15 3,716,166
63 3,716,167
146HE 3,716,168
157 3,716,169
162 3,716,170
396 3,716,171
453 3,716,172
455 3,716,173

CLASS 224
1B 3,716,174

CLASS 225
96.5 3,716,176

CLASS 226
1 3,716,177
11 3,716,178

CLASS 227
48 3,716,179

CLASS 229
43 3,716,180
57 3,716,181
62 3,716,182

CLASS 232
1R 3,716,183
43.1 3,716,184

CLASS 235
7R 3,716,694
26 3,716,695
30R 3,716,185
61.1 3,716,698
61.11E 3,716,699
61.11H 3,716,701
61.5E 3,716,696
61.6A 3,716,700
61.9R 3,716,697
70R 3,716,186
3,716,702
71A 3,716,187
92PD 3,716,704
92PL 3,716,703
151 3,716,705
151.33 3,716,706
200 3,716,707

CLASS 236
92R 3,716,188

CLASS 239
2S 3,716,190
8 3,716,189
112 3,716,191
205 3,716,192
222 3,716,193
318 3,716,194
375 3,716,195

CLASS 240
10.6R 3,716,708
106R 3,716,710
106.1 3,716,709

CLASS 241
1 3,715,983
27 3,716,196
43 3,716,197
188R 3,716,198

CLASS 242
1.1R 3,716,199
43 3,716,200
107 3,716,201
118.7 3,716,202
131 3,716,203
156 3,716,204
194 3,716,205

CLASS 244
15A 3,716,206
53R 3,716,207
108 3,716,208
123 3,716,209

CLASS 245
1 3,716,210

CLASS 248
168 3,716,211
278 3,716,212
399 3,716,213
447 3,716,214

CLASS 250
43.5 3,716,711
51.5 3,716,712
80 3,716,713
83.3D 3,716,715
83.3 3,716,714
203R 3,716,716
217F 3,716,717

CLASS 251
358 3,716,215

CLASS 252
8.5C 3,716,486
82 3,716,487
155 3,716,488
300 3,716,489
301.1R 3,716,491
301.1W 3,716,490
301.2P 3,716,492
317 3,716,493
408 3,716,494
431 3,716,495
439 3,716,496
470 3,716,497
522 3,716,498
524 3,716,499

CLASS 254
139.1 3,716,216
3,716,217

CLASS 256
64 3,716,218

CLASS 259
177R 3,716,219

CLASS 260
2.1C 3,716,500
2.1E 3,716,501
2.5AY 3,716,502
3 3,716,503
8 3,716,504
17A 3,716,505
17R 3,716,507
22CB 3,716,506
22A 3,716,508
23.07A 3,716,509
28.5AS 3,716,510
29.3 3,716,512
29.6RB 3,716,511
29.6TA 3,716,547
33.4P 3,716,514
33.6A 3,716,513
37R 3,716,515
45.8A 3,716,516
46.5Y 3,716,518
46.54 3,716,517
47CB 3,716,519
47EN 3,716,520
59 3,716,521
64 3,716,522
75M 3,716,523
78.5 3,716,524
128 3,716,525
212 3,716,526
233.3A 3,716,527
239.3P 3,716,528
239.55C 3,716,530
239.55D 3,716,529
240A 3,716,531
240.1 3,716,532
243C 3,716,533
248NS 3,716,535
249.9 3,716,536
250A 3,716,534
256.5R 3,716,537
268BC 3,716,538
268TR 3,716,539
268C 3,716,540
286R 3,716,541
289R 3,716,542
290V 3,716,543
3,716,545
292 3,716,544
295AM 3,716,546
296R 3,716,548
297R 3,716,549
308D 3,716,550
309 3,716,551
309.5 3,716,552
3,716,553
309.7 3,716,554
310R 3,716,555
326.3 3,716,556
327E 3,716,557
332.3R 3,716,558
343.2S 3,716,559
345.9 3,716,561
346.2 3,716,560
348.051 3,716,563
348.5V 3,716,562
404 3,716,564
410.9R 3,716,565
412.8 3,716,566
429.5 3,716,567
429.7 3,716,568
448.8R 3,716,569
453R 3,716,570
463 3,716,571
3,716,572
471A 3,716,573
473F 3,716,574
475PR 3,716,575
486D 3,716,576
486H 3,716,577
488CD 3,716,578
488B 3,716,579
488J 3,716,580
497A 3,716,581
507R 3,716,582
520 3,716,583
535R 3,716,584
562P 3,716,587
574 3,716,585
591 3,716,586
609R 3,716,588
621R 3,716,589
645 3,716,590
648R 3,716,591
650R 3,716,592
653.6 3,716,593
665R 3,716,594
666PY 3,716,595
671C 3,716,596
3,716,597
831 3,716,598
859R 3,716,599
873 3,716,601
889 3,716,602
953 3,716,603
959 3,716,600

CLASS 261
36R 3,716,220

CLASS 264
.5 3,716,605
3R 3,716,604
25 3,716,606
29 3,716,607
36 3,716,608
111 3,716,609
152 3,716,610
241 3,716,612
254 3,716,613
290N 3,716,611
344 3,716,614

CLASS 269
48.1 3,716,224
269 3,716,225

CLASS 271
31 3,716,226
47 3,716,228
79 3,716,227

CLASS 272
57E 3,716,229
58 3,716,230
3,716,231
63 3,716,232

CLASS 273
1L 3,716,233
1.5R 3,716,234
26E 3,716,235
138R 3,716,236
142H 3,716,237
149P 3,716,238
194A 3,716,239

CLASS 274
2 3,716,240
4B 3,716,243
4D 3,716,241
3,716,242

CLASS 277
65 3,716,244
176 3,716,245

CLASS 279
1SG 3,716,247
2 3,716,246

CLASS 280
11.35T 3,716,248
81A 3,716,249
104.5A 3,716,250
124F 3,716,251
150.5 3,716,252
166 3,716,254
415A 3,716,253
491E 3,716,255

CLASS 281
29 3,716,256

CLASS 285
210 3,716,257

CLASS 287
60 3,716,258
189.36D 3,716,259

CLASS 292
103 3,716,260
169.23 3,716,261
218 3,716,262

CLASS 294
19R 3,716,263
63A 3,716,264
70 3,716,265
71 3,716,266

CLASS 296
23R 3,716,267
35A 3,716,268
97H 3,716,269

CLASS 297
377 3,716,270
457 3,716,271

CLASS 299
5 3,716,272

CLASS 303
20 3,716,274
21AF 3,716,275
21CG 3,716,273
70 3,716,277
82 3,716,276

CLASS 307
13 3,716,718
17 3,716,719
141 3,716,720
141.4 3,716,721
215 3,716,722
221C 3,716,723
3,716,724
223 3,716,725
237 3,716,726
243 3,716,727
291 3,716,728
295 3,716,729
3,716,730

CLASS 308
3.8 3,716,279
9 3,716,278
207A 3,716,280

CLASS 310
13 3,716,731
61 3,716,732
71 3,716,733
72 3,716,734
240 3,716,735

CLASS 312
114 3,716,281
322 3,716,282
330 3,716,283
339 3,716,284

CLASS 313
39 3,716,736
59 3,716,737
65R 3,716,738
82R 3,716,739
108R 3,716,741
182 3,716,742
220 3,716,743
3,716,744

CLASS 315
3.6 3,716,745
5.35 3,716,746
10 3,716,747
11 3,716,740
23 3,716,749
27SR 3,716,748
39.71 3,716,750
106 3,716,751
151 3,716,752
241P 3,716,753

CLASS 316
21 3,716,285

CLASS 317
2F 3,716,754
3,716,755
13A 3,716,756
40R 3,716,757
96 3,716,758

100 3,716,759
101DH 3,716,760
101B 3,716,761
107 3,716,762
157.5 3,716,763
234R 3,716,765
234 3,716,764

CLASS 318
102 3,716,766
139 3,716,767
3,716,768
254 3,716,769
259 3,716,770
331 3,716,771
332 3,716,772
600 3,716,773

CLASS 320
64 3,716,774

CLASS 321
5 3,716,775
8R 3,716,776
27R 3,716,777

CLASS 323
8 3,716,778

CLASS 324
34TK 3,716,779
46 3,716,781
61R 3,716,782
73 3,716,783
77B 3,716,784
3,716,785
158F 3,716,786
173 3,716,787
174 3,716,788

CLASS 325
38A 3,716,789
49 3,716,790
324 3,716,780
363 3,716,791
438 3,716,792
487 3,716,793

CLASS 328
39 3,716,794
63 3,716,795
3,716,796
3,716,797
67 3,716,798
150 3,716,799
151 3,716,800

CLASS 330
29 3,716,801

CLASS 331
8 3,716,802

CLASS 332
7.51 3,716,804
11D 3,716,803

CLASS 333
1.1 3,716,805
10 3,716,806
18 3,716,807
72 3,716,808
82R 3,716,809

CLASS 335
154 3,716,810
160 3,716,811
179 3,716,812

CLASS 336
60 3,716,813

CLASS 337
123 3,716,814

CLASS 339
44M 3,716,815
53 3,716,816
74R 3,716,817
97L 3,716,818
143T 3,716,819
147P 3,716,820
205 3,716,821

CLASS 340
1R 3,716,822
3R 3,716,823
3,716,824
3,716,825
5H 3,716,826
8S 3,716,827
10 3,716,828
15.5DP 3,716,829
18LD 3,716,830
52A 3,716,831
3,716,832
61 3,716,833
147R 3,716,834
154 3,716,835
167R 3,716,836
172.5 3,716,837
3,716,838
3,716,839
3,716,840
3,716,841
3,716,842
3,716,843
173LM 3,716,845
173LS 3,716,844
174YC 3,716,847
174M 3,716,846
311 3,716,848
347DD 3,716,851
3,716,852
347NT 3,716,849
365E 3,716,850
730 3,716,066

CLASS 343
5LS 3,716,855
3,716,866
5PD 3,716,854
5PR 3,716,853
6.8LC 3,716,856
3,716,857
7.3 3,716,858
7.7 3,716,859
11R 3,716,860
108R 3,716,863
3,716,864
108 3,716,862
225 3,716,865
701 3,716,867
741 3,716,861
768 3,716,868
779 3,716,869

CLASS 350
3.5 3,716,286
3,716,287
97 3,716,288
160LC 3,716,289
3,716,290
203 3,716,291

CLASS 353
91 3,716,292
103 3,716,293

CLASS 355
3 3,716,294
3,716,295
53 3,716,296
67 3,716,297
71 3,716,298
83 3,716,299

CLASS 356
97 3,716,300
165 3,716,301

CLASS 404
70 3,716,302

CLASS 415
72 3,716,304

CLASS 417
2 3,716,305
44 3,716,306
191 3,716,307
286 3,716,308
422 3,716,309
552 3,716,310

CLASS 418
61 3,716,311
94 3,716,312
121 3,716,313
150 3,716,314

CLASS 423
35 3,716,615
49 3,715,764
121 3,716,617
134 3,716,616
143 3,716,618
228 3,716,620
247 3,716,619
248 3,716,621
3,716,622
3,716,623
274 3,716,624
392 3,716,625
418 3,716,626
440 3,716,627
447 3,716,331
3,716,332
507 3,716,628
513 3,716,629
594 3,716,630

CLASS 424
1 3,716,631
3,716,632
47 3,716,633
93 3,716,634
122 3,716,635
211 3,716,636
243 3,716,637
3,716,638
244 3,716,639
3,716,640
251 3,716,641
263 3,716,642
286 3,716,643
308 3,716,644
346 3,716,645
347 3,716,646

CLASS 425
8 3,716,315
13 3,716,316
198 3,716,317
245 3,716,318
293 3,716,319
326 3,716,320
383 3,716,321
392 3,716,322
450 3,716,323

CLASS 431
185 3,716,324

CLASS 432
133 3,716,222
260 3,716,223

CLASSIFICATION OF DESIGNS

D 2— 28 226,295
D 6— 86 226,296
226,297
125 226,298
252 226,299
265 226,300
D 8— 151 226,301
225 226,302
D 9— 66 226,303
125 226,304
188 226,305
282 226,306
D14— 24 226,307
D22— 5 226,308
25 226,309
226,310
226,311
D23— 3 226,312
32 226,313
94 226,314
D26— 5 226,315
14 226,316
D29— 11 226,317
D34— 5 226,318
226,319
226,321
15 226,320
D42— 7 226,322
D44— 40 226,323
D48— 20 226,324
23 226,325
31 226,326
226,327
D49— 35 226,328
D56— 4 226,329
D61— 1 226,330
226,331
226,332
D74— 226,333
226,334
5 226,335
226,336
226,337
17 226,338
D81— 25 226,339
D83— 1 226,340
226,341
D85— 2 226,342
D86— 10 226,343
D87— 3 226,344
D89— 1 226,345
D94— 3 226,346

CLASSIFICATION OF PLANTS

P. — 21 3,303
P. — 27 3,302
P. — 37 3,304
P. — 70 3,305

GEOGRAPHICAL INDEX OF RESIDENCE OF INVENTORS

(U.S. States, Territories and Armed Forces, the Commonwealth of Puerto Rico, and the Canal Zone)

Alabama	1
Alaska	2
American Samoa	3
Arizona	4
Arkansas	5
California	6
Canal Zone	7
Colorado	8
Connecticut	9
Delaware	10
District of Columbia	11
Florida	12
Georgia	13
Guam	14
Hawaii	15
Idaho	16
Illinois	17
Indiana	18
Iowa	19
Kansas	20
Kentucky	21
Louisiana	22
Maine	23
Maryland	24
Massachusetts	25
Michigan	26
Minnesota	27
Mississippi	28
Missouri	29
Montana	30
Nebraska	31
Nevada	32
New Hampshire	33
New Jersey	34
New Mexico	35
New York	36
North Carolina	37
North Dakota	38
Ohio	39
Oklahoma	40
Oregon	41
Pennsylvania	42
Puerto Rico	43
Rhode Island	44
South Carolina	45
South Dakota	46
Tennessee	47
Texas	48
Utah	49
Vermont	50
Virginia	51
Virgin Islands	52
Washington	53
West Virginia	54
Wisconsin	55
Wyoming	56
U.S. Air Force	57
U.S. Army	58
U.S. Navy	59

(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

PATENTS

1 : 3,715,974
3,716,050
3,716,108
4 : 3,715,904
3,715,937
3,716,085
3,716,170
3,716,292
3,716,425
3,716,718
3,716,838
5 : 3,716,165
6 : 3,715,777
3,715,778
3,715,782
3,715,795
3,715,797
3,715,804
3,715,805
3,715,827
3,715,828
3,715,837
3,715,843
3,715,853
3,715,858
3,715,860
3,715,905
3,715,911
3,715,923
3,715,927
3,715,943
3,715,951
3,715,963
3,715,971
3,715,972
3,715,975
3,716,010
3,716,011
3,716,029
3,716,037
3,716,088
3,716,106
3,716,134
3,716,156
3,716,177
3,716,178
3,716,180
3,716,183
3,716,192
3,716,195
3,716,216
3,716,228
3,716,230
3,716,231
3,716,236
3,716,254
3,716,255
3,716,261
3,716,264
3,716,266
3,716,278
3,716,287
3,716,298
3,716,306
3,716,315
3,716,332
3,716,335
3,716,342
3,716,350
3,716,370
3,716,371
3,716,372
3,716,382
3,716,406
3,716,418
3,716,431
3,716,433
3,716,462
3,716,475
3,716,477
3,716,494
3,716,517
3,716,518
3,716,529
3,716,564
3,716,565
3,716,577
3,716,585
3,716,600
3,716,653
3,716,664
3,716,688
3,716,697
3,716,703
3,716,705
3,716,711
3,716,713
3,716,714
3,716,716
3,716,725
3,716,738
3,716,745
3,716,762
3,716,765
3,716,809
3,716,826
3,716,832
3,716,835
3,716,853
3,716,863
8 : 3,715,815
3,715,912
3,716,002
3,716,837
9 : 3,715,868
3,715,895
3,715,917
3,716,201
3,716,232
3,716,349
3,716,356
3,716,367
3,716,387
3,716,392
3,716,411
3,716,414
3,716,415
3,716,427
3,716,489
3,716,609
3,716,649
3,716,674
3,716,675
3,716,698
3,716,699
3,716,704
3,716,777
3,716,786
3,716,810
10 : 3,715,878
3,715,942
3,715,976
3,716,220
3,716,401
3,716,506
3,716,510
3,716,522
3,716,534
3,716,535
11 : 3,715,772
3,715,824
3,715,982
3,716,086
12 : 3,715,770
3,715,803
3,715,862
3,715,885
3,715,893
3,716,048
3,716,182
3,716,513
3,716,611
3,716,793
3,716,814
3,716,854
13 : 3,715,794
3,715,887
3,715,990
3,716,058
3,716,091
3,716,151
3,716,168
3,716,281
3,716,321
3,716,423
3,716,446
15 : 3,716,009
17 : 3,715,775
3,715,784
3,715,786
3,715,788
3,715,789
3,715,800
3,715,813
3,715,814
3,715,833
3,715,836
3,715,879
3,715,888
3,715,898
3,715,935
3,716,013
3,716,038
3,716,049
3,716,065
3,716,067
3,716,089
3,716,092
3,716,096
3,716,124
3,716,131
3,716,140
3,716,159
3,716,162
3,716,171
3,716,188
3,716,214
3,716,219
3,716,237
3,716,239
3,716,243
3,716,257
3,716,262
3,716,279
3,716,299
3,716,348
3,716,364
3,716,400
3,716,409
3,716,468
3,716,492
3,716,516
3,716,539
3,716,548
3,716,559
3,716,597
3,716,645
3,716,652
3,716,654
3,716,659
3,716,668
3,716,671
3,716,701
3,716,728
3,716,730
3,716,760
3,716,770
3,716,774
3,716,792
3,716,796
3,716,797
3,716,808
3,716,821
3,716,865
3,716,867
18 : 3,715,787
3,715,871
3,715,889
3,715,899
3,715,906
3,715,932
3,715,953
3,715,967
3,716,019
3,716,023
3,716,090
3,716,119
3,716,146
3,716,161
3,716,198
3,716,267
3,716,503
3,716,514
3,716,554
3,716,632
3,716,682
3,716,811
3,716,819
3,716,831
19 : 3,715,973
3,716,082
3,716,133
3,716,152
3,716,526
3,716,527
3,716,651
3,716,794
3,716,864
20 : 3,715,781
3,715,856
3,715,928
3,716,026
3,716,114
3,716,402
21 : 3,715,766
3,715,799
3,716,063
3,716,072
3,716,130
3,716,500
3,716,683
3,716,736
22 : 3,715,834
3,715,910
3,716,068
3,716,434
3,716,447
3,716,540
23 : 3,715,955
24 : 3,715,870
3,715,875
3,715,954
3,715,991
3,716,235
3,716,303
3,716,369

3,716,424
3,716,493
3,716,550
3,716,657
3,716,785
3,716,795
3,716,824
3,716,848
3,716,859
3,716,869
25 : 3,715,793
3,715,865
3,715,918
3,715,961
3,716,057
3,716,099
3,716,135
3,716,142
3,716,301
3,716,363
3,716,407
3,716,410
3,716,451
3,716,466
3,716,501
3,716,509
3,716,547
3,716,660
3,716,681
3,716,685
3,716,800
3,716,827
3,716,828
26 : 3,715,796
3,715,821
3,715,840
3,715,863
3,715,864
3,715,903
3,715,909
3,715,931
3,715,934
3,715,936
3,715,968
3,715,993
3,715,994
3,715,999
3,716,022
3,716,066
3,716,076
3,716,127
3,716,128
3,716,158
3,716,248
3,716,251
3,716,260
3,716,273
3,716,282
3,716,284
3,716,307
3,716,309
3,716,384
3,716,394
3,716,484
3,716,507
3,716,520
3,716,523
3,716,538
3,716,603
3,716,612
3,716,798
3,716,816
27 : 3,715,798
3,715,823
3,715,829
3,715,874
3,715,920
3,715,924
3,715,985
3,715,996
3,716,001
3,716,007
3,716,081
3,716,141
3,716,145
3,716,153
3,716,190
3,716,194
3,716,204
3,716,221
3,716,250
3,716,253
3,716,347
3,716,696
3,716,845
28 : 3,715,831
3,716,005
3,716,202
29 : 3,715,900
3,716,169
3,716,212
3,716,569
3,716,733
3,716,791
3,716,817
30 : 3,716,634
31 : 3,716,116
32 : 3,716,615
33 : 3,716,843
34 : 3,715,783
3,715,818
3,715,842
3,715,866
3,715,902
3,715,916
3,715,983
3,715,998
3,716,006
3,716,052
3,716,160
3,716,206
3,716,234
3,716,258
3,716,285
3,716,329
3,716,336
3,716,346
3,716,374
3,716,388
3,716,397
3,716,403
3,716,416
3,716,429
3,716,438
3,716,445
3,716,458
3,716,463
3,716,488
3,716,498
3,716,499
3,716,502
3,716,504
3,716,530
3,716,536
3,716,543
3,716,551
3,716,556
3,716,561
3,716,570
3,716,573
3,716,595
3,716,599
3,716,624
3,716,663
3,716,666
3,716,667
3,716,689
3,716,715
3,716,719
3,716,723
3,716,726
3,716,740
3,716,747
3,716,789
3,716,803
3,716,857
3,716,868
35 : 3,715,913
3,716,054
36 : 3,715,785
3,715,807
3,715,809
3,715,851
3,715,857
3,715,884
3,715,947
3,715,959
3,715,962
3,715,978
3,715,986
3,715,995
3,715,997
3,716,017
3,716,047
3,716,073
3,716,079
3,716,125
3,716,181
3,716,246
3,716,259
3,716,263
3,716,283
3,716,320
3,716,359
3,716,398
3,716,413
3,716,422
3,716,432
3,716,435
3,716,436
3,716,448
3,716,456
3,716,461
3,716,469
3,716,474
3,716,521
3,716,568
3,716,572
3,716,598
3,716,629
3,716,644
3,716,658
3,716,661
3,716,662
3,716,673
3,716,708
3,716,722
3,716,724
3,716,732
3,716,739
3,716,759
3,716,768
3,716,781
3,716,806
3,716,807
3,716,833
3,716,842
3,716,844
3,716,850
3,716,851
3,716,861
37 : 3,715,830
3,715,957
3,716,078
3,716,317
3,716,325
3,716,601
39 : 3,715,773
3,715,774
3,715,790
3,715,855
3,715,882
3,715,894
3,715,925
3,715,980
3,715,981
3,716,043
3,716,044
3,716,075
3,716,077
3,716,084
3,716,098
3,716,117
3,716,126
3,716,136
3,716,147
3,716,199
3,716,223
3,716,225
3,716,280
3,716,311
3,716,331
3,716,355
3,716,379
3,716,380
3,716,442
3,716,485
3,716,557
3,716,582
3,716,610
3,716,672
3,716,690
3,716,721
3,716,756
3,716,787
3,716,790
40 : 3,715,792
3,715,806
3,716,149
3,716,155
3,716,186
3,716,272
3,716,291
3,716,319
3,716,340
3,716,343
3,716,480
3,716,495
3,716,545
3,716,591
3,716,593
41 : 3,716,004
3,716,031
3,716,059
3,716,112
42 : 3,715,764
3,715,808
3,715,811
3,715,844
3,715,847
3,715,876
3,715,921
3,715,926
3,715,941
3,716,021
3,716,030
3,716,110
3,716,132
3,716,138
3,716,139
3,716,144
3,716,173
3,716,197
3,716,222
3,716,252
3,716,274
3,716,276
3,716,318
3,716,337
3,716,354
3,716,390
3,716,405
3,716,417
3,716,421
3,716,441
3,716,460
3,716,464
3,716,470
3,716,479
3,716,491
3,716,508
3,716,524
3,716,553
3,716,592
3,716,596
3,716,613
3,716,619
3,716,630
3,716,641
3,716,684
3,716,691
3,716,735
3,716,741
3,716,763
3,716,775
3,716,805
3,716,823
3,716,834
44 : 3,716,056
3,716,437
3,716,825
46 : 3,715,948
3,716,032
3,716,782
47 : 3,716,000
3,716,025
3,716,203
3,716,277
3,716,327
3,716,616
48 : 3,715,779
3,715,812
3,715,850
3,715,872
3,715,890
3,715,891
3,715,958
3,716,040
3,716,074
3,716,100
3,716,101
3,716,174
3,716,179
3,716,184
3,716,208
3,716,238
3,716,289
3,716,338
3,716,476
3,716,486
3,716,487
3,716,575
3,716,576
3,716,707
3,716,727
3,716,764
3,716,783
3,716,829
3,716,830
3,716,840
3,716,855
3,716,860
3,716,866
49 : 3,715,816
3,715,819
3,715,822
3,715,992
3,716,115
3,716,167
3,716,344
3,716,604
50 : 3,716,270
3,716,706
51 : 3,715,810
3,715,869
3,715,880
3,715,914
3,715,915
3,716,027
3,716,028
3,716,172
3,716,233
3,716,328
3,716,375
3,716,511
3,716,749
3,716,841
53 : 3,716,008
3,716,042
3,716,702
54 : 3,715,969
3,716,039
55 : 3,715,765
3,715,845
3,716,055
3,716,102
3,716,143
3,716,256
3,716,288
3,716,351
3,716,389
3,716,393
3,716,720
3,716,771
3,716,772

DESIGN PATENTS

6 : 226,301
226,314
226,317
226,333
226,334
8 : 226,319
226,330
12 : 226,316
13 : 226,299
17 : 226,322
226,335
226,342
226,346
18 : 226,302
226,318
226,325
20 : 226,341
21 : 226,339
25 : 226,340
26 : 226,298
226,328
34 : 226,329
36 : 226,295
226,296
226,297
226,300
226,306
226,320
226,332
226,336
226,337
226,338
37 : 226,326
226,327
39 : 226,303
226,304
226,305
40 : 226,313
42 : 226,308
226,323
47 : 226,344
55 : 226,312
226,321
226,331
226,343

PLANT PATENTS

6 : 3,302
3,303
8 : 3,305
16 : 3,304

U. S. GOVERNMENT PRINTING OFFICE : O - 1973

OFFICIAL GAZETTE of the UNITED STATES PATENT OFFICE

February 20, 1973 Volume 907 Number 3

CONTENTS

Page

Patents and Trademark Notices
- Trademark Registration Treaty 581
- Effect of One-Half Day Holiday on January 19, 1973 605
- Effect of Closing Patent Office on January 25, 1973 605
- Errata 605
- Patent Suits 605

Patent Notices
- Disclaimers 607
- Dedication 607
- Certificates of Correction for the Week of February 20, 1973 607

Condition of Patent Applications 608

Reissue Patents Granted 609

Plant Patents Granted 610

Patents Granted
- General and Mechanical 611
- Chemical 756
- Electrical 807

Design Patents Granted 852

Index of Patentees . . . . . PI 1

Indices of Reissues, Plants, and Designs . . . . . PI 31

Classification of
- Patents (Including Reissues) . . . . . PI 33
- Designs and Plants . . . . . PI 35

Geographical Index of Residence of Inventors
- Patents (Including Reissues) . . . . . PI 36
- Designs and Plants . . . . . PI 37

The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

THE OFFICIAL GAZETTE (PATENTS SECTION), issued weekly, subscription $89.00 per annum, foreign mailing $22.25 additional; single copies $2.00 each.

THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly, subscription $17.00 per annum, foreign mailing $4.25 additional; single copies 40 cents each.

CIRCULARS OF GENERAL INFORMATION concerning PATENTS or TRADEMARKS, price 15 cents each.

PRINTED COPIES OF PATENTS are furnished by the Patent Office at 50 cents each; PLANT PATENTS in color, $1.00 each; copies of TRADEMARKS and DESIGN PATENTS at 20 cents each. Address orders to the Commissioner of Patents, Washington, D.C., 20231.

Printing authorized by Section 11(a)3 of Title 35, U.S. Code P.O.

U.S. DEPARTMENT OF COMMERCE
UNITED STATES PATENT OFFICE
TRADEMARK REGISTRATION TREATY

This is further to the notices published in Volumes 902 and 903 of the OFFICIAL GAZETTE *on September 19, 1972 and October 31, 1972, respectively.*

As a result of the recommendations of the Committee of Experts which met in Geneva, Switzerland from December 5–12 to review the draft Regulations of the Treaty, the World Intellectual Property Organization (WIPO) released on January 31, 1973, a revised draft of the Regulations (Document TRT/DC/2.Rev.) to supersede the draft of the Regulations appearing in document TRT/DC/2 as published in the OFFICIAL GAZETTE *on September 19, 1972. Also released by WIPO on January 31, 1973, were proposals for amending the draft Treaty (TRT/DC/1.Add.) as it appeared in document TRT/DC/1, also published in the* OFFICIAL GAZETTE *on September 19, 1972.*

It is to be noted that the Comments on the draft Treaty contained in document TRT/DC/1 have not been revised so that they neither refer to the proposals made in document TRT/DC/1.Add. nor to the revisions of the draft Regulations as contained in document TRT/DC/2.Rev.

These documents are published by the Patent Office at this time so that interested parties will have an opportunity to review them and offer their views and suggestions.

Final comments on the Conference drafts of the Treaty and the Regulations should be submitted to the Commissioner of Patents, Washington, D.C., 20231, by April 6, 1973, in order to be considered in preparation of the U.S. position at the Diplomatic Conference scheduled from May 17 to June 12, 1973, in Vienna, Austria.

ROBERT GOTTSCHALK,
Commissioner of Patents.

Jan. 26, 1973.

TRT/DC/1.Add.

ADDENDUM TO DOCUMENT TRT/DC/1

(prepared by the International Bureau)

1. This document contains proposals for amending the draft of the Trademark Registration Treaty as appearing in document TRT/DC/1. The proposals are based on the recommendations of the Committee of Experts on the International Registration of Marks which met at Geneva from December 5 to 12, 1972, and whose report was published in document TRT/III/6.

2. The proposals concern the following Articles of the draft contained in document TRT/DC/1: 7(1), 12(3)(a), (4)(a),(4)(b), 14(3),(4)(b),(6), 15(4), 16(3)(b), 17, 18(1),(9), 25(3), 29 *bis*.

Article 7

3. Add to paragraph (1) the following sentence:

"… The International Bureau shall issue to the owner of the international registration a certificate of international registration."

Article 12

4. Paragraph (3)(a) is to read as follows:

"The International Bureau shall, as provided in the Regulations, record any notification received under paragraph (2) and publish a corresponding notice."

5. In paragraph (4)(a), omit the following words:

"… notify the owner of the international registration, …"

6. In paragraph (4)(b), replace the words "and the International Bureau shall publish a corresponding notice" by the following text:

"… and the International Bureau shall record the notification received and publish a corresponding notice."

Article 14

7. In paragraph (3), substitute for the number "(2)" the following number:

"(4)"

8. Add to paragraph (4)(b) the following sentence:

"Any national Office may collect the fee prescribed by its national law in connection with the examination of the said evidence adduced before it."

9. Add as a new paragraph the following text:

"(6) Any change in the name of the owner of the international registration shall be treated as a change in the ownership of the international registration."

Article 15

10. In paragraph (4), substitute for the word "restitute" the following word:

"reinstate"

Article 16

11. In paragraph (3)(b), omit the following words:

"… the owner of the international registration and …"

Article 17

12. Replace Article 17 by the following text:

ARTICLE 17

Fees

"(1) [*Fees Belonging to the International Bureau*] (a) The International Bureau shall be entitled to fees in connection with the filing of each international application, request for recording of later designations, demand for renewal, and such other operations and services as are subject, according to this Treaty or the Regulations, to the payment of fees.

"(b) The Regulations fix the amounts of the fees referred to in subparagraph (a).

"(2) [*Fees Belonging to the Contracting States*] Each Contracting State shall be entitled to fees ("State fees") in connection with each designation and each renewal concerning it. The State fees shall be either "individual" or "standard," according to the choice of the Contracting State. The choice shall be exercised and applied as provided in the Regulations and shall apply to all designations and renewals concerning the Contracting State.

"(3) [*Individual State Fees*] (a) Subject to subparagraphs (b) to (f), the amounts of individual State fees applicable to any State shall be determined by such State.

"(b) The amounts of the individual State fees shall be communicated by the national Office of the Contracting State to the International Bureau in the currency and within the time limits specified in the Regulations. They shall remain applicable for the periods specified in the Regulations.

"(c) The amounts of the individual State fees may vary only according to the number of classes to which the goods and/or services listed in respect of that State belong under the International Classification **[and according to whether the mark is or is not a certification mark or a collective mark].

"(d) Any individual State fee shall belong to the designated State in respect of which it was paid and shall be transferred to its national Office as provided in the Regulations.

"(e) The amount of the individual State fee to which the Contracting State is entitled in connection with each designation concerning it ("individual State designation fee") shall not exceed [75% of] the total amount of any filing, class, examination, registration and publication fees which that State prescribes in connection with an application for registration in the national register of marks.

"(f) The amount of the individual State fee to which the Contracting State is entitled in connection with each renewal concerning it ("individual State renewal fee") shall not exceed the amount of the renewal fee which that State prescribes for the renewal of a registration in the national register of marks, provided that, if the latter amount relates to a period which is longer or shorter than ten years, the said limit shall be proportionately reduced or proportionately increased, as the case may be.

"(4) [*Standard State Fees*] (a) The amounts of the standard State designation fee and of the standard State renewal fee shall be fixed in the Regulations.

(b) The standard State fees shall belong to the States which have chosen standard State fees. The total amount of such fees collected by the International Bureau for any given calendar year shall be distributed and transferred in the course of the following year to the national Offices of the Contracting States to which the standard State fees apply in proportion to the number of designations and renewals concerning each of them, provided that the number resulting for each Office shall be first multiplied by a coefficient, as fixed in the Regulations, based on the extent of the examination which the national law provides.

"(5) [*Other Details Concerning Fees*] The Regulations give further details concerning fees and provide for the total or partial reimbursement of certain fees in certain circumstances."

Article 18

13. Paragraph (1) is to read as follows:

"[*Fees*] Subject to Article 14(4)(b), no national Office of any designated State shall, unless acting as an independent review authority, require the payment of any fee by the applicant or the owner of the international registration in connection with the obtaining and renewing of the effects, in the said State, of international applications, international registrations, and recordings concerning such applications and registrations."

14. Add a new paragraph (9) reading as follows:

"[*Certification of Documents Issued by the International Bureau*] Where any document issued by the International Bureau bears the seal of that Bureau and the signature of the Director General or a person acting on his behalf, no authority of any Contracting State shall require authentication, legalization or any other certification of such document, seal or signature, by any other person or authority."

Article 25

15. Paragraph (3) should read as follows:

"(a) Where there are several applicants, they shall appoint a common representative. In the absence of such appointment, the applicant first named in the international application shall be considered the duly appointed representative of all the applicants.

"(b) Where there are several owners of the international registration, they shall appoint a common representative. In the absence of such appointment, the natural person or legal entity first named among the said owners in the International Register of Marks shall be considered the duly appointed representative of all the owners of the international registration.

"(c) Subparagraph (b) shall not apply to the extent that the owners own the international registration in respect of different designated States, or in respect of different goods and/or services, or in respect of different States and different goods and/or services."

Article 29bis

16. Insert, between Articles 29 and 30, a new Article reading as follows:

"ARTICLE 29bis

Notification of Owner of International Registration

Any matter recorded by the International Bureau in respect of an international registration shall be the subject of a corresponding notification to the owner of the international registration. Details may be provided in the Regulations."

NOTE. 17. It is to be noted that the comments on the draft Treaty contained in document TRT/DC/1, dated July 30, 1972, have not been revised, so that they cover neither the proposals made in the present document nor the revisions of the draft Regulations as contained in document TRT/DC/2.Rev.

TRT/DC/2.Rev.

REVISED DRAFT REGULATIONS UNDER THE TRADEMARK REGISTRATION TREATY

(prepared by the International Bureau)

NOTE

The present document is a revised version of document TRT/DC/2, dated July 30, 1972. The revisions are based on the recommendations of the Committee of Experts on the International Registration of Marks which met at Geneva from December 5 to 12, 1972, and whose report was published in document TRT/III/6.

LIST OF RULES

Rule Concerning These Regulations

- Rule 1: Abbreviated Expressions
  - 1.1 "Treaty"
  - 1.2 "Chapter" and "Article"
  - [1.3 Associations]
  - 1.4 "Gazette"
  - 1.5 "Table of Fees"

Rules Concerning Chapter I

- Rule 2: Representation Before the International Bureau
  - 2.1 Number of Duly Appointed Representatives
  - 2.2 Form of Appointment
  - 2.3 Revocation or Renunciation of Appointment
  - 2.4 General Powers of Attorney
- Rule 3: The International Register of Marks
  - 3.1 Keeping of the International Register
- Rule 4: Applicant; Owner of the International Registration
  - 4.1 Several Applicants; Several Owners of the International Registration
  - 4.2 The Same Applicant for All Designated States
- Rule 5: Mandatory Contents of the International Application
  - 5.1 Indication that the International Application is Filed Under the Treaty
  - 5.2 Indications Concerning the Applicant
  - 5.3 Reproduction of the Mark; Color; Transliteration
  - 5.4 List of Goods and/or Services
  - 5.5 Identification of States
  - 5.6 Choice Between National and Regional Marks
  - **[5.7 Certification and Collective Marks]
  - *[5.8 Applications Filed Through the Intermediary of a National Office]
- Rule 6: Optional Contents of the International Application
  - 6.1 Naming of a Representative
  - 6.2 Claiming of Priority
  - 6.3 Declaration of Intent to Use the Mark
  - 6.4 Declaration of Actual Use
  - 6.5 Declarations Under Articles 20(2) and 21(2)
  - 6.6 Option Under Article 11(3)
  - 6.7 Trade or Business of the Applicant
  - 6.8 Translation of the Mark
- Rule 7: Languages
  - 7.1 Language of the International Application
  - 7.2 Language of the Request for Recording of Later Designations
  - 7.3 Language of Registrations, Recordings, Annotations and Communications
- Rule 8: Form of the International Application
  - 8.1 Printed Forms
  - 8.2 Copies; Signature
  - 8.3 No Additional Matter
- Rule 9: Fees Payable With the Filing of the International Application
  - 9.1 International Application Fee and State Designation Fees
- Rule 10: Mandatory Contents of the Request for Recording of Later Designations
  - 10.1 Indication that the Request is for Recording of Later Designations
  - 10.2 Indications Concerning the Applicant or the Owner of the International Registration
  - 10.3 Identification of the International Application or International Registration
  - 10.4 Identification of the Later Designated States
  - 10.5 Indication of the Choice Between National and Regional Marks
  - **[10.6 Certification and Collective Marks]
  - *[10.7 Requests Filed Through the Intermediary of a National Office]
- Rule 11: Optional Contents of the Request for Recording of Later Designations
  - 11.1 Claiming of Priority
  - 11.2 Declaration of Intent To Use
  - 11.3 Declaration of Actual Use
  - 11.4 Declarations Under Articles 20(2) and 21(2)
  - 11.5 List of Goods and/or Services
  - 11.6 Option Under Article 11(3)
- Rule 12: Form of the Request for Recording of Later Designations
  - 12.1 Printed Forms
  - 12.2 Copies; Signature
  - 12.3 No Additional Matter
- Rule 13: Fees Payable With the Request for Recording of Later Designations
  - 13.1 International Later Designation Fee and State Designation Fees
- Rule 14: Defects in the International Application
  - 14.1 Minimum Amount Under Article 7
  - 14.2 Notification, and Reimbursement of Certain Fees, Under Article 7(5)
  - *[14.3 Notification of the National Office]
- Rule 15: Defects in the Request for Recording of Later Designations
  - 15.1 Application of Rule 14

---

*Provisions exclusively concerning "indirect filing" are placed between brackets preceded by one asterisk.

**Provisions exclusively concerning certification and collective marks are placed between brackets preceded by two asterisks.

- Rule 16: Procedure Where Avoiding the Effects of Declining is Sought
  - 16.1 Recording and Publication Under Article 9(3)
  - 16.2 Information Available to National Offices
  - 16.3 Information Furnished by the National Office
- Rule 17: Publication of International Registrations and Recordings of Later Designations; Certificate of International Registration
  - 17.1 Contents of Publication of International Registrations
  - 17.2 Contents of Publication of Recordings of Later Designations
  - 17.3 Certificate of International Registration
- Rule 18: Notification of International Registrations and Recordings of Later Designations
  - 18.1 Form of Notification
  - 18.2 Time of Notification
- Rule 19: Refusals; Notices of Possible Refusal
  - 19.1 Notifying the International Bureau; Grounds
  - 19.2 Notifying the Owner of the International Registration; Publication
  - 19.3 Notification and Recording of Final Decisions of Refusal; Cancellation of the Designation, and Publication of the Cancellation
  - 19.4 Notification and Publication Where Final Decision Results in Acceptance of the Effect Provided for in Article 11(2)
  - 19.5 Belated Notifications
- Rule 20: Final Decisions of Cancellation
  - 20.1 Notification and Recording of Final Decisions of Cancellation; Cancellation of the Designation, and Publication of the Cancellation
- Rule 21: Changes in Ownership
  - 21.1 Request for Recording of Change in Ownership
  - 21.2 Publication Where the Change in Ownership is Total
  - 21.3 Publication Where the Change in Ownership is Partial
  - 21.4 Notification of Recording of Changes
  - 21.5 Notification of Declining of the Recording
  - 21.6 Denial
- Rule 22: Recording of Limitations of the List of Goods and/or Services
  - 22.1 Request for Recording of Limitation of the List
  - 22.2 Concept of Limitation
  - 22.3 Recording, Publication, and Notification, of Limitation of the List
  - 22.4 Declining the Recording of Limitation of the List
  - 22.5 Non-Admission by Designated State
- Rule 23: Renewal
  - 23.1 Reminder by the International Bureau
  - 23.2 Demand for Renewal
  - 23.3 International Renewal Fee and State Renewal Fees
  - 23.4 Imperfect Demands
  - 23.5 Recording, Publication, and Notification
  - 23.6 Declining the Demand
  - 23.7 Reimbursement of Certain Fees
  - 23.8 Recording of Lack of Demand
  - 23.9 Publication of Lists of International Registration Not Renewed
- Rule 24: Declarations of Actual Use
  - 24.1 Information on Requirements Concerning Routine Declarations of Actual Use
  - 24.2 National Forms
  - 24.3 International Form
- Rule 25: Declarations Concerning Earlier National or Madrid Registrations
  - 25.1 Separately Filed Declarations
  - 25.2 Certification of National Registrations
  - 25.3 Defects
  - 25.4 Publication; Notification
- Rule 26: Transmittal of Documents to the International Bureau
  - 26.1 Place and Mode of Transmittal
  - 26.2 Date of Receipt of Documents
- Rule 26^{bis}: Signature
  - 26^{bis}.1 Legal Entity
  - 26^{bis}.2 Exemption from Certification
- Rule 27: Calendar; Computation of Time Limits
  - 27.1 Calendar
  - 27.2 Periods Expressed in Years, Months, or Days
  - 27.3 Local Dates
  - 27.4 Expiration on a Non-Working Day
- Rule 28: Payment of Fees
  - 28.1 Payment to the International Bureau
  - 28.2 Applicable Fee Schedule
  - 28.3 Currency
  - 28.4 Deposit Accounts
  - 28.5 Indication of the Mode of Payment
  - 28.6 Effective Date of Payment
- Rule 29: Withdrawals and Renunciations
  - 29.1 Withdrawal of the International Application or Request for Recording of Later Designation
  - 29.2 Renunciation of the International Registration or of Certain Designations
  - 29.3 Procedure
- Rule 30: Choice Between Individual and Standard State Fees
  - 30.1 Initial Choice
  - 30.2 Change in Choice
- Rule 31: Change in the Amounts of Individual State Fees
  - 31.1 Communication; Effective Date
- Rule 32: State Fees
  - 32.1 Individual State Fees
  - 32.2 Standard State Fees
- Rule 33: Fees Belonging to the International Bureau
  - 33.1 Fees Belonging to the International Bureau
- Rule 34: Recordings effected by National Offices
  - 34.1 Notification of Certain Recordings Effected by National Offices
  - 34.2 Annotation and Publication
- Rule 34^{bis}: Changes in Addresses
  - 34^{bis}.1 Recording and Publication
- Rule 34^{ter}: Recording and Publication Concerning Representatives
  - 34^{ter}.1 Recording
  - 34^{ter}.2 Publication
- Rule 35: The Gazette
  - 35.1 Contents and Title of the Gazette
  - 35.2 Frequency of Issue of the Gazette
  - 35.3 Languages of the Gazette
  - 35.4 Sale of the Gazette
  - 35.5 Copies of the Gazette for National Offices
  - 35.6 Errors in Publications
  - 35.7 Further Details

- Rule 36: Copies and Other Information Available to the Public
  - 36.1 Copies and Information Concerning International Applications and Registrations
- Rule 37: Fees in the Case of Regional Marks
  - 37.1 Reference to Other Rules
- Rule 38: Procedure Where Correction of Errors of the International Bureau is Sought
  - 38.1 Time Limit Under Article 29
  - 38.2 Application of Rule 16

Rules Concerning Chapter II

- Rule 39: Expenses of Delegations
  - 39.1 Expenses Borne by Governments
- Rule 40: Absence of Quorum in the Assembly
  - 40.1 Voting by Correspondence
- Rule 41: Administrative Instructions
  - 41.1 Establishment of Administrative Instructions; Matters Governed by Them
  - 41.2 Control by the Assembly
  - 41.3 Publication and Effective Date
  - 41.4 Conflict with the Treaty and the Regulations
- Annex: Table of Fees

DRAFT REGULATIONS

RULE 1

Abbreviated Expressions

1.1 *"Treaty"*

In these Regulations, the word "Treaty" means the Trademark Registration Treaty.

1.2 *"Chapter" and "Article"*

In these Regulations, the words "Chapter" and "Article" refer to the specified Chapter or Article of the Treaty.

[1.3 *Associations*

References to legal entities in these Regulations, where such references concern them in their capacity of applicants or owners of international registrations, shall be construed as references also to associations referred to in Article 4(5).]

1.4 *"Gazette"*

In these Regulations, "Gazette" means the official Gazette of the International Bureau referred to in Article 2(ix).

1.5 *"Table of Fees"*

In these Regulations, "Table of Fees" means the table of fees annexed hereto.

RULES CONCERNING CHAPTER I

RULE 2

Representation Before the International Bureau

2.1 *Number of Duly Appointed Representatives*

(a) The applicant and the owner of the international registration may appoint only one representative.

(b) Where several natural persons or legal entities have been indicated as representatives by the applicant or the owner of the international registration, the natural person or legal entity first mentioned in the document in which they are indicated shall be regarded as the only duly appointed representative.

(c) Where the representative is a partnership or firm composed of attorneys or patent or trademark agents, it shall be regarded as one representative.

(d) Where the representative is a member of a partnership or firm composed of attorneys or patent or trademark agents, he may appoint as his agent any other member of the same partnership or firm [unless expressly excluded by the terms of the appointment].

(e) Any representative may appoint as his agent any of his employees [unless expressly excluded by the terms of the appointment].

2.2 *Form of Appointment*

(a) A representative shall be regarded as a "duly appointed representative" if his appointment complies with the prescriptions of paragraphs (b) to (e).

(b) The appointment of any representative shall require:

(i) that his name appear as that of a representative in the international application and that such application bear the signature of the applicant, or

(ii) that a separate power of attorney (i.e., a document appointing the representative), signed by the applicant or the owner of the international registration, be filed with the International Bureau.

(c) Where there are several applicants or owners of the international registration, the document containing or constituting the appointment of their common representative shall be signed by all of them.

(d) Any document containing or constituting the appointment of a representative shall indicate his name and his address. Where the representative is a natural person, his name shall be indicated by his family name and given name(s), the family name being indicated before the given name(s). Where the representative is a legal entity or a partnership or firm of attorneys or patent or trademark agents, "name" shall mean the complete name of the legal entity or partnership or firm. The address of the representative shall be indicated in the same manner as that provided for in respect of the applicant in Rule 5.2(c).

(e) The document containing or constituting the appointment shall contain no words which, contrary to Article 25(2), would limit the powers of the representative to certain matters or exclude certain matters from the powers of the representative.

(f) Where the appointment does not comply with the requirements referred to in paragraphs (b) to (e), it shall be treated by the International Bureau as if it had not been made, and the applicant or the owner of the international registration as well as the natural person, the legal entity, the partnership or firm which was indicated as the representative in the purported appointment shall be informed of this fact by the International Bureau.

(g) The Administrative Instructions shall provide recommended wording for the appointment.

(h) Where, under Rule 2.1(d) or (e), a representative appoints an agent, paragraphs (b)(ii) and (d) to (g) shall apply, *mutatis mutandis*, to the appointment of the agent by the representative.

2.3 *Revocation or Renunciation of Appointment*

(a) The appointment of any representative may be revoked at any time by the natural person who or legal entity which has appointed that representative. The revocation shall be effective even if only one of the natural persons who or legal entities which have appointed the representative revokes the appointment.

(b) Revocation shall require a written document signed by the natural person or the legal entity referred to in the preceding paragraph.

(c) The appointment of a representative as provided in Rule 2.2 shall be regarded as the revocation of any earlier appointment of any other representative. The appointment shall preferably indicate the name of the other earlier appointed representative.

(d) Any representative may renounce his appointment through a notification signed by him and addressed to the International Bureau.

(e) Paragraphs (a) to (d) shall apply, *mutatis mutandis,* to the revocation and the renunciation of the appointment of any agent referred to in Rule 2.1(d) and (e).

2.4 *General Powers of Attorney*

The appointment of a representative in a separate power of attorney (i.e., a document appointing the representative) may be general in the sense that it relates to more than one international application and more than one international registration in respect of the same natural person or legal entity. The identification of such applications and registrations, as well as other details in respect of such general power of attorney and of its revocation or renunciation, shall be provided in the Administrative Instructions. The Administrative Instructions shall also fix the amount of the fee payable in connection with the filing of general powers of attorney.

Rule 3

The International Register of Marks

3.1 *Keeping of the Interational Register*

(a) The International Register of Marks shall contain, in respect of each mark registered therein:

(i) all the indications that must or may be furnished under the Treaty or these Regulations, and that have in fact been furnished, to the International Bureau, and, where relevant, the date on which such indications were received by that Bureau,
(ii) the amount of all fees received and the date or dates on which they were received by the International Bureau,
(iii) the number and date of the international registration and the numbers, if any, and the dates of all recordings relating to such registration.

(b) The Administrative Instructions shall regulate the establishment of the International Register of Marks, and, subject to the Treaty and these Regulations, shall specify the form in which it shall be kept and the procedure which the International Bureau shall follow for inscribing recordings therein and for preserving it from loss or other damage.

Rule 4

Applicant; Owner of the International Registration

4.1 *Several Applicants; Several Owners of the International Registration*

(a) If there are several applicants, the right to file an international application shall be recognized only if all of them are residents or nationals of Contracting States.

(b) If there are several owners of an international registration, the right to own such a registration shall be recognized only if all of them are residents or nationals of Contracting States.

4.2 *The Same Applicant for All Designated States*

(a) The applicant shall be the same for the purposes of all the designated States.

(b) Where the international application, as filed, does not indicate the same applicant for the purposes of all the designated States, that application shall be treated as if only the State first mentioned therein, and any other State for the purposes of which the same applicant is indicated as for the said first-mentioned State, had been designated.

Rule 5

Mandatory Contents of the International Application

5.1 *Indication that the International Application is Filed Under the Treaty*

The indication referred to in Article 5(1)(a)(i) shall be worded as follows: "The undersigned requests that the mark herein reproduced be registered in the International Register of Marks established under the Trademark Registration Treaty"; or it shall consist of a statement to the same effect.

5.2 *Indications Concerning the Applicant*

(a) The applicant's identity shall be indicated by his name. If the applicant is a natural person, his name shall be indicated by his family name and given name(s), the family name being indicated before the given name(s). If the applicant is a legal entity, its name shall be indicated by the full, official designation of the said entity.

(b) The applicant's residence and nationality shall be indicated by the name(s) of the State(s) of which he is a resident and of which he is a national.

(c) The applicant's address shall be indicated in such a way as to satisfy the customary requirements for prompt postal delivery at the indicated address and shall, in any case, consist of all the relevant administrative units up to, and including, the house number, if any. Where the national law of the designated State does not require the indication of the house number, failure to indicate such number shall have no effect in that State. Any telegraphic and teletype address and telephone number that the applicant may have should preferably be indicated. For each applicant, only one address shall be indicated; if several addresses are indicated, only the one first mentioned in the international application shall be considered.

5.3 *Reproduction of the Mark; Color; Transliteration*

(a) Where the mark consists only of letters of the Latin alphabet, Arabic or Roman numerals, and punctuation signs usual in connection with the Latin alphabet, and the applicant does not wish to claim any special graphic feature, the mark may be reproduced, for example by typing the letters, numerals and signs, on the sheet itself on which the international application appears. The use of small letters and capital letters shall be permitted, and shall be followed in the publications of the International Bureau.

(b) In cases other than that referred to above, the mark shall be reproduced on a sheet of paper of A4 size (29.7 cm x 21 cm), separate from the sheet on which the text of the international application appears, and shall be attached to the latter sheet. The reproduction of the mark itself on the separate sheet shall not occupy a space larger than 10 centimeters horizontally and 10 centimeters vertically. The reproduction of the mark on the separate sheet shall be of a quality admitting of direct reproduction by photography and printing processes. The separate sheet shall indicate the name and address of the applicant.

(c) Where color is claimed, the international application shall contain a statement to that effect and shall be accompanied by

(i) either a reproduction of the mark in color in one copy satisfying the requirements set forth in paragraph (b),
(ii) or a reproduction of the mark in color in the number of copies fixed in the Administrative Instructions and a reproduction of the mark in black and white in one copy containing a description of the colors in words and signs as specified in the Administrative Instructions, all copies satisfying the requirements set forth in paragraph (b).

(d) Where the mark or a certain part of it is three-dimensional, the international application and the separate sheet containing the reproduction of the three-dimensional feature shall contain an indication to that effect.

(e) Where the mark is intended to be used, or also to be used, as a sound mark, the international application and any separate sheet containing the reproduction of the mark shall contain an indication to that effect.

(f) Where the mark consists of or contains matter in script other than Latin script or numbers expressed in forms other than Arabic or Roman, the international application shall also contain a transliteration of such matter in Latin script and Arabic numerals; the transliteration shall follow the English pronunciation if the international application is in English, and the French pronunciation if it is in French. If the International Bureau finds that such transliteration is incorrect or is missing and it is equipped to effect itself the said transliteration, it shall do so. In the latter case, however, it shall notify the applicant of its transliteration and invite him to make comments on it within one month from the date of the notification, and shall not proceed with the international registration before the expiration of the said period of one month.

5.4 *List of Goods and/or Services*

(a) Each of the groups of terms pertaining to the same class of the International Classification shall be preceded by an indication of the number of the class, and the various groups shall follow in the numerical order of the corresponding classes.

(b) If, in the list of goods and/or services contained in the international application as filed, the terms are not or not properly grouped as provided in Article 5(1)(a)(iv), the International Bureau shall [, after having notified the applicant of its intention to do so and allowing him one month from the date of the notification to react to such notification,] classify each term as required and constitute the required groups. If any of the terms does not permit classification in one class only of the International Classification, it shall be classified in each of the applicable classes.

(c) If the International Bureau finds that any term is incomprehensible, it shall notify the applicant of its finding and allow him one month from the date of the notification to react to such notification. The applicant may react by submitting arguments to the effect that the term is comprehensible or by submitting a request that the incomprehensible term be deleted or—if, in respect of the incomprehensible term, no class has been indicated in the international application—that it be classified in a given class or in given classes. If, on the basis of the said arguments or other considerations, the International Bureau finds that the term is comprehensible, it shall treat it according to its comprehended meaning. Otherwise it shall delete it ex officio, unless the international application or the request to classify referred to above indicates, in respect of the incomprehensible term, one or more given classes. In this last case, the International Bureau shall leave the incomprehensible term in the said class or classes.

(d) The list of goods and/or services shall be the same for the purposes of all States designated in the international application as filed or as limited under Article 7(4)(b). Where the international application as filed or as limited under Article 7(4)(b) indicates different goods and/or services in respect of different designated States, that application shall be treated as if only the State first mentioned therein, and any other States for the purposes of which the same list of goods and/or services is indicated as for the said first-mentioned State, had been designated.

5.5 *Identification of States*

(a) Identification of any State shall consist in writing its name in the international application in a manner sufficiently clear for the purposes of identification.

(b) The identification of any designated State which is not a Contracting State shall be treated as if such State had not been identified.

5.6 *Choice Between National and Regional Marks*

(a) The availability of any choice referred to in Article 5(1)(a)(vi) shall be notified by the interested Contracting State to the International Bureau, and that Bureau shall publish a corresponding announcement.

(b) The choice referred to in Article 5(1)(a)(vi) shall be indicated by the words "national mark desired" or "regional mark desired," respectively, or by other words to that effect, appearing next to the name of the designated State to which the choice applies.

**[5.7 *Certification and Collective Marks*

The indication referred to in Article 5(1)(a)(vii) shall consist of the words "certification mark desired" or "collective mark desired," respectively, or other words to that effect, appearing next to the name of the designated State to which the indication applies.]

*[5.8 *Applications Filed Through the Intermediary of a National Office*

(a) The indication referred to in Article 5(3)(b) shall be worded as follows: "The . . . ① certifies that the present international application was filed with it on . . . ②." ① Indicate the name of the national Office. ② Indicate the date.

(b) The national Office of any Contracting State whose national law provides that international applications of residents of that State may be filed through the intermediary of the national Office of the said State shall, at least once a week, send to the International Bureau a note containing the following indications concerning each of the international applications filed with it since the sending of the last such note:

(i) the name of the applicant,
(ii) a reproduction of the mark,
(iii) the date on which the international application was filed with that Office,
(iv) the date on which the international application was mailed to the International Bureau.

(c) The notes referred to in paragraph (b) shall be numbered consecutively. Where since the sending of the last note no international applications have been received by the national Office, the note shall state that fact.

(d) If the International Bureau does not receive any of the international applications listed in any note within 15 days from the date on which it received such note, it shall inform the national Office accordingly.]

Rule 6

Optional Contents of the International Application

6.1 *Naming of a Representative*

The international application may indicate a representative.

6.2 *Claiming of Priority*

(a) The declaration referred to in Article 5(1)(b) shall consist of a statement to the effect that the priority of an earlier application is claimed and shall indicate:

(i) where the earlier application is an application filed for the registration of a mark in the register of marks of a given country, the country in which it was filed; where the earlier application is an international application filed under the Treaty, a State designated therein; where the earlier application is an application for a

regional mark, the authority with which it was filed and a State for which it was filed;
(ii) the date on which the earlier application was filed;
(iii) the number allotted to the earlier application.

(b) If the declaration does not indicate the country or State, and the date, referred to in paragraph (a)(i) and (ii), the Intenational Bureau shall treat the declaration as if it had not been made.

(c) If the application number referred to in paragraph (a)(iii) is not indicated in the decalaration but is furnished by the applicant or the owner of the international registration to the International Bureau prior to the expiration of the 10th month from the filing date of the said application, it shall be considered to have been included in the declaration and shall be published by the International Bureau.

[(d) If the declaration referred to in Article 5(1)(b) claims the priority of an earlier application in respect of fewer than all the goods and/or services listed in that application, the declaration shall specify the goods and/or services to which the declaration relates.]

[(e) If the declaration referred to in Article 5(1)(b) claims the priority of more than one earlier application, the provisions of paragraphs (a) to (c) shall apply to each of them and the declaration shall specify which of the earlier applications relate to which of the goods and/or services listed in the international application.]

6.3 *Declaration of Intent To Use the Mark*

(a) Any declaration made under Article 18(4)(a) shall consist of the following statement: "The undersigned applicant declares that (he) (it) intends to use the mark which is the subject of this international application himself (itself) and/or by and through persons whose use inures to his (its) benefit in commerce with and/or on the territory of . . . ① on and/or in connection with the goods and/or services listed in this international application." ① If the declaration relates to all the States designated in the international application, insert "each of the States designated in this application"; otherwise, indicate those of the States designated in respect of which the declaration is made.

(b) It shall depend on the national law of each designated State whether any declaration to the same effect as but worded differently than in paragraph (a) shall produce the effect provided for in Article 18(4)(a) in that State.

6.4 *Declaration of Actual Use*

In respect of any designated State, the following statement, signed by the applicant, may be made and attached to the international application:

> "The undersigned applicant declares that the following mark . . . ① which is the subject of the international application to which this declaration is attached is now in use by and through . . . ② in commerce with and/or on the territory of . . . ③ on or in connection with the following goods and/or services listed in respect of such State . . . ④; that such use commenced on . . . ⑤; and that the mode and manner in which the mark is used is:
>
> ☐ on labels or tags affixed to and/or containers for the goods, as evidenced by the attached specimen(s) or facsimile(s) ⑥;
> ☐ on displays which are associated with the goods, as evidenced by the attached specimen(s) or facsimile(s) ⑥;
> ☐ in the case of services, in advertising of such services, as evidenced by the attached specimen(s) or facsimile(s) ⑥;
> ☐ other [recite sufficient facts in addition to, or in lieu of, checking one or more of the above boxes as to sales or advertising, or both, to show that the mark is in current use]."
>
> ① Reproduce the mark. ② Insert "the undersigned applicant" and/or, if applicable, the name and address of the person and/or persons whose use of the mark inures to the benefit of the applicant in the State. ③ Insert name of State. ④ Insert "all" or indicate the particular goods and/or services on or in connection with which the mark is used. ⑤ Insert the date of commencement of the continuing use of the mark, including, where different dates are applicable to different goods and/or services, the particular goods and/or services to which each such date relates. ⑥ The inclusion of specimens or facsimiles may be dispensed with where the declaration is made in respect of a State whose national law does not require that specimens or facsimiles be attached to routine declarations of actual use.

6.5 *Declarations Under Articles 20(2) and 21(2)*

(a) Any declaration under Article 20(2), where included in the international application, shall:

(i) specify the designated State or States in respect of which it is made,
(ii) contain the allegation that the applicant owns a national registration or national registrations of the same mark in the said State or States,
(iii) indicate, in respect of each such national registration its number.

(b) Any declaration under Article 21(2), where included in the international application, shall:

(i) specify the designated State or States in respect of which it is made,
(ii) contain the allegation that the applicant owns a Madrid registration of the same mark in respect of the said State or States,
(iii) indicate the relevant registration number under the Madrid Agreement.

6.6 *Option Under Article 11(3)*

The indication referred to in Article 11(3) shall be effected by identifying the appropriate national register (for example, "Supplemental Register" or "Part B Register").

6.7 *Trade or Business of the Applicant*

The applicant may indicate in the international application the trade or business in which he is engaged.

6.8 *Translation of the Mark*

If the mark consists of or contains one or more words which can be translated into the language of the international application, that application may contain such translation.

RULE 7

Languages

7.1 *Language of the International Application*

The international application shall be in the English or in the French language.

7.2 *Language of the Request for Recording of Later Designations*

The request for the recording of any later designation shall be in the same language as that in which the international application was filed.

7.3 *Language of Registrations, Recordings, Annotations and Communications*

(a) Registrations, recordings and annotations by the International Bureau shall be in the same language as that in which the international application was filed.

(b) Any notification or other communication addressed by the International Bureau to the applicant or the owner of the international registration and any request, demand, declaration or other communication addressed by the applicant or the owner of the international registration to the International Bureau shall be in the same language as that in which the international application was filed.

(c) Notifications by the national Offices to the International Bureau, and letters or other written communications from the national Offices to the International Bureau, shall be in the English or in the French language, it being understood that copies of papers filed by a third party in the case of an opposition proceeding attached to any notice of possible refusal, any copy referred to in Rule 19.3(a)(iii) [and the documents referred to in Rule 21.1(f), last sentence] shall be in the language in which such papers, copy [and documents] were filed with the national Office.

(d) Letters from the International Bureau to any national Office shall be in English or French according to the wish of the national Office; any matter in such letters quoted from the International Register shall be in the language in which such matter appears in that Register.

(e) Where the International Bureau is under the obligation to forward to the applicant or the owner of the international registration any of the communications referred to in paragraph (c), it shall forward them in the language in which it received them.

RULE 8

Form of the International Application

8.1 *Printed Forms*

(a) The international application shall be made on a printed form furnished free of charge, on request, by the International Bureau to prospective applicants, attorneys, patent or trademark agents, and the national Offices.

(b) The form shall be filled in preferably by typewriter and shall be easily legible.

8.2 *Copies; Signature*

(a) Subject to Rule 5.3(c)(ii), the international application, including the reproduction of the mark and any attachments, shall be filed in one copy.

(b) The international application shall be signed by the applicant.

8.3 *No Additional Matter*

(a) The international application shall not contain any matter, and shall not be accompanied by any document, other than those prescribed or permitted by the Treaty or these Regulations.

(b) If the international application contains matter other than that prescribed or permitted, the International Bureau shall delete it ex officio; and if the international application is accompanied by any document other than those prescribed or permitted, the International Bureau shall treat such document as if it had not been transmitted to it and shall return the said document to the applicant.

RULE 9

Fees Payable With the Filing of the International Application

9.1 *International Application Fee and State Designation Fees*

(a) The fees payable with the international application shall be:

(i) an "international application fee," and, where Rule 5(3)(c)(i) applies, a color reproduction fee,
(ii) in respect of each designated State, the individual State designation fee or the standard State designation fee, as the case may be.

(b) The amounts of the international application fee, the color reproduction fee and the standard State designation fee are indicated in the Table of Fees.

(c) The amounts of the individual State designation fees concerning the various Contracting States shall be published by the International Bureau each year in the month of August. The amounts so published shall be applicable as the individual State designation fees from January 1 to December 31 of the year following the year in which they are published.

RULE 10

Mandatory Contents of the Request for Recording of Later Designations

10.1 *Indication that the Request is for Recording of Later Designations*

The indication referred to in Article 6(2)(a)(i) shall be worded as follows: "The undersigned applicant/owner of the international registration identified herein requests the recording in the International Register of Marks of the following later designations made under the Trademark Registration Treaty"; or it shall consist of a statement to the same effect.

10.2 *Indications Concerning the Applicant or the Owner of the International Registration*

The provisions of Rule 5.2 shall apply, *mutatis mutandis*, in the case of Article 6(2)(a)(ii).

10.3 *Identification of the International Application or International Registration*

(a) The international application shall be identified by a copy of the same and *[, where it was filed direct with the International Bureau,] the date on which it was filed with or mailed to the International Bureau *[or, where it was filed through the intermediary of a national Office, the name of that Office and the date on which it was received by or mailed to the said Office].

(b) The international registration shall be identified by its international registration number and date.

10.4 *Identification of the Later Designated States*

The provisions of Rule 5.5 shall also apply, *mutatis mutandis*, in the case of Article 6(2)(a)(iv).

10.5 *Indication of the Choice Between National and Regional Marks*

The choice referred to in Article 6(2)(a)(v) shall be indicated by the words "national mark desired" or "regional mark desired," respectively, or by other words to that effect, appearing next to the name of the designated State to which the choice applies.

**[10.6 *Certification and Collective Marks*

The indication referred to in Article 6(2)(a)(vi) shall consist of the words "certification mark desired" or "collective mark desired," respectively, or other words to that effect, appearing next to the name of the designated state to which the indication applies.]

*[10.7 *Requests Filed Through the Intermediary of a National Office*

(a) The indication referred to in Article 6(3)(b) shall be worded as follows: "The . . . ① certifies that the present request was filed with it on . . . ②." ① Indicate the name of the national Office. ② Indicate the date.

(b) The national Office of any Contracting State whose national law provides that requests for the recording of later designations by residents of that State may be filed through the intermediary of the national Office of the said State shall, at least once a week, send to the International Bureau a note containing the following indications concerning each of the requests filed with it since the sending of the last such note:

(i) the name of the applicant or the owner of the international application,

(ii) the international registration number and date to which the request refers or, where such number and date are not available, the reproduction of the mark, together with, where the international application was filed through the intermediary of the national Office, the date on which it was so received by such Office and the date on which it was mailed to the International Bureau or, where the international application was filed direct with the International Bureau, the date on which it was so filed or the date on which it was mailed to the International Bureau,

(iii) the date on which the request was filed with that Office,

(iv) the date on which the request was mailed to the International Bureau.

(c) The notes referred to in paragraph (b) shall be numbered consecutively. Where since the sending of the last note no requests have been filed with the national Office, the note shall state that fact.

(d) If the International Bureau does not receive any of the requests listed in any note within 15 days from the date on which it received such note, it shall inform the national Office accordingly.]

Rule 11

Optional Contents of the Request for Recording of Later Designations

11.1 *Claiming of Priority*

Rule 6.2 shall apply also to the declaration referred to in Article 6(2)(b).

11.2 *Declaration of Intent to Use*

(a) Any declaration made under Article 18(4)(a) shall consist of the following statement: "The undersigned applicant/owner of the international registration declares that he (it) intends to use the mark which is the subject of the international application/international registration to which this request relates himself (itself) and/or by and through persons whose use inures to his (its) benefit in commerce with and/or on the territory of . . . ① on and/or in connection with the goods and/or services listed in this request." ① If the declaration relates to all the States designated in the request, insert "each of the States designated in this request"; otherwise, indicate those of the States designated in the request in respect of which the declaration is made.

(b) It shall depend on the national law of each designated State whether any declaration to the same effect as but worded differently than in paragraph (a) shall produce the effect provided for in Article 18(4)(a) in that State.

11.3 *Declaration of Actual Use*

In respect of any State designated in the request for recording of later designations, a statement, signed by the applicant or the owner of the international registration and whose form shall be the same as that appearing in Rule 6.4 or Rule 24.3, as the case may be, may be made and attached to the request.

11.4 *Declarations Under Articles 20(2) and 21(2)*

The provisions of Rule 6.5 shall apply, *mutatis mutandis*, to any declaration under Articles 20(2) or 21(2), where such declaration is included in the request for the recording of later designations.

11.5 *List of Goods and/or Services*

The concept of limitation referred to in Article 6(2)(b), second sentence, is defined in Rule 22.2.

11.6 *Option Under Article 11(3)*

The indication referred to in Article 11(3) shall be effected by identifying the appropriate national register (for example, "Supplemental Register" or "Part B Register").

Rule 12

Form of the Request for Recording of Later Designations

12.1 *Printed Forms*

(a) The request for recording of later designations shall be made on a printed form furnished free of charge, on request, by the International Bureau to applicants, owners of international registrations, attorneys, patent or trademark agents, and the national Offices.

(b) The form shall be filled in preferably by typewriter and shall be easily legible.

12.2 *Copies; Signature*

(a) The request for recording of later designations and any attachments thereto shall be filed in one copy.

(b) The request shall be signed by the applicant or the owner of the international registration.

12.3 *No Additional Matter*

Rule 8.3 shall also apply to requests for recording later designations.

Rule 13

Fees Payable With the Request for Recording of Later Designations

13.1 *International Later Designation Fee and State Designation Fees*

(a) The fees payable with the request for the recording of the later designation of any Contracting State shall be the following:

(i) an "international later designation fee," and, where Rule 5(3)(c)(i) applies, a color reproduction fee,

(ii) in respect of each later designated State indicated in the request, the individual State designation fee or the standard State designation fee, as the case may be.

(b) The amounts of the international later designation fee, the standard State designation fee and the color reproduction fee are indicated in the Table of Fees.[1]

Rule 14

Defects in the International Application

14.1 *Minimum Amount Under Article 7*

The minimum amount referred to in Article 7(2)(a)(ix) and (3)(a)(i) shall be an amount equivalent to the amount of the international application fee referred to in Rule 9.1(a)(i).

14.2 *Notification, and Reimbursement of Certain Fees, Under Article 7(5)*

Where the International Bureau declines the international application, it shall notify the applicant accordingly and shall state the grounds for declining. It shall reimburse to the applicant all fees received from him except an amount equivalent to the international application fee referred to in Rule 9.1(a)(i).

*[14.3 *Notification of the National Office*

Where the international application is treated as provided for in Article 7(6), the International Bureau shall inform accordingly the national Office through the intermediary of which the application was filed.]

---

[1] As to the amounts of the individual State designation fees, see Rule 9.1(c).

Rule 15

Defects in the Request for Recording of Later Designations

15.1 *Application of Rule 14*

The provisions of Rule 14 shall apply, *mutatis mutandis*, in respect of Article 8, provided that the amount referred to in Rules 14.1 and 14.2 shall be an amount equivalent to the amount of the international later designation fee referred to in Rule 13.1(a)(i).

Rule 16

Procedure Where Avoiding the Effects of Declining is Sought

16.1 *Recording and Publication Under Article 9(3)*

(a) The fact of having received a copy of a petition under Article 9(1)(i) shall, where the petition relates to a mark which is already registered in the International Register of Marks, be recorded by recording the subject of the petition, the name of the national Office to which it appears to be addressed, and the date on which the said copy was received.

(b) The publication under Article 9(3) shall contain the international registration number of the mark, the name of the State to whose national Office the petition appears to have been addressed, and the date on which the copy of the petition was received by the International Bureau.

16.2 *Information Available to National Offices*

On the request of the applicant or owner of the international registration, or of the interested national Office, the International Bureau shall send to that Office a copy of the file of the declined international application or declined request for recording later designations, together with a memorandum setting out the grounds for and the various steps leading to the declining of the said application or request.

16.3 *Information Furnished by the National Office*

Any request by a national Office referred to in Article 9(2)(i) shall indicate the grounds on which it is based.

Rule 17

Publication of International Registrations and Recordings of Later Designations; Certificate of International Registration

17.1 *Contents of Publication of International Registrations*

(a) The publication of any international registration shall contain:

(i) the name and address of the owner of the international registration, together with any indication of his trade or business and, if he bases his right to file international applications on his residence in, or his nationality of, a State other than that in which he has his address, the name of the State of his residence or nationality, as the case may be,

(ii) the reproduction of the mark, together with any indication under Rule 5.3(d) or (e) and any transliteration and translation; where color is claimed, the reproduction shall be in color if Rule 5.3 (c)(i) applies, and it shall be in black and white and shall be accompanied by a description of the colors in words and signs if Rule 5.3(c)(ii) applies,

(iii) the list of goods and/or services,

(iv) the names of the designated States and, where applicable, after the name of each such State, an indication concerning the choice referred to in Rule 5.6 **[and the indication referred to in Rule 5.7],

(v) the international registration date,

(vi) the international registration number,

(vii) where the priority of one or more earlier applications is claimed, the date of filing and the number (if available) of such applications, the name of the country or countries in which or for which they were filed, and, where applicable, an indication that the application was filed under this Treaty or, where it was for a regional mark, an indication of the authority with which it was filed,

(viii) any indication under Article 11(3),

(ix) any declaration under Articles 20(2) and 21(2),

(x) the particulars concerning the representative, as provided in Rule 34*ter*.2(*a*).

(b) Where, in respect of any designated State, the international registration is effected pursuant to Article 9(2)(i), this fact shall be indicated in the publication.

(c) The Administrative Instructions shall provide for the composition and allocation of international registration numbers.

17.2 *Contents of Publication of Recordings of Later Designations*

(a) The publication of any recording of a later designation shall contain:

(i) *mutatis mutandis*, the same elements as those referred to in Rule 17.1(a),

(ii) the international later designation number,

(iii) the date of the recording of the later designation.

(b) Where the recording of any later designation is effected pursuant to Article 9(2)(i), this fact shall be indicated in the publication.

(c) The Administrative Instructions shall provide for the composition and allocation of international later designation numbers.

(d) Where the recording of any later designation was effected sufficiently prior to the date of publication of the international registration to be practical to do so, the publication of the recording of the later designation shall be consolidated with the publication of the international registration.

17.3 *Certificate of International Registration*

The certificate of international registration shall be issued in the name of the International Bureau and shall be signed by the Director General or an officer of the International Bureau authorized by the Director General. It shall consist of a facsimile of the publication of the international registration and a statement to the effect that the international registration reproduced therein has been effected in the International Register of Marks. It shall be promptly sent to the owner of the international registration.

Rule 18

Notification of International Registrations and Recordings of Later Designations

18.1 *Form of Notification*

The notification referred to in Article 10(2) shall be effected separately for each national Office and shall consist of:

(i) a list of the international registration numbers and the international later designation numbers of the international registrations and recordings of later designations in which the State of the said Office has been designated,
(ii) separate reprints made of the publication by the International Bureau of each international registration and of each recording of later designations referred to in the said list,
(iii) a copy of the international application or the request for the recording of later designations if it contains a declaration made under Article 18(4)(a),
(iv) a copy of any declaration made under Rules 6.4 or 11.3,
(v) where Rule 5.3(c)(ii) applies, the reproduction in color of the mark in the number of copies specified in the Administrative Instructions, provided that such Instructions shall enable each national Office to require at least 6 copies.

18.2 *Time of Notification*

The notification shall be effected on the same day as that on which the issue of the Gazette is published that contains the matter from which the reprints referred to in Rule 18.1(ii) are made.

Rule 19

Refusals; Notices of Possible Refusal

19.1 *Notifying the International Bureau; Grounds*

(a) Any notification under Article 12(2)(a) shall be sent in one copy, preferably on a form furnished free of charge by the International Bureau to the national Office of each Contracting State. The notification shall, in any case, contain:

(i) the international registration number of the international registration, or the international later designation number of the later designation, as the case may be, to which the refusal or the notice of possible refusal relates,
(ii) an indication of the mark in the cases and the manner provided for in paragraph (b),
(iii) an indication as to whether the notification is that of a refusal or of a notice of possible refusal,
(iv) where it relates to some only of the goods and/or services listed, identification of those to which it relates,
(v) the grounds referred to in Article 12(2)(a)(ii) and (iii), together with a reproduction of any mark cited in the notification and not reproduced therein and a copy of the list of goods and/or services (in the original language) pertaining to such mark, and, when the notice of possible refusal specifies the grounds by reference to the opposition of a third party, a copy of any document filed by the opposing party in which the said grounds are specified, together with a reproduction of any mark cited in the said document and not reproduced therein and a copy of the list of goods and/or services pertaining to such mark; where the grounds specified by the national Office in the notice of possible refusal do not include the grounds or some of the grounds invoked in the document filed by the opposing party and transmitted together with the said notice by the national Office, all the grounds contained in the said document shall be considered as having been specified by the national Office,
(vi) an indication as to whether any remedy is available, and if so with which authority it has to be sought and within what time limit.

(b) The cases and the manner referred to in paragraph (a)(ii) and in Rules 20.1(a)(ii), 22.3(c) and 26.1(c)(ii) shall be as follows:

(i) where the mark consists of letters of the Latin alphabet, Arabic or Roman numerals, and punctuation signs usual in connection with the Latin alphabet, without any special graphic features and without also containing figurative elements, the indication shall consist of the letters, numerals and signs;
(ii) where the mark consists of letters, numerals and signs referred to in item (i) but such letters, numerals and signs have some special graphic features, the indication shall consist of the letters, numerals and signs accompanied by the words "(special graphic features)" or other words to that effect;
(iii) where the mark consists of letters, numerals and signs referred to in item (i) as well as figurative elements, the indication shall consist of the letters, numerals and signs accompanied by the words "(and figurative elements)" or other words to that effect;
(iv) where the mark is one to which both items (ii) and (iii) apply, the words accompanying it shall be "(special graphic features and figurative elements)" or other words to that effect.

(c) The form referred to in paragraph (a) shall be prepared separately for each Contracting State, in collaboration with its national Office. It shall list the more common of the grounds for refusal with a reference to the pertinent provisions of the national law so that, wherever possible, such grounds may be specified by marking the applicable items of the list. The form shall contain a space reserved for specifying any other grounds and for other possible indications.

19.2 *Notifying the Owner of the International Registration; Publication*

(a) The notification referred to in Article 12(3)(a) shall indicate the date on which any notification made under Article 12(2)(a) was received by the International Bureau and shall include a copy thereof. The International Bureau shall effect any notification referred to in Article 12(3)(a) promptly after the receipt of the notification referred to in Article 12(2)(a).

(b) The publication of the notification referred to in Article 12(3)(a) shall be effected promptly and shall contain:

(i) the international registration number of the international registration, or the international later designation number of the later designation, as the case may be, to which the refusal or the notice of possible refusal relates, and the name of the owner of the international registration,
(ii) the name of the State whose national Office transmitted the notification,
(iii) a statement to the effect that a notification under Article 12(2)(a) was received.

19.3 *Notification and Recording of Final Decisions of Refusal; Cancellation of the Designation, and Publication of the Cancellation*

(a) The notification by the national Office under Article 12(4)(a) shall be effected promptly after the date on which the decision of refusal becomes final. The notification shall contain:

(i) an indication that it relates to a final decision of refusal,

(ii) the indications referred to in Rule 19.1(a)(i) and (ii),
(iii) where the decision is that of a court, a copy of the final decision, or, where the decision is not that of a court, the grounds given in the final decision, preferably in the same manner as that indicated in Rule 19.1(c),
(iv) where the notification relates to some only of the goods and/or services listed, identification of those to which it relates,
(v) the name of the authority which pronounced the decision, the number, if any, and the date of such decision, and
(vi) the date on which the decision became final.

(b) The notification by the International Bureau under Article 12(4)(a) shall be effected as soon as possible and shall include a copy of the notification referred to in paragraph (a), as well as the name of the State whose authorities have pronounced the final decision and an indication of the date of receipt of such notification by the International Bureau.

(c) The details of the recording referred to in Article 12(4)(a) shall be provided in the Administrative Instructions.

(d) The publication referred to in Article 12(4)(a) shall be effected promptly and shall consist of the indications contained in the notification referred to in paragraph (a)(i), (ii) and (iv) to (vi), above, as well as the name of the State whose authorities have pronounced the final decision and the name of the owner of the international registration.

19.4 *Notification and Publication Where Final Decision Results in Acceptance of the Effect Provided for in Article 11(2)*

(a) The notification under Article 12(4)(b) shall be effected promptly after the final disposal of the case and shall consist of a statement to the effect that the notice of possible refusal or the refusal is withdrawn, the indications referred to in Rule 19.1(a)(i) and (ii), the number, if any, and the date of the decision, and the date on which the decision became final.

(b) The publication referred to in Article 12(4)(b) shall be effected promptly and shall consist of the elements referred to in paragraph (a), as well as the name of the owner of the international registration and the name of the State whose authorities have pronounced the final decision.

19.5 *Belated Notifications*

If any notification referred to in Article 12(2)(a) is received by the International Bureau after the expiration of the time limit fixed in that provision, the International Bureau shall inform accordingly the national Office which effected the notification, treat such notification as if it had not been effected, inform the owner of the international registration that the notification it received is belated, and send to the owner a copy thereof.

Rule 20

Final Decisions of Cancellation

20.1 *Notification and Recording of Final Decisions of Cancellation; Cancellation of the Designation, and Publication of the Cancellation*

(a) The notification referred to in Article 13(2) shall be effected promptly after the date on which the decision of cancellation becomes final and shall contain:

(i) the international registration number of the international registration, or the international later designation number of the later designation, as the case may be, to which the final decision of cancellation relates,
(ii) an indication of the mark in the cases and the manner provided for in Rule 19.1(b),
(iii) where the final decision relates to some only of the goods and/or services listed, identification of those to which it relates,
(iv) the name of the authority which pronounced the fiinal decision,
(v) the number, if any, and the date of such decision,
(vi) the date on which the decision became final.

(b) The deails of the recording referred to in Article 13(2) shall be provided in the Administrative Instructions.

(c) The publication referred to in Article 13(2) shall be effected promptly and shall consist of the indications contained in the notification referred to in paragraph (a), as well as the name of the State whose authorities have pronounced the final decision of cancellation and the name of the owner of the international registration.

Rule 21

Changes in Ownership

21.1 *Request for Recording of Change in Ownership*

(a) The indication referred to in Article 14(1)(b)(i) shall preferably be worded as follows: "The undersigned requests that the following change in ownership concerning the international registration identified herein be recorded."

(b) Rule 5.2 shall apply, *mutatis mutandis,* to the indications concerning the new owner referred to in Article 14(1)(b)(iii).

(c) The designated States referred to in Article 14(1)(b)(iv) shall be identified by their names in a manner sufficiently clear for the purpose, provided that, where the request relates to all the States designated in the existing international registration, they may be identified by a statement to that effect.

(d) The goods and/or services referred to in Article 14(1)(b)(iv) shall be identified as follows:

(i) where the request relates to all of the designated States and all of the goods and/or services listed in respect of each of those States, by a statement to that effect,
(ii) where the request relates to all of the designated States and the list of goods and/or services, while being the same for each, is more limited than in the international registration, by a new list and by a statement to the effect that it applies to all of the designated States,
(iii) in all other cases, in respect of those States for which the list of goods and/or services is the same as in the existing international registration, by a statement to that effect, and, in respect of those States for which the list of goods and/or services is more limited than the list of goods and/or services in the existing international registration, by a new list.

(e) The attestation referred to in Article 14(1)(c) shall be worded as follows: "According to evidence produced before this Office, . . . ① appears to be the successor in title of . . . ② to the extent described in the present request, and the conditions referred to in Article 14(1)(c) of the Trademark Registration Treaty appear to be fulfilled. This attestation is given for the sole purpose of allowing the change of ownership to be recorded in the International Register of Marks." ① Insert the name of the new owner. ② Insert the name of the earlier owner.

(f) The attestation shall be dated and shall bear the stamp or seal of the national Office and the signature of an official thereof. [The attestation shall be accompanied by the documents produced as evidence.]

(g) The amount of the fee referred to in Article 14(1)(d) is indicated in the Table of Fees.

(h) The request may contain an indication of the trade or business in which the new owner is engaged.

21.2 *Publication Where the Change in Ownership is Total*

(a) Where the change in ownership concerns all the designated States and all the goods and/or services, the publication referred to in Article 14(1)(d) shall contain:

(i) an indication that the change in ownership concerns all the designated States and all the goods and/or services,
(ii) the name and address of the new owner together with the indication, if any was given by him, of his trade or business and, if he bases his right to own international registrations on his residence in, or his nationality of, a State other than that in which he has his address, the name of the State of his residence or nationality, as the case may be,
(iii) the name of the earlier owner,
(iv) the date on which the International Bureau received the request,
(v) a reference to all the prior publications concerning the international registration except those which have been superseded by later publications in respect of that registration.

(b) The publication shall be effected under the number of the international registration, and, where applicable, the numbers of later designations to which it refers, followed by such further indications as the Administrative Instructions shall provide.

21.3 *Publication Where the Change in Ownership is Partial*

(a) Where the change in ownership concerns fewer than all of the designated States and/or some only of the goods and/or services, the publication referred to in Article 14(1)(d) shall contain two parts, one concerning the new owner, the other the earlier owner.

(b) The part concerning the new owner shall contain:

(i) an indication that the publication is effected pursuant to a request for the recording of a change in ownership,
(ii) the date on which the International Bureau received the request,
(iii) the number under which the part concerning the earlier owner is published,
(iv) the name and address of the new owner together with the indication, if any was given by him, of his trade or business and, if he bases his right to own international registrations on his residence in, or his nationality of, a State other than that in which he has his address, the name of the State of his residence or nationality, as the case may be,
(v) all the indications which, prior to the date referred to in item (ii), were published in respect of the international registration and which have not been superseded by later publications in respect of that registration, except those indications which solely concern designated States and goods and/or services in respect of which ownership is retained by the earlier owner.

(c) The part concerning the earlier owner shall contain:

(i) an indication that the publication concerns an existing international registration and contains those elements of that registration which, after the recording of the change in ownership concerning that registration, continue to concern the earlier owner,
(ii) the number under which the part concerning the new owner is published,
(iii) the date on which the International Bureau received the request,
(iv) all the indications which, prior to the date referred to in item (iii), were published in respect of the international registration and have not been superseded by later publications in respect of that registration, except those indications which, because of the change in ownership, no longer concern the earlier owner.

(d) Each part shall have a number and possibly also an appropriately worded heading. The Administrative Instructions shall provide the details of such numbers and headings.

21.4 *Notification of Recording of Changes*

(a) The notifications referred to in Article 14(1)(d) shall be effected by sending separate reprints of the publication referred to in Rules 21.2 and 21.3.

(b) The transmittal to designated Offices of the reprints referred to in paragraph (a) shall be accompanied by a list of the numbers referred to in Rules 21.2(b) and 21.3(d) relating to recordings concerning the designated State to which the list is addressed. Rule 18.2 shall apply, *mutatis mutandis*.

21.5 *Notification of Declining of the Recording*

The notification referred to in Article 14(2) shall be effected by letter. The letter shall state the grounds for declining.

21.6 *Denial*

(a) The notification by the national Office referred to in Article 14(4)(c) shall:

(i) refer to the fact of the denial,
(ii) identify the authority that pronounced the denial and the date on which it was pronounced,
(iii) indicate the relevant number or numbers referred to in Rule 21.2(b) and 21.3(d),
(iv) contain a brief indication of the grounds for the denial.

(b) The recording and the publication referred to in Article 14(4)(c) shall contain:

(i) the elements referred to in paragraph (a),
(ii) the date on which the International Bureau received the notification referred to in paragraph (a),
(iii) a reference to the publication of the recording effected under Article 14(1)(d).

(c) The notification by the International Bureau referred to in Article 14(4)(c) shall be sent to the earlier and the new owners and to the national Office which has notified the denial.

RULE 22

Recording of Limitations of the List of Goods and/or Services

22.1 *Request for Recording of Limitation of the List*

(a) The request for recording referred to in Article 15(1) shall indicate its purpose and contain:

(i) the name of the owner of the international registration,
(ii) the international registration number,
(iii) the desired limitation of the list of goods and/or services,
(iv) where the request relates to fewer than all the designated States, identification of those States to which it relates,
(v) where the request relates to one only of the designated States and, while not conforming with the concept of limitation as defined in Rule 22.2(a) and (b), it conforms with a decision of the national Office or other competent authority of such State concerning the national registration, a copy of such decision and, if the decision is in a language other than English or French, a translation of such decision.

(b) The request shall be signed by the owner of the international registration.

(c) The amount of the fee referred to in Article 15(2) is indicated in the Table of Fees.

(d) Where any term which is the subject of the request appears under more than one class of the International Classification and the request does not identify the class or classes to which it relates, such request shall be treated as if it related to the term under each of the classes under which it appears.

22.2 *Concept of Limitation*

(a) Subject to paragraph (c), any request under Article 15 shall be regarded as conforming with the concept of limitation if it is presented in any of the following forms:

(i) it asks for the deletion of one or more terms in the list of goods and/or services,
(ii) it asks for the insertion of one or more words, linked to the existing term by words (such as "except") which, from the point of view of syntax, make it clear that the inserted word or words are meant to be excluded from the existing term (for example, *milk products* (existing term) *except* (linking word) *condensed milk* (inserted words)),
(iii) it asks for the insertion of one or more words linked to the existing term by words (such as "provided that") which, from the point of view of syntax, make it clear that the inserted words are covered by the existing term (for example, *pineapples* (inserted word) *provided that they are* (linking words) *canned fruits* (existing term)).

(b) Unless the limitation is presented in one of the forms described in paragraph (a), it shall not, subject to paragraph (c), be regarded as conforming with the concept of limitation, however clear it may be that, in the ordinary sense of the word, there is a limitation (for example, replacing the term "milk products" by "condensed milk").

(c) For the purposes of Rule 22.1(a)(v), any change in the list of goods and/or services decided upon by the national Office or other competent authority concerned shall be deemed to conform with the concept of limitation.

22.3 *Recording, Publication, and Notification, of Limitation of the List*

(a) If the request complies with the prescribed requirements, the International Bureau shall record the indications referred to in Rule 22.1(a)(i) to (iv) and the date on which the request was received.

(b) Where the request is based on a decision referred to in Rule 22.1(a)(v), this fact, together with the following particulars, shall also be recorded:

(i) the name of the authority which pronounced the decision,
(ii) the number, if any, and the date of such decision.

(c) The publication and the notification referred to in Article 15(2) shall contain the indications referred to in Rule 22.1(a)(i) to (iv), the indications referred to in paragraph (b), the date of the recording and an indication of the mark in the cases and the manner provided for in Rule 19.1(b).

22.4 *Declining the Recording of Limitation of the List*

If the request does not comply with the prescribed requirements, the International Bureau shall decline the recording of the limitation and shall notify the owner of the international registration accordingly. The notification shall include the grounds for declining.

22.5 *Non-Admission by Designated State*

(a) The notification by the national Office referred to in Article 15(4) shall:

(i) refer to the fact of non-admissibility,
(ii) identify the authority that pronounced the decision and the date on which it was pronounced,
(iii) indicate the relevant international registration number and date,
(iv) indicate the name of the owner of the international registration,
(v) contain a brief indication of the ground(s) for the non-admissibility.

(b) The annotation and the publication referred to in Article 15(4) shall contain:

(i) the elements referred to in paragraph (a),
(ii) the date on which the International Bureau received the notification referred to in paragraph (a),
(iii) a reference to the publication of the recording effected under Article 15(1),
(iv) an indication of the fact of reinstatement, together with the identification of the publication which contained the now reinstated elements of the international registration.

(c) The notifications by the International Bureau referred to in Article 15(4) shall be sent to the owner of the international registration and to the national Office which has notified the non-admissibility.

RULE 23

Renewal

23.1 *Reminder by the International Bureau*

The International Bureau shall send a letter to the owner of the international registration before the expiration of the term, initial or renewal (as the case may be), which is in effect, reminding him that such term is about to expire. Further details concerning the contents of the reminder shall be provided in the Administrative Instructions. The reminder shall be sent at least 6 months before the expiration date. Failure to send or receive the reminder, or the fact of sending or receiving it outside the said period, or any error in the reminder, shall not affect the expiration date.

23.2 *Demand for Renewal*

(a) Any demand for renewal may exclude any of the designated States.

(b) Any demand for renewal may exclude in respect of any of the designated States all the goods and/or services appearing in the international registration under a given class or under given classes of the International Classification.

(c) The demand for renewal referred to in Article 16(3)(a) shall preferably be made on a printed form furnished free of charge by the International Bureau together with the reminder referred to in Rule 23.1. The demand shall, in any case, indicate its purpose and contain:

(i) the name and address of the owner of the international registration,
(ii) the international registration number,
(iii) where the demand contains any exclusion under paragraphs (a) or (b), the identification of the State or States and/or the class or classes referred to in paragraph (b).

(d) Where the demand contains any exclusion under paragraphs (a) or (b), it shall be signed by the owner of the international registration.

(e) The demand for renewal shall not be combined with any other request; in particular, it shall not contain a request for recording a later designation, a request for recording a change in ownership, or, subject to paragraph (b), a request for recording a limitation in the list of goods and/or services.

(f) Rule 8.3 shall also apply to demands for renewal, provided that any declaration under Article 18(3)(d) may be filed at the same time as the demand for renewal.

23.3 *International Renewal Fee and State Renewal Fees*

(a) The fees payable under Article 16(3)(a) shall be the following:

(i) an "international renewal fee," and, where Rule 5.3(c)(i) applies, a color reproduction fee, as well as, where applicable, the "renewal surcharge" referred to in Article 16(3)(a),
(ii) in respect of each designated State to which the demand relates, the individual State renewal fee or the standard State renewal fee, as the case may be.

(b) The amounts of the international renewal fee, the color reproduction fee, the renewal surcharge and the standard State renewal fee are indicated in the Table of Fees.

(c) The amounts of the individual State renewal fees concerning the various Contracting States shall be published by the International Bureau each year in the month of August. The amounts so published shall be applicable as the individual State renewal fees from January 1 to December 31 of the year following the year in which they are published.

23.4 *Imperfect Demands*

(a) Where, within the time limits fixed in Article 16(3)(a), the International Bureau receives:

(i) a demand which does not conform with the requirements of Rule 23.2, or
(ii) a demand but no payment or insufficient payment to cover the renewal fees and any surcharge that is due, or
(iii) money which appears to be intended to cover fees connected with renewal but no demand,

it shall, whenever practicable, promptly invite the owner of the international registration to present a correct demand, to pay or complete the renewal fees and any surcharge that is due, or to present a demand, as the case may be. The invitation shall indicate the applicable time limits.

(b) Failure to send or receive the invitation referred to in paragraph (a), or any delay in dispatching or receiving such invitation, or any error in the invitation, shall not prolong the time limits fixed in Article 16(3)(a).

23.5 *Recording, Publication, and Notification*

(a) Where the demand is presented and the fees are paid as prescribed, the International Bureau shall record the renewal and shall publish the elements, as specified in paragraph (b), of the international registration as it stands on the first day of the term of renewal, together with an indication both of the fact that the publication is that of a renewal and of the date on which the renewal shall expire.

(b) The elements referred to in paragraph (a) shall be the following:

(i) the name and address of the owner of the international registration, together with any indication of his trade or business and, if he bases his right to own international registrations on his residence in, or his nationality of, a State other than that in which he has his address, the name of the State of his residence or nationality, as the case may be,
(ii) the reproduction of the mark, together with any indication under Rule 5.3(d) or (e) and any transliteration and translation; where color is claimed, the reproduction shall be in color if Rule 5.3(c)(i) applies, and it shall be in black and white and shall be accompanied by a description of the colors in words and signs if Rule 5.3(c)(ii) applies,
(iii) the list of goods and/or services, provided that, where the list of goods and/or services differs in respect of different designated States, the publication shall contain appropriate indications in order to show which goods and/or services relate to which designated States, and
(iv) the names of the designated States and, where applicable, after the name of each such State, an indication concerning the choice referred to in Rule 5.6 **[and/or the indication referred to in Rule 5.7],
(v) where, in respect of any designated State, a refusal or notice of possible refusal was notified and no final decision resulting in the cancellation of the designation or in the acceptance of the effect referred to in Article 11(2) has been notified, an indication that a refusal or notice of possible refusal was notified, together with the date of the receipt by the International Bureau of the notification of the refusal or notice of possible refusal,
(vi) the international registration number,
(vii) any international later designation number,
(viii) where the priority of one or more earlier applications was claimed, a statement that such claim has been made,
(ix) a reference to any indication under Article 11(3),
(x) a reference to any declaration under Articles 20(2) and 21(2),
(xi) particulars concerning the representative, as provided in Rule 34*ter*.2(a).

(c) Any indication which, at some time prior to the first day of the term of renewal, has been part of the international registration but which, before that day, has been cancelled or superseded shall not be included in the publication referred to in paragraph (a).

(d) The International Bureau shall notify the owner of the international registration of the renewal by sending him a reprint of the publication referred to in paragraph (a).

(e) The International Bureau shall notify each designated Office of the renewal by sending it:

(i) a reprint of the publication referred to in paragraph (a), and
(ii) where Rule 5.3(c)(ii) applies, the reproduction of the mark in the number of copies specified in the Administrative Instructions, provided that such Instructions shall enable each national Office to require at least 6 copies.

23.6 *Declining the Demand*

(a) Where the time limits fixed in Article 16(3)(a) are not respected or where the demand does not conform with the requirements of Rule 23.2 or the fees (including, where applicable, any surcharge) are not paid as prescribed, the International Bureau shall decline the demand and shall notify the owner of the international registration by letter. The letter shall state the grounds for declining the demand.

(b) The International Bureau shall not decline any demand before the expiration of 6 months after the starting date of the term of renewal.

23.7 *Reimbursement of Certain Fees*

Where, under Rule 23.6(a), the International Bureau declines the demand, it shall reimburse to the owner of the international registration all fees received from him except an amount equivalent to the international renewal fee referred to in Rule 23.3(a)(i).

23.8 *Recording of Lack of Demand*

Where, by the expiration of 6 months after the starting date of the term of renewal, no demand for renewal is presented to the International Bureau in respect of any or all of the designated States, such fact shall be recorded by the International Bureau.

23.9 *Publication of Lists of International Registrations Not Renewed*

The International Bureau shall publish, at intervals specified in the Administrative Instructions, a list of the international registration numbers of those international registrations which, having become due for renewal, have been renewed in respect of none of the designated States.

RULE 24

Declarations of Actual Use

24.1 *Information on Requirements Concerning Routine Declarations of Actual Use*

The national Office of any Contracting State whose national law requires the filing of routine declarations referred to in the first sentence of Article 18(3)(d) shall inform the International Bureau of such requirement and of any changes therein. Such information shall, in particular, indicate the time limits within which such declarations must be filed according to the national law and state whether the attachment of specimens or facsimiles to routine declarations of actual use is required by the national law. The information shall be promptly published.

24.2 *National Forms*

The national Office of any Contracting State referred to in Rule 24.1 shall supply free of charge to the International Bureau in reasonable quantities declaration forms, in the form prescribed by the national law of that State, for the purposes of making declarations referred to in Article 18(3)(d). The International Bureau shall furnish such forms free of charge to interested persons.

24.3 *International Form*

(a) Where the declaration referred to in Article 18(3)(d) is not made on a national form according to Rule 24.2, it shall be made on a form ("international form") consisting of the following statement and shall be signed by the owner of the international registration:

> "The undersigned owner of the international registration declares that he (it) is the owner of the international registration which was effected under No. . . . , as shown by recordings in the International Register of Marks, in respect of . . . ① on . . . ②; that the mark which is the subject of the international registration herein identified is now in use by and through . . . ③ in commerce with and/or on the territory of the said State on or in connection with the following goods and/or services listed in respect of such State: . . . ④; that such use commenced on . . . ⑤; and that the mode or manner in which the mark is used is:
>
> ☐ on labels or tags affixed to and/or containers for the goods, as evidenced by the attached specimen(s) or facsimile(s)⑥;
> ☐ on displays which are associated with the goods, as evidenced by the attached specimen(s) or facsimile(s)⑥;
> ☐ in the case of services, in advertising of such services, as evidenced by the attached specimen(s) or facsimile(s)⑥;
> ☐ other [recite sufficient facts in addition to, or in lieu of, checking one or more of the above boxes as to sales or advertising, or both, to show that the mark is in current use]."
>
> ① Insert name of State. ② Insert international registration date or, if applicable, recording date of the later designation of such State. ③ Insert "the undersigned owner" and/or, if applicable, the name and address of the person and/or persons whose use of the mark inures to the benefit of the owner in the State. ④ Insert "all" or indicate the particular goods and/or services on or in connection with which the mark is used. ⑤ Insert the date of commencement of the continuing use of the mark, including, where different dates are applicable to different goods and/or services, the particular goods and/or services to which each such date relates. ⑥ The inclusion of specimens or facsimiles may be dispensed with where the declaration is made in respect of a State whose national law does not require that specimens or facsimiles be attached to routine declarations of actual use.

(b) The International Bureau shall furnish such forms free of charge to interested persons.

(c) The inclusion of specimens or facsimiles may be dispensed with where the declaration is made in respect of a State whose national law does not require that specimens or facsimiles be attached to routine declarations of actual use.

(d) The specimens referred to in paragraph (a) shall, in the case of a mark for goods, be duplicates of the actually used labels, tags, or containers, or of the displays associated therewith, or portions thereof, when made of suitable material and capable of being arranged flat and of a size not larger than the declaration. When, owing to the mode of applying or affixing the mark to the goods or to the manner of its use on the goods, such specimens cannot be furnished, suitable photographs or other acceptable reproductions, not larger than the declaration, which clearly and legibly show the mark and all matter used in connection therewith shall be furnished. In the case of marks for services, specimens or facsimiles, as specified above, of the mark as used in the sale or advertising of the services shall be furnished unless impossible because of the nature of the mark or the manner in which it is used, in which event some other acceptable reproductions shall be furnished.

(e) It shall depend on the national law of each Contracting State whether any declaration to the same effect as but worded differently than in paragraph (a) shall produce the same effect.

RULE 25

Declarations Concerning Earlier National or Madrid Registrations

25.1 *Separately Filed Declarations*

(a) Any separately filed declaration under Article 20(2) shall:

(i) specify the designated State or States in respect of which it is made,
(ii) contain the allegation that the owner of the international registration owned a national registration or national registrations in the said State or States on the international registration date or the international later designation date, as the case may be,
(iii) indicate, in respect of each such national registration, its number,
(iv) indicate the international registration number of the international registration to which it relates.

(b) Any separately filed declaration under Article 21(2) shall:

(i) specify the designated State or States in respect of which it is made,
(ii) contain the allegation that the owner of the international registration owned a registration under the Madrid Agreement in respect of the said State or States on the international registration date or the international later designation date, as the case may be,
(iii) indicate the number of the relevant Madrid registration,
(iv) indicate the international registration number of the international registration to which it relates.

25.2 *Certification of National Registrations*

The certification of the copy of any national registration referred to in Article 20(2) shall be in the English or French language, shall be signed by a person authorized by the national Office to effect certifications and shall indicate the date to which the certification refers. That date shall be the international registration date or the international later designation date, as the case may be, or, where the certification is made before international registration or recording of the later designation is effected, the date on which the certification is effected. In the latter case, the national Office effecting the certification shall, on the request of the International Bureau presented once the said registration or recording is effected by it, indicate to that Bureau any change which might have occurred in respect of the national registration between the date to which the certification referred and the international registration date or the recording date of the later designation, as the case may be.

25.3 *Defects*

(a) The International Bureau shall promptly notify the applicant or the owner of the international registration of any defect in the declaration made under Article 20(2) or Article 21(2), including the absence of the certified copy referred to in Article 20(2) and any defect in the certification thereof as provided in Rule 25.2.

(b) As long as any defect referred to in paragraph (a) is not corrected, the International Bureau shall treat the declaration as if it had not been made.

25.4 *Publication; Notification*

(a) Unless effected by virtue of Rule 17.1(a)(ix) or Rule 17.2(a)(i), the publication of any declaration under Article 20(2) or Article 21(2) shall indicate:

(i) the fact that the publication relates to a declaration made under Article 20(2) or 21(2), as the case may be,
(ii) the State or States in respect of which the declaration was made and the numbers of the relevant national or Madrid registrations,
(iii) the international registration number of the international registration to which the declaration relates,
(iv) the name of the owner of the international registration.

(b) Unless effected by virtue of Rule 18.1, the notification of any declaration under Article 20(2) or 21(2) shall consist of an indication that the declaration made under Article 20(2) or 21(2), as the case may be, was recorded by the International Bureau and shall be accompanied by a copy of the declaration.

RULE 26

Transmittal of Documents to the International Bureau

26.1 *Place and Mode of Transmittal*

(a) International applications, requests, demands, notifications and any other documents intended for filing, notification or other communication to the International Bureau shall be deposited with the competent service of that Bureau during the office hours fixed in the Administrative Instructions, or mailed to that Bureau.

(b) Where any document is transmitted to the International Bureau in response to an invitation by that Bureau bearing a reference number, the document shall indicate such reference number.

(c) Where paragraph (b) does not apply, any document transmitted to the International Bureau shall:

(i) where it relates to an international application, be accompanied by a copy of such application,
(ii) where it relates to an international registration, indicate, by its international registration number, the internatonal registration to which it relates; it may also contain a reproduction of the mark or an indication of the mark in the cases and the manner provided for in Rule 19.1(b).

(d) Paragraph (c) shall not apply in those cases where these Regulations contain specific provisions on the identification of the international application or registration to which any document transmitted to the International Bureau relates.

26.2 *Date of Receipt of Documents*

Any document received by the International Bureau through deposit or mail shall be considered to have been received on the day on which it is actually received by that Bureau, provided that, when it is actually received after office hours, or on a day when the Bureau is closed for business, it shall be considered to have been received on the next subsequent day on which the Bureau is open for business.

RULE 26bis

Signature

26bis.1 *Legal Entity*

(a) Where any document submitted to the International Bureau is signed by a legal entity, the name of the legal entity shall be indicated in the place reserved for signature and shall be accompanied by the signature of the natural person or persons entitled to sign for such legal entity according to the national law of the country under whose law the legal entity was established.

(b) The provisions of paragraph (a) shall apply, *mutatis mutandis*, to partnerships or firms composed of attorneys or patent or trademarks agents but which are not legal entities.

26bis.2 *Exemption from Certification*

No signature provided for under the Treaty or these Regulations shall require authentication, legalization or other certification.

RULE 27

Calendar; Computation of Time Limits

27.1 *Calendar*

The International Bureau, national Offices, applicants and owners of international registrations shall, for the purposes of the Treaty and these Regulations, express any date in terms of the Christian era and the Gregorian calendar.

27.2 *Periods Expressed in Years, Months, or Days*

(a) When a period is expressed as one year or a certain number of years, computation shall start on the day following the day on which the relevant event occurred, and the period shall expire in the relevant subsequent

year in the month having the same name and on the day having the same number as the month and the day on which the said event occurred, provided that if the relevant subsequent month has no day with the same number the period shall expire on the last day of that month.

(b) When a period is expressed as one month or a certain number of months, computation shall start on the day following the day on which the relevant event occurred, and the period shall expire in the relevant subsequent month on the day which has the same number as the day on which the said event occurred, provided that if the relevant subsequent month has no day with the same number the period shall expire on the last day of that month.

(c) When a period is expressed as a certain number of days, computation shall start on the day following the day on which the relevant event occurred, and the period shall expire on the day on which the last day of the count has been reached.

27.3 *Local Dates*

(a) The date which is taken into consideration as the starting date of the computation of any period shall be the date which prevails in the locality at the time when the relevant event occurred.

(b) The date on which any period expires shall be the date which prevails in the locality in which the required document is filed or the required fee is paid.

27.4 *Expiration on a Non-Working Day*

If the expiration of any period during which any document or fee must reach the International Bureau or any of its agencies falls on a day on which such Bureau or agency is not open for business, or on which ordinary mail is not delivered in Geneva or the locality in which the agency is situated, the period shall expire on the next subsequent day on which neither of the said two circumstances obtains.

RULE 28

Payment of Fees

28.1 *Payment to the International Bureau*

All fees due under the Treaty and these Regulations shall be payable to the International Bureau.

28.2 *Applicable Fee Schedule*

The fees payable shall:

(i) where they concern an international application or a request for the recording of a later designation, be the fees in force on the date the international application or the request for the recording of the later designation is received by the International Bureau *[or, where the application or request has been filed through the intermediary of a national Office under Article 5(3), on the date on which it was received by that Office],
(ii) where they concern a demand for renewal, be the fees in force on the date which precedes by six months the starting date of the term of renewal.

28.3 *Currency*

(a) Subject to paragraph (b), all fees due under the Treaty and these Regulations shall be payable in Swiss currency.

(b) Where the International Bureau has agencies, the Administrative Instructions may, under specified conditions, allow exceptions to the provisions of paragraph (a).

28.4 *Deposit Accounts*

(a) Any natural person or legal entity may open a deposit account with the International Bureau or any of its agencies.

(b) The details concerning deposit accounts shall be provided in the Administrative Instructions.

28.5 *Indication of the Mode of Payment*

(a) Unless the payment is made in cash to the cashier of the International Bureau, the international application, and any request, demand, or other document, filed with the International Bureau in connection with any international registration, subject to the payment of any fee, shall indicate:

(i) the name and address, as provided in Rule 5.2(a) and (c), of the natural person or legal entity making the payment, unless the payment is made by a cheque attached to the document,
(ii) the mode of payment, which may be by an authorization to debit the amount of the fee to the deposit account of such person or entity, or by transfer to a bank account or to the postal cheque account of the International Bureau, or by cheque. The Administrative Instructions shall provide the details, in particular those governing the kind of cheques that shall be accepted in payment.

(b) Where the payment is made pursuant to an authorization to debit the amount of the fee to a deposit account, the authorization shall specify the transaction to which it relates, unless there is a general authorization to debit to a specified deposit account any fee concerning a certain applicant, owner of an international registration, or duly appointed representative.

(c) Where the payment is made by transfer to a bank account or to the postal cheque account of the International Bureau, or by a cheque not attached to the international application, request, demand, or other document, the notification of the transfer or the cheque (or paper accompanying it) shall identify the transaction to which the payment relates, in the manner to be provided for in the Administrative Instructions.

28.6 *Effective Date of Payment*

Any payment shall be considered to have been received by the International Bureau on the date indicated hereinbelow:

(i) if the payment is made in cash to the cashier of the International Bureau, on the date on which such payment is made,
(ii) if the payment is made by debiting a deposit account with the International Bureau pursuant to a general authorization to debit, on the date on which the international application, the request for the recording of later designation, the demand for renewal or other document entailing the obligation to pay fees is received by the International Bureau, or, in the case of a specific authorization to debit, on the date on which the specific authorization is received by the International Bureau,
(iii) if the payment is made by transfer to a bank account or to the postal cheque account of the International Bureau, on the date on which such account is credited,
(iv) if the payment is made by cheque, on the date on which the cheque is received by the International Bureau, provided that it is honored upon presentation to the bank on which the cheque is drawn.

RULE 29

Withdrawals and Renunciations

29.1 *Withdrawal of the International Application or Request for Recording of Later Designation*

(a) Any withdrawal of an international application shall be treated as such by the International Bureau if the communication of withdrawal reaches it before registration is effected and preparations for publication have been completed.

(b) Any withdrawal of a request for the recording of later designation shall be treated as such by the International Bureau if the communication of withdrawal reaches it before recording is effected and preparations for publication have been completed.

29.2 *Renunciation of the International Registration or of Certain Designations*

(a) The owner of the international registration may, at any time, renounce the international registration or the recording of the designation of any designated State.

(b) Renunciation of the recording of all designated States shall be treated as renunciation of the international registration.

29.3 *Procedure*

(a) Withdrawals and renunciations referred to in Rules 29.1 and 29.2 shall be effected in a written communication addressed to the International Bureau and signed by the applicant or the owner of the international registration, as the case may be.

(b) The International Bureau shall acknowledge receipt of the communication referred to in paragraph (a). In the case of any withdrawals, the International Bureau shall reimburse to the applicant or the owner of the international registration any State designation fee which it has received from him in connection with any State affected by the withdrawal.

(c) The International Bureau shall record and publish renunciations, and shall notify interested designated Offices thereof. The details shall be provided in the Administrative Instructions.

RULE 30

Choice Between Individual and Standard State Fees

30.1 *Initial Choice*

Any Contracting State shall choose between individual and standard State fees in a written declaration addressed to the International Bureau at the same time as it deposits its instrument of ratification or accession. If it chooses individual State fees, the declaration shall also indicate the amounts of those individual State fees in Swiss francs. The choice of the Contracting State shall become effective and the amounts indicated shall be applicable from the date on which such State becomes bound by the Treaty. Where the Contracting State fails to indicate its choice at the prescribed time, or where it chooses individual State fees but fails to indicate their amounts in Swiss francs, it shall be considered to have chosen standard State fees.

30.2 *Change in Choice*

Any Contracting State may at any time indicate, in a written declaration addressed to the International Bureau, that it wishes to choose standard State fees instead of individual State fees or vice versa, provided that, in the latter case, the declaration shall indicate also the amounts of the individual State fees. The change in choice shall apply from January 1 of that calendar year which commences at the expiration of at least six months after the date on which the International Bureau receives the declaration. If the desired change is for individual State fees but the declaration fails to indicate their amounts in Swiss francs, the declaration shall be treated as if it had not been made.

RULE 31

Change in the Amounts of Individual State Fees

31.1 *Communication; Effective Date*

Any change in the amounts of individual State fees, expresesd in Swiss francs, shall be communicated in writing by the interested national Office to the International Bureau. The amounts so communicated shall be applicable as from January 1 of that calendar year which commences at the expiration of at least 6 months after the date on which the International Bureau receives the communication.

RULE 32

State Fees

32.1 *Individual State Fees*

(a) The International Bureau shall in every calendar year transfer to any interested designated Office the fees refered to in Article 17(3)(d) that are collected in respect of international registrations, recordings of requests for later designations, and recordings of renewals, effected in the preceding calendar year.

(b) Further details shall be provided in the Administrative Instructions.

32.2 *Standard State Fees*

(a) The coefficient referred to in Article 17(4)(b) shall be:

(i) 2, if the national law provides only for examination of "absolute grounds of nullity,"

(ii) 3, if the national law provides for examination as to whether there is conflict with another mark ("relative grounds of nullity") and if such examination is carried out only where there is third-party opposition,

(iii) 4, if the national law provides for examination of relative grounds of nullity ex officio and without third-party opposition,

(iv) 5, if the national law provides for examination of relative grounds of nullity ex officio followed by the possibility of third-party opposition.

(b) Further details shall be provided in the Administrative Instructions.

RULE 33

Fees Belonging to the International Bureau

33.1 *Fees Belonging to the International Bureau*

All fees and charges collected under the Treaty, these Regulations and the Administrative Instructions, except those referred to in Article 17(2), shall belong to the International Bureau.

RULE 34

Recordings Effected by National Offices

34.1 *Notification of Certain Recordings Effected by National Offices*

The notification provided for in Article 19(1) shall be made on a form furnished by the International Bureau and the details of which are provided in the Administrative Instructions.

34.2 *Annotation and Publication*

The Administrative Instructions shall provide for the extent to which annotations of any changes notified under Article 19(2) shall be made in the International Register of Marks and shall be published by the International Bureau, provided that such annotation and such publication shall at least indicate the international registration number of the mark, the State which it concerns, the date on which it was received, and its subject matter.

RULE 34^{bis}

Changes in Addresses

34^{bis}.1 *Recording and Publication*

(a) The International Bureau shall, on request, record and publish, free of charge, any change in the address of the owner of the international registration or his representative.

(b) The request shall be signed.

RULE 34^{ter}

Recording and Publication Concerning Representatives

34^{ter}.1 *Recording*

(a) Where a representative is appointed, the appointment shall be recorded.

(b) Where the appointment of a representative is revoked or renounced, the revocation or the renunciation shall be recorded.

(c) Paragraphs (a) and (b) shall apply, *mutatis mutandis*, to any agent referred to in Rule 2.1(d) and (e).

34^{ter}.2 *Publication*

(a) Where a representatative is appointed, his appointment, including his name and address, shall be published [unless he expressly requests that they should not be published].

(b) Where the appointment of a representative is revoked or renounced, the revocation or the renunciation shall be published unless, at the time the publication could be effected, the appointment of another representative is published.

[(c) Paragraph (b) shall not apply where the appointment which is the subject of the revocation or the renunciation has not been published.]

RULE 35

The Gazette

35.1 *Contents and Title of the Gazette*

(a) All matters which, according to the Treaty or these Regulations, the International Bureau is obliged to publish shall be published in a periodical entitled "International Marks Gazette/*Gazette internationale des marques.*"

(b) The Administrative Instructions may provide for the inclusion of other matters in the Gazette.

35.2 *Frequency of Issue of the Gazette*

The Gazette shall be issued once a week.

35.3 *Languages of the Gazette*

(a) The Gazette shall be issued in a bilingual (English and French) edition.

(b) The Administrative Instructions shall identify those portions which require translation (for example, the lists of goods and/or services and those portions which do not require translation (for example, the names of the designated States).

(c) Matters which can be easily understood even if not translated (for example, the names of the designated States), or which are indicated by signs or abbreviations (for example, "Ren." for "Renewal/*Renouvellement*") to which the keys shall be published in each issue, need not be translated. The details shall be provided in the Administrative Instructions.

(d) Matters not falling within the scope of paragraph (c) (for example the lists of goods and/or services) shall always be published in both languages. The publication shall indicate which is the original language. Translations shall be prepared by the International Bureau. In case of any divergence between the original and the translation, all legal effects shall be governed by the original.

35.4 *Sale of the Gazette*

The subscription and other sale prices of the Gazette shall be fixed in the Administrative Instructions.

35.5 *Copies of the Gazette for National Offices*

(a) Before July 1 of each year each national Office shall notify the International Bureau of the number of copies of the Gazette which it wishes to receive in the next subsequent year.

(b) The International Bureau shall make the requested number of copies available to the national Office:

(i) free of charge, up to the same number as the number of units corresponding to the class chosen under the Paris Convention by the Contracting State of which the said Office is the national Office,

(ii) at half of the ordinary subscription or sale price for copies in excess of the said number.

(c) Copies given free of charge or sold under paragraph (b) shall be for the internal use of the national Office which has requested them.

35.6 *Errors in Publications*

(a) Any error in the Gazette may be rectified by the International Bureau through publication of an appropriate corrigendum.

(b) Any national Office and any interested person may call any error in the Gazette to the attention of the International Bureau.

35.7 *Further Details*

Further details concerning the Gazette may be provided in the Administrative Instructions.

RULE 36

Copies and Other Information Available to the Public

36.1 *Copies and Information Concerning International Applications and Registrations*

(a) Any person may obtain from the International Bureau, against payment of a fee whose amount shall be fixed in the Administrative Instructions, certified or uncertified copies or extracts of the international registration or of any document in the file of any international application or registration. Each copy or extract shall reflect the situation of the international registration or of the file, or parts of such registration or file, on a specific date; such date shall be indicated in the said copy or extract.

(b) On request and against payment of a fee whose amount shall be fixed in the Administrative Instructions, any person may obtain from the International Bureau oral or written information, or information by telecopier devices, on any fact appearing in any document in the file of any international application or registration.

(c) Notwithstanding paragraphs (a) and (b), the Administrative Instructions may waive the obligation to pay any fee where the work or the expense connected with the furnishing of a copy, extract, or information is minimal.

RULE 37

Fees in the Case of Regional Marks

37.1 *Reference to Other Rules*

Rules 9, 13, 23.3, 30 and 31 shall apply, *mutatis mutandis*, in respect of regional marks, provided that any notification under Rule 30 and any communication under Rule 31 shall be made by the intergovernmental authority entrusted with the task of registering regional marks.

RULE 38

Procedure Where Correction of Errors of the International Bureau is Sought

38.1 *Time Limit Under Article 29*

The time limit referred to in Article 29(1) shall be:

(i) where the alleged error may be discovered on the basis of a notification sent by the International Bureau to the applicant or owner of the international registration, 2 months from the date of such notification,

(ii) where item (i) does not apply and the alleged error may be discovered on the basis of a publication of the International Bureau, 2 months from the date of such publication,

[(iii) where neither item (i) nor item (ii) applies, 5 years from the date of the act which comprised or caused the error or, where the error consists of an omission, from the date on which the omitted act should have been performed, unless the national law provides for a time limit which expires later. In the latter case, the time limit provided for in the national law shall apply.]

38.2 *Application of Rule 16*

The provisions of Rule 16 shall apply, *mutatis mutandis*, in respect of Article 29.

RULES CONCERNING CHAPTER II

RULE 39

Expenses of Delegations

39.1 *Expenses Borne by Governments*

The expenses of each delegation participating in any session of the Assembly and in any committee, working group or other meeting dealing with matters of concern to the Union shall be borne by the Government which has appointed it.

RULE 40

Absence of Quorum in the Assembly

40.1 *Voting by Correspondence*

(a) In the case provided for in Article 30(5)(b), the International Bureau shall communicate any decision of the Assembly (other than decisions relating to the Assembly's own procedure) to the Contracting States which were not represented when the decision was made and shall invite them to express in writing their vote or abstention within a period of 3 months from the date of the communication.

(b) If, at the expiration of the said period, the number of Contracting States having thus expressed their vote or abstention attains the number of Contracting States which was lacking for attaining the quorum when the decision was made, that decision shall take effect provided that at the same time the required majority still obtains.

RULE 41

Administrative Instructions

41.1 *Establishment of Administrative Instructions; Matters Governed by Them*

(a) The Director General shall establish Administrative Instructions. He may modify them. They shall deal with matters in respect of which these Regulations expressly refer to such Instructions and with details in respect of the application of these Regulations.

(b) All forms of interest to applicants and owners of international registrations shall be included in the Administrative Instructions.

41.2 *Control by the Assembly*

The Assembly may invite the Director General to modify any provision of the Administrative Instructions, and the Director General shall proceed accordingly.

41.3 *Publication and Effective Date*

(a) The Administrative Instructions and any modification thereof shall be published in the Gazette.

(b) Each publication shall specify the date on which the published provisions become effective. The date need not be the same for all the provisions provided that no provision may be declared effective prior to the expiration of a period of one month after the publication date of that issue of the Gazette in which it has been published.

41.4 *Conflict with the Treaty and the Regulations*

In the case of conflict between any provision of the Administrative Instructions and any provision of the Treaty or of these Regulations, the latter shall prevail.

ANNEX TO THE REGULATIONS

TABLE OF FEES

The fees marked by an asterisk apply to the following States . . . [here will be named all the States which have chosen the standard State fee system (see Articles 17(2) and (4)]. Where, either because of the choice exercised by the applicant or owner of the international registration under Article 5(1)(a)(vi) or 6(2)(a)(v), or because only a regional mark is available, the designation of one State party to a regional treaty has the effect of a wish to obtain the effect provided for in Article 11(2) available to regional marks, the fees marked by an asterisk shall be payable once even if the regional registration effect is available in more than one State party to the regional treaty.

	Kind of Fee	*Amount in Swiss Francs*
1.	*Application*	
1.1	International Application Fee (Rule 9.1(a)(i)): irrespective of the number of designated States and of the number of classes	400
1.2	* Standard State Designation Fee (Rule 9.1(a)(ii)): for each designated State to which the Standard Fee System applies	[1] 30
1.3	Color Reproduction Fee (Rule 9.1(a)(i))	100
2.	*Later Designation*	
2.1	International Later Designation Fee (Rule 13.1(a)(i)): irrespective of the number of designated States and of the number of classes	100
2.2	* Standard State Designation Fee (Rule 13.1(a)(2)): for each designated State to which the Standard Fee System applies	[1] 30
2.3	Color Reproduction Fee (Rule 13.1(a)(i))	100
3.	*Changes in Ownership*	
3.1	Request for Recording Change in Ownership Fee (Rule 21.1(f))	100
4.	*Limitation of List of Goods and/or Services*	
4.1	Request for Recording of Limitation of the List of Goods and/or Services Fee (Rule 22.1(c))	100
5.	*Renewal*	
5.1	International Renewal Fee (Rule 23.3(a)(i)): irrespective of the number of designated States and of the number of classes	400
5.2	Renewal Surcharge (Rule 23.3(a)(i)): irrespective of the number of designated States and of the number of classes	200
5.3	* Standard State Renewal Fee (Rule 23.3(a)(ii)): for each designated State in which the Standard Fee System applies	[1] 30
5.4	Color Reproduction Fee (Rule 23.3(a)(i))	100

---

[1] Multiplied by the number of classes.

[Printed in Official Gazette, Feb. 20, 1973]

PATENT OFFICE NOTICES

Effect of One-Half Day Holiday on Jan. 19, 1973

By Executive Order 11696 of Jan. 17, 1973, President Nixon ordered that employees in Federal executive departments in the Washington, D.C. metropolitan area be excused from duty for one-half day on Friday, Jan. 19, 1973. He further ordered that the one-half day "shall be a holiday for the purposes of Executive Order 11582 (Feb. 11, 1971), 5 U.S.C. §§ 5546 and 6103(b), and any other statute so far as it relates to the pay and leave of employees of the United States."

Inquiry has been made as to whether Jan. 19, 1973, constitutes a "holiday within the District of Columbia" within the meaning of 35 U.S.C. 21, permitting actions due in the Patent Office on that date to be taken on Monday, Jan. 22, 1973.

It is the apparent intent of 35 U.S.C. 21 that, if the Patent Office is open for business during part of a day, that day is not a "holiday within the District of Columbia" within the meaning of the said statute. Accordingly, any action due in the Patent Office on January 19, 1973, must be taken on that day to be timely. The Patent Office will receive papers on Jan. 19, 1973, as usual and at the facilities provided on ordinary work days.

ROBERT GOTTSCHALK,
Commissioner of Patents.

Jan. 18, 1973.

Effect of Closing of Patent Office on Jan. 25, 1973

In view of the provisions of Executive Order 11700 issued Jan. 23, 1973 by President Nixon, providing for the closing of all Federal government agencies on Jan. 25, 1973, and for consideration of that day as falling within the provisions of 5 U.S.C. 6103(b), that day constitutes "a holiday within the District of Columbia" under the provisions of 35 U.S.C. 21. Any action due in the Patent Office on Jan. 25, 1973, is to be considered timely if taken on Jan. 26, 1973.

ROBERT GOTTSCHALK,
Commissioner of Patents.

Jan. 24, 1973.

Errata

Under Patent Notices published Nov. 28, 1972, at 904 O.G. 456, column 2, paragraph beginning with "3,147,906" is incorrect and is hereby cancelled in its entirety.

Under "Trademark Notices" published in 905 O.G. TM 126, first column, line 11, paragraph beginning with "Reg. No. 202,172" is in error and is hereby cancelled in its entirety. This suit does not involve Trademark Reg. No. 202,172, but does involve Design Patent 202,172.

Patent Suits

Notices under 35 U.S.C. 290; Patent Act of 1952

(D.C. Md.) Cleeton Patent No. 2,452,549 (250—36), for DOUBLE PULSE GENERATOR. *Held* claim 13 invalid. *Cleeton et al.* v. *Hewlett-Packard Co.*, 343 F. Supp. 1215, 173 USPQ 534.

(D.C. Md.) Kaehni et al. Patent No. 2,463,280 (88—1), for SPECTROSCOPIC GRATINGS. *Held* claims 1 and 4 not infringed. *Kaehni* v. *Diffraction Co.*, 342 F. Supp. 523, 173 USPQ 705.

(D.C. Md.) Cleeton Patent No. 2,471,413 (178—68), for PULSE CODE SIGNALLING SYSTEM. *Held* claim 13 invalid. *Cleeton et al.* v. *Hewlett-Packard Co.*, 343 F. Supp. 1215, 173 USPQ 534.

(C.A.N.Y.) Hoffman et al. Patent No. 2,614,916 (71—2.4), for AGRICULTURAL CHEMICAL COMPOSITIONS. *Held* claim 1 invalid and claim 7 valid and infringed. *Ansul Co.* v. *Uniroyal, Inc.*, 448 F.2d 872, 169 USPQ 759.

(D.C.N.J.) Keiser Patent No. 2,661,534 (30—248), for SHEARING DEVICES. *Held* claims 3 and 5 invalid. *Keiser* v. *J. Wiss & Sons Co.*, 340 F. Supp. 41, 173 USPQ 594.

(C.A. Fla.) Pohland Patent No. 2,728,779 (260—326.3), for PROPOXYPHENE HYDROCHLORIDE. *Held* claim 2 valid and infringed. *Eli Lilly & Co. Inc.* v. *Generix Drug Sales, Inc.*, 460 F. 2d 1096, 174 USPQ 65.

(C.A. Ill.) Heibel Patent No. 2,766,510 (29—25.42), for METHOD AND APPARATUS FOR MAKING CONDENSERS. *Held* claims 1, 3, 4, 5 and 6 invalid. *Erie Technological Products, Inc.* v. *Die Craft Metal Products, Inc.*, 461 F.2d 5, 173 USPQ 644.

(D.C. Mass.) Hincher Patent No. 2,841,056 (93—36), for MACHINE FOR FLARING EDGE OF STRIP OF CARDBOARD. *Held* invalid. *Custom Paper Products Co.* v. *Atlantic Paper Box Co.*, 340 F. Supp. 897, 173 USPQ 505.

(C.A. Tex.) Ramirez Patent No. 2,980,014 (99—353), for DOUGH PRODUCT PROCESSING MACHINE. *Held* invalid. *Ramirez* v. *Perez*, 457 F.2d 267, 173 USPQ 263.

(D.C.S.C.) Wildbolz et al. Patent No. 3,029,477 (19—.2), for AUTOMATIC CARDING PLANT. *Held* claims 1, 5, 6, 8 and 11 valid and infringed. *Maschinenfabrik Rieter A.G.* v. *Greenwood Mills et al.*, 340 F. Supp. 1103, 173 USPQ 605.

(C.A. Nev.) Hurford et al. Patent No. 3,072,982 (22—200), for METHOD OF PRODUCING SOUND. *Held* invalid. *Westinghouse Electric Corp.* v. *Titanium Metals Corp. of America*, 454 F.2d 515, 172 USPQ 194.

(C.A. Pa.) Spitz Patent No. 3,076,421 (110—18), for PROCESS FOR REMOVING ORGANIC INSULATION FROM SCRAP WIRE. *Held* valid and infringed. *Trio Process Corp.* v. *L. Goldstein's Sons, Inc.*, 461 F.2d 66, 174 USPQ 129.

(D.C.N.J.) Noznick et al. Patent No. 3,098,748 (99—118), for WHIPPING AND POWDERED SHORTENING COMPOSITION. *Held* claims 1–24 invalid and not infringed. *Kraftco Corp.* v. *Beatrice Foods Co.*, 342 F. Supp. 1361, 172 USPQ 465.

(C.A. Ga.) Rutkovsky et al. Patent No. 3,118,531 (198—38), for SYSTEM FOR CONVEYING AND DISPATCHING GARMENTS. *Held* claim 1 invalid. *Railex Corp.* v. *Speed Check Co.*, 457 F.2d 1040, 173 USPQ 513.

(C.A. Wis.) Wolf et al. Patent No. 3,169,612 (189—34), for OVERHEAD DOOR CONSTRUCTION. *Held* invalid. *Frantz Mfg. Co.* v. *Phenix Mfg. Co.*, 457 F.2d 314, 173 USPQ 266.

(D.C. Fla.) Gould Patent No. 3,216,038 (15—159), for METHOD OF TREATING CENTER OF POLYPROPYLENE BRISTLES. *Held* claims 1, 2, 3 and 5 invalid and not infringed. *Keystone Plastics, Inc.* v. *C & P Plastics, Inc.*, 340 F. Supp. 55, 173 USPQ 395.

(D.C. Del.) Seelig et al. Patent No. 3,257,230 (117—107.2), for DIFFUSION COATING OF METALS. *Held* invalid. *Chromaloy Am. Corp.* v. *Alloy Surfaces Co.*, 339 F. Supp. 859, 173 USPQ 295.

(C.A. Calif.) Pickering et al. Patent No. 3,266,015 (340—81), for PLASTIC BLINKER LIGHT. *Held* invalid. *Pickering* v. *Holman et al.*, 459 F.2d 403, 173 USPQ 583.

(C.A. Minn.) Alpana Patent No. 3,289,377 (52—656), for THERMALLY INSULATED FRAME. *Held* invalid. *Flour City Architectural Metals* v. *Alpana Aluminum Products, Inc.*, 454 F.2d 98, 172 USPQ 341.

(C.A. Calif.) Anderson Patent No. 3,290,586 (324—52), for OPEN CABLE PAIR LOCATOR. *Held* claims 1–5 invalid for obviousness. *Hewlett-Packard Co.* v. *Tel-Design, Inc.*, 460 F.2d 625, 174 USPQ 140.

(D.C. Pa.) Nairn et al. Patent No. 3,295,094 (156—79), for TEXTURED FOAM PROCESSES. *Held* claims 1–3, 5–9, 16, 21, 22, 26–30, 32, 55 and 62 valid and infringed. *Congoleum Industries, Inc.* v. *Armstrong Cork Company*, 339 F. Supp. 1036, 173 USPQ 147.

(D.C. Pa.) Nairn et al. Patent No. 3,293,108 (161—160), for TEXTURED FOAM PRODUCTS. *Held* claims 1–6, 11, 15–18, 20, 21, 25, 26, 28, 30, 33, 34 and 39 valid and infringed. *Id.*

(D.C.N.J.) Hall Patent No. 3,317,926 (4—172), for SWIMMING POOL OF PREFABRICATED CONSTRUCTION. *Held* claims 11, 12 and 15 invalid and not infringed. *Hall* v. *U.S. Fiber Plastics Corp.*, 341 F. Supp. 978, 172 USPQ 556.

(D.C. Fla.) Gould Patent No. 3,330,721 (161—175), for SYNTHETIC FILAMENTS. *Held* not infringed. *Keystone Plastics, Inc.* v. *C & P Plastics, Inc.*, 340 F. Supp. 55, 173 USPQ 395.

(D.C. Ill.) Grosholz et al. Patent No. 3,335,713 (128—1), for INFANT INCUBATOR. *Held* claims 13, 14 and 16 invalid. *Air-Shields, Inc. et al.* v. *Air Reduction Co., Inc.*, 331 F. Supp. 673, 169 USPQ 450.

(C.A. Pa.) Huffman Patent No. 3,382,280 (260—562), for CHEMICAL COMPOUND KNOWN AS 3,4-DICHLOROPROPIOANILIDE. *Held* invalid. *Monsanto Co.* v. *Rohm & Haas* Co., 456 F.2d 592, 172 USPQ 323.

(C.A. Minn.) Hadfield Patent No. 3,387,666 (172—20), for MACHINE COMBINING CUTTING AND ROLLING OF SOD. *Held* claim 3 invalid and not infringed. *Hadfield* v. *Ryan Equipment Co.*, 456 F.2d 1218, 173 USPQ 322.

(D.C. Colo.) Lear et al. Patent No. 3,400,227 (179—100.11), for COMBINED RADIO AND TAPE PLAYER. *Held* claims 1, 3, 4 and 5 valid and infringed. *Gates Learjet Corp.* v. *Magnasync Craig Corp.*, 339 F. Supp. 587, 173 USPQ 203.

(D.C. Colo.) Lear Patent No. 3,403,868 (242—55.19), for MAGNETIC TAPE CARTRIDGE SYSTEM. *Held* claim 12 valid and infringed. *Id.*

(D.C. Colo.) Lear et al. Patent No. 3,437,762 (179—100.2), for MULTI-TRACK CARTRIDGE PLAYER. *Held* valid and infringed. *Id.*

(D.C. Colo.) Lear Patent No. 3,560,126 (242—55.19), for MAGNETIC TAPE CARTRIDGE PLAYER SYSTEM. *Held* valid and claims 1, 2 and 3 infringed. *Id.*

(C.A. Wis.) Brainard et al. Reissue Patent No. 25,737 (29—568), for MACHINE TOOL WITH MECHANICAL CUTTING TOOL CHANGER. *Held* invalid (complaint dismissed). *Kearney & Trecker Corp.* v. *Giddings & Lewis, Inc.*, 452 F.2d 579, 171 USPQ 650.

(D.C. Tex.) Records Reissue Patent No. 26,220 (166—8), for METHOD AND APPARATUS FOR CONTROLLING ABNORMAL PRESSURE CONDITIONS. *Held* claims 4, 18, 20 and 21 valid but not infringed; claim 13 invalid. *Drilling Well Control, Inc.* v. *Dresser Industries, Inc.*, 340 F. Supp. 1266, 174 USPQ 222.

(D.C.N.Y.) Udin Reissue Patent No. 26,259 (160—161), for ADJUSTABLE WINDOW GRILLE. *Held* claims 1 and 2 invalid for obviousness. *Udin* v. *J. Kaufman Iron Works, Inc.*, 342 F. Supp. 1090, 173 USPQ 716.

(C.A. Fla.) Brose Reissue Patent No. 26,368 (152—370), for TIRE REPAIR INSERT. *Held* not infringed. *Brose* v. *Sears, Roebuck & Co.*, 455 F.2d 769, 172 USPQ 458.

(D.C.N.Y.) Jones Design Patent No. 203,491 (D83—12), for WALL MOUNTED MERCURY SPHYGMOMANOMETER. *Held invalid. W. A. Baum Co.* v. *Propper Mfg. Co.*, 343 F. Supp. 1016, 174 USPQ 22.

(C.A. Wis.) Wolf et al. Design Patent No. 194,094 (D13—1), for OVERHEAD GARAGE DOOR. *Held* invalid. *Frantz Mfg. Co.* v. *Phenix Mfg. Co.*, 457 F.2d 814, 173 USPQ 266.

Disclaimers

3,378,762.—*William J. Korchak*, Arlington, Tex. MULTIPLE FLUID DELIVERY SYSTEM WITH LIQUID AND GAS PURGING MEANS. Patent dated Mar. 19, 1968. Disclaimer filed June 26, 1972, by the assignee, *General Motors Corporation.*

Hereby enters this disclaimer to claims 1, 2 and 3 of said patent.

3,615,302.—*Robert A. Rowse*, Shrewsbury, and *Roy S. Nelson*, Sterling, Mass. THERMOSET-RESIN IMPREGNATED HIGH-SPEED VITREOUS GRINDING WHEEL. Patent dated Oct. 26, 1971. Disclaimer filed June 1, 1972, by the assignee, *Norton Company.*

Hereby enters this disclaimer to claims 1 through 6, inclusive, of said patent.

Dedications

2,755,148.—*Pierre Grouard* and *Maurice Courtiere*, Versailles, France. SUPPORTING DEVICE FOR A SHAFT OF A CENTRIFUGAL APPARATUS. Patent dated July 17, 1956. Dedication filed Nov. 27, 1972, by the assignee, *Societe Siderurgique de Granulation*, assenting.

Hereby dedicates to the Public the portion of the term of the patent subsequent to July 17, 1973.

3,283,800.—*Franz Ischinger*, Katharinenberg, *Georg Behrmann*, Katzwang, and *Karl Linzenkirchner*, Ingolstadt, Germany. WHEEL FOR PNEUMATIC TIRES. Patent dated Nov. 8, 1966. Dedication filed Nov. 29, 1972, by the assignee, *Zweirad Union AG.*

Hereby dedicates to the Public the portion of the term of the patent subsequent to Nov. 8, 1983.

3,483,070.—*Walter B. Kennedy*, Glens Falls and *Donald B. Wheeler*, Hudson Falls, N.Y. METHOD OF SANDING HONEYCOMB STRUCTURE AND THE SANDED ARTICLE. Patent dated Dec. 9, 1969. Dedication filed Dec. 20, 1972, by the assignee, *Union Camp Corporation.*

Hereby dedicates to the Public the entire remaining portion of the term of said patent.

3,511,208.—*Oscar C. Woodruff*, Shreveport, La. FISHING RIG. Patent dated May 12, 1970. Dedication filed Aug. 3, 1972, by the assignee, *Jamajo Industries, Inc.*

Hereby dedicates said patent to the Public for the entire remaining term thereof.

3,646,855.—*Paul Adolf Müller*, Herrliberg, Switzerland. METHOD AND APPARATUS FOR PRODUCING A TOBACCO FILTER ROD OR CORD FROM A WEB OF FIBROUS MATERIAL. Patent dated Mar. 7, 1972. Dedication filed Dec. 22, 1971, by the assignee, *Celfil Company Establishment.*

Hereby dedicates to the Public the portion of the term of the patent subsequent to Apr. 20, 1982.

Certificates of Correction for the Week of Feb. 20, 1973

3,454,623
3,489,307
3,489,750
3,565,247
3,583,112
3,583,252
3,592,583
3,602,778
3,610,537
3,614,549
3,617,718
3,626,504
3,627,381
3,627,722
3,630,130
3,630,792
3,631,476
3,631,154
3,633,283
3,634,389
3,634,441
3,635,819
3,639,336
3,641,948
3,642,677
3,643,591
3,645,096
3,652,222
3,662,673
3,663,472
3,667,201
3,668,984
3,670,162
3,671,150
3,671,577
3,671,662
3,674,936
3,675,168
3,676,269
3,676,452
3,677,416
3,678,045
3,678,781
3,679,431
3,681,077
3,681,190
3,681,958
3,682,254
3,682,771
3,682,938
3,682,952
3,682,996
3,683,023
3,683,210
3,683,417
3,684,337
3,684,766
3,685,557
3,685,872
3,685,895
3,686,129
3,686,189
3,686,878
3,687,337
3,687,847
3,687,895
3,687,910
3,688,037
3,688,796
3,689,394
3,689,596
3,689,709
3,689,748
3,690,315
3,690,426
3,690,554
3,691,132
3,691,150
3,691,283
3,691,354
3,691,760
3,692,141
3,692,298
3,692,741
3,692,767
3,692,895
3,692,942
3,692,980
3,693,160
3,693,238
3,693,315
3,693,353
3,693,378
3,693,538
3,693,572
3,693,785
3,693,904
3,694,015
3,694,076
3,694,158
3,694,283
3,694,308
3,694,480
3,694,887
3,694,949
3,695,022
3,695,250
3,695,152
3,695,654
3,695,659
3,695,692
3,695,800
3,696,109
3,696,184
3,696,331
3,696,340
3,696,352
3,696,362
3,696,686
3,696,698
3,697,120
3,697,319
3,697,499
3,698,296
3,698,459
3,698,478
3,699,054
3,699,061
3,699,064
3,699,684
3,700,148

PATENT EXAMINING CORPS

R. A. WAHL, Assistant Commissioner
WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF FEBRUARY 6, 1973

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—M. STERMAN, Director Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	12-16-71
GENERAL ORGANIC CHEMISTRY, GROUP 120—I. MARCUS, Director Heterocyclic; Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	12-12-71
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—L. J. BERCOVITZ, Director Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	8-18-71
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—A. P. KENT, Director Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	10-13-71
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—R. FRIEDMAN, Director Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	11-01-71
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—N. ANSHER, Director Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	6-14-72
SPECIAL LAWS ADMINISTRATION, GROUP 220—R. L. CAMPBELL, Director Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	5-31-72
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	4-03-72
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—L. FORMAN, Director Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	10-27-71
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—W. L. CARLSON, Director Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	12-27-71
DESIGNS, GROUP 290—R. L. CAMPBELL, Director Industrial Arts; Household, Personal and Fine Arts.	5-04-71
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—A. BERLIN, Director Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	3-01-72
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—D. J. STOCKING, Director Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus: Plastics Working Apparatus: Plastic Block and Earthenware Apparatus: Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	1-03-72
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—A. RUEGG, Director Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	3-03-72
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—M. M. NEWMAN, Director Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	3-06-72
MISCELLANEOUS CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—T. J. HICKEY, Director Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	10-26-71

Expiration of patents: The patents within the range of numbers indicated below expire during February 1973, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents	Numbers 2,733,439 to 2,736,897, inclusive
Plant Patents	Number 1,456

REISSUES

FEBRUARY 20, 1973

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

27,583
PROCESS FOR PREPARATION OF GELATINOUS MATERIAL FROM ANIMAL COLLAGEN

**Pierre Charier-Vadrot, 1 Route de Lagnes,
Cavillon, France**

No Drawing. Original No. 3,514,518, dated May 26, 1970, Ser. No. 691,726, Dec. 19, 1967. Application for reissue Oct. 14, 1971, Ser. No. 189,443
Claims priority, application France, Dec. 22, 1966, 88,514; Jan. 23, 1967, 92,145, 92,146; Germany, Apr. 27, 1967, C 42,146
Int. Cl. A23j *1/10;* **C08g** *1/06;* **C09h** *3/00*
U.S. Cl. 424—360 **10 Claims**

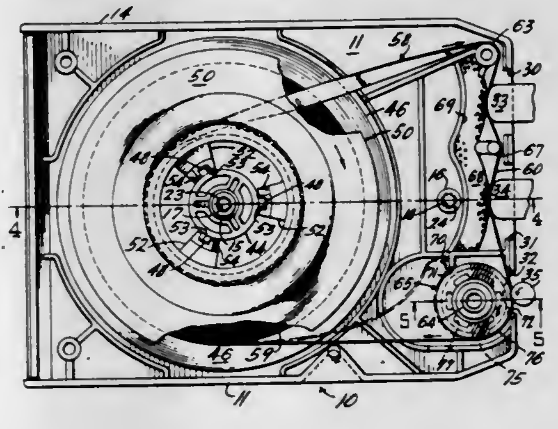
Gelatin and equivalent gelatinous products that are cold water soluble and heat resistant are prepared from a source material, such as animal collagen or marine or vegetable colloids, by subjecting the source material, either directly or following a pretreatment, to low temperature freezing followed by lyophilization. The lyophilization may be performed by radiant heating of the product to about 100° C.

27,584
TAPE CARTRIDGE

**Ralph E. Cousino, Glendale, Calif., assignor to
Orrtronics Inc., Perryburg, Ohio**

Original No. 3,420,463, dated Jan. 7, 1969, Ser. No. 608,151, Jan. 9, 1967. Application for reissue Dec. 10, 1970, Ser. No. 97,057
Int. Cl. B65h *17/48, 17/20*
U.S. Cl. 242—55.19 A **5 Claims**

An endless magnetic tape cartridge playable in all positions includes a tape spool having its upper plate removably locked to its hub. A pressure roller assembly mounted within the cartridge includes a hub having a plurality of spaced openings and a resilient roller covering mounted on the hub and seated within the hub openings. A stripper bar is mounted within the cartridge in opposed relationship to a non-conforming tape entranceway. A label is mounted over assembly screws connecting a cover and base comprising the housing, thereby providing a cartridge tamper indicator.



PLANT PATENTS

GRANTED FEBRUARY 20, 1970

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

3,306
MILKWEED PLANT

Barnell L. Cobia, 135 Temple Grove Drive,
Winter Garden, Fla. 32787
Filed May 18, 1971, Ser. No. 144,694
Int. Cl. A01h *5/00*

U.S. Cl. Plt.—88 **1 Claim**

A new and distinct plant variety of the milkweed family is principally distinguished from its antecedents and known related varieties by a growth habit providing specimens which have leaf blades that are characteristically curled transversely of the midrib, which have stems that in color are dominated by red, red-purple and yellow-red hues, which have petioles and peduncles that in color are dominated by relatively long lasting red and red-purple hues, which have leaf blades that are variegated in patterns normally identifiable with those of the *Hoya carnosa compacta* (cv) Marginalis variety and have a green center field which is characteristically overcast in color dominated by relatively long lasting red, red-purple and yellow-red hues with generally low value and low chroma and a surrounding albino border area that in color is dominated by relatively long lasting red-purple, red and yellow-red hues of generally higher value and chroma than encountered in the green center field, and which have an inflorescence with sepals and petals having attractive colors dominated by red-purple hues.

3,307
MILKWEED PLANT

Barnell L. Cobia, 135 Temple Grove Drive,
Winter Garden, Fla. 32787
Filed May 18, 1971, Ser. No. 144,691
Int. Cl. A01h *5/00*

U.S. Cl. Plt.—88 **1 Claim**

A new and distinct plant variety of the milkweed family has a loose growth habit providing specimens with stems and petioles with certain color characteristics, a wavy splotched and/or streaked variegated leaf blade with certain color characteristics involving relatively long lasting red-purple, red and/or yellow-red hues, and an inflorescence with mixtures of 5-merous and 4-merous type flowers that are frequently deformed and have streaks or splotches of color in the lower epidermal side of the petals.

3,308
APPLE TREE

Walter E. Runkel, 19368 Midway Ave.,
Southfield, Mich. 48075
Filed Apr. 9, 1971, Ser. No. 132,922
Int. Cl. A01h *5/03*

U.S. Cl. Plt.—34 **1 Claim**

1. A new and distinct variety of apple tree, substantially as herein shown and described, characterized particularly as to novelty by the unique and distinctive rich flavor of the fruit; and further characterized by the long keeping quality of the fruit in storage with no tendency to shrivel.

3,309
CHRYSANTHEMUM PLANT

Leonard H. Shoesmith, Westfield-Woking Surrey, England, assignor to Pan-American Plant Company, Chicago, Ill.
Filed June 4, 1971, Ser. No. 150,247
Int. Cl. A01h *5/00*

U.S. Cl. Plt.—77 **1 Claim**

A new variety of chrysanthemum plant having a standard incurved type of bloom of very large size and pure white color, with no undertones of other colors, and being photoperiodic responsive for year-around flowering. The new plant has a very vigorous growth and is particularly distinguished from other varieties by its capability of producing a very large and full sized flower on a reduced amount of growing time.

PATENTS

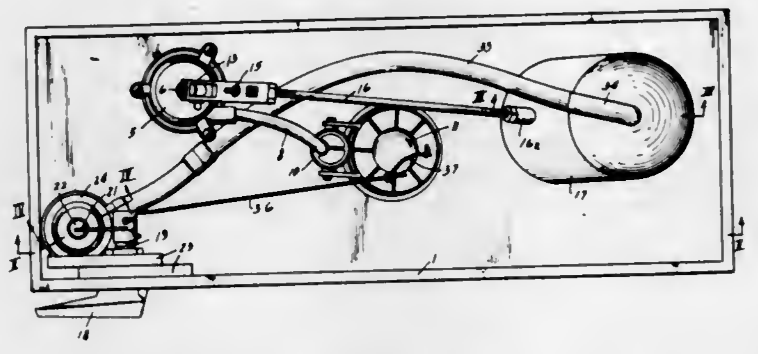
GRANTED FEBRUARY 20, 1970

GENERAL AND MECHANICAL

3,716,870
VALVE CONTROL MECHANISM

James A. Ducey, 607 W. Chestnut St., Robinson, Ill.
Filed Jan. 18, 1971, Ser. No. 107,115
Int. Cl. E03d *1/36*

U.S. Cl. 4—41 **4 Claims**

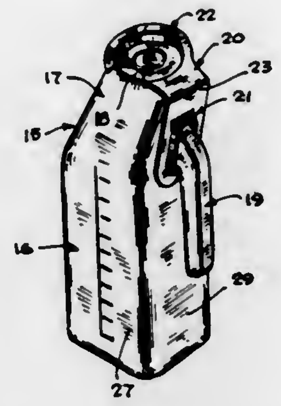


The invention herein disclosed relates to a valve control mechanism particularly designed for use with toilet flush tanks. This mechanism includes an open end cup type float, wherein air is compressed as the liquid level in which the open end of the float is immersed rises, together with means for releasing such compressed air to permit rapid dropping of the float and complete opening of a liquid supply valve controlled thereby.

3,716,871
DISPOSABLE URINAL

Anton G. Borse, Hinsdale, Ill., assignor to Borse Plastic Products Corporation, Hinsdale, Ill.
Filed Sept. 1, 1971, Ser. No. 176,840
Int. Cl. A47k *11/00;* **A61q** *9/00*

U.S. Cl. 4—110 **8 Claims**

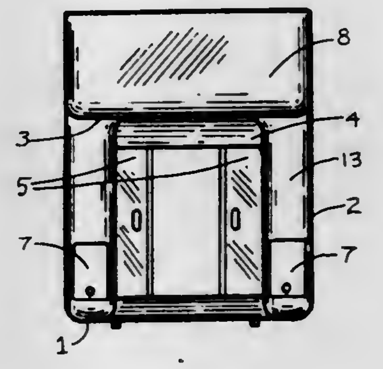


A disposable urinal made of plastic material which is blow-molded and includes an upstanding body with a neck portion at the upper end angularly related to the body and a handle portion integrally molded with the neck portion open at one end to facilitate hanging on a bed rail or the like. A cap that is separately molded is provided for locking relation to the handle and for closing the mouth of the neck selectively to form an odor shield.

3,716,872
TOILET COVER CHAIR

Simone Zieman, Carlsbad Springs, Ontario, Canada
Filed Aug. 19, 1971, Ser. No. 173,038
Int. Cl. A47k *17/00*

U.S. Cl. 4—1 **9 Claims**

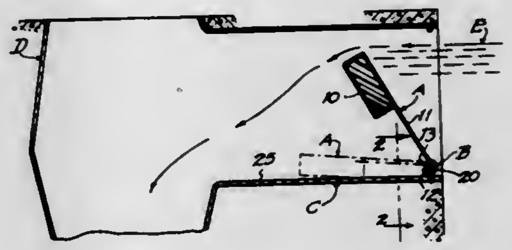


A chair which fits over the common toilet including the water box. The chair includes arms and a back. The seating portion of the chair has a closable opening. The chair when fitted over the toilet and water box hides the unsightly toilet and provides an attractive comfortable chair that can be used for sitting upon.

3,716,873
SWIMMING POOL SKIMMER WITH DEMOUNTABLE WEIR

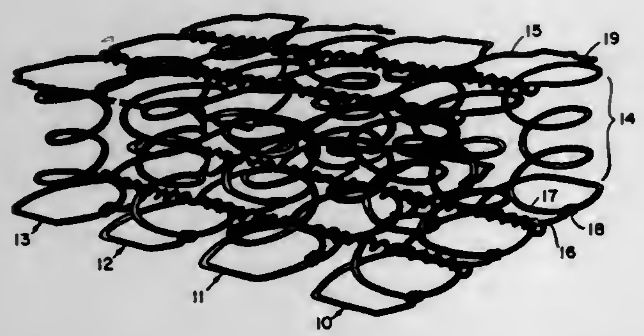
Paul R. Blum, Van Nuys, Calif., assignor to Marine Swimming Pool Equipment Co., North Hollywood, Calif.
Filed Dec. 3, 1971, Ser. No. 204,428
Int. Cl. E04h *3/16, 3/18*

U.S. Cl. 4—172.17 **4 Claims**



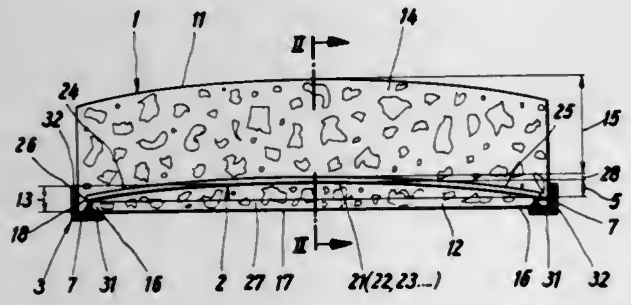
A weir of flexible, elastic sheet material having, along one margin thereof an integral open sleeve with a longitudinally extending gap narrower than the diameter of a pivot pin on which the weir is fulcrumed, is attached to the pin by pressing the margins of the gap against the pin to spring open the sleeve and receive the pin therewithin. The pin is a stiff but flexible tube which is mounted between opposed walls of a skimmer throat by flexing it to spring its ends into sockets in such walls.

3,716,874
DIFFERENTIALLY RESILIENT SPRING ASSEMBLY
Herbert J. Thomas, Jr., Holland, Mich., assignor to Holland Wire Products Inc., Holland, Mich.
Filed July 22, 1971, Ser. No. 165,161
Int. Cl. A47c *23/04, 25/00*
U.S. Cl. 5—260 **5 Claims**



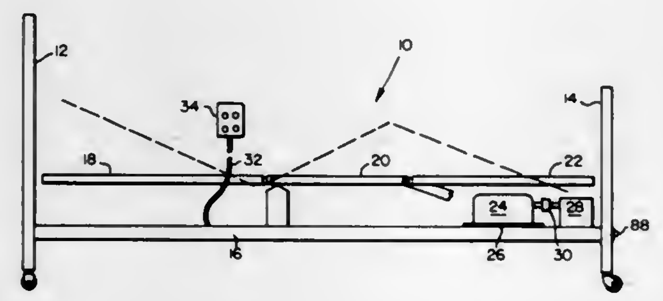
An assembly of coiled compression springs arranged side-by-side, with the opposite ends of the springs disposed in parallel planes. The ends of the springs at one of these planes are knotted, and the opposite ends are free (cantilever), except for essentially pivotal connections to adjacent spring elements. A mattress having such a spring assembly is covered by upholstery material, and is reversible to give two degrees of local softness.

3,716,875
THREE-DIMENSIONAL UPHOLSTERY ELEMENT
Norbert Fehr, Schaanwald, Liechtenstein, assignor to A. C. 1. Trust, Vaduz, Liechtenstein
Filed May 13, 1970, Ser. No. 48,629
Int. Cl. A47c *23/00*
U.S. Cl. 5—345 **5 Claims**



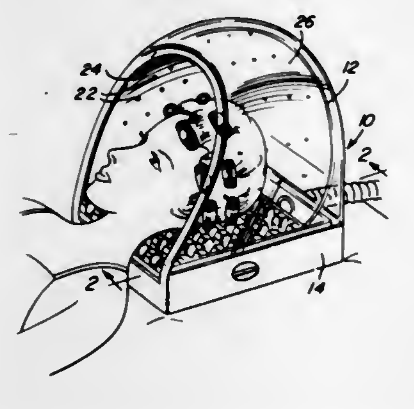
The upholstery element is adapted to provide a resiliently yielding support and comprises individual rod-shaped resilient inserts spaced apart in the direction of one dimension of the upholstery element and extending in said upholstery element in a longitudinal direction which is transverse to the direction in which they are spaced apart, connecting layers of foam disposed between said inserts and constituting the only connection between said inserts and adapted to take up forces which occur between the inserts, said connecting layers joining said inserts in a common composite body, and covering layers of foam adjoining said connecting layers and covering said inserts in those surface areas which are not covered by the connecting layers.

3,716,876
ACTUATION MEANS FOR AN ADJUSTABLE BED
Arthur P. Petzon, James M. Conway, and David E. Barth, all of Erie, N.Y., assignors to Sybron Corporation, Rochester, N.Y.
Filed May 20, 1971, Ser. No. 145,322
Int. Cl. A61g *7/00, 7/10*
U.S. Cl. 5—68 **6 Claims**



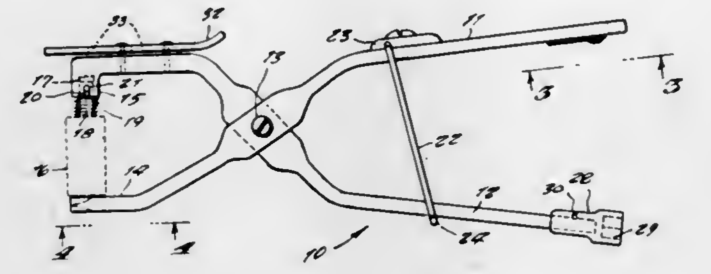
The invention involves the use of photocells to electrically isolate the control circuit of the adjustable bed from the motor drive circuit so that the person operating the hand held controller is isolated from the high voltage hazard of the drive circuit. The bed frame is not grounded but is maintained at a zero electrical potential and mechanical insulators are used to isolate the bed structure from the electric control and drive circuits and from earth ground. In addition, a monitoring light is used to indicate the presence of a correct grounding of the electrical components of the bed so that a broken or incorrect grounding situation is readily apparent.

3,716,877
RESILIENT HAIR DRYER CUSHION
Georgia E. Glintz, 2909 University Avenue, Des Moines, Iowa
Division of Ser. No. 18,558, March 11, 1970, Pat. No. 3,641,682. This application Dec. 8, 1971, Ser. No. 206,094
Int. Cl. A47g *9/00*
U.S. Cl. 5—338 **2 Claims**



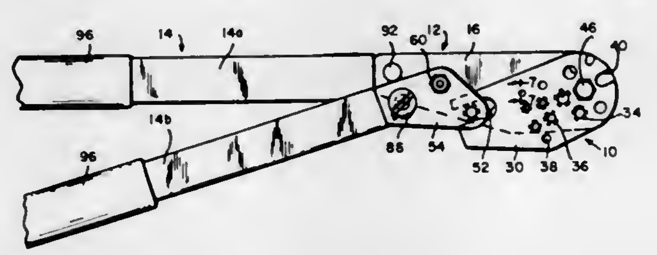
A head cushioning and hair drying facilitating cushion having waffle-like projections thereon. Facing sides of adjacent projections include free end portions which are divergent and adapted to cradle rollers on a person's head resting on the cushion. In addition, the cushion includes openings formed therethrough between adjacent projections for facilitating the passage of drying air to hair wound on hair rollers cradled between the outer ends of the projections.

3,716,878
CONDENSOR SPRING DEPRESSOR PLIERS
Carl E. Gross, Route No. 1, Hillcrest Addition, Hillsboro, Ill.
Filed Oct. 28, 1970, Ser. No. 84,728
Int. Cl. B25b *7/22, 27/14*
U.S. Cl. 7—5 **2 Claims**



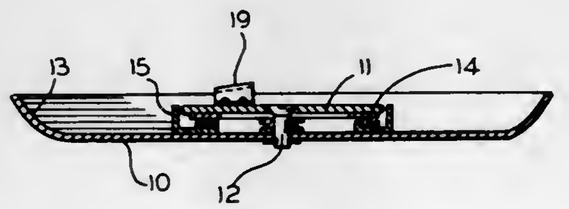
A pair of pliers for depressing condenser springs, the device comprising a pair of levers attached pivotly free at their centers, one ends of the levers forming jaws between which a condenser can be fitted, the tool further including a sparkplug guagel and a point guagel as well as an interchangeable socket head, an open wrench and screwdriver.

3,716,879
MANUALLY ACTUATABLE TOOL
Alfred Z. Boyajian, Manhattan Beach, Calif., assignor to Bayan, Limited, Nassau, Bahama Islands
Filed June 21, 1971, Ser. No. 155,026
Int. Cl. B25f *1/04*
U.S. Cl. 7—5.6 **10 Claims**



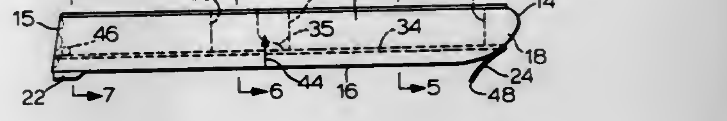
A tool for cutting or bending wires, rods, bolts and the like embodying as components shearing instrumentalities and bending instrumentalities operable by a common pair of pivotally connected rigid handles.

3,716,880
CIRCULAR WATER SKIS OR SURFBOARD
Hugh E. Sorenson, 3813–A N. 37th St., Milwaukee, Wis. 53264
Filed Sept. 25, 1970, Ser. No. 75,640
Int. Cl. A63c *15/00*
U.S. Cl. 9—310 G **1 Claim**



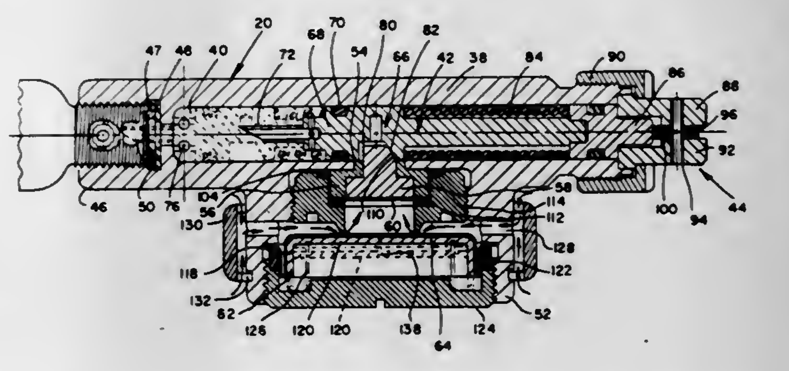
A saucer-shaped water ski includes a rotatable turntable for receiving and supporting the user's feet.

3,716,881
BUOYANT MANOEUVRABLE SKI
Paul Tilings, 7 Staghill Drive, Apt. 101, East York, Ontario, Canada
Filed May 13, 1971, Ser. No. 142,941
Int. Cl. A63c *15/00*
U.S. Cl. 9—310 D **17 Claims**



A buoyant manoeuvrable elongated ski of foam plastic material, having an upturned ski-nose at the front, and a flat, unobstructed bottom surface. A foot-well is provided in the top of the ski just to the rear of the mid-flotation point such that the flotation moment forwardly of the foot-well is from 10% to 30% greater than the flotation moment rearwardly thereof. The weight moment of the ski rearwardly of the foot-well is from 20% to 40% greater than the weight moment of the ski forwardly thereof. A resilient flipper is attached to the ski part-way up the ski-nose and extends downwardly and rearwardly from its point of attachment to the ski.

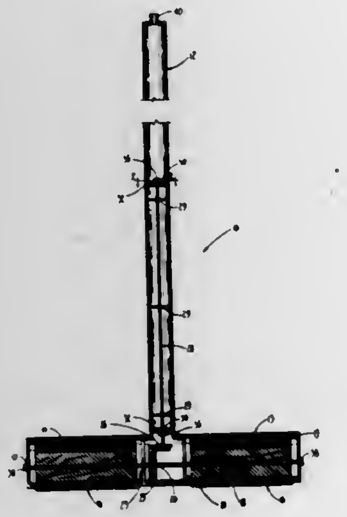
3,716,882
AUTOMATIC INFLATOR DEVICE FOR EXPANDABLE STRUCTURES
William J. Middleton, Jr., Felton, and Fred P. Snyder, Dover, Del., assignors to ILC Industries, Inc., Dover, Del.
Filed Aug. 5, 1970, Ser. No. 61,454
Int. Cl. B63c *9/24*
U.S. Cl. 9—314 **19 Claims**



An inflator device for releasing inflating material from a pressurized container to inflate a structure, that is actuated by hydrostatic pressure to effect dissolving of soluble triggering means to cause release of the inflating material when the device is immersed to a predetermined depth in water and method of inflating the device.

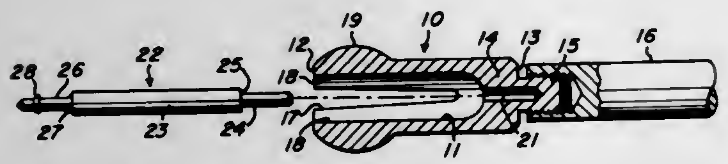
3,716,883
FLUID DRIVEN CLEANING IMPLEMENT FOR SWIMMING POOLS
Maurice Monroe, 1748 Sereno Place, Vallejo, Calif.
Filed Sept. 24, 1970, Ser. No. 75,031
Int. Cl. E04h *3/20;* **A47l** *5/00*
U.S. Cl. 15—1.7 **6 Claims**

A fluid driven implement for removing dirt and stains from the walls of a swimming pool is described, said implement having an inverted T-like configuration, comprising in part a horizontally disposed elongate brush housing having rear and side walls defining a semi-cylindric cavity, the opening defined by the walls of the housing lying in an essentially vertical plane, a hollow, elongate handle extending vertically from the rear wall of the housing, an opening in the rear wall affording an inlet to the handle interior, cylindric brushes longitudinally aligned within the semi-cylindric housing, and a water actuated turbine comprising a shaft and impeller assembly rotatably supported within the hollow handle, rotary motion of the turbine transmitted to the brushes through a right angle gear. An outlet at the end of the hollow handle is connected to the low pressure side of a water pump, whereby water adjacent the inlet to the handle is drawn therethrough to drive the turbine.



3,716,884
GUN BORE CLEANING IMPLEMENT

Ramon E. Lavins, 220 East Beechwood Avenue, Dayton, Ohio
Filed March 29, 1971, Ser. No. 128,806
Int. Cl. F41f *17/14*
U.S. Cl. 15—104.16 12 Claims

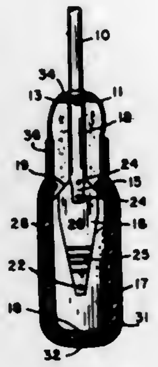


A rod tip member for use in gun bore cleaning and the like in which the tip is comprised of a tubular body member of such split construction as to be inherently resilient and formed with an external bulbous portion for wiping contact with a bore wall. A pin is seated at one end within the body member and projects axially thereof at its other end for penetration of reduced diameters and for cooperative engagement with a cleaning patch.

3,716,885
CURLING BROOMS

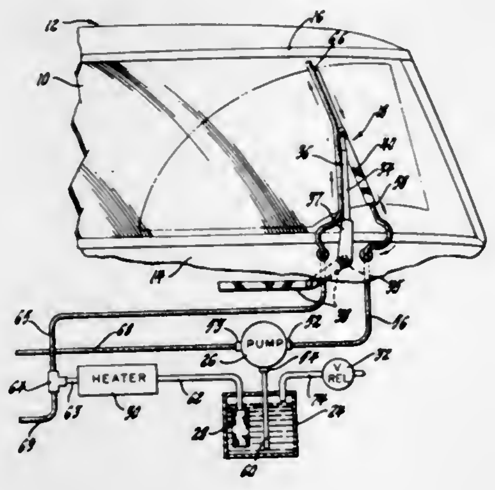
Albert N. Thompson, 93 Fontainer Crescent, Windsor Park, Winnipeg 6, Manitoba, Canada
Filed Nov. 3, 1970, Ser. No. 86,459
Int. Cl. A47l *13/16;* **A63b** *67/14*
U.S. Cl. 15—210 R 2 Claims

A curling broom presenting a handle having the lower end reinforced by a tubing which forms an extension to the upper end of a laminated fabric paddle; a ring carried by the tubing; said paddle comprising a central plate which is outer reinforced by tapered overlays that are weakened at selected locations for paddle flexibility; said paddle enclosed by synthetic foam for free paddle movement, noise absorption and enlargement of the broom; a napped sock enveloped over the above parts and upper secured to said ring by a draw string; and a frictional sleeve over the upper part of the sock to compress the synthetic foam around the tubing.



3,716,886
WINDSHIELD CLEANER SYSTEM

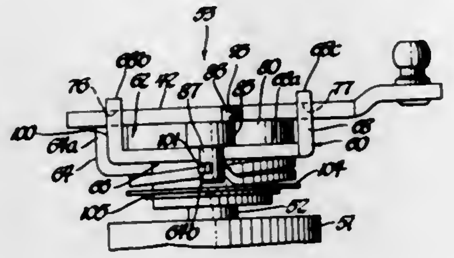
Edward D. Klomp, Mt. Clemens, Mich., assignor to General Motors Corporation, Detroit, Mich.
Filed March 29, 1971, Ser. No. 128,908
Int. Cl. B60s *1/48*
U.S. Cl. 15—250.04 2 Claims



In a preferred form, this disclosure relates to a windshield cleaning system wherein washer fluid is continuously circulated by a pump from a reservoir through a flexible wiper blade and back to the reservoir. The wiper blade is mounted for oscillating movement across the outer surface of the windshield and has a passage therethrough in communication with the other surface of the windshield through which the washer fluid continuously circulates. The wiper blade has lip portions which engage the outer surface for wiping the same end for substantially preventing leakage of the washer fluid circulating through the passage between the wiper blade and the windshield. The windshield is cleaned by virtue of the continuously circulating cleaning fluid and the engagement of the wiper blade moving thereacross.

3,716,887
WINDSHIELD WIPER SYSTEM

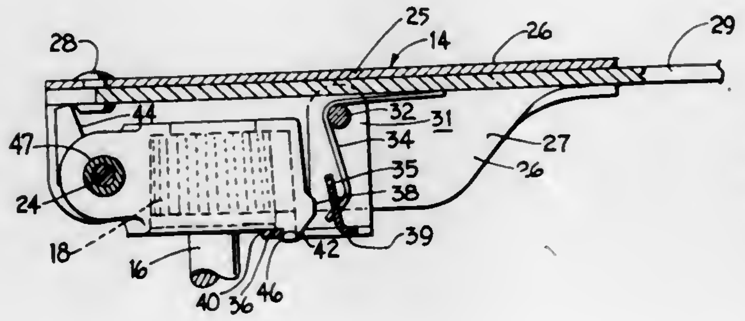
James D. Bellware, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.
Filed Aug. 26, 1971, Ser. No. 175,176
Int. Cl. B60s *1/24*
U.S. Cl. 15—250.17 2 Claims



In a preferred form, this disclosure relates to a windshield wiping apparatus having a pair of oscillatable windshield wipers. a pair of oscillatable drive pivots to which the wipers are drivingly connected, a drive mechanism having a rotatable output shaft and a yieldable force transmitting means for connecting the output shaft to a crank arm and a drive transmission or linkage operatively connected with the crank arm and the drive pivot for oscillating the same to oscillate the wipers. The drive mechanism is operable to rotate the crank arm through the yieldable force transmitting means through a first orbit of a given radius during running operation and is operable to eccentrically move the rotatable output shaft to increase the throw of the crank arm to effect movement of the wipers from their inboard position toward a depressed park position when wiper operation is being terminated. The yieldable force transmitting means is operable to allow the crank arm to remain stationary and the output shaft to be eccentrically shifted and trip a park switch upon the wipers encountering an obstruction which creates a back force in excess of a predetermined magnitude upon being moved from their inboard position toward their park position.

3,716,888
WINDSHIELD WIPER ARM

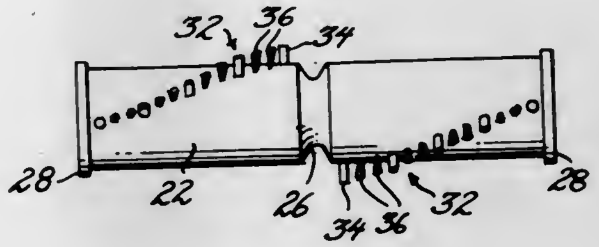
William C. Riester, Williamsville, N.Y., assignor to Trico Products Corporation, Buffalo, N.Y.
Filed Aug. 26, 1971, Ser. No. 175,277
Int. Cl. B60s *1/02*
U.S. Cl. 15—250.34 8 Claims



A windshield wiper arm assembly includes a retainer for housing and journaling a pivotally mounted wiper arm mounting head and also for supporting a cantilever type self-biasing arm extension member. A spring latch member releasably retains the mounting head fixed with respect to the retainer and also functions to secure the mounting head in position on the driving burr and pivot shaft assembly in a positive operative position.

3,716,889
VACUUM CLEANER

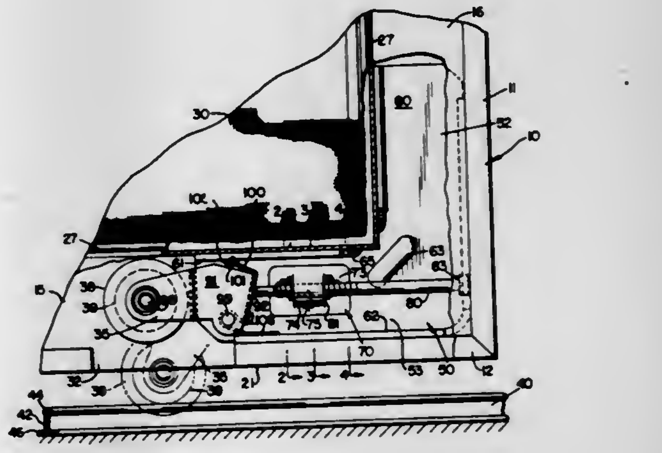
Albert H. Goldstein, Bal Harbour, Fla., assignor to Wallace Leisure Products, Inc., Philadelphia, Pa.
Filed Oct. 12, 1970, Ser. No. 79,851
Int. Cl. A47l *5/00*
U.S. Cl. 15—366 6 Claims



A vacuum cleaner having an agitator in the form of a cylindrical element with a plurality of rigid agitator elements projecting radially outwardly therefrom. A second form of the invention has agitator elements comprised of resilient material disposed intermediate the rigid agitator elements.

3,716,890
CORNER BRACKET AND ROLLER ASSEMBLY FOR SLIDING DOORS

Henry E. Benson, Hialeah, Fla., assignor to Warren Industries, Division of the Celotex Corporation, Hialeah, Fla.
Filed May 22, 1972, Ser. No. 255,393
Int. Cl. A47h *15/00*
U.S. Cl. 16—91 10 Claims

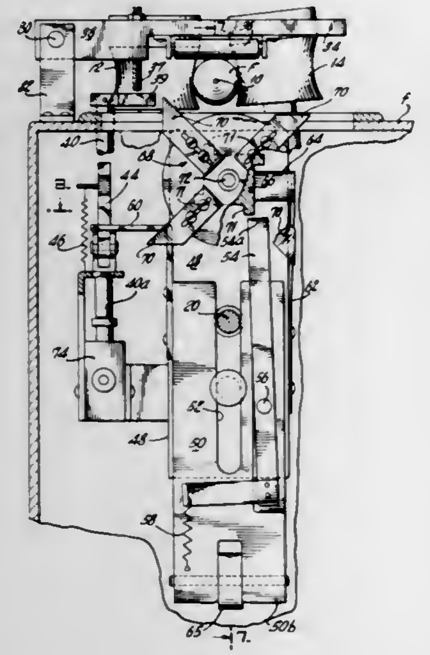


A sliding door roller assembly comprising a unitary pressformed L-shaped corner bracket having a pivotal roller carriage with an outwardly biased detent engageable in a groove in a flange of the corner bracket.

3,716,891
FRANKFURTER SEPARATOR MECHANISM WITH CUTTER SENSOR DEVICE

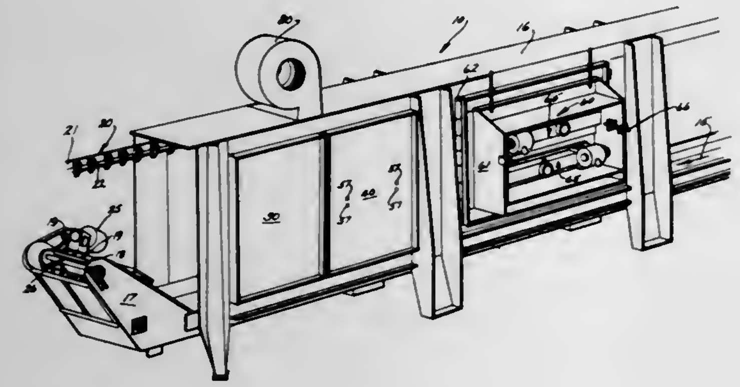
Douglas M. Demarest, Port Washington, N.Y., assignor to Linker Machines, Inc., Newark, N.J.
Filed Feb. 12, 1970, Ser. No. 10,765
Int. Cl. A22c *11/00*
U.S. Cl. 17—1 F 6 Claims

A mechanism for a frankfurter, sausage or the like assembly line in which a device automatically senses the ligature between adjacent frankfurters, and the ligature is also stretched for cutting purposes. Thereafter, an assembly maintains the power on the rotating knife so that a clean cut of the ligature is made and the sensor released for indicating the position of the following ligature for severing the same.



3,716,892
METHOD AND APPARATUS FOR PROCESSING POULTRY

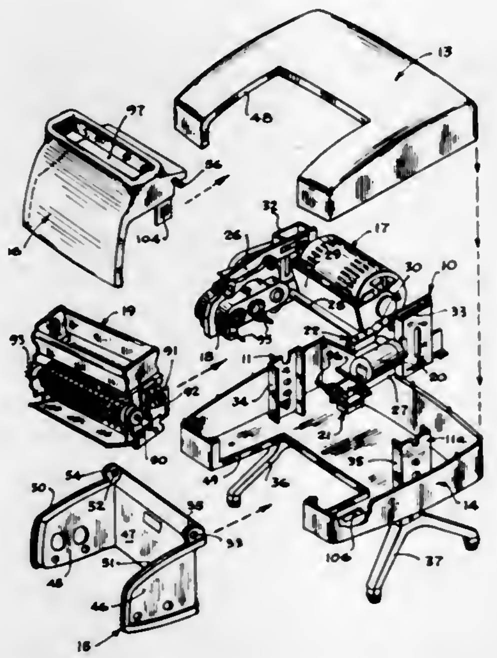
Wayne G. Miles, and Edward J. Crane, both of Ottumwa, Iowa, assignors to International Agri-Systems, Inc., Ottumwa, Iowa
Continuation-in-part of Ser. No. 9,151, Feb. 6, 1970, abandoned. This application Oct. 19, 1970, Ser. No. 81,820
Int. Cl. A22c *21/02*
U.S. Cl. 17—11 **50 Claims**



A poultry processing apparatus and method wherein the poultry are continuously conveyed through an elongated enclosure. The environmental air within at least portions of the enclosure is kept at predetermined temperature and humidity conditions so as to effect scalding of the fowl within the enclosure without immersing them in a liquid bath. Means are provided within the enclosure for spraying the fowl with a liquid scalding solution and picking the feathers therefrom. The feathers are carried away by a liquid-filled trough in the bottom of the enclosure.

3,716,893
MEAT TENDERIZER

Francis H. Vogelsang, Laporte, Ind., assignor to Maatschappij Van Berkel's Patent, N.V., Rotterdam, Netherlands
Filed April 14, 1971, Ser. No. 133,838
Int. Cl. A22c *09/00*
U.S. Cl. 17—26 **6 Claims**



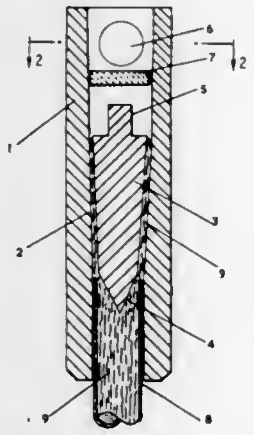
Meat tenderizer including a U-shaped frame with operating elements mounted thereon and enclosed by a U-shaped housing. The operating elements include a reduction gear box having three shafts, one input and two outputs. A knife frame assembly having knife blade assemblies is supported directly on said gear box to assure proper alignment with clutch members of the gear box and knife blade assemblies. The housing includes a cover enclosing the knife frame assembly and having a magnet thereon coacting with a magnet in the housing to operate a proximity switch and prevent running of the tenderizer when the cover is displaced from closed position.

ERRATUM

For Class 24—68 see:
Patent No. 3,716,985

3,716,894
ROPE FITTINGS

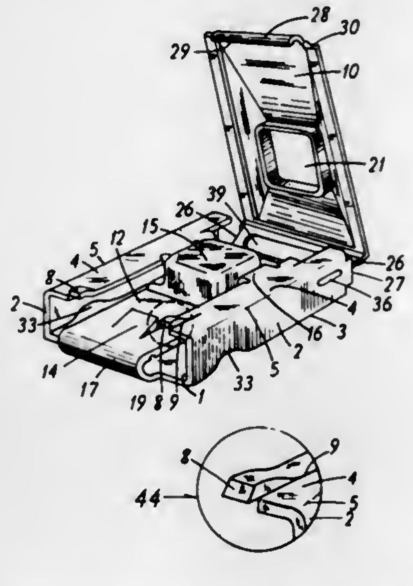
Derek Kingston, and Frank Nattrass, both of Harrogate, England, assignors to Imperial Chemical Industries Limited, London, England
Filed Jan. 5, 1971, Ser. No. 104,072
Int. Cl. F16g *11/04*
U.S. Cl. 24—126 L **8 Claims**



Simplified means for terminating fiber ropes comprising a conical member and a tapered socket therefor, the taper of each being such as to produce substantially constant annular area therebetween equal to the total cross-sectional area of the rope and the cone angle of the conical member being less than the natural angle of friction between the member and the rope fibers.

3,716,895
UNITARY SEAT BELT BUCKLE

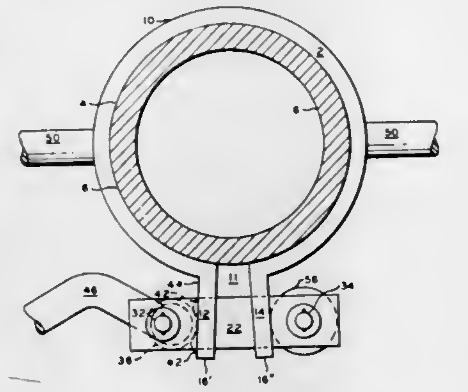
Thomas E. Fohr, Warren, Mich., assignor to Allied Chemical Corporation, New York, N.Y.
Filed Oct. 27, 1971, Ser. No. 193,084
Int. Cl. A44f *11/26*
U.S. Cl. 24—230 SL **40 Claims**



A unitary seat belt buckle fabricated from a single blank to include in one single piece all the required elements such as a housing, an opening and guides for inserting an apertured tongue, a latch, biased for locking engagement with the tongue, which latch can be urged to the unlocked position by a push button, a cover to the housing providing access to the push button and means for attaching a belt.

3,716,896
ECCENTRICALLY LOCKING APPARATUS HOLDER

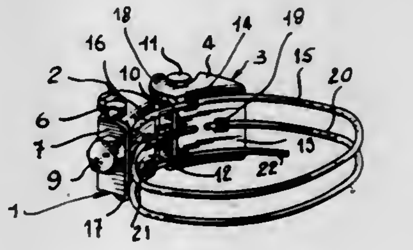
Ed. O. Seabourn, Stavanger, Norway, and Lonnie E. Gatlin, Victoria, Tex., assignors to Phillips Petroleum Company
Filed Oct. 28, 1971, Ser. No. 193,258
Int. Cl. A44b *21/00;* **F16l** *55/16*
U.S. Cl. 24—257 **10 Claims**



An eccentrically locking apparatus holder for attachment of a body thereof about a pipe, said apparatus having first and second flanges, a cam surface, and a rotatable eccentric bushing for movement of the bushing along the cam surface for urging the flanges toward one another and forcibly clamping the body about the pipe. At least one holding member is fixedly attached to the body for maintaining associated apparatus positioned relative to the pipe.

3,716,897
TIGHTENING COLLAR

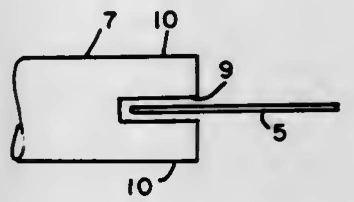
Georges Renaud, Nogent-sur-Marne, France, assignor to Louis Claude Weydert, Rueil-Malmaison, France
Filed Feb. 14, 1972, Ser. No. 226,081
Claims priority, application France, Feb. 16, 1971, 2,105,129
Int. Cl. B65d *63/02*
U.S. Cl. 24—283 **7 Claims**



A clamping device particularly suited for use with tubes having a helical reinforcement member embedded therein. The device is characterized by a pair of tube engaging wires or wire-cable combinations each of which encompasses in excess of one turn of a helix, these tube engaging elements cooperating to form a substantially continuous means for engaging a tube along a length exceeding two full turns of the reinforcement member.

3,716,898
LAMP HAVING IMPROVED PRESS SEAL

John W. Anderson, Danvers, Mass., assignor to Sylvania Electric Products Inc.
Original application Aug. 28, 1970, Ser. No. 67,699. Divided and this application Aug. 26, 1971, Ser. No. 175,306
Int. Cl. H01j *9/18*
U.S. Cl. 29—25.13 **4 Claims**

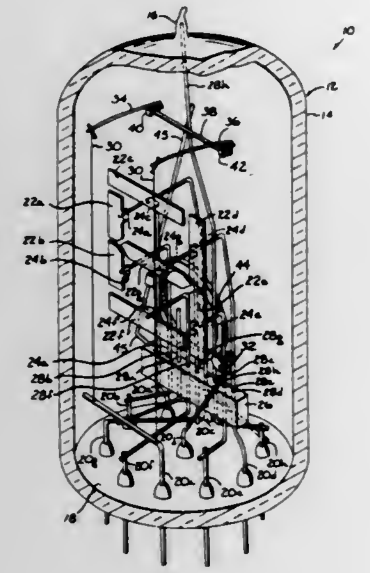


A thin refractory metal ribbon is completely embedded in the press seal of a high silica glass lamp envelope. One end of the ribbon is securely held within a longitudinal slot of a lamp lead-in wire, thereby establishing physical and electical connection between the ribbon and the lead-in wire.

3,716,899
VACUUM TUBE READOUT DEVICE HAVING RUGGEDIZED INTERNAL ELECTRODE STRUCTURE AND METHOD OF MAKING SAME

Donald R. Kerstetter, and Harold D. Losey, both of Emporium, Pa., assignors to Sylvania Electric Products Inc.
Division of Ser. No. 82,705, Oct. 21, 1970. This application Oct. 13, 1971, Ser. No. 188,977
Int. Cl. H01j *9/00*
U.S. Cl. 29—25.14 **3 Claims**

A numeric readout display utilizing segmented phosphor coated anodes for the presentation of information. The internal mount structure is ruggedized by providing an insulating and lead-spacing glass support therein. Additionally, a novel method of assembly includes making segmented anodes as a one-piece, integral structure, attaching this unit to the leads extending from the lead-spacing glass support and subsequently cutting apart the anode unit to form the segments and applying phosphor thereto.



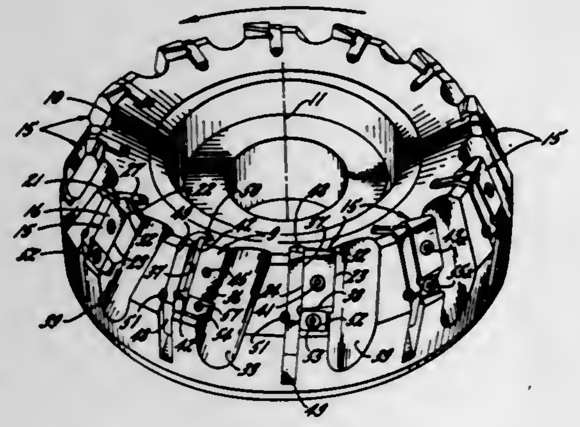
3,716,900
INDEXABLE CUTTING INSERT AND HOLDER THEREFOR

Donald S. Erkfritz, Rockford, Ill., assignor to The Ingersoll Milling Machine Company, Rockford, Ill.

Division of Ser. No. 67,949, Aug. 28, 1970. This application Feb. 25, 1972, Ser. No. 229,436

Int. Cl. B26d *1/12*

U.S. Cl. 29—105 A **3 Claims**



Rectangular blocks or inserts of cutting material having a center hole are secured by conically headed screws in peripheral pockets in the rotary body of a face milling cutter and are adapted for selective indexing about the screw axis into a plurality of cutting positions. One of the abutments defining each indexed position of the insert is itself mounted for indexing about its central axis and is locked in place by a conically headed screw which crowds the abutment against the cutter body.

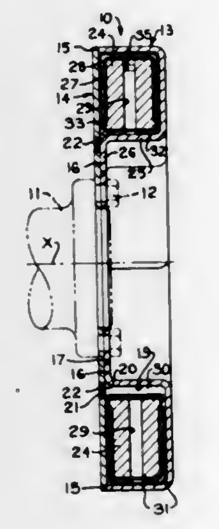
3,716,901
METHOD FOR MAKING A TORSIONAL VIBRATION DAMPER

Gary O. Bragg; Russel F. Bahr, and Shellie O. Williamson, all of Peoria, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed May 24, 1971, Ser. No. 146,257

Int. Cl. B21d *53/10*; **B23p** *19/00, 17/00*

U.S. Cl. 29—149.5 NM **5 Claims**



A fluidized bed coating method is used to cover the weight of a torsional vibration damper with a thin coating of a bearing material, such as nylon. Thereafter, the weight is rotatably mounted in a housing which is filled with a viscous damping fluid.

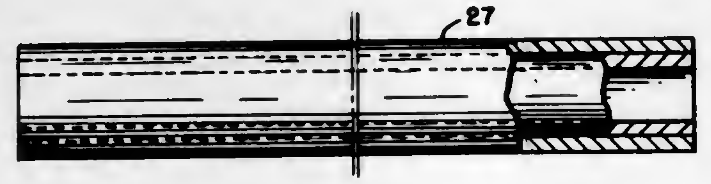
3,716,902
METHOD OF MAKING A COMPOSITE WELDING TORCH TIP

Harry T. Pearce, Altoona, Pa., assignor to Small Tube Products, Inc., Altoona, Pa.

Filed Feb. 18, 1970, Ser. No. 12,223

Int. Cl. B23p *15/26, 17/00*

U.S. Cl. 29—157 C **5 Claims**



Welding torch tips and cutting torch tips made from drawn copper tubing instead of conventional copper rod with its expensive drilled-out holes.

A torch tip comprising an inner copper tube having a desired inner diameter, an outer copper tube drawn onto the inner tube and drawn to a desired outer diameter to form a combined tube, a nozzle formed on one end of the combined tube, and threads formed on the other end for attachment to a torch. The wall of the inner tube is thinner than the wall of the outside tube. If the torch tip is to be used for cutting, a plurality of radially spaced flutes are formed in the inner surface of the outer tube. If the torch tip is to be used for welding, the inner tube may be made of a lead-brass alloy that is resistant to wear of the welding wire passing therethrough.

A method of making a torch tip comprising the steps of taking an inner seamless copper tube, drawing said inner tube to a desired inner and outer diameter, cutting said inner tube into sections and annealing them, drawing said inner sections to desired inner and outer diameter, taking an outer tube, drawing said outer tube to a desired outer and inner diameter, cutting said outer tube into sections and annealing them, inserting an inner tube section into an outer tube section, drawing the tube sections together into a combined tube section, trimming and straightening the combined tube sections, cutting the combined sections to tip-length units, swaging one end of each tip unit into a cone shape to form a nozzle, and threading the other end of each tip unit to adapt it for attachment to a torch. If the torch tip is to be used for cutting, the method includes the step of forming a plurality of inner flutes on the inner surface of the outer tube during the drawing operation before insertion therein of the inner tube.

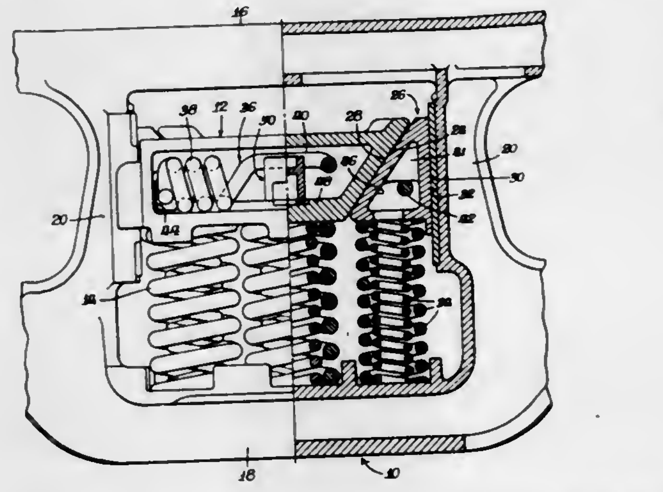
3,716,903
PROCESS FOR ASSEMBLING A SNUBBING ARRANGEMENT IN A RAILWAY TRUCK

Carl E. Tack, Elmhurst, Ill., assignor to Amsted Industries Incorporated, Chicago, Ill.

Continuation-in-part of Ser. No. 736,420, June 12, 1968, Pat. No. 3,575,117. This application Jan. 4, 1971, Ser. No. 103,424

Int. Cl. B21f *35/00*; **B23p** *13/00*

U.S. Cl. 29—173 **5 Claims**



A process for assembling a snubbing arrangement in a railway truck where the truck includes a bolster interconnecting a pair of side frames and a pair of friction shoes in inclined bolster pockets at each end of the bolster and cooperating with vertical surfaces in each side frame. The process includes the steps of assembling the friction shoes in the bolster pockets, inserting a torsional spring means in an unstressed condition into the bolster with a central portion engaging the bolster and end portions engaging the friction shoes, inserting the bolster, spring means and friction shoes into the respective side frame, and imparting a constant load on the spring means by urging the central portion away from the bolster so as to urge the friction shoes upwardly into the pockets and outwardly into snubbing engagement with the vertical surfaces of the side frame.

3,716,904
COAXIAL STAKE FOR HIGH FREQUENCY CABLE TERMINATION

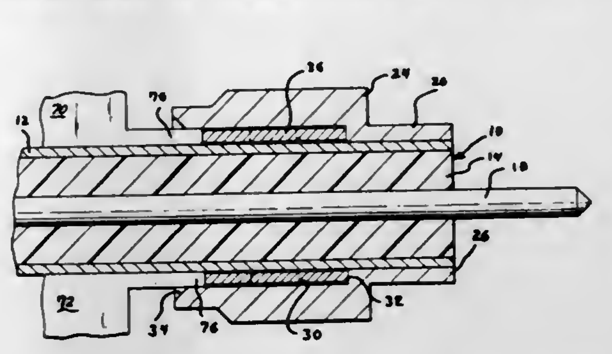
George W. Ziegler, Jr., Carlisle, Pa., assignor to AMP Domestic Inc.

Original application Dec. 11, 1967, Ser. No. 689,649, now Patent No. 3,533,051. Divided and this application June 5, 1970, Ser. No. 57,393

Int. Cl. H01r *7/06*

U.S. Cl. 29—203 H **6 Claims**

A connector and method of connection for high frequency coaxial cable is disclosed featuring a soft ferrule driven by dies to expand inwardly and outwardly as it is compressed axially through inelastic deformation to develop hoop stresses in a center tubular portion of a connector and in the outer conductor of the cable. The length and thickness dimensions of the ferrule relative to the diameter of the cable outer conductor are controlled to provide a broad area of contact between the stressed elements to provide a permanent sealed termination with minimized cable deformation. The connector structure is arranged to facilitate a ready measurement of the extent of ferrule deformation to ascertain proper installation.



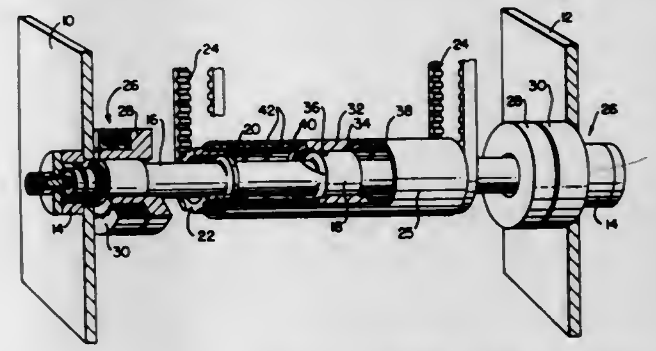
3,716,905
METHOD OF MAKING CONNECTION BETWEEN A PRINTING DRUM AND TORSION SHAFT

Melvin A. Soderstrom, Dayton, Ohio, assignor to The National Cash Register Company, Dayton, Ohio

Division of Ser. No. 763,118, Sept. 27, 1968, Pat. No. 3,556,003. This application Sept. 18, 1970, Ser. No. 73,644

Int. Cl. B23p *11/02*

U.S. Cl. 29—447 **4 Claims**



A printing drum is connected to a shaft in such a manner as to withstand the severe stresses created in the connection therebetween when the drum is operated in a mode of intermittent rotary motion. A hardened external contacting surface on the shaft is plated with a layer of copper, and a hardened internal contacting surface on the drum is shrink-fitted on said external contacting surface to form said connection.

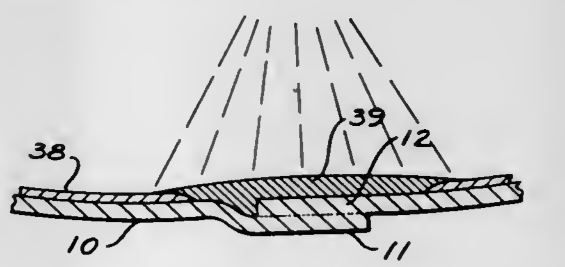
3,716,906
METHOD OF MAKING FOOD CONTAINERS

Thomas D. Troughton, Richmond, Calif., assignor to Rheem Manufacturing Company, Richmond, Calif., New York, N.Y.

Filed April 6, 1970, Ser. No. 25,637

Int. Cl. B23k *11/00*

U.S. Cl. 29—460 **13 Claims**



A method of making tin lines drums and other large containers adapted for use in storing and shipping food products. The method is particularly concerned with making the shell or body tube for such container, and utilizes as the starting material a flat metal sheet plated along at least one side with a layer of tin. The plated sheet is formed into a tube having overlapped longitudinal edges which are then seam welded to each other from end to end thereof. Finally, the welded seam and surface portions bordering the same along the interior of the shell are sprayed with molten tin which is reflowed after impact with the shell because the temperature thereof along the sprayed band is maintained at a value above the melting temperature of the tin by utilizing for this purpose a component of the residual heat from the seam welding process.

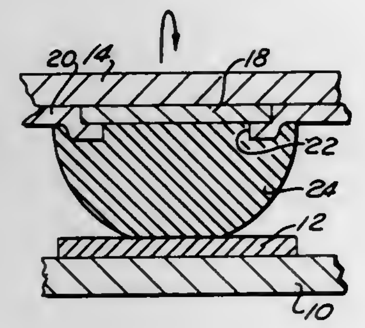
3,716,907
METHOD OF FABRICATION OF SEMICONDUCTOR DEVICE PACKAGE

Charles Ernest Anderson, Melbourne Beach, Fla., assignor to Harris-Intertype Corporation, Wilmington, Del.

Filed Nov. 20, 1970, Ser. No. 91,311

Int. Cl. B23k *1/20*

U.S. Cl. 29—470.9 **6 Claims**



Method of electrically interconnecting two electrical components, e.g. a semiconductor chip and a substrate, via contacts formed of aluminum, gold or silver by joining the contacts with a body of metal containing germanium and the same metal from which the contacts are formed, and heating the body of metal to the melting temperature of the eutectic alloy formed between germanium and the alloy.

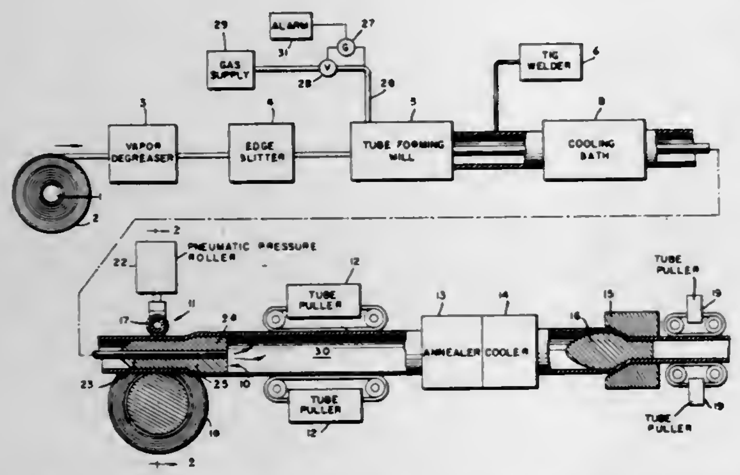
3,716,908
METHOD FOR WELDING

Douglas W. Rowell, North Woodbury, Conn., assignor to Anaconda American Brass Company

Division of Ser. No. 826,198, May 20, 1969. This application Sept. 27, 1971, Ser. No. 184,163

Int. Cl. B23k *31/02*

U.S. Cl. 29—477.7 **5 Claims**



A method and apparatus for the continuous production of welded tube from a continuous length of strip material wherein the welded seam is cold worked and wherein the physical nature of the welded seam is continuously monitored to insure that a proper weld is produced is described herein.

3,716,909
IMPROVED METHOD OF SOLDERING

Jr. Stokes, Murrysville; Robert A. Cargnel, Export, and Robert C. Geiger, Lower Burell, both of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 71,281, Sept. 10, 1970, abandoned. This application April 13, 1972, Ser. No. 243,841

Int. Cl. B23k *31/02, 35/24*

U.S. Cl. 29—504 **13 Claims**

An improved soldering alloy for soldered joints comprising one or more aluminum members has a base containing lead and bismuth to which is added a small amount of silver or indium. The solder alloy has a low melting point of typically less than 480°F together with very good corrosion resistance. The alloy can also contain relatively small amounts of tin, zinc and antimony.

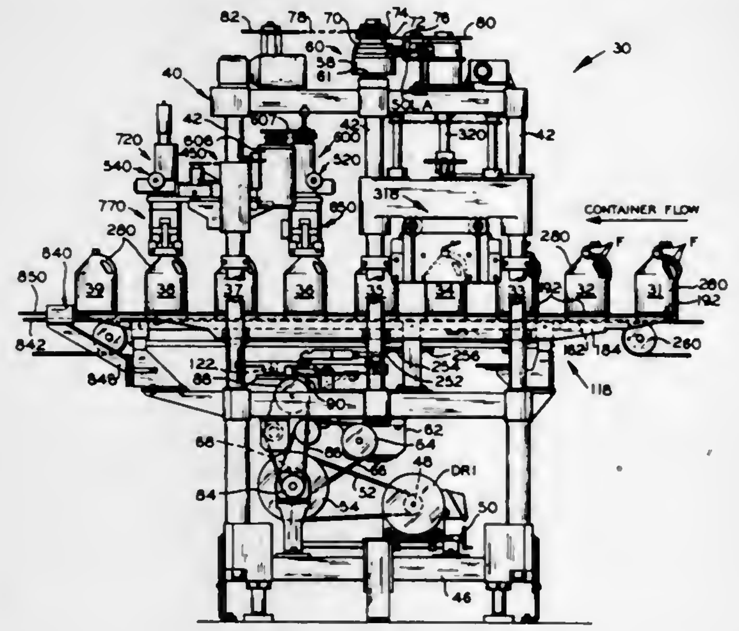
3,716,910
MOLDED PLASTIC CONTAINER SECONDARY OPERATIONS MACHINE

Noel B. Eggert, Toledo, Ohio, assignor to Owens-Illinois, Inc.

Filed Nov. 27, 1970, Ser. No. 93,069

Int. Cl. B23p *23/00*

U.S. Cl. 29—563 **7 Claims**



A method and apparatus is provided for performing secondary operations on plastic containers including deflashing, machining, leak detecting and dimension checking. The assemblies for performing these secondary operations are synchronized and designed to enable sequential operations to each of a continuing succession of containers to enable more and faster operations than in the past. A transfer mechanism indexes the containers between operation stations. Defective containers are rejected as the containers emerge from the processing apparatus.

3,716,911
METHOD OF PRODUCING SMALL AREA SEMICONDUCTOR COMPONENTS

Joachim Burtscher, Munich; Reimer Emeis, Ebermannstadt, and Adolf Herlet, Baldham, all of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed June 15, 1970, Ser. No. 46,216

Claims priority, application Germany, June 20, 1969, P 19 31 336.1

Int. Cl. B01j *17/00*

U.S. Cl. 29—578 **3 Claims**

Method of producing small area semiconductor components with a sequence of at least three mutually parallel

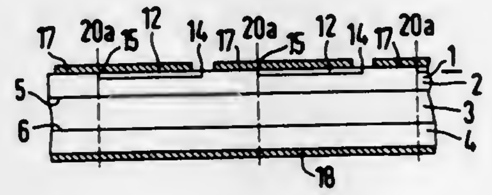
zones of alternating conducted type. The following steps are sequentially executed:

a. The same zone sequence is first produced in a large area semiconductor wafer, as in a small area semiconductor component, with the zones parallel to the main surface of the semiconductor wafer and with pattern like break-throughs in an outer zone, at one surface, wherein the adjacent inner zone emerges to the surface;

b. The boundary lines of the pattern like breakthroughs are subsequently masked at least over one length portion, on the main surface of the semiconductor wafer;

c. The unmasked parts of this surface, are thereafter, provided with a metal cover; and

d. the components are cut out of the semiconductor wafer.



3,716,912
METHOD OF CENTERING THE STATOR AND ROTOR OF AN ELECTRIC MOTOR

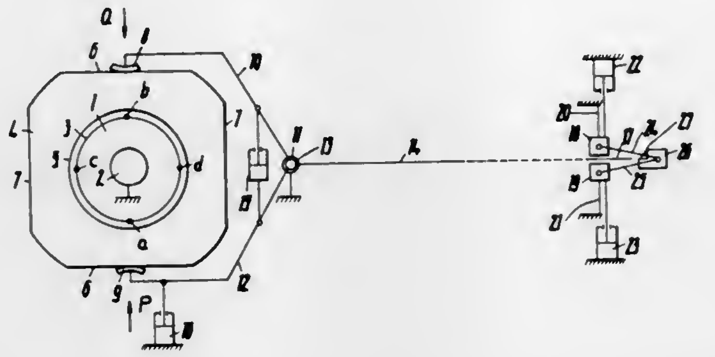
Holger Vind, Nordborg, Denmark, assignor to Danfoss A/S, Nordborg, Denmark

Filed Jan. 4, 1971, Ser. No. 103,607

Claims priority, application Germany, Jan. 13, 1970, P 20 01 178.3

Int. Cl. H02k *15/00*

U.S. Cl. 29—596 **3 Claims**



The invention relates to a method and apparatus for centering the rotor of an electric motor relative to the stator thereof to provide a circumferentially constant air gap. The stator member is fastened in a fixed position and jaws, which are mounted for pivotal movement about an external axis, are clamped externally of the stator member so that the stator member may move to two extreme positions allowed by the air gap clearance. A lever attached to the jaws indicates the two extreme positions and other apparatus is provided for determining the center position of the lever which in turn indicates a centered position for the stator relative to the rotor.

3,716,913
METHOD OF AND APPARATUS FOR PREPARING COLD CRIMP SLEEVES

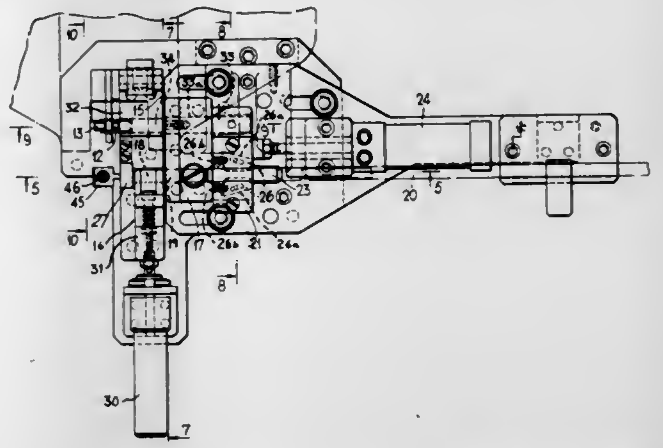
Carlo Masino, and Paolo Gilardine, both of Turin, Italy, assignors to AMP Incorporated, Harrisburg, Pa.

Division of Ser. No. 794,881, Jan. 29, 1972, abandoned. This application April 9, 1970, Ser. No. 31,439

Int. Cl. H02g *15/00;* **H01r** *9/00*

U.S. Cl. 29—629 **13 Claims**

A continuous length of cold crimp sleeve material is fed past a shear blade towards a stop. A perform die is disposed between the stop and the shear blade and is driven with the shear blade from a press ram. The preform die moves in a reverse direction to the shear blade and shearing and preforming are performed simultaneously. The preformed cut sleeve is transferred laterally to a crimping station where the dies are operated from the ram simultaneously with the shear blade and preform die. A further transfer device driven with the feeding device for the sleeve length transfers cut sleeve lengths from a first transfer part into the dies and presents a stop serving to position the leading end of a crimped termination within the cold crimp sleeve.



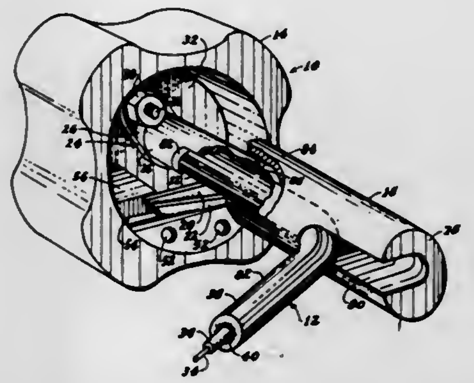
3,716,914
WIRE CUTTER AND STRIPPER

Michell J. Freije, R.R. 2, P.O. Box 323C, Carmel, Ind. 46032

Filed July 22, 1971, Ser. No. 165,003

Int. Cl. H02g *1/12*

U.S. Cl. 30—90.1 **15 Claims**



An easily-operated hand tool, particularly useful in cutting and stripping coaxial cable. In a single operation, it cuts and strips the insulations and the internal wire braid or mesh from coaxial cable at any desired length pattern; that is, it cuts the outer insulation and the wire braid or mesh at one length from the cable-end, and cuts those components and the inner insulation at a lesser length from the cable-end, leaving a free non-insulated remote end of the inner cable wire, with an adjacent portion of insulation-coated inner cable wire which has just the outer insulation and the wire braid or mesh removed.

3,716,915
GUIDE AND CUTTER

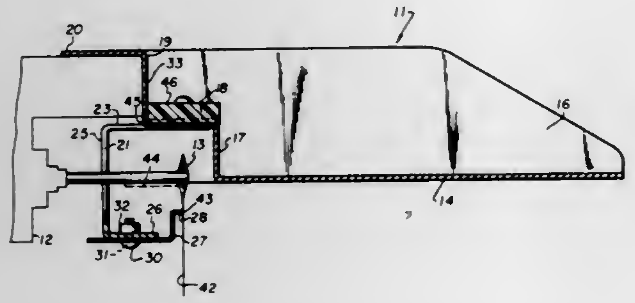
Kenneth C. Mandas, 79 A Linn Drive, Verona, N.J. 06120

Filed Mar. 10, 1970, Ser. No. 18,088

Int. Cl. B26b *29/00*

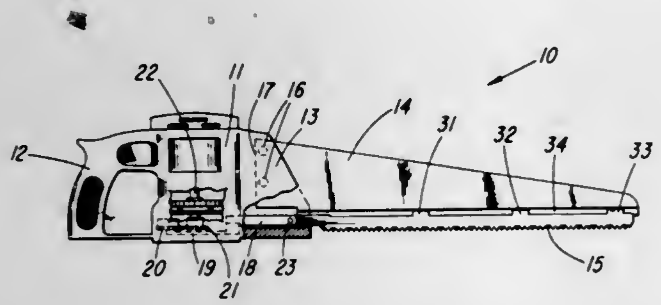
U.S. Cl. 30—293 **8 Claims**

A guide and cutter for trimming relatively hard, brittle plastics or plastic like veneer such as Formica in which a double edged, wedge-shaped rotory cutter severs excess overhang leaving a clean, shaped and relatively finished surface, the rotory cutter being driven by any suitable motor supported by a guide attached thereto which guide orients the cutter during severence and provides control for the depth of cut while permitting continuous observation of the cutter from above the overhang.



3,716,916
RECIPROCATING SAW AND BLADE THEREFOR

Carl J. Alexander, Moorepark, Mich., assignor to Wells Manufacturing Corporation, Three Rivers, Mich.
Filed Feb. 16, 1970, Ser. No. 11,723
Int. Cl. B27b *11/00*
U.S. Cl. 30—369 **9 Claims**

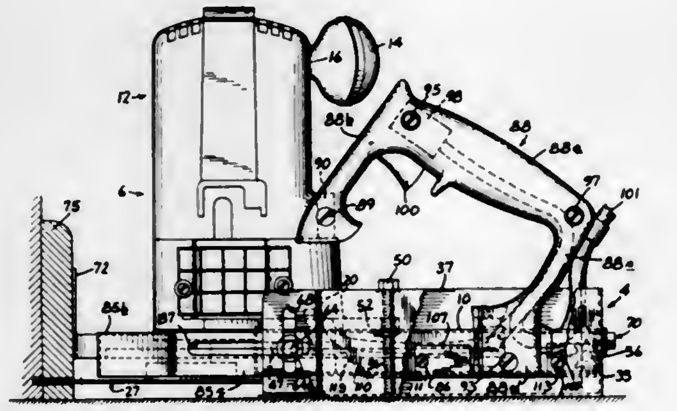


A power-driven reciprocating saw comprises a motor having a housing, a blade support arm secured on the housing, a saw blade bearing against the support member and having alternating raker teeth and pairs of flat bevel ground cutting teeth, and means drivingly connecting the blade with the motor so as to impart reciprocating motion to the blade.

3,716,917
PORTABLE ELECTRIC SAW, GRINDER, SANDER OR THE LIKE

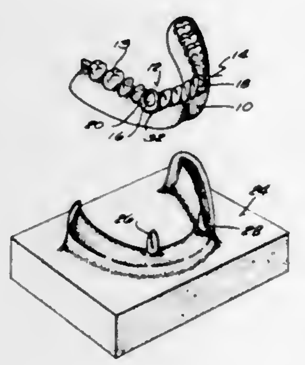
Zorro D. Ruben, Evanston, Ill.
(8923 Bronx, Skokie, Ill. 60076)
Filed Oct. 7, 1970, Ser. No. 78,832
Int. Cl. B27b *9/02*
U.S. Cl. 30—391 **32 Claims**

A portable machine tool unit comprising a base member having an open-top box-like construction open at the top thereof and having a bottom wall for guiding the machine tool over a floor or other similar surface. A motor and frame assembly is both vertically and tiltably adjustably mounted within the box-like member with the motor and frame assembly being lockable in any one of a number of adjusted positions thereof by tightening suitable fastening means exposed on the outside of the machine tool unit. The motor has a spindle depending from the motor and a circular saw blade, sander, grinder wheel or the like is removably secured to the bottom of the spindle, the various adjusted positions of the motor and frame assembly positioning the circular tool in a variety of possible positions including positions where the front of the tool is located at or slightly below the plane of the bottom surface of the bottom wall of the base member with the remainder of the tool angling rearwardly and upwardly away from the same, and positions where the circular tool has varying elevations preferably above and parallel to the bottom wall of the base member for undercutting doors, jambs and baseboards at various elevations. A pair of widely spaced handlebars positioned preferably as close to the bottom portion of the motor and frame assembly as possible, is provided, the handlebars preferably inclining upwardly and forwardly at an angle in the neighborhood of 45 degrees.



3,716,918
DENTURE COUPLING AND METHOD OF FORMING COUPLING

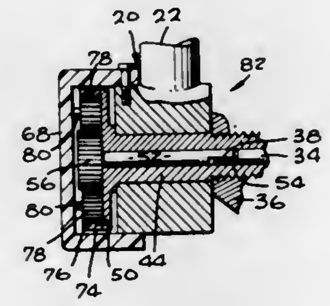
John W. Tole, Milwaukee, Paul J. Stolber, Brookfield, and Leroy W. Etzel, Milwaukee, Wis., assignors to Northwest Dental Laboratorles, Inc., Milwaukee, Wis.
Filed Sept. 10, 1971, Ser. No. 179,442
Int. Cl. A61c *13/22*
U.S. Cl. 32—5 **5 Claims**



A prosthetic denture of the type which is secured in place by coupling with one or more remaining healthy natural teeth, includes apertures in the denture which register with and receive the natural teeth and in which the apertures are provided with silicone rubber gasket liners which are bonded to the aperture walls. The gaskets are formed in the denture by providing oversize apertures in the denture, applying a primer to the denture, and molding silicone rubber in the apertures around a model of the natural teeth on a counterpart. When the silicone rubber has cured, it is trimmed with high speed abrasive stones. The silicone gaskets comfortably, yieldably and securely receive and embrace the natural teeth and provide an air seal to prevent entry of air and particles beneath the denture.

3,716,919
MEASURING WHEEL DEVICE

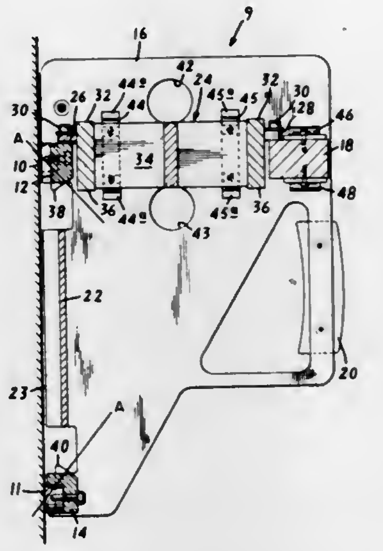
Wallace D. Evans, Jr., Los Angeles, Calif., assignor to Rolatape Corporation, Santa Monica, Calif.
Filed Feb. 16, 1971, Ser. No. 115,494
Int. Cl. G01b *3/12*
U.S. Cl. 33—141 E **9 Claims**



A measuring wheel device including a gearing assembly to transmit the wheel movement to a counter mechanism, the gearing assembly comprising an idler gear located between the first and second drive gears, the gearing assembly being located within a chamber formed within the wheel hub cover, the size of the gears within the gearing assembly being capable of being varied to establish different ratios between the wheel and the counter mechanism.

3,716,920
PRECISION SQUARE

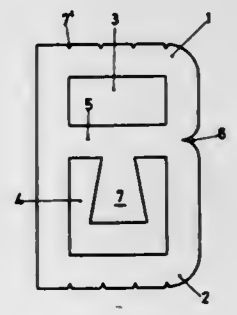
John H. Worthen, Providence, R.I., assignor to Federal Products Corporation, Providence, R.I.
Filed Sept. 9, 1969, Ser. No. 856,324
Int. Cl. B43l *7/00*
U.S. Cl. 33—174 M **32 Claims**



A highly accurate precision square can be hung so as to engage a nominally vertical surface and provide a substantially horizontal measuring surface. The measuring surface may be used to support a measuring instrument adapted to determine deviation from the vertical direction as defined by gravity. The device may also be used to determine the straightness of a surface or the angle between a vertical surface and a horizontal surface. Additionally, the square may be used to determine the perpendicularity of two nominally perpendicular surfaces or the paralellism of two nominally vertical surfaces. The square may be hung against a vertical surface in two orientations displaced from each other by 180°. This feature enables two measurements to be made which can be combined to calibrate the angle of the square so that any deviation from 90° it contains can be compensated for in making subsequent measurements.

3,716,921
TEMPLATE FOR TRACING SMALL AND CAPITAL LETTERS AND NUMBERS

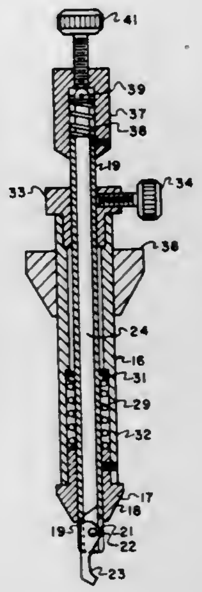
Fernando Suarez Vicent, Coruna, Spain, assignor to Manuel Lainz S. A., Santander, Spain
Filed May 27, 1970, Ser. No. 41,013
Claims priority, application Spain, May 27, 1969, 148972; Jan. 9, 1970, 154884
Int. Cl. B43l *13/20*
U.S. Cl. 33—174 B **5 Claims**



A template for tracing letters with two openings, a plurality of notches on the outer edge and a trapezoidal holding means.

3,716,922
GAUGING METHOD AND APPARATUS FOR DIESEL INJECTOR NOZZLES

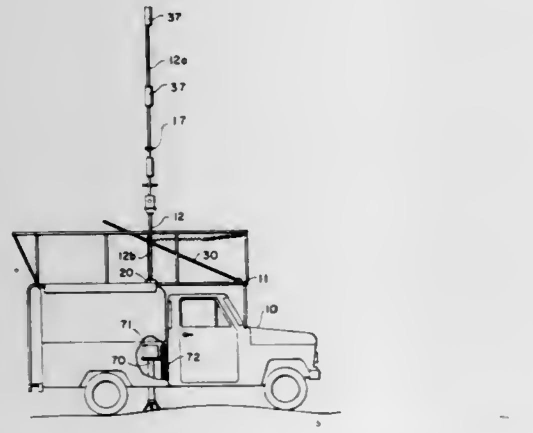
Everett E. Shaver, 760-A Casiano Drive, Santa Barbara, Calif.
Filed Dec. 28, 1970, Ser. No. 101,485
Int. Cl. G01b *3/38*
U.S. Cl. 33—181 R **4 Claims**



The invention permits the gauging or measurement of the protrusion of diesel injector nozzle past the fire deck of a combustion chamber without tearing down the engine. Instead, the measurement is made in a blind fashion. The nozzle is removed and a tool, in the shape of a simulated nozzle is inserted against the nozzle seat. It has a rotatable finger that feels and locates the fire deck, and this location is set into the tool and the finger is then rotated to an alignment position so that the tool can be removed. The tool can be calibrated to measure this dimension accurately. Preferably it is inserted into a simulated motor section wherein nozzle seat is relatively moveable with respect to a simulated fire deck and the feeler action is repeated to transfer this feeler setting to the simulated motor section which is then set to the same setting. The removed nozzle is inserted into the simulated motor section and the protrusion above the simulated fire deck is measured directly. If the protrusion is too great, shims are placed on the nozzle seat. If the protrusion is too little, the seat is reamed out.

3,716,923
SURVEYING APPARATUS

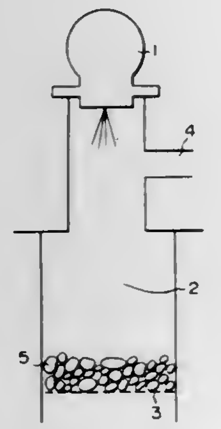
Willis O. Bazhaw, Dallas, Tex., assignor to Hunt Oil Company, Dallas, Tex.
Filed July 16, 1970, Ser. No. 55,373
Int. Cl. G01c *15/06*
U.S. Cl. 33—264 **7 Claims**



Disclosed is a surveying method and apparatus including a self-powered mobile target rod carrier and rotatable target rod with calibrated means for measuring horizontal angles. The mobile vehicle also includes a retractable table for placing gravity measuring equipment on the terrain at the data point and determining the elevation of the target above the point at which the data is taken.

3,716,924
METHOD OF DRYING SYNTHETIC RUBBER MATERIAL

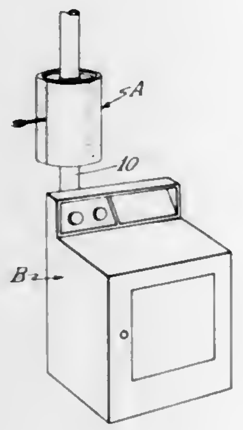
Katsuyasu Takase, Yuzo Nakane, and Masamichi Yomura, all of Tokyo, Japan, assignors to The Japanese Geon Company, Ltd. and The Futaba Netsukagaku Kenkyujo Ltd., both of Tokyo, Japan
Filed March 12, 1971, Ser. No. 123,719
Int. Cl. F26b *3/00*
U.S. Cl. 34—36 **4 Claims**



A method of drying synthetic rubber materials, which comprises contacting a moisture-containing synthetic rubber material with superheated steam at a temperature which is higher than the condensing temperature of steam, such condensing temperature being higher than 100°C., and up to 500°C.

3,716,925
HUMIDIFIER ATTACHMENT FOR CLOTHES DRYERS

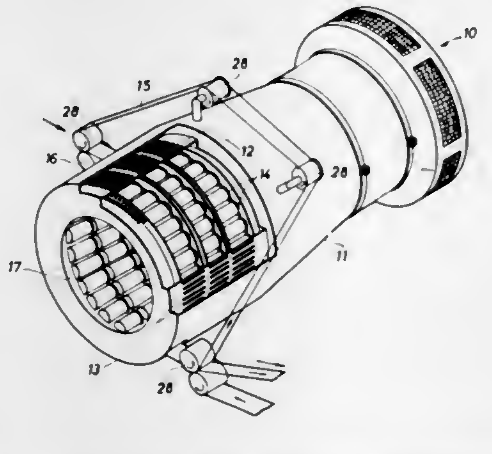
Ray E. Hartung, 7381 Memory Lane, Minneapolis, Minn.
Continuation-in-part of abandoned application Ser. No. 869,846, Oct. 27, 1969. This application Oct. 12, 1971, Ser. No. 187,970
Int. Cl. F26b *21/00*
U.S. Cl. 34—80 **5 Claims**



A humidifying chamber is provided in the vent pipe from a clothes dryer, and the air vented may be bypassed through the chamber to deliver heated moist air to the area near the dryer. A damper controls the flow of air so that the hot moist air may be vented to outside atmosphere when desired.

3,716,926
PHOTOGRAPHIC DRYER

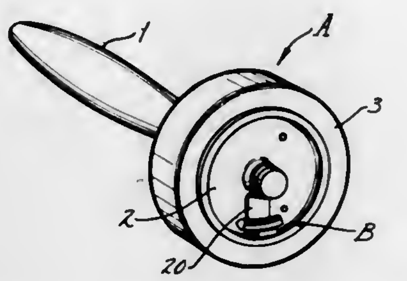
Emile Frans Stievenart, Mortsel, Belgium, assignor to Gevaert-Agfa N.V., Mortsel, Belgium
Filed March 10, 1971, Ser. No. 122,693
Claims priority, application Belgium, March 11, 1970, 49970
Int. Cl. F26b *13/00*
U.S. Cl. 34—160 **8 Claims**



Dryer for continuous web material including conveyor means extending in a generally circular, preferably helical, path and supporting the material on one side from movement along such path, a drying air plenum extending along a substantial portion of the conveyor path and having a wall lying in generally closely spaced parallel relation to such path portion with apertures in the wall for directing air onto the web material supported on the conveyor, an air current generator for supplying air to the plenum. Preferably, the plenum is in the form of an annular chamber defined by two spaced walls, one of which is apertured, which extends around the conveyor path.

3,716,927
WHEEL WEIGHT DEMONSTRATING DEVICE

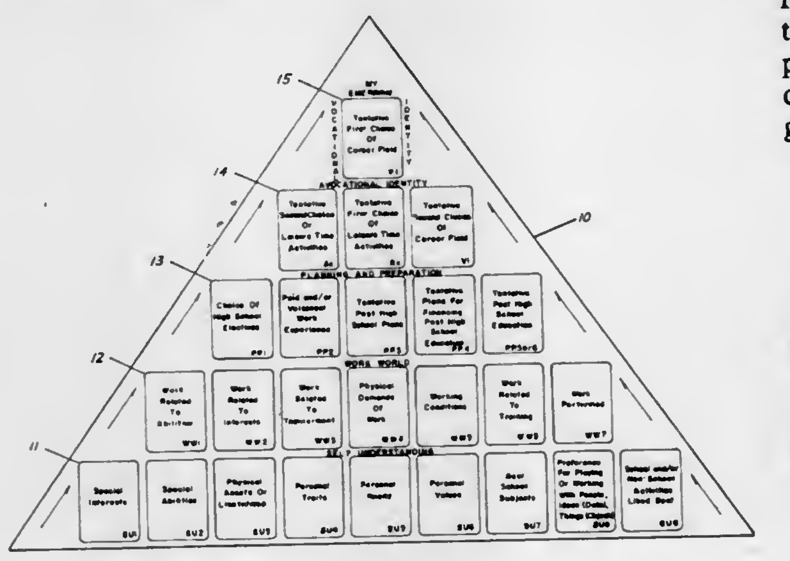
Warren E. Carter, Murfreesboro, Tenn., assignor to Perfect Equipment Corporation, Murfreesboro, Tenn.
Filed Nov. 29, 1971, Ser. No. 202,875
Int. Cl. G09b *23/10*
U.S. Cl. 35—19 R **7 Claims**



In a device for demonstrating the effectiveness of the balancing attributes of a standard wheel balance weight, a wheel is rotatably mounted to the end of the handle, and said wheel incorporates a fixed weight that is eccentrically mounted for the purpose of inducing unbalanced-oscillatory type rotation of the wheel when turned for the purpose of displaying an unbalanced condition in the mounting of a wheel, as for example, an automobile wheel. The invention includes essentially a clip that is mounted for restrained pivotal movement proximate that surface of the rim opposite its mounting to the handle, and said clip is provided with a turned or bent distal end to which a regular wheel weight may be mounted. The surface of the rim proximate the location of this clip is relatively flat, and can easily support any form of visual display matter such as advertising, or a wheel weight chart, or the like, which can be viewed in combination with the manipulation of the wheel weight so as to depict the balancing condition that is achieved through the affixing of one or more wheel weights to the rim of an auto-mobile. wheel.

3,716,928
VOCATIONAL GUIDANCE AIDS

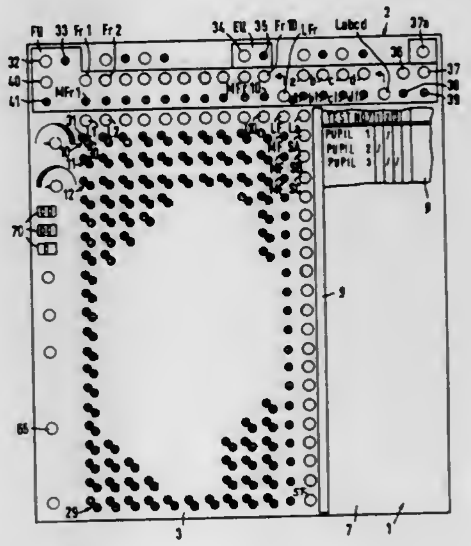
Robert S. Meyer, 475 Presidential Lane, Madison, Wis. 53711
Filed Apr. 5, 1972, Ser. No. 241,365
Int. Cl. G09b *19/00*
U.S. Cl. 35—22 R **1 Claim**



A vocational guidance aid which may be played as a group game or used as an individual counseling tool. The aid has a plurality of information cards and at least one board with defined card receptacle spaces arranged in pyramiding fashion with the first choice vocational career at the pinnacle. The cards carry various information on personal, work world, and planning and preparation factors that affect ones decision on a vocation. The cards are selected by the individual and placed on the board spaces to which they are coded to build a foundation for a vocational choice.

3,716,929
EDUCATIONAL SYSTEM FOR QUESTIONING A PLURALITY OF PUPILS SIMULTANEOUSLY

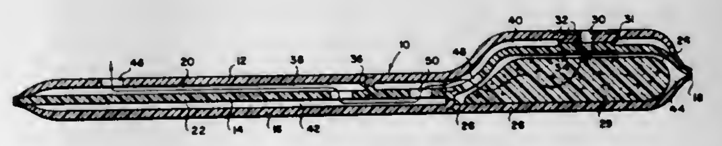
Fritz Barrabas, Bochum, Germany, assignor to Westfalische Bergewerkschaftskasse, Bochum, Germany
Filed Nov. 5, 1969, Ser. No. 870,546
Claims priority, application Germany, Nov. 5, 1968, P 18 06 913.1
Int. Cl. G09b *7/02*
U.S. Cl. 35—48 R **17 Claims**



Instructional system which affords the simultaneous questioning of a number of pupils by one teacher to determine the extent of their knowledge. Each pupil has a desk with answer keys. The teacher asking the questions has a desk with solution keys, as well as a pupils' monitor with visual indicators which can be extinguished by the teacher and which give a qualified repetition of an answer given by the pupil. The pupils' monitor has two visual indicators. During a given period of time the two indicators are selectively effective for each of the solutions fed in from the teacher's desk and for each pupil to qualify the given answer as false and as correct, respectively. The pupils' desks have visual indicators which can be switched on by the pupils and only qualify the answer previously given by the keys.

3,716,930
COMBINATION MASSAGING, AIR-CUSHIONING AND VENTILATING INSOLE

Harry Brahm, P. O. Box 372, Riverside Station, Miami, Fla.
Filed April 23, 1971, Ser. No. 136,715
Int. Cl. A43b *7/06*
U.S. Cl. 36—3 B **4 Claims**

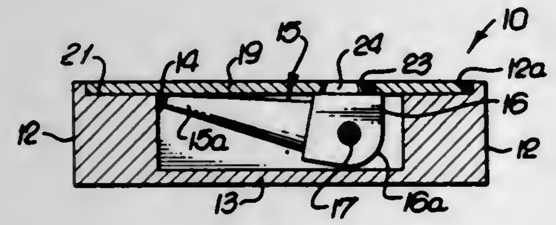


A combination massaging, air cushioning and ventilating insole unit having top, center and bottom layers of air impervious material shaped peripherally to fit within a shoe, the peripheries of the three layers being adhered together to form an air tight top chamber between the top and center layers and an air tight bottom chamber between the center layer and the bottom layer, an air intake and pumping chamber formed in the heel portion of the insole unit, a resilient open-cell foam pad positioned in said air intake and pumping chamber, means in the heel portion of the insole unit providing access of the ambient air to the intake and pumping chamber, discharge means provided in the forward portion of the top layer, and means for controlling flow of air from the intake and pumping chamber to the discharge means in the top layer.

ERRATUM

For Class 36—61 see:
Patent No. 3,717,238

3,716,931
RETRACTABLE SPIKE FOR GOLF SHOE
Michael R. Loudermilk, 1390 E. Vegas Valley Drive, Las Vegas, Nev.
Filed April 12, 1971, Ser. No. 133,241
Int. Cl. A43c *15/00*
U.S. Cl. 36—61 **10 Claims**

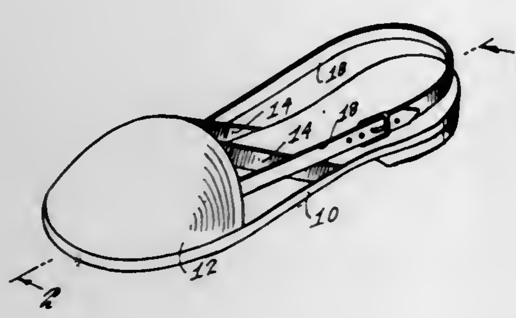


A retractable spike and support assembly for a sport shoe, comprises:

a. a receptacle to be carried on a base to fit on the shoe, and

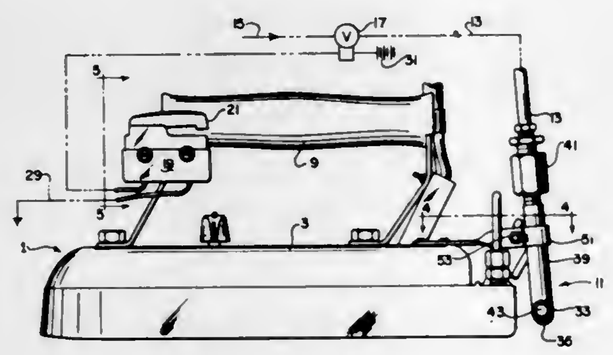
b. a spike carried by the receptacle to swing between retracted position in which the spike is received in the receptacle, and extended position in which the spike protrudes away from the receptacle interior for ground engagement.

3,716,932
SLIP ON STEEL FOOT GUARD
Steve Pakulak, 99 West Myook Drive, Eugene, Oreg.
Filed May 11, 1971, Ser. No. 142,221
Int. Cl. A43b *13/22*
U.S. Cl. 36—72 R **1 Claim**



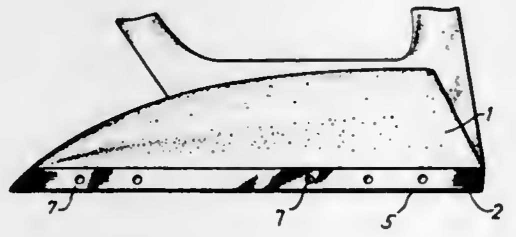
A slipperlike structure with metal toe and rubber sole can be detachably slipped over a light work shoe as a foot protector.

3,716,933
FLATIRON WITH WORK COOLING MEANS
Homer Evans, and William R. Cole, Jr., Brookhaven, Miss., assignors to Kellwood Company, St. Louis, Mo.
Filed Oct. 18, 1971, Ser. No. 190,184
Int. Cl. D06f *75/00*
U.S. Cl. 38—75 **9 Claims**



A flatiron having an air diffuser at the rear thereof for blowing air downwardly on work being pressed to cool it, an on-off valve for the air, and a switch at the forward end of the handle in position for operation by the thumb of the user's hand on the handle of the iron for operating the valve.

3,716,934
PRESS OR FLATIRON SURFACE
Hans Ivar Wallsten, Saffle, Sweden, assignor to AB Inventing, Saffle, Sweden
Continuation-in-part of Ser. No. 62,428, Aug. 10, 1970, Pat. No. 3,659,347. This application Dec. 27, 1971, Ser. No. 212,586
Int. Cl. D06f *75/38*
U.S. Cl. 38—93 **8 Claims**

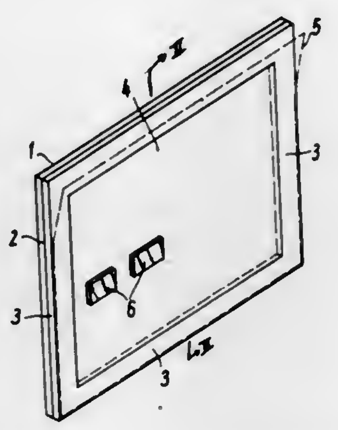


The surface of an implement for ironing moistened material has an outer porous layer, preferably of sintered material, which permits steam to enter through its pores. A solid blocking layer separates the porous layer from a heating source, and passages within the implement permit the steam to exit at points removed from the moistened material.

3,716,935
MAGNETIC BOARD WITH CHART AND MARKERS
Haas Friederichs, Wiesbaden, Germany, assignor to Hermann Holtz, Wiesbaden, Germany
Filed Aug. 5, 1971, Ser. No. 169,416
Claims priority, application Germany, Sept. 24, 1970, P 20 47 075.1
Int. Cl. G09f *7/02*
U.S. Cl. 40—142 A **11 Claims**

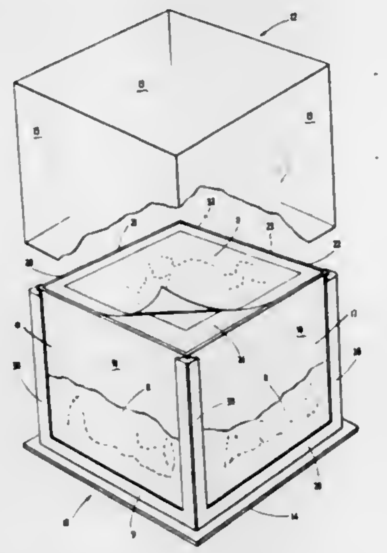
A magnetic board having a ferromagnetic chart and permanently magnetized markers. The board comprises a base

board having a continuous strip of permanently magnetized material along the circumferential edges thereof and a filler



material of non-permanent magnetic material filling the space intermediate said continuous strip.

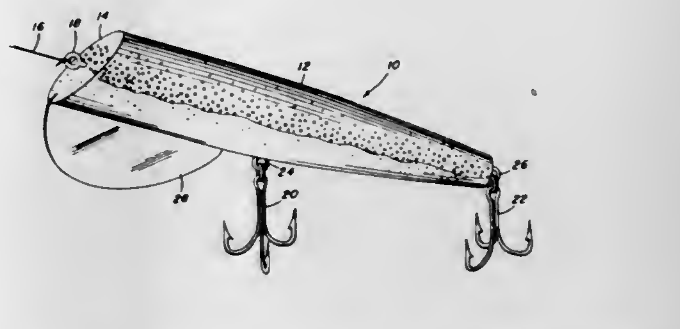
3,716,936
DISPLAY DEVICE
Oscar Miller, 4 Overlook Park,
Newton Center, Mass. 02159
Filed June 17, 1970, Ser. No. 46,904
Int. Cl. G09f *1/12*
U.S. Cl. 40—152 **11 Claims**



In a preferred embodiment, the display device is fabricated of plastic, is adapted to display black and white or color photographs, and includes a base having four walls extending therefrom each of which has a picture holding surface. The four walls and base define a picture storage compartment. The device may also include a removable top panel upon which another picture may rest and a transparent cover that is inserted over the cubic picture display device.

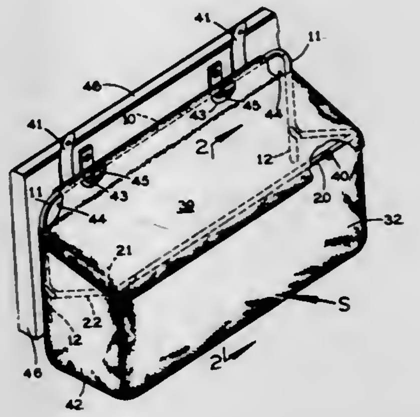
3,716,937
FISHING LURE
Robert C. Santosuosso, 42 Sterling St.,
Malden, Mass. 02148
Filed July 26, 1971, Ser. No. 166,028
Int. Cl. A01k *85/00*
U.S. Cl. 43—42.47 **1 Claim**

A high action fishing plug is disclosed for use in both casting and trolling. The lure is comprised of a continuously tapered body portion of a light-weight wood or the like adapted to float when idle. The body portion is formed with a forward face rearwardly beveled upwardly from the lower forward end of the plug to produce a diving action when the plug is pulled through water. Relatively heavy hooks are positioned to keep the plug upright and a downwardly and rearwardly extending vertical transparent vane extends from the forward end of the plug



along the lower leading end of the plug to introduce a transverse wiggling motion. The exposed edge of the vane forms an arc from front to rear.

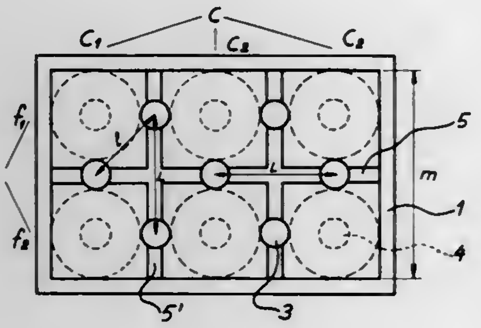
3,716,938
SUSPENSION FISH BOX
Walter D. Ammons, 11 Little Ocean Club, Stuart, Fla.
Filed Sept. 20, 1971, Ser. No. 181,799
Int. Cl. A01k *97/00*
U.S. Cl. 43—55 **3 Claims**



A main tubular frame bent to provide a straight top bar with legs depending from opposite ends thereof, together with a sub-frame of similar configuration hinged to the main frame with means to limit swinging movements therebetween. The two frames support a flexible water-tight sheet fashioned to provide an open-top box depending from the top bars, the sheet being provided with cut-away portions at the bar ends and therebetween to exposed portions of the bars therethrough. Hooks fixedly carried by a fishing yacht, as within its cockpit, when engaged with the top bar under side of the main frame, provide adequate support for the entire box structure at a desired elevation. Its normally open top is then positioned to receive both water and fish, as and when caught, any substantial load being evenly distributed lengthwise of the bar tops. The box contents will remain intact therein until unloaded, whereupon the box may be water-flushed, collapsed, and stowed away to await further usage at a later time.

3,716,939
TOY CONSTRUCTION SYSTEMS
Jose Maria Arnau Pibet, via Augusta 195, Barcelona, Spain
Filed June 30, 1971, Ser. No. 158,229
Claims priority, application Spain, Sept. 16, 1970, 383688
Int. Cl. A63h *33/08*
U.S. Cl. 46—25 **14 Claims**

A toy building element which is adapted to be interengaged with a similar or identical building element comprising a hollow rectangular box which has an exterior top face with a plurality of rows of a plurality of equally spaced cylindrical projections which extend above the top face and which are provided with boxes having diameters which are the same as cylindrical pin elements which project in an opposite direction from an interior face within the box. The diameter of the pin elements is substantially equal to the spacing between adjacent cylindrical projections of adjacent rows. This makes it possible to interengage the cylindrical pin of one building element between the cylindrical projections of another building element or to engage the pins into the bores of the cylindrical projections.



3,716,940

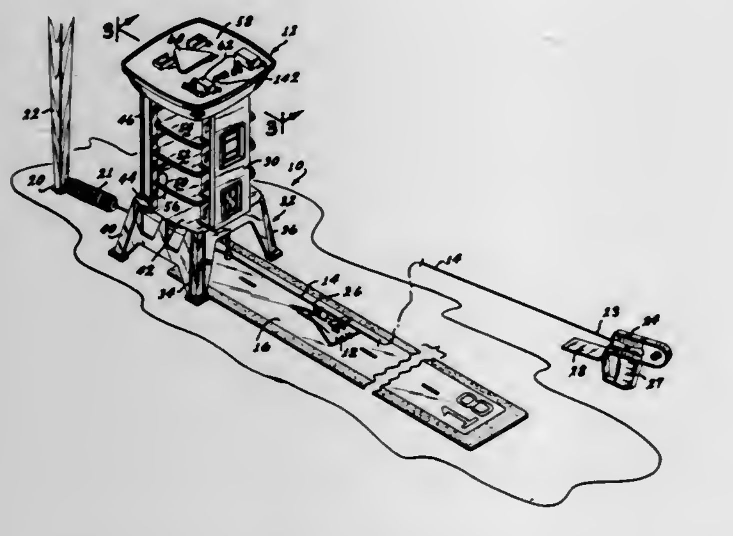
TOY FLIGHT SIMULATOR AND CONTROL TOWER SYSTEM

Denis V. Bosley, Palos Verdes Peninsula, Philip W. Crain, Redondo Beach, Raymond J. Douglas, Lomita, Bernard Loomis, Palos Verdes Peninsula, Floyd E. Schlau, Palos Verdes Estates, and William A. Staats, Torrance, Calif., assignors to Mattel, Inc., Hawthorne, Calif.

Filed Jan. 20, 1971, Ser. No. 107,907

Int. Cl. A63h *27/04*

U.S. Cl. 46—77 **5 Claims**



A toy flight simulator and control tower system, including a guideline anchored at one end and controlled at the other end, an airplane movable along the guideline, a landing strip and a control tower. The control tower includes a position indicator which is connected to the guideline to indicate to the operator the relative position of the airplane as it descends the guideline. Height is indicated in two separate manners, while lateral position is indicated in one manner. The system may be disassembled for ease in packaging and is rugged yet inexpensive.

3,716,941

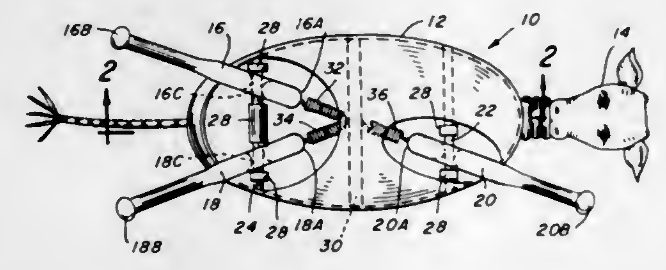
APPARATUS FOR USE BY A RODEO PERFORMER FOR PRACTICING TYING THE LEGS OF A CALF

Roy L. Dowden, Route 4, Box 208, Claremore, Okla., and Lionel E. Russell, Route 1, Oologah, Okla.

Filed May 5, 1971, Ser. No. 140,318

Int. Cl. A63h *11/00*

U.S. Cl. 46—123 **2 Claims**



An apparatus for use by a rodeo performer for practicing tying the legs of a roped calf, including a body of the general size and shape of a bovine calf, at least three leg members, the inner ends of each of the leg members being pivotally affixed to the body and the leg members being pivotal such that the outer ends may be simultaneously juxtaposed whereby a tie string may be placed therearound.

3,716,942

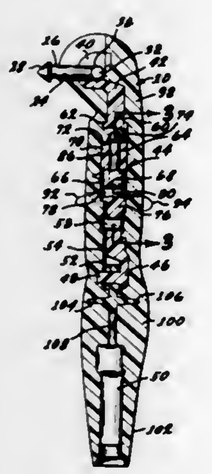
FIGURE TOY HAVING A LIMB INCLUDING A TENSIONED, DETENTED CONNECTOR

Armando J. Garcia, Sylmar, Gregory M. Gunther, Palos Verdes Estates, and Juanito O. Villanueva, Lawndale, Calif., assignors to Mattel, Inc., Hawthorne, Calif.

Filed Sept. 13, 1971, Ser. No. 180,020

Int. Cl. A63h *3/46*

U.S. Cl. 46—163 **3 Claims**



A portion of a figure toy limb carries a skin-covered armature provided with a tensioned, detented connector permitting rotation about the longitudinal axis of that portion of the limb which contains the connector. One half of the connector comprises a male insert having first and second ends with latching teeth intermediate the ends and a tension member at one of the ends. The other half of the connector is a female insert adapted to encompass the male insert and engage both the latching teeth and the tension member in such a manner that rotation about the longitudinal axis of the limb is permitted, but meets with resistance.

3,716,943

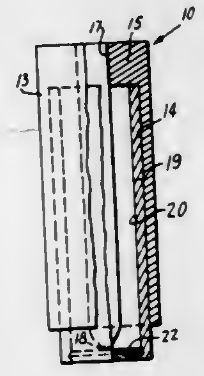
HUNTING CALL

Francis J. Orzetti, P.O. Box 95, Marvin Station, Wilcox, Pa.

Filed Dec. 6, 1971, Ser. No. 205,036

Int. Cl. A63h *5/00*

U.S. Cl. 46—189 **1 Claim**



A hunting call consisting of an elongate hollow generally cylindrical body formed of hard wood and having a dowel fixed to one end thereof and extending therethrough and exposed at the opposite end. A second hollow generally cylindrical body is also formed of hard wood and has a disc of barium ferrite embedded in one end thereof so that the exposed end of the pin can be drawn thereacross to produce the sound of a lost turkey. This sound is produced by drawing the letter C with the pin on the barium ferrite disc. To produce the sound of a squirrel relatively short squeeking strokes are made on the disc.

3,716,944

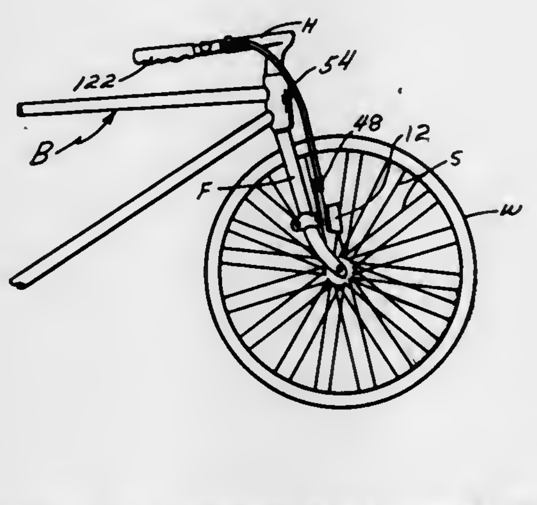
NOISE MAKER

Albert H. Mizrahi, 532 Page St., Stoughton, Mass.

Filed April 12, 1972, Ser. No. 243,278

Int. Cl. A63h *5/00*

U.S. Cl. 46—175 **13 Claims**



A noise maker has a chamber with a cover that has a projecting striker of resilient material that normally is positioned in the path of the spokes of a bicycle wheel thus making a noise when the spokes contact it. Disconnect mechanism connects with a handle bar, and connecting means operably connects said chamber with said mechanism. Said mechanism has a rotatable sleeve that rotatably extends over the handle bar and rotatably connects with clamping members that are fixed to said handle bar. A hand grip outside of and fixed to said sleeve actuates the latter thus transferring the motion through said connecting means to the chamber and its striker to thereby move the striker into or out of normal position as desired.

3,716,945

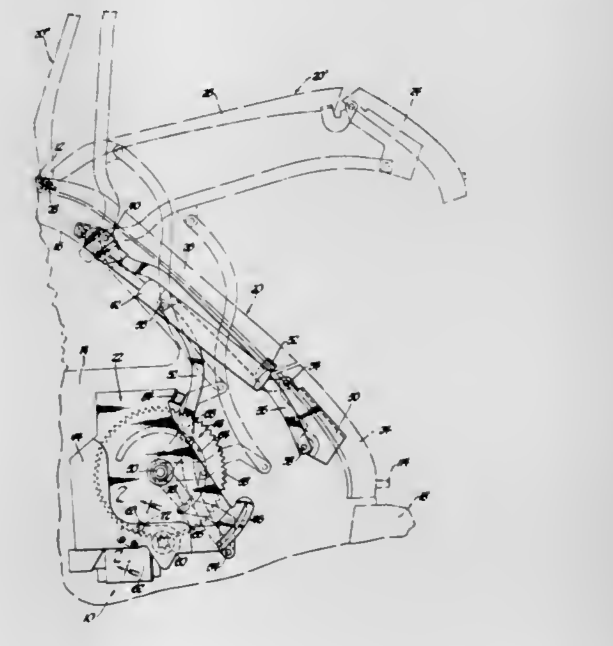
CLOSURE OPERATOR

Norman F. Cooper, Mt. Clemens; James H. Dozois, Harper Woods, and Bert R. Wanlass, Warren, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Dec. 2, 1971, Ser. No. 203,967

Int. Cl. E05f *15/12*

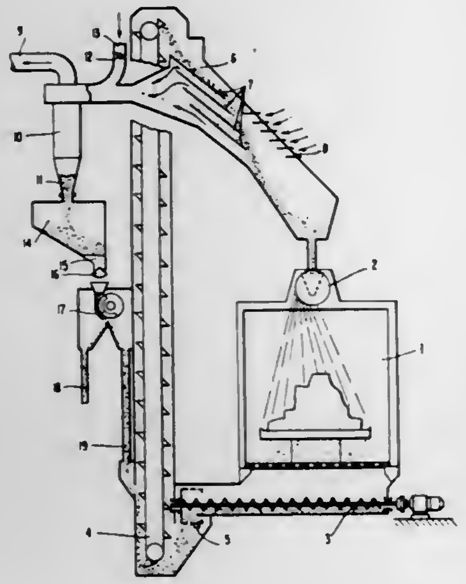
U.S. Cl. 49—139 **3 Claims**



A closure operator particularly adapted for use with a station wagon tailgate type closure and adapted to permit randomly interchangeable operation of the tailgate in either one of a power mode and a manual mode, the closure operator including a driving member movable from a center position in opening and closing directions corresponding to movement of the closure toward an open position and a closed position, means defining a slot in the driving member, a driven member connected to the closure for moving the latter in the power mode and having a pin thereon engageable on the driving member in the slot, a reversible electric motor for moving the driving member in either one of the opening and closing directions, and a control circuit having a first manually actuable switch for energizing the motor to move the driving member away from the center position in either the opening or closing directions and a second switch responsive to the position of the driving member for reversing the motor to bring the driving member back to the center position and sequencing means for preventing reversing of the motor through the second switch until the first switch is deactuated. In the center position of the driving member the pin is located adjacent one or the other of the ends of the slot when the closure is in the open and closed positions so that movement of the closure in the manual mode effects lost motion between the driving and driven members as the pin traverses the length of the slot while movement of the driving member effects engagement between an end of the slot and the pin to effect movement of the driven member and the closure in the power mode.

3,716,946
METHOD AND APPARATUS FOR CLEANING AND RECUPERATING SHOT IN THE CIRCULATORY SYSTEM OF BLASTING APPARATUS

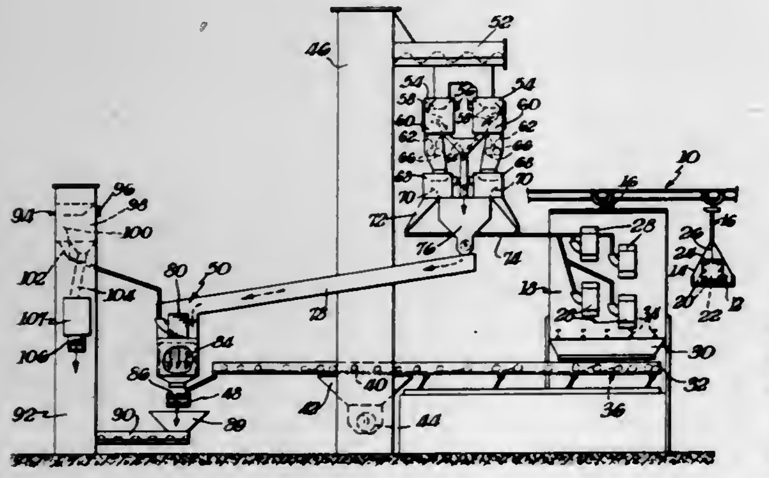
Max E. Graf, Karlsruhe-Durlach, Germany, assignor to Badische Maschinenfabrik GmbH
Filed Dec. 8, 1970, Ser. No. 96,170
Claims priority, application Germany, Dec. 11, 1969, P 19 62 117.1
Int. Cl. B24c *3/00*
U.S. Cl. 51—9 **8 Claims**



A method and apparatus for cleaning and recuperating shot in which material that is separated from the shot in a first air separator, does not reach the air line system together with the cleaning air but is separated in a second air separator downstream of the cascades of the first air separator by reason of its larger grain size or higher specific weight and is conducted to a magnetic separator whose outlet for magnetic material is conducted back to the shot circulatory system of the apparatus.

3,716,947
ABRASIVE BLAST CLEANING SYSTEM

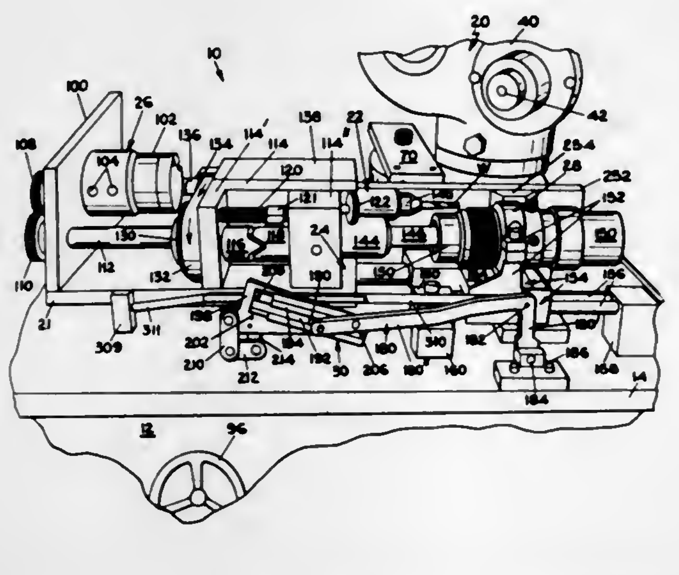
James H. Carpenter, Hagerstown, Md., and Joseph E. Bowling, Jr., Waynesboro, Pa., assignors to The Carborundum Company, Niagara Falls, N.Y.
Filed Jan. 21, 1971, Ser. No. 108,417
Int. Cl. B24c *3/04, 3/14*
U.S. Cl. 51—9 **36 Claims**



An abrasive blast cleaning system includes blast means for granulating and scouring the sand removed from a no-bake mold whereby the sand is reconditioned for reuse in a subsequent no-bake molding operation.

3,716,948
TAPERED END MILL MACHINE

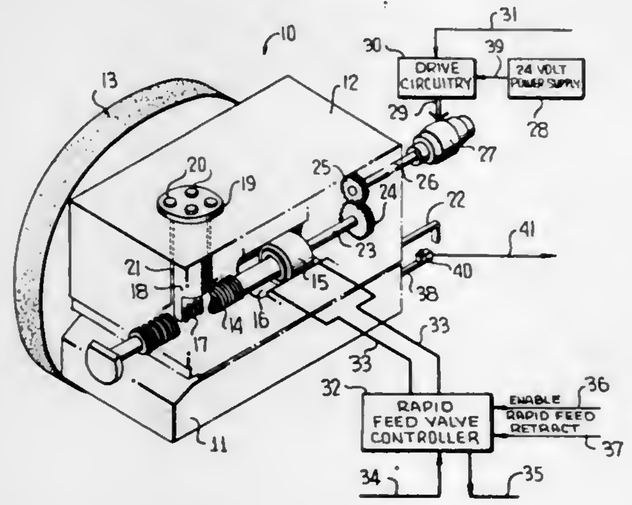
Kenneth P. Stanaback, 3640 Breton Road S.E., Grand Rapids, Mich.
Filed April 22, 1971, Ser. No. 136,354
Int. Cl. B24b *3/06*
U.S. Cl. 51—95 LH **18 Claims**



Apparatus for forming helical flutes in a tapered workpiece, and for sharpening such workpieces, especially to form and sharpen a novel tapered end mill, and employing special control over the position and feed of the workpiece relative to the machining tool.

3,716,949
FEED RATE AND POSITIONING CONTROL SYSTEM FOR A MACHINE TOOL

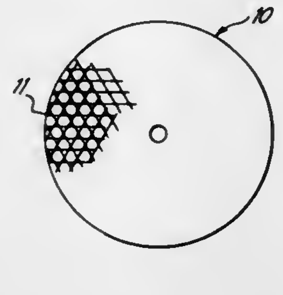
Ralph E. Price, and Stanley C. Schoonover, both of Waynesboro, Pa., assignors to Landis Tool Company
Filed June 12, 1970, Ser. No. 45,829
Int. Cl. B24b *49/10*
U.S. Cl. 51—165.8 **14 Claims**



A feed rate and positioning control system for a machine tool is described which utilizes an electro-hydraulic pulse motor to move a grinding wheel support at preselected rates and for predetermined distances during a grinding operation. A control counter is arranged, via rate selecting switches, to select pulses of various predetermined pulse repetition rates for controlling the rates at which the electro-hydraulic pulse motor moves during a grinding operation. End point selecting switches and comparators are provided for determining the distances moved by the support during a grinding operation to signal the control counter to change rates or to start a dwell period. Dwell selecting switches, responsive to the control counter, are provided to establish the duration of dwell periods between application of selected rates and to signal the control counter at the end of each dwell period, including a spark out period at the end of the grinding operation.

3,716,950
REINFORCED ABRASIVE WHEELS

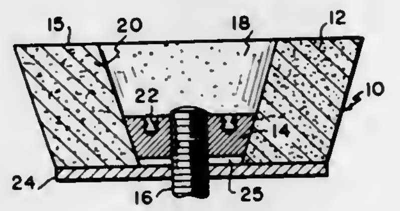
Charles A. McClure, R.D. No. 2, P.O. Box 290, Malvern, Pa.
Filed Oct. 12, 1971, Ser. No. 188,338
Int. Cl. B24d *5/08*
U.S. Cl. 51—206 NF **10 Claims**



Abrasive wheels are reinforced by one or more disc-like layers of open-mesh triaxial fabric, preferably of glass composition. If uniform, the mesh openings are relatively large, preferably with a side length of at least a half inch. A simple fabric layer may be sandwiched by layers of bonded abrasive material, or a pair of fabric layers may sandwich and be bonded to an intervening layer of abrasive material.

3,716,951
CUP GRINDING WHEELS

Klemens C. Walters, Logan Road, R.D. 1, Box 318, Gibsonia, Pa. 15044
Filed May 5, 1971, Ser. No. 140,323
Int. Cl. B24b *41/00;* **B24d** *5/00, 7/00*
U.S. Cl. 51—209 R **8 Claims**

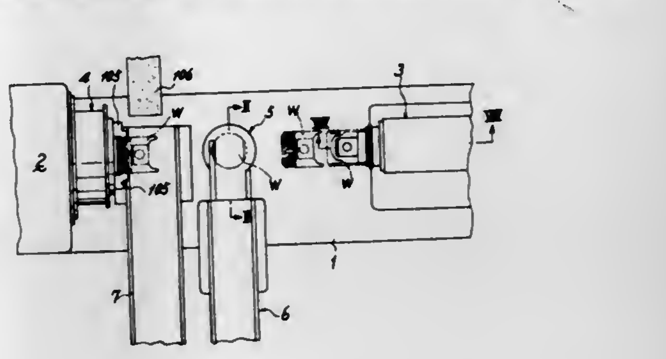


A cup grinding wheel has a frusto-conical central opening therethrough. A frusto-conical shaped nut engages a spindle of a grinding tool and the opening of the cup grinding wheel to secure the cup grinding wheel to an adapter plate separate from or integral with the grinding tool.

3,716,952
LOADING DEVICE

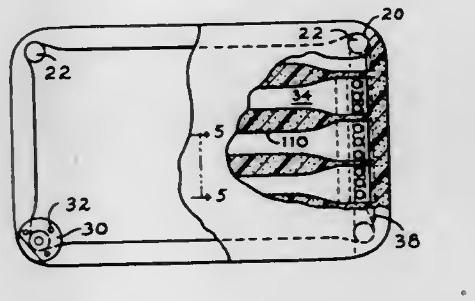
Goro Terahara, Kariya, Japan, assignor to Toyoda Koki Kabushiki Kaisha, Kairya-shi, Japan
Filed Aug. 13, 1971, Ser. No. 171,620
Int. Cl. B24b *47/20, 17/00*
U.S. Cl. 51—215 HM **18 Claims**

A device for automatically loading a non-circular workpiece onto a machine tool in a preselected angular position. The device comprises an indexing mechanism for indexing the workpiece into the proper angular position, a holding mechanism for holding the indexed workpiece, and a shifting mechanism for moving the workpiece from the holding mechanism to a clamping fixture of the machine tool without any deviation from the established proper angular position.



3,716,953
LIGHT-WEIGHT, CRASHPROOF, TUBULAR STRUCTURE

Alvin Edward Moore, 916 Beach Blvd., Waveland, Miss.
Filed May 5, 1970, Ser. No. 34,795
Int. Cl. E04b *1/345*
U.S. Cl. 52—2 **14 Claims**

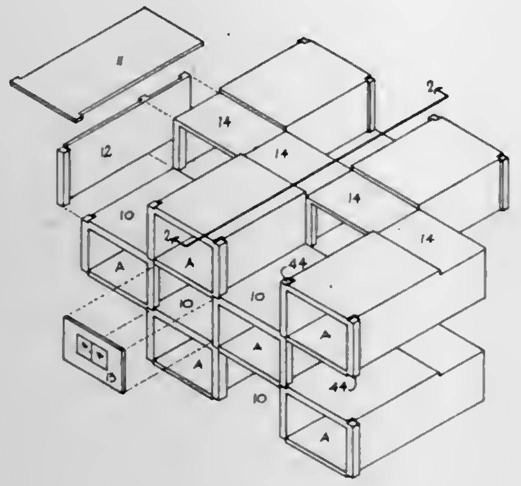


An elongated tubular structure, of non-stretchable material — preferably comprising impermeable-to-gas thin metal having: flat, wider, sealed ends; and intermediate, elongated links, each of which has a hollow portion, inflated with gas at a pressure well above that of the atmosphere, and a wider, bonded, flattened-tube band at each link end. Each flat, tubular-structure end comprises a welded, vulcanized or otherwise bonded, sealed joint between two flat sides of the structure and an outer-end means for attachment of this end to a similar portion at the other end and/or to adjoining structure (an end flange, optionally having bolt or rivet holes). Adjacent inflated links are preferably joined by a flatter, wider portion that preferably allows passage of gas between links and inflation of all the links from a single gas inlet, permanently sealed after inflation. The disclosure also comprises a strongly rigid or very stiffly resilient vehicular body (strongly protecting a load in a crash) and stiffly resilient shock-taking means, yieldable without fracture under major shock, comprising tubular structure of the above type.

3,716,954
MODULAR BUILDING SYSTEM

Edward D. Kelbish, 280 Vanderbilt Ave., Brooklyn, N.Y. 11205
Filed Aug. 31, 1971, Ser. No. 176,549
Int. Cl. E04g *1/04*
U.S. Cl. 52—79 **8 Claims**

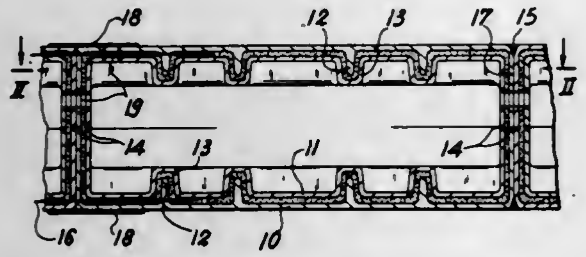
A modular building system which utilizes a plurality of column supported, preformed box-shaped modular units, which are cast as a single unit, adapted for interconnected assembly, and include a factory installation of all kitchens, bathrooms, closets, interior partitions, stairs needed for the proper functioning of the enclosed spaces.



These modular units are stacked in a predetermined manner to form a variety of efficient, easily planned multi-level residential buildings which maximize the advantages of both overlapped and staggered modular assembly.

3,716,955
LIGHT-WEIGHT CELLULAR STRUCTURE

Andre Loupere, Arcachon, France, assignor to Commissariat A L'Energie Atomique, Paris, France
Filed Nov. 1, 1971, Ser. No. 194,318
Int. Cl. F16f *15/04*
U.S. Cl. 52—227 **15 Claims**



A cellular structure each cell of which is constituted by a stiff outer box and a stiff inner box, with a damping means therebetween.

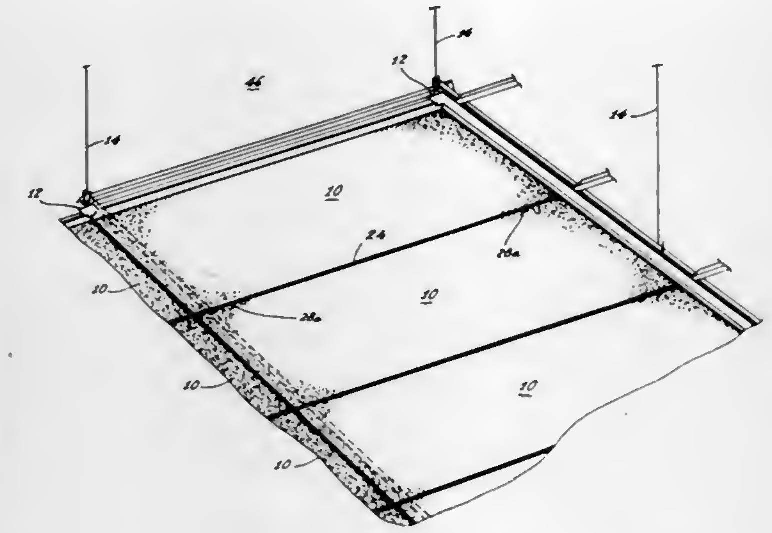
The two boxes of each cell cooperate without being in direct contact, by means of mating male and female ribs mounted in a herring-bone pattern, said ribs being located in the cell and inwardly directed.

Preferably, the structure surfaces are coated, at least at the junctions between adjacent cells, with a thermal insulator.

3,716,956
DOWNWARD ACCESS SPLINE FOR DEMOUNTABLE SUSPENDED CEILING SYSTEM

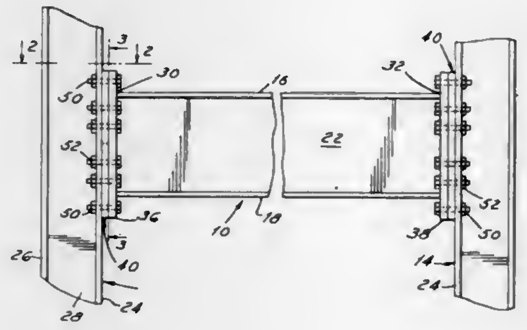
John E. Stanley, La Canada, Calif., assignor to Duo-Flex Corporation, Glendale, Calif.
Filed June 7, 1971, Ser. No. 150,549
Int. Cl. E04b *5/52*
U.S. Cl. 52—484 **4 Claims**

A device for installing a demountable suspended tiled ceiling system constructed of parallel primary support members fixedly suspended from the upper part of a building space and spaced from each other, and T-type intermediate support members extending between, and resting upon the shoulders of adjacent primary support members. In this system, at least one of said intermediate support members is constructed of two disengageable L-shaped halves adapted to be joined back-to-back and latched together to form a T-spline. One of said halves is shorter than the distance between adjacent primary support members. The tiles are of such total length that when rabbetted at their upper edges of each end, they fit against the sides of the primary support members and overlap one half of the width of the bottoms of said primary support members. Thereby the tiles may be mounted flushly in end-to-end abutment. The tiles are slotted laterally to receive the flanges of the T-type intermediate support members. When it is desired to remove the tiles, a protruding wire tab from the disengageable intermediate support member may be pushed upwardly to lift the latter and shift it relative to the longer half to disengage it therefrom so that the shorter half may be pulled down with the tile which it supports. Whereupon the other longer half may be removed from the adjacent tile by sliding it laterally and that tile also pulled downwardly for removal.



3,716,957
COLUMN FLANGE AND STIFFENER PLATE CONSTRUCTION

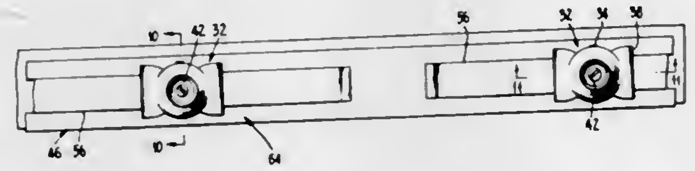
James T. Bernardi, 17200 Fairfield, Detroit, Mich. 48221
Filed Oct. 23, 1970, Ser. No. 83,328
Int. Cl. E04b *1/18;* **F16b** *9/02*
U.S. Cl. 52—633 **3 Claims**



A beam is provided with an end construction for rigid connection to a vertical column. One end of the beam is provided with a rigidly connected vertically extending support plate. A stiffener plate provided with a centrally located, vertically extending elongated slot is interposed between one flange of the column and the support plate, with one side of the stiffener plate in surface to surface contact with the adjacent column flange. The stiffener plate is welded to the column flange, with weld material completely occupying the elongated vertical slot to thereby rigidly connect the stiffener plate to the opposing flange of the column and thereby increase the effective thickness of the column flange. The support plate abuts the opposite side of the stiffener plate. A plurality of high strength bolts extend through the support plate, stiffener plate and column flange to provide a rigid connection, with the bolts being located and arranged in rows on opposite sides of the welded slot-joint so that the force applied to the column flange is rotated 90° and distributed throughout the web of the column.

3,716,958
HIDDEN SHEET SECURING ASSEMBLY

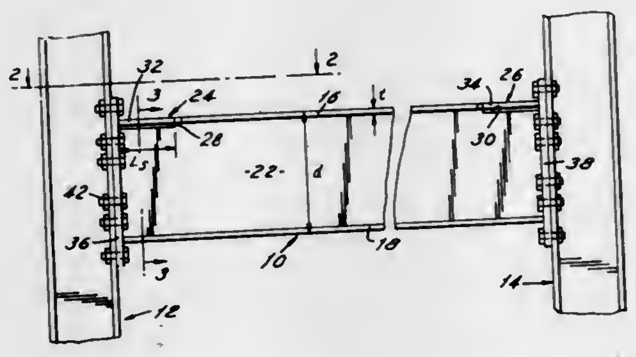
Ian Scrivener, Beecroft, New South Wales, Australia, assignor to Comalco Limited, Melbourne, Australia
Filed July 9, 1970, Ser. No. 53,544
Claims priority, application Australia, July 10, 1969, 57755/69
Int. Cl. E04b *1/40;* **E04d** *3/361*
U.S. Cl. 52—713 **3 Claims**



The invention relates to an improved roofing or wall covering sheet having a rib formation which permits more effective connection to a roof or wall frame. The sheet is provided with one or more ribs, each of which has a groove on each of its sides, the mouth of the groove facing away from the roof or wall frame. The sheet is held in position by means of clips which have arms projecting towards the roof or wall frame and into the grooves. To facilitate installation the clips may be connected to a mounting plate which automatically locates them at the correct spacing.

3,716,959
BEAM END CONSTRUCTION FOR SEMI-RIGID CONNECTION TO A COLUMN

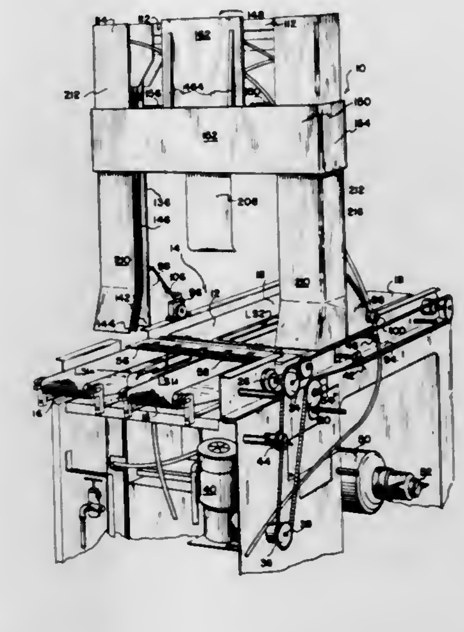
James T. Bernardi, 17200 Fairfield, Detroit, Mich.
Filed Sept. 15, 1970, Ser. No. 72,431
Int. Cl. E04c *3/32, 3/38*
U.S. Cl. 52—721 **2 Claims**



An H-shaped beam is provided with an end construction for semi-rigid connection to a vertical column. The end construction includes a slot provided in the web adjacent the upper flange of the beam. The slot defines a separated flange portion which is capable of elongation under beam loading. The end of the beam, including the separated flange, is rigidly connected to the column.

3,716,960
METHOD AND APPARATUS FOR INSERTING A THREE-SIDED WRAP

James C. Wright, Golden, and Peter Nemeth, Denver, both of Colo., assignors to Cutler-Hammer, Inc., Milwaukee, Wis.
Filed Dec. 17, 1970, Ser. No. 99,156
Int. Cl. B65b *11/06, 41/16, 57/12*
U.S. Cl. 53—3 **18 Claims**

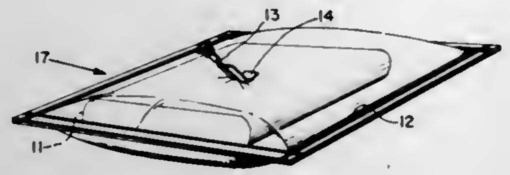


This invention relates to an accessory attachment for a bottom wrap inserter that converts the latter apparatus to a three-sided wrap inserter. Specifically, the attachment takes the web from the bottom wrap inserter and feeds it vertically up a pair of retractable transversely spaced tracks that engage the side margins thereof. The leading edge of the web is held against the front face of an overhead plate by a retractable pressure member while the tracks are retracted to leave the side margins free. The incoming stack passes between the tracks in retracted position on the conveyor top of the bottom wrap inserter and engages the web blocking its path, whereupon, the web is pulled free and the leading edge thereof lays back across the top of the stack. Meanwhile, as the stack continues to move forward along the conveyor table of the bottom wrap inserter, it pulls an additional length of web from the supply roll thereof which is subsequently severed in the usual manner. The resulting sheet wrap covers the top, leading end and bottom of the stack instead of the bottom alone. The invention also encompasses the novel method of inserting a three-sided wrap which comprises pushing the leading edge of a web vertically up into position to intercept an incoming stack by guiding the side margins thereof in slotted tracks, holding the leading edge of the web at a superimposed position above the stack while the tracks are retracted to remote locations permitting the stack to pass freely therebetween, allowing the stack to pull the leading edge of the wrap free by impinging thereagainst thus defining a flap adapted to lay back along the top thereof, and cutting the web free of the supply roll therefor at a location underneath the stack thus freeing a bottom-covering flap.

3,716,961
IN-PACKAGE STERILIZATION

Paul E. Cope, Cincinnati, and Joe G. Miles, Greenhills, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio
Filed Dec. 29, 1970, Ser. No. 102,479
Int. Cl. B65b *55/18*
U.S. Cl. 53—21 FC **2 Claims**

A method for sterilizing articles on a production basis, within individual storing and shipping packages after the articles are packaged. One or more articles are sealed within a gas-permeable package, sterilant is injected into the package,



and the package containing both the article and the sterilant is moved to a well ventilated holding area where it is held until sterilization is complete.

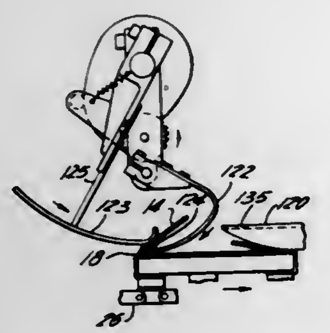
3,716,962
CARTON FLAP FOLDING MECHANISM

Jacobus Joseph Langen; Marinus Jacobus Maria Langen, both of Rexdale, Ontario, and Ernest Topler, Toronto, all of Canada, assignors to American Can Company, New York, N.Y.

Division of Ser. No. 822,778, March 6, 1969, abandoned. This application Dec. 18, 1970, Ser. No. 99,504

Int. Cl. B65b *7/20;* **B31b** *1/54*

U.S. Cl. 53—209 **2 Claims**



A machine for forming and sealing a carton from a flat carton blank. The carton is formed by a mandrel in cooperation with a guide means which are positioned adjacent the path of movement of the mandrel. A conveyor also assists in formation of the carton around the mandrel. The mandrel is removed from the carton and after filling the carton is closed and sealed.

3,716,963
SHRINK-FILM CAPPING MACHINE

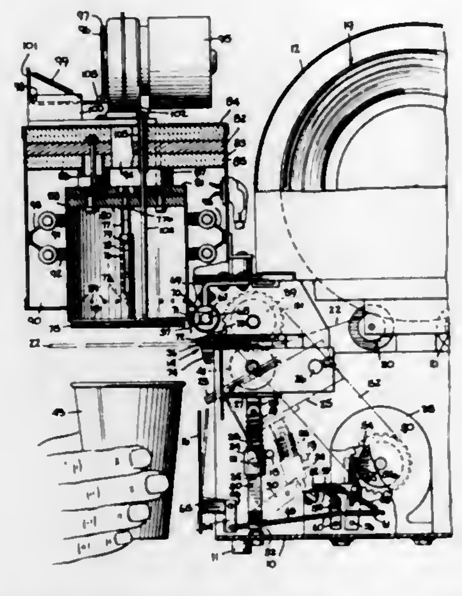
Ralph Gilbert Amberg, Monticello, Ind., assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Nov. 25, 1970, Ser. No. 92,605

Int. Cl. B65b *7/28*

U.S. Cl. 53—296 **16 Claims**

Counter top machine for shrink-film capping of containers in which a capping unit is mounted on a cabinet so that the lower end of the unit is spaced above the counter. The capping unit includes a sealing tube for receiving the upper end of the container as the container is manually moved upwardly and for directing hot air around the edges of the shrink-film closure, the central portion of which is held between a vertically movable plunger plate and the container and the hot air being supplied from a chamber containing electric heating elements and fed by an air valve controlled centrifugal blower, the air valve being actuated by upward movement of the container. A puncturing needle on the plunger punctures the closure and a heated knife on the unit severs the film. The cabinet contains a roll of shrinkable film which is fed in measured amounts by an electric motor drive between corrugated jaws which direct the film beneath the plunger plate, the drive being activated by a manually operable trigger lever located below the jaws. One of the jaws is toggle actuated for initial threading of the film between the jaws.



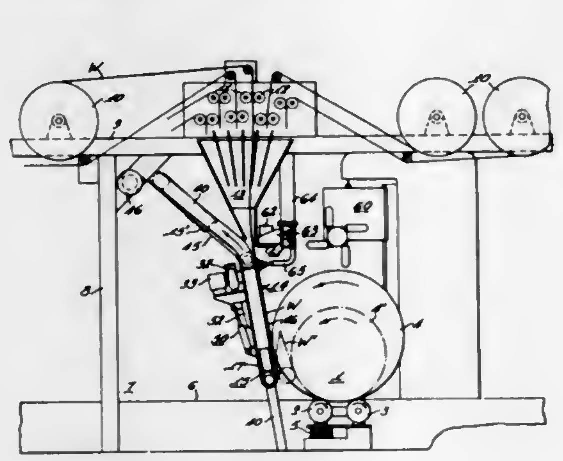
3,716,964
WRAPPING SHEET DISPENSER FOR ROLL WRAPPING MACHINE

George E. Reynolds, Donald J. Mattison, and Fred J. Gedemer, Appleton, Wis., assignors to Allis-Chalmers Manufacturing Company, Milwaukee, Wis.

Filed Dec. 28, 1970, Ser. No. 101,945

Int. Cl. B65b *41/06*

U.S. Cl. 53—389 **2 Claims**



A roll wrapping machine is provided with structure for supporting a roll of wrapper paper above a wrapping station. A vacuum box having a flat downwardly inclined wrapping paper guiding surface is arranged between the wrapping station and the wrapper roll. A lower end of the box is arranged adjacent the lower portion of a roll to be wrapped at the wrapping station and an upper end of the box is both above and rearward of the lower end. A roller is mounted for rotation about its central axis in parallel spaced alignment with the upper end of the box and another roller is mounted for rotation about its central axis in parallel spaced alignment with the lower end of the box. The wrapping paper guiding surface is provided with a plurality of elongated slots extending along the surface perpendicular to the rollers. A plurality of endless air pervious belts encircle the rollers with each belt lapping one of the slots. An air evacuating pump is connected to the box for evacuating air from the box and drawing air into the box through the belts and slots to hold a portion of the wrapping paper flat thereon. A drive motor is connected to one of the rollers to move the belts, and wrapping paper held flat thereon, downwardly along the guiding surface to dispense the wrapping paper from the lower end of the box along a path converging toward the wrapping station. The upper end of the box is supported for pivotal movement about a horizontal axis parallel to the guiding surface. A power operated actuating linkage is operative to pivot the box about the horizontal axis and swing the lower end of the box toward the wrapping station to place the leading edge of wrapping paper held on the guiding surface, in flat contact with a lower portion of a roll to be wrapped. The box is supported by tracks for upward movement to an elevated position in which the lower end of the box clears a space through which a wrapped roll may be discharged.

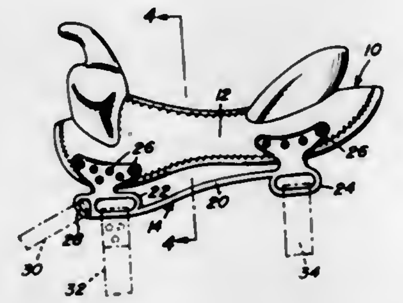
3,716,965
SADDLE RIG BAR

Robert A. Douglas, P.O. Box 4002, Sheridan, Wyo.

Filed Sept. 24, 1970, Ser. No. 75,215

Int. Cl. B68c *1/02*

U.S. Cl. 54—46 **2 Claims**



An elongated bar for use in pairs and disposition along opposite sides of a saddle tree and securement to the remote lower edge portions of the legs of the saddle tree fork at points adjacent the front and rear ends of the fork legs. The bars each include opposite end attachment points by which the bars are to be secured to the corresponding fork legs by suitable fasteners secured through the attachment points and anchored to the fork legs. Some of the disclosed attachment points are rigid with the corresponding ends of the associated bar and some of the disclosed attachment points are pivotally secured to the opposite ends of the corresponding bar for oscillation about substantially aligned axes. Further, one form of saddle rig anchor disclosed includes merely mounting eyes or rings rigidly attached to the opposite ends of each fork leg of an associated saddle tree without a bar portion extending between each pair of opposite side mounting eyes or rings.

3,716,966
WET ELECTROSTATIC PRECIPITATOR

Alexander P. de Seversky, Northport, N.Y., assignor to Electronatom Corporation, New York, N.Y.

Continuation-in-part of application Ser. No. 855,369, Nov. 25, 1959. This application Aug. 31, 1960, Ser. No. 53,255

Int. Cl. B03c *3/41, 3/78, 3/49*

U.S. Cl. 55—118 **4 Claims**

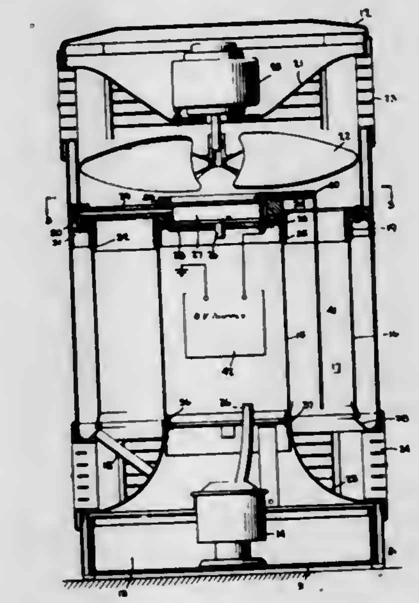
1. An electrostatic precipitator for cleaning contaminated gas comprising:

(a) concentrically-arranged inner and outer collector tubes defining a vertically-disposed annular gas passage,

(b) means coupled to a well to draw liquid therefrom and to feed the liquid to the upper ends of said tubes to produce a downwardly-flowing and substantially uniform liquid film on those surfaces of said inner and outer tubes which line said passage,

(c) concentrically-arranged troughs at the lower ends of said tubes to receive the downwardly-flowing liquid therefrom and to discharge the liquid into said well,

(d) inlet means to introduce said contaminated gas into the lower end of said annular passage between said troughs, said inlet means including means to admit said gas in a horizontal plane and further including a frusto-conical deflector in axial alignment with said tubes to direct contaminated gas entering in the horizontal plane upwardly through the vertically-disposed annular passage,



(e) a discharge electrode structure supported within said passage,

(f) means to apply a high voltage between said discharge electrode structure and both of said tubes to cause migration of particles in said gas toward the films on said tubes and thereby produce a clean gas, and

(g) outlet means at the upper end of said annular passage to discharge the clean gas into the atmosphere, said outlet means including an inverted frusto-conical deflector in axial alignment with said tubes to direct the clean gas from said passage outwardly in the horizontal plane.

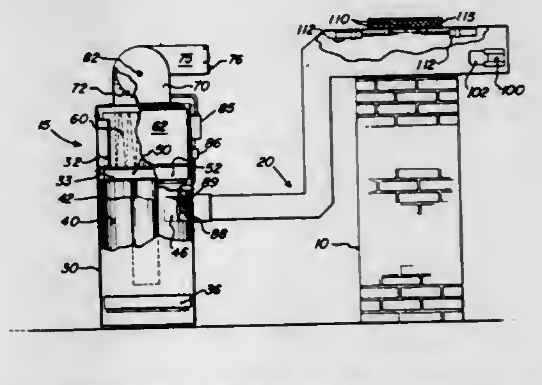
3,716,967
FILTERING APPARATUS

Lawrence O. Doyle, Jr., Wayzata, and Harlen D. Meek, Anoka, both of Minn., assignors to Anti-Pollution Devices, Inc., Hopkins, Minn.

Filed Sept. 11, 1970, Ser. No. 71,561

Int. Cl. B01d *50/00*

U.S. Cl. 55—217 **6 Claims**



A filtering apparatus adapted to be connected to a burner apparatus of the furnace type in buildings to remove fly ash, smoke and other contaminate particles from the flue gases or discharge gases therefrom. It includes three stages of filtration the first being a cyclone type separator and the second and third stages being mechanical filters. An exhaust or blower assembly is mounted on the casing to draw gases through the filtering apparatus from the chimney. Operation of the same is made automatic by a temperature sensor in the filtering apparatus which is connected to the chimney by means of transverse duct work. An air inlet is provided in the transverse duct work to draw in ambient air along with the gases for the purposes of cooling the same as they pass through the filtering apparatus.

3,716,968
INSTALLATION FOR FILTERING AND CLEANING FILTERS

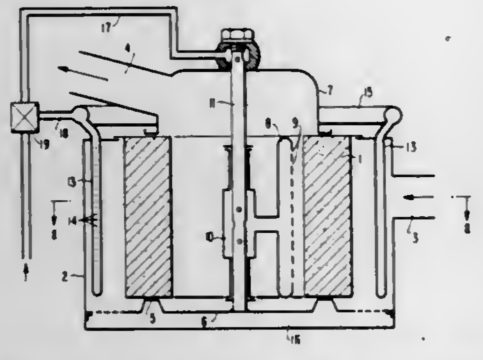
Arthur Mischke, Ruit Kreis Esslingen, Germany, assignor to Daimler-Benz Aktiengesellschaft, Stuttgart-Unterturkeim, Germany

Filed March 26, 1970, Ser. No. 22,840

Claims priority, application Germany, March 28, 1969, P 19 16 099.7

Int. Cl. B01d *46/04*

U.S. Cl. 55—294 **14 Claims**



An installation for cleaning a filter, particularly a paper filter or the like, arranged in the intake installation of a combustion engine, in which a blow-out device adapted to be connected with a compressed air source is arranged inside of the intake installation which has one or several discharge apertures that are directed preferably approximately perpendicularly against the filtered-air-side of the filter; additional blow-out devices may be provided on the outside of the filter whose discharge apertures are directed approximately tangentially to the outer side of the filter so as to remove from the filter those dust particles which have been loosened by the blast from the discharge apertures on the inside of the filter.

3,716,969
CONTINUOUS MOVING LAYER TYPE ADSORPTION DEVICE

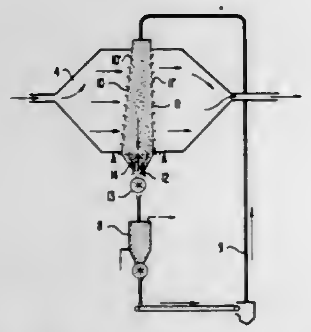
Isamu Maeda, Niihama-shi, Japan, assignor to Sumitomo Jukikai Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 10, 1971, Ser. No. 206,815

Claims priority, application Japan, Dec. 10, 1970, 45/108933

Int. Cl. B01d *53/06*

U.S. Cl. 55—390 **10 Claims**



A continuous moving layer adsorption device employed in an exhaust gas desulfurization system is made of an adsorption vessel as the main body filled with activated charcoal and a rectifying device included therein, the adsorption vessel main body comprising a side wall provided with a number of louvers and located at the gas-introducing side of the vessel, another side wall having delivery holes located at the gas-exhausting side of the vessel, the distance between the gas-introducing side wall and the gas-exhausting side wall being larger toward the downward portion of the vessel, a hopper-like portion provided adjacently below the two side walls, and an elongated port provided at the bottom of the hopper-like portion for delivering the activated charcoal; and the rectifying device comprising a rectifying body placed in the hopper-like portion and a rectifying place extended downwardly from the rectifying body.

3,716,970
FILTER DEVICE AND METHOD FOR THE MANUFACTURE THEREOF

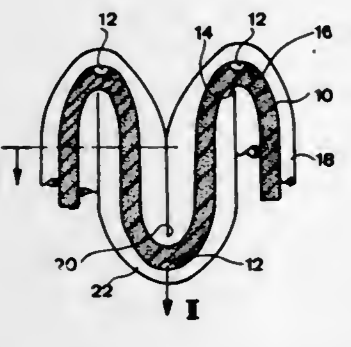
Ewald Stupf, Birmensdorf, and Tammo Haan, Dietlikon, both of Switzerland, assignors to Luwa AG, Zurich, Switzerland

Filed Aug. 13, 1970, Ser. No. 63,519

Claims priority, application Switzerland, Aug. 20, 1969, 12591/69

Int. Cl. B01d *39/20*

U.S. Cl. 55—521 **17 Claims**



A filter device comprising zig-zag folded substantially flat filter material is disclosed. The invention contemplates the provision of at least one, but preferably a plurality of substantially parallel tubular-shaped elements defining bead means or elevated portions secured to a least one side of the filter material. The tubular-shaped elements extend substantially perpendicular to the folds of the filter material and serve to support such folds in spaced relationship from one another.

The invention further contemplates an improved method for the manufacture of such filter device wherein prior to the formation of the folds at the flat filter material there is first formed at least one tubular-shaped element at the filter material, then an adhesive material is applied to the tubular-shaped element, preferably by introduction thereof internally of such tubular-shaped element so that the adhesive material penetrates through the tubular-shaped element and fixedly adheres such tubular-shaped element to the neighboring portions of the filter material.

3,716,971
METHOD OF FILTERING

Thomas V. Reinauer, 9 Dunnder Drive, Summit, N.J.

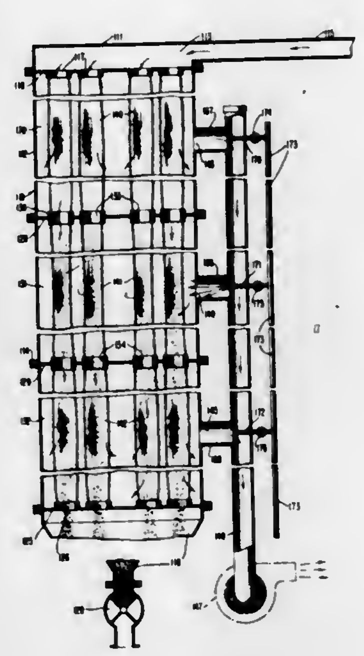
Continuation-in-part of Ser. No. 713,864, March 18, 1968, Pat. No. 3,630,005. This application March 29, 1971, Ser. No. 129,057

Int. Cl. B01d *46/04*

U.S. Cl. 55—96 **9 Claims**

Method of affecting separation of particulate matter from a gaseous carrier by selective subdivided passage of said carrier through a plurality of discrete filter chambers disposed in vertical superposed relation interconnected by a vertically

oriented conduit member that is constituted, at least in part, by permeable filter medium that forms a portion of the defining walls of each such chamber. The invention also includes an improved cleaning method wherein the filter media associated with each discrete and vertically superposed filter chamber is



subjected to cleaning in predetermined sequence that is directionally concurrent to the direction of particulate matter displacement toward a receiving hopper and wherein the lower portions of the filter media are preferentially subjected to an effectively greater quanta of cleaning than the upper portions thereof.

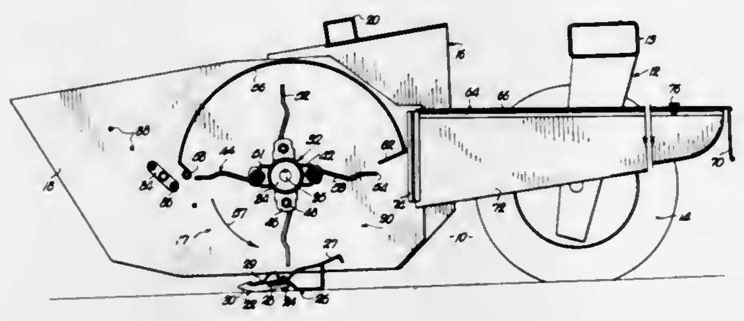
3,716,972
MOWING, CONDITIONING AND WINDROWING MACHINE AND METHOD

Cecil L. Case, Newton, Kans.; Robert L. Elder, Yukon, Okla., and Ferol S. Fell, Newton, Kans., assignors to Hesston Corporation, Hesston, Kans.

Filed July 12, 1971, Ser. No. 161,688

Int. Cl. A01d

U.S. Cl. 56—1 **12 Claims**



In the drying of hay, the stems only of the crop are conditioned, during cutting and before the cut crop is returned to the ground, by a flailing action which produces multiple transverse fractures along all of the stems as they are continuously blown and forcibly projected butt first in a wide, uniform, thin stream into a windrowing assembly. A single rotor with stem-fracturing hammers or blades not only conditions the stems while they are in movement, with sufficient severity to assure complete moisture release in accordance with stem coarseness and density of growth, all without undue loss of stem stiffness, leaf knock off or clipping, but also performs the function of creating air currents that provide the additional forces needed to properly propel the cut crop and produce a loose, fluffy, faster curing windrow.

3,716,973
MACHINES FOR CUTTING CROPS

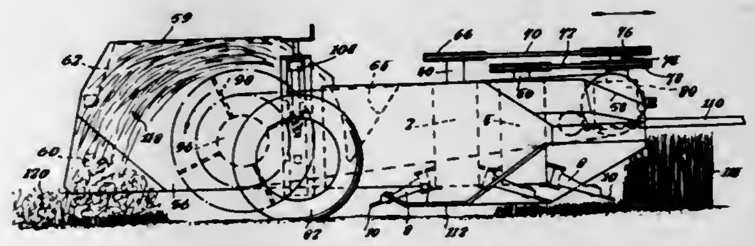
Archibald W. Kidd, Melksham, England, assignor to Archie Kidd (Designs) Limited, Roundway, Devizes, Wiltshire, England

Filed July 13, 1970, Ser. No. 54,202

Claims priority, application Great Britain, July 16, 1969, 35,703/69

Int. Cl. A01d *43/04*

U.S. Cl. 56—6 **11 Claims**



Machine for cutting crops by cutters pivotally mounted on a pair of drums mounted on vertical axes and rotating in opposite directions, the cut crop being swept backwards between the drums to a tedder mounted behind the drums. The tedder forms the cut crop into a light fluffy swath.

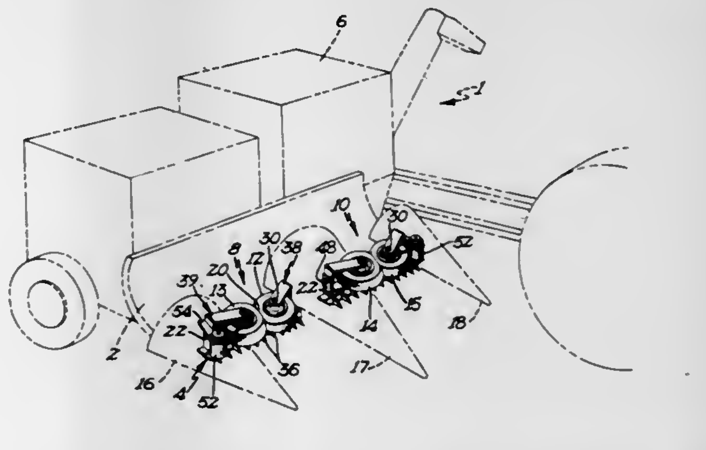
3,716,974
HARVESTING ATTACHMENT FOR COMBINES

James F. Wehde, Garretson, S. Dak.

Filed June 21, 1971, Ser. No. 154,867

Int. Cl. A01d *45/02*

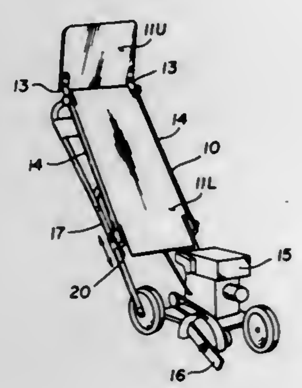
U.S. Cl. 56—14.3 **13 Claims**



A harvesting attachment for combines comprising at least one pair of gripping wheels pivotally supported on the front of the combine receiving platform above the combine cutting blade at an angularly inclined position with respect to the ground, the gripping wheels being in pressure contact with each other along a gripping area positioned in alignment with a row of crops, such as a sow beans, being harvested. The gripping wheels are so positioned with respect to the combine cutting blade and their angular inclination and rotational speed with respect to the ground speed of the combine are so adjusted that the wheels will grip and lift plant stalks a predetermined distance vertically and hold the stalks for cutting from their roots by the combine cutting blade prior to conveying the stalks rearwardly onto the combine receiving platform.

3,716,975
SAFETY SHIELD FOR POWERED LAWN EQUIPMENT

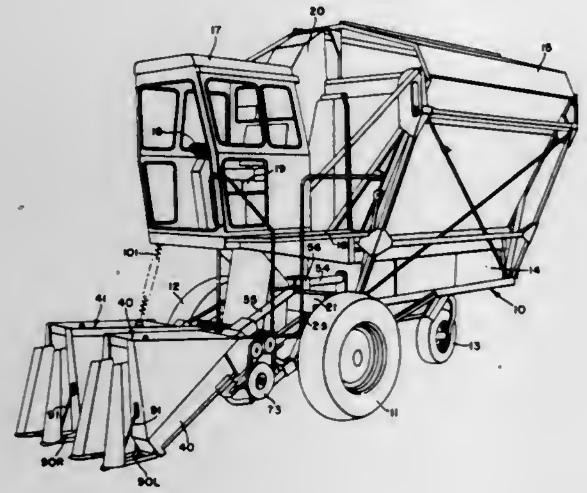
Alfred E. Smith, 3938 Lorado Way, Los Angeles, Calif.
Filed Jan. 20, 1972, Ser. No. 219,320
Int. Cl. A01g ***3/06***
U.S. Cl. 56—17.4 **6 Claims**



A safety shield, for protection of the operator from flying debris, which is fastened to the arms and handles of powered lawn tools such as power lawn edgers and power lawn mowers. The shield is in the form of metal or plastic plates which are fastened to the arms and handles of the equipment. An extension of the shield is set above the handles of the tool in a plane that intersects the imaginary line between the face of the operator and the working area of the powered equipment.

3,716,976
CROP HARVESTER

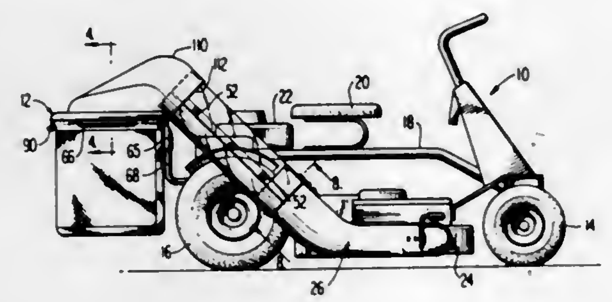
Russell Dean Copley, Ankeny, and Francis Edward Schlueter, Des Moines, both of Iowa, assignors to Deere & Company, Moline, Ill.
Filed June 9, 1971, Ser. No. 151,423
Int. Cl. A01d ***45/02***
U.S. Cl. 56—106 **21 Claims**



A crop harvester composed in part of a crop-treating unit mounted on a frame and having a forward crop inlet thereon. The harvester also includes in part forwardly disposed harvesting units mounted on a transverse horizontal pivot and having their rear ends opening downwardly above the crop inlet. Drive mechanism to the harvester includes a rotary member driven by a power source on the main frame and supported concentrically with the horizontal pivot. The rotary member is provided for each harvesting unit and is connected to the harvesting mechanism therein by drive means.

3,716,977
GRASS CATCHER ASSEMBLY

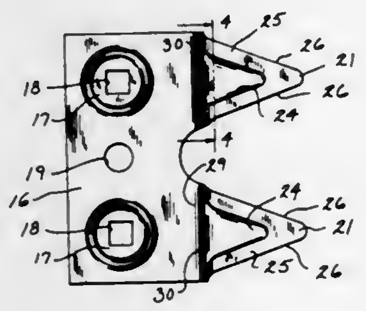
Harold P. Jackson, McDonough, Ga., assignor to McDonough Power Equipment, Inc., McDonough, Ga.
Filed Nov. 8, 1971, Ser. No. 196,583
Int. Cl. A01d ***35/22***
U.S. Cl. 56—202 **27 Claims**



A grass catcher assembly for a lawn mower including a rectangular main frame adapted to be supported at the rear of a lawn mower in a horizontal plane, a rectangular subframe having a bag suspended therefrom with the subframe slidably mounted for movement in a horizontal plane relative to said main frame. Closing the top of the bag is a cover releasably secured on the main frame and having an inlet opening for receiving a chute extending from the blade housing of the mower to deliver grass clippings into the bag through the cover. The inlet opening is located to one side of the cover and defined by a raised portion on the cover which also defines a passage for guiding the grass clippings in the longitudinal direction of the bag to ensure uniform distribution of the grass clippings across the bag. The subframe with the bag depending therefrom is releasably retained in the main frame for use by means of a pivoted stop which may be moved to release the subframe and permit it together with the bag to be slid in a horizontal plane out of the main frame for discharging the contents of the bag.

3,716,978
SHEAR FINGERS FOR SICKLE BARS

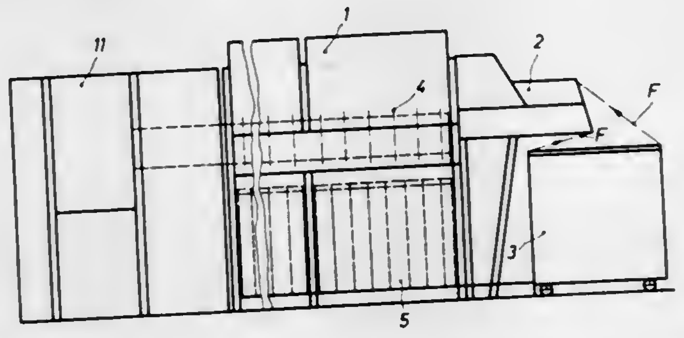
Joseph Haban, Mound & Marquette Streets, Racine, Wis.
Division of Ser. No. 56,427, Aug. 20, 1970, Pat. No. 3,682,021. This application May 8, 1972, Ser. No. 251,249
Int. Cl. A01d ***55/10***
U.S. Cl. 56—310 **8 Claims**



Pointed shear fingers are formed, preferably in multiples, from a flat metal plate which is blanded out to the required outline. The blank is formed in a die which offsets the projecting finger portions and simultaneously creates a convexity of the bottom surface bordered by angled edges or bevels, the forming also producing a concavity in the top of each finger, leaving a flat V-shaped marginal portion which provides shearing edges in conjunction with the formed bevels of the bottom side. Shear fingers are separated by clean-out recesses which are formed in the blanking operation.

3,716,979
METHOD AND ARRANGEMENT FOR SUPPLYING SLIVER TO A FINE SPINNING MACHINE

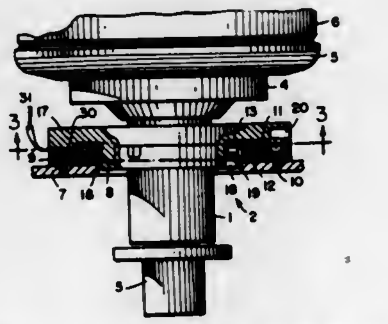
Karl Handschuh, Oberhaunstadt, and Fritz Schumann, Ingolstadt, both of Germany, assignors to Schubert & Salzer Maschinenfabrik Aktiengesellschaft, Ingolstadt, Germany
Filed Dec. 16, 1970, Ser. No. 98,840
Claims priority, application Germany, Dec. 24, 1969, P 19 64 857.8
Int. Cl. D01h ***9/18***
U.S. Cl. 57—34 R **15 Claims**



Sliver is transported in large transport cans to a refilling device adjacent to a fine spinning machine having two parallel rows of spinning stations. The sliver is transferred from such large transport cans to supply cans which are smaller and are movable between the refilling station and individual spinning stations. At least four parallel supply can supporting tracks are provided, two of which are spinning head feeding tracks and two are refilling tracks. One refilling track receives empty supply cans transferred from the feeding tracks for circulation past the refilling station, and the other track receives the refilled supply cans for transfer to a spinning head feeding track. The refilling can tracks can be connected at both ends for unidirectional, or at one end for reversible, transfer of empty supply cans from one refilling track past a refilling device to the other track. The filled supply cans may be exchanged for emptied supply cans by connecting a spinning head feeding track to a refilling track and moving the supply cans along a continuous path, or by rails pushing filled supply cans transversely from a filling track onto an adjacent spinning head feeding track, thereby pushing empty supply cans onto another filling track.

3,716,980
RAPID MOUNTING FOR SPINDLE IN YARN TWISTING MACHINES

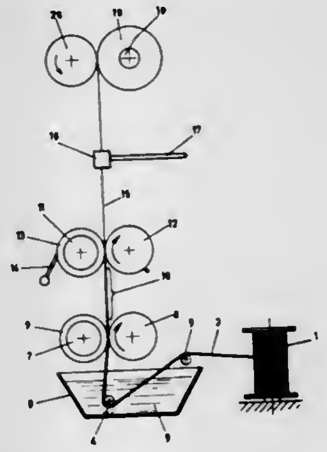
Karl-Heinz Rehn, Remscheid, and Heinz Middelmann, Krawinklerbrucke, both of Germany, assignors to Barmag Barmer Maschinenfabrick Aktiengesellschaft, Wuppertal, Germany
Filed Feb. 24, 1971, Ser. No. 118,444
Claims priority, application Germany, March 2, 1970, P 20 09 592.5
Int. Cl. D01h ***7/08***
U.S. Cl. 57—130 **9 Claims**



A rapidly mounted twist spindle in twisting machines, especially double-twist twisting machines, in which the spindle housing becomes securely but removably axially positioned and rotatably locked onto a carrier member through paired fastening means connected to the housing and the carrier, respectively. Such twist spindles are employed in large numbers for a twisting of threads or yarns.

3,716,981
METHOD FOR MANUFACTURING LINEN YARN, AND LINEN YARN OBTAINED BY APPLICATION OF THIS METHOD

Cornelis Bok, Leidschendam, Netherlands, assignor to Nederlandse Organisatie Voor Toigepast Natuurwetenschappelijk Onderzoek Ten Behoeve Van Nijverheid Handel En Verkeer, The Hague, Netherlands
Filed April 23, 1971, Ser. No. 136,724
Claims priority, application Netherlands, April 28, 1970, 7006240
Int. Cl. D02g ***3/40***
U.S. Cl. 57—139 **5 Claims**



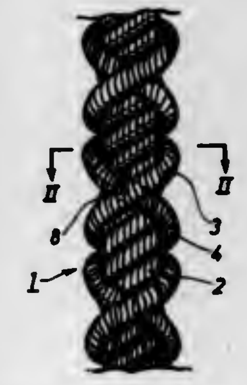
A process for the manufacture of linen yarn in which both twisting and sizing have been eliminated.

Instead, the coherence of the fibers is provided by the natural adhesives which, after a specific chemical decomposition of flax, are still present in the resulting fibers.

A roving of these fibers is drafted in a wet condition that is defined by the fact that the fibers have a water content between 200 and 350 percent when they are travelling through the drafting device, is false-twisted upon delivery from the drafting device, would to a bobbin at a speed that is substantially the same as the delivery speed of the drafting device, and finally dried.

3,716,982
EXTRA COARSE-LAID WIRE ROPE FOR REINFORCED CONCRETE

Takashi Morohashi, and Yuji Morohashi, both of 1-15-9 Sagami Dai, Sagamihara, Japan
Filed Nov. 6, 1970, Ser. No. 87,419
Claims priority, application Japan, Nov. 17, 1969, 44/91919
Int. Cl. D07b ***1/06, 1/14***
U.S. Cl. 57—145 **2 Claims**

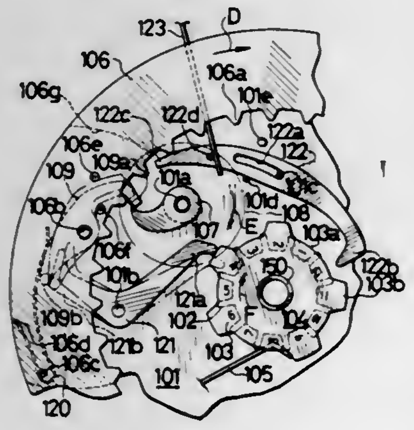


This invention generally involves wire rope which is suitable for use in the concrete working in very tall buildings or ultra high buildings. More particularly, this invention relates to a wire rope which has an extremely coarse-laid surface so as to increase adhesive strength or bond strength in respect to the placed concrete.

3,716,983
CALENDAR WATCH

Kazuo Tanaka; Akira Tsuzuki, and Tetsuo Matsumura, all of Tokyo, Japan, assignors to Citizen Watch Company Limited, Tokyo, Japan

Filed June 22, 1971, Ser. No. 155,433
Claims priority, application Japan, June 22, 1970, 45/54199
Int. Cl. G04b *19/24*
U.S. Cl. 58—58 **3 Claims**



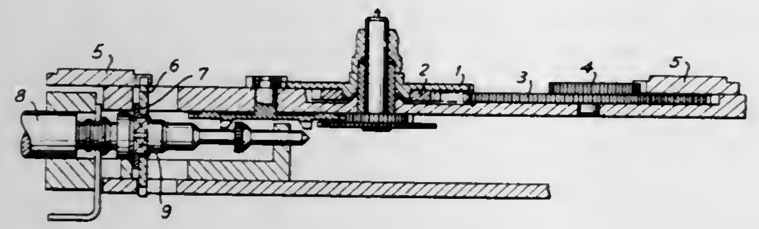
This invention relates to the feed mechanism of the above kind, by which a plurality of calendar teeth are automatically fed at every end of small or even months, so as to obviate otherwise troublesome manual calendar feed operation to be carried out at such every month end above referred to.

The improvement resides in the provision of a small month end driver rotatably mounted on said date dial and adapted for performing a complete revolution per month together therewith said driver being controlled in its position by said cam and in close proximity of every month end.

3,716,984
WATCH STRUCTURE HAVING PLASTIC AND METAL COMPONENTS

Toshiaki Saito, Suwa, and Mamoru Miyasaka, Nagano, both of Japan, assignors to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed July 28, 1971, Ser. No. 166,752
Claims priority, application Japan, July 30, 1970, 45/75486
Int. Cl. G04b *19/24*
U.S. Cl. 58—58 **6 Claims**

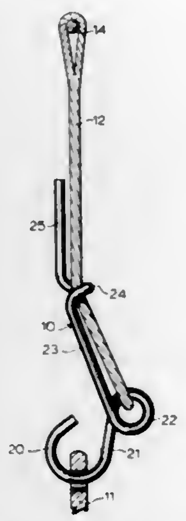


In a watch having both plastic and metal components and particularly where the components are gears, engagement between any metal component and any plastic component is frictional only. Engagement of teeth takes place only between metal components and metal components on the one hand and plastic components and plastic components on the other hand.

3,716,985
LINE TIGHTENING LEVER

Clarence P. Meister, 42024 Stanberry Avenue, Sterling Heights, Mich.

Filed Dec. 13, 1971, Ser. No. 207,242
Int. Cl. A44b *21/00;* **A45f** *1/18*
U.S. Cl. 24—68 F **2 Claims**

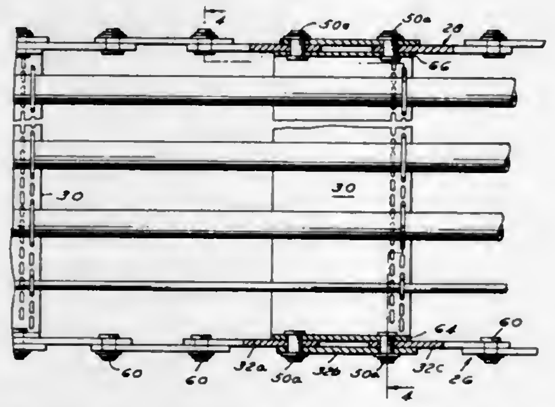


A line tightening lever having a pivotal or hook end constituting the fulcrum point, a line attaching eye constituting the weight point, and a power bar arm extending from the eye at a relatively large angle relative to an axis extending between the hook end and the eye so that when the lever is swung by moving the arm angularly past the axis, the hook end pivots and the eye moves sidewise off the axis and endwise toward the plane of the hook extending the line under added tension to tighten it. A second arm extension handle on the first arm beyond the engaging means provides the user with added mechanical advantage to swing the lever. The arm has engaging means for abutting the line in the tightened position to prevent reverse swing of the lever thereby maintaining the increased tension on the line. Upon the lever being released, the engaging means forces a turn in the line thereby shortening the extension of the line to add to the tension exerted.

3,716,986
ROLLING CONDUCTOR SUPPORT

Gordon H. Cork, Birmingham, and David M. Tenniswood, Troy, both of Mich., assignors to Gemco Electric Company, Clawson, Mich.

Continuation-in-part of Ser. No. 41,842, June 1, 1970, abandoned. This application Oct. 21, 1970, Ser. No. 82,566
Int. Cl. F16g *13/16*
U.S. Cl. 59—78.1 **1 Claim**

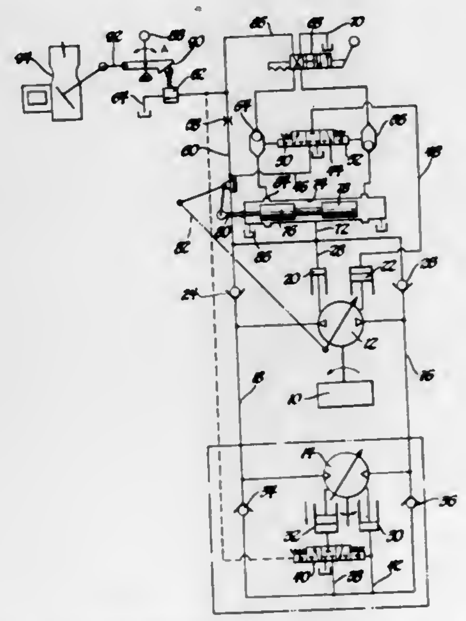


A rolling conductor support for supporting, guiding and protecting electrical, hydraulic, coolant and the like conductors extending between parts of machines which move relative to one another on guides or tracks. The conductor support comprises a plurality of parallel chains connected in laterally spaced relation by conductor supporting bridges to which the conductors are fastened by clips or retainer loops. The chains are composed of links pivotally connected at overlapping contiguous ends, with a slot in one end of each link receiving a stop pin in the overlapping contiguous end of the next link, the length of the slots determining the bending radius of the chains.

3,716,987
POWER TRANSMISSION

Kurt R. Lonnemo, Troy, Mich., assignor to Sperry Rand Corporation, Troy, Mich.

Filed Sept. 22, 1971, Ser. No. 182,676
Int. Cl. F02b *41/00*
U.S. Cl. 60—19 **3 Claims**

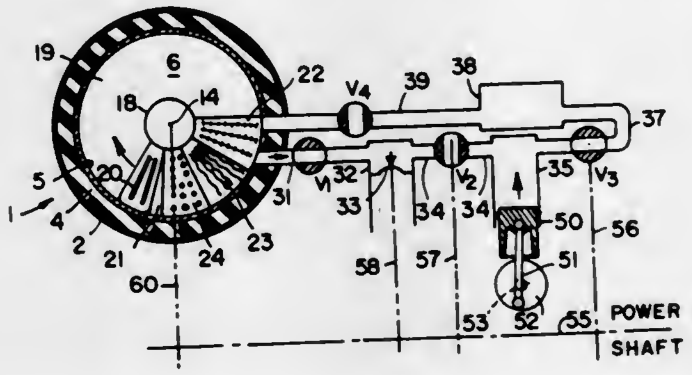


A hydrostatic transmission using a variable displacement pump is driven by an internal combustion engine and has a control system wherein a single pedal or lever controls both the engine throttle and pump displacement. The position of the pedal or control lever determines both the throttle opening and the input torque to the hydrostatic transmission. The control automatically varies the pump displacement to maintain the selected input torque against the momentary load conditions on the hydraulic motor in accordance with the torque-speed characteristics of the engine. The control utilizes a hydraulic bridge circuit, having in its feedback leg, a pair of laminar flow restrictions varied in accordance with the position of the pump displacement regulator.

3,716,988
PRESSURE TRANSLATING APPARATUS AND PROCESS

Jaroslav Wurm, Cicero, Ill., assignor to The Institute of Gas Technology, Chicago, Ill.

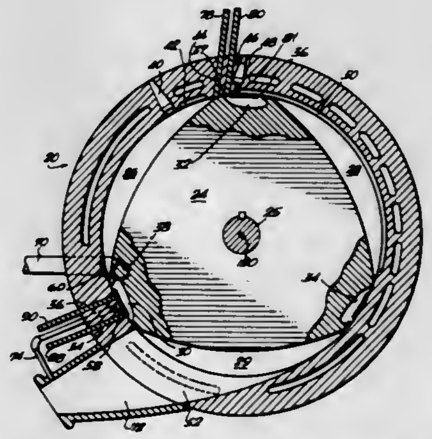
Filed Jan. 20, 1971, Ser. No. 108,115
Int. Cl. F03g *7/06;* **F25b** *1/00, 27/00*
U.S. Cl. 60—24 **6 Claims**



An apparatus and process for conversion of thermal energy into mechanical energy having a portion of the working fluid of a heat engine isolated from the active volume of the heat engine for adiabatic expansion to about the lowest pressure of the heat engine cycle and return of said portion of working fluid to the heat engine during the latter portion of the cooling cycle of the heat engine. In one embodiment the working fluid of a heat engine is in direct communication with a primary expansion pressure sensitive means for primary conversion of thermal energy to mechanical energy, and then a portion of the partially de-energized working fluid is isolated from the active volume of the heat engine and in communication with a secondary expansion means such as a piston or rotary expander wherein the working fluid with the energy remaining after expansion in the primary expansion means is further adiabatically expanded to about the lowest pressure of the heat engine cycle after which the working fluid is returned to the heat engine. The apparatus is particularly advantageously used as a prime mover and in conjunction with a cooling device or other pumping systems.

3,716,989
ROTARY JET TWIN-PROPULSION ENGINE

Renan Moreira, 3727 SW. 8th St.,
Coral Gables, Fla. 33134
Filed Mar. 24, 1971, Ser. No. 127,523
Int. Cl. F02c *3/16;* **F02b** *53/04*
U.S. Cl. 60—39.34 **26 Claims**



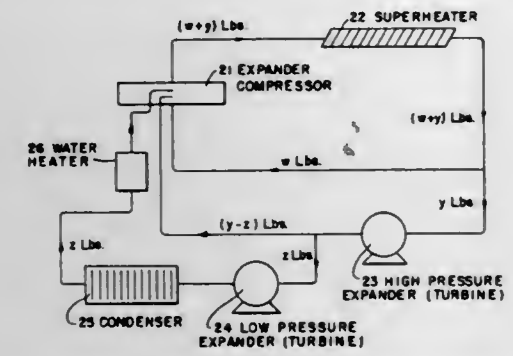
This invention pertains to an internal combustion engine of the rotary type which provides two force components, jet thrust and expansion forces to, in effect, provide an engine within an engine. One or more cam-rotors are provided in a housing including stators for each cam-rotor. Each cam-rotor includes one or more lobes, provided with jet combustion chambers, and is configurated to provide peripheral compression, expansion and exhaust chambers within the stator. Inwardly and outwardly sliding vanes are at all times urged against the peripheral face of each cam-rotor to cooperate with a lobe thereof to compress a mixture of air and fuel which is fed into the compression chamber. After the mixture is fully compressed it is transmitted into the combustion chamber within a lobe for subsequent firing when the rotational movement of the cam-rotor positions said combustion chamber in the area of a firing means within the expansion chamber. After the firing occurs, the expanding gases rush from the combustion chamber through jet ports to provide jet thrust forces within the expansion chamber and the sliding vanes provide a blocking means whereby the expansion forces in the expansion chamber combine with the jet thrust forces to react against the trailing portion of the lobe to drive the cam-rotor in its predetermined direction of rotation.

3,716,990
CONDENSABLE VAPOR POWER PRODUCING SYSTEM

John Gordon Davoud, Richmond, Va., assignor to Edwin Cox Associates, Richmond, Va.

Filed May 12, 1971, Ser. No. 142,468
Int. Cl. F01k *25/00, 23/00*
U.S. Cl. 60—94 **24 Claims**

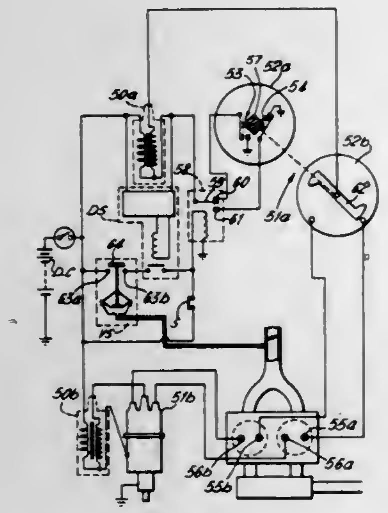
Steam or other condensable vapor heated to a predetermined temperature at a predetermined pressure and having a given entropy is expanded in part in a work producing zone to a lower pressure and then condensed while the remaining part is expanded in a second zone; and following expansion, water is added thereto, with or without addition, or following withdrawal, of a portion of steam at the same state as the second portion of steam after expansion, to form a weight of



steam greater than that introduced into the second zone but at a lower entropy, using the work of expansion in the second zone to compress the steam expanded in the second zone, plus the further portion of added steam, when such addition of steam is made, or minus the portion removed, when such removal is made, plus the added water, to the original predetermined pressure.

3,716,991
EXHAUST GAS PURIFYING DEVICE

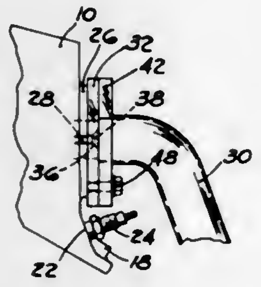
Yasuo Tatsutomi, and Hiroshi Shimizu, both of Hiroshima, Japan, assignors to Toyo Kogyo Co., Ltd., Aki-gun, Hiroshima-ken, Japan
Filed April 28, 1971, Ser. No. 138,146
Claims priority, application Japan, April 28, 1970, 45/41661
Int. Cl. F02b *75/10*
U.S. Cl. 60—289 **9 Claims**



An exhaust gas purifying device comprises an improved control system for controlling a device for regulating the flow of a supplementary air to the afterburner, disposed in an exhaust system of an internal combustion engine, or a device for controlling the spark-plug ignition timing, in response to the difference between the temperature of the internal combustion engine and the ambient temperature around the engine for the purpose of reducing to an inappreciable value the amount of noxious unburned compounds present in an exhaust gas emerging from the exhaust system of the engine. The difference of temperature therebetween can be detected by a combined pair of thermal sensitive elements such as thermistors or the like. An essential advantage of the present invention is that the ambient temperature is taken into consideration for efficiently and advantageously operating the exhaust gas purifying device.

3,716,992
ADAPTOR FOR EXHAUST MANIFOLD

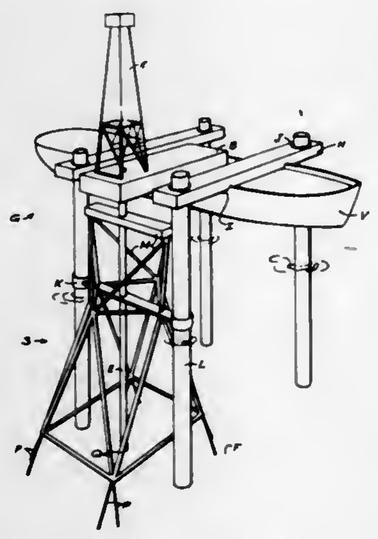
Jere F. Stahl, 1420 E. Philadelphia Street, York, Pa.
Filed Dec. 2, 1971, Ser. No. 204,026
Int. Cl. F01n *7/18*
U.S. Cl. 60—323 **5 Claims**



An adaptor plate by which oversize exhaust pipes may be connected to the exhaust ports of a cylinder head of an internal combustion engine. The oversize exhaust pipes are welded to a header flange which has exhaust holes thercin adapted to be aligned with the exhaust ports of the head of said engine by means of additional threaded screw holes formed in said adaptor plate at greater radial distances from the exhaust passages therein and said adaptor plate also having countersunk holes therein adjacent the peripheries of the exhaust passages therein for reception of bevel headed screws which are threaded into the conventional threaded holes adjacent opposite sides of the exhaust ports of the cylinder head to secure the adaptor plate to said head.

3,716,993
MODULAR OFFSHORE STRUCTURES SYSTEM

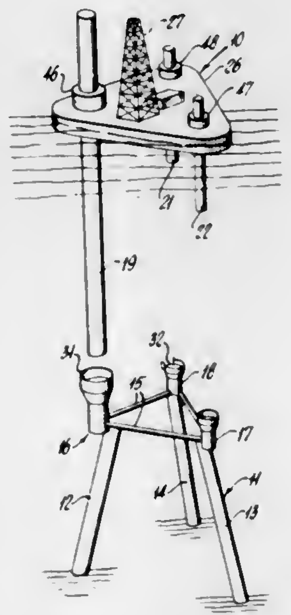
Maurice N. Sumner, 1301 Diez, Houston, Tex.
Continuation-in-part of Ser. No. 649,889, June 29, 1967, Pat. No. 3,575,005. This application Jan. 18, 1971, Ser. No. 107,288
Int. Cl. E02b *17/04*; **E02c** *5/00*
U.S. Cl. 61—46.5 **24 Claims**



A modular-like system of offshore structures for imparting flexibility to the offshore exploration and production and transportation industries so that exploration, production and development work can take place over a large range of marine depths and operational circumstances with one or more marine vessels, a family of spacing-jack-and-coupling means for stabilizing the vessels and for coupling them thereto, and a family of supporting stationing structures or modules which are used for lending support to the stabilized vessel or to operational structures established by the vessel.

3,716,994
ASSEMBLY SYSTEM FOR A DETACHABLY CONNECTED OFFSHORE MARINE STRUCTURE

Ivo C. Pogonowski, Houston, Tex., assignor to Texaco, Inc., New York, N.Y.
Filed June 28, 1971, Ser. No. 157,152
Int. Cl. E02b *17/00*
U.S. Cl. 61—46.5 **6 Claims**

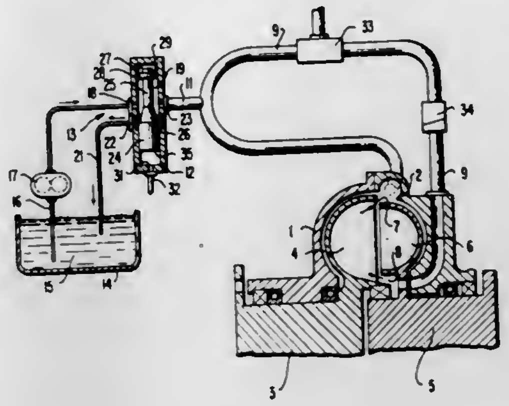


The invention relates to an offshore marine structure characteristic of the kind adapted to be positioned in a body of water. The structure includes a lower pedestal that is anchored, piled or otherwise firmly fixed to the floor of the body of water. A deck section normally elevated above the water's surface, is supported by a plurality of downwardly extending columns or legs that connect it to said lower pedestal. The respective members are brought into unitary engagement by supporting at least one of said legs from the buoyant deck while the latter is floating. The said one leg thereby engages its lower end in a docking receptacle carried on the anchored pedestal. Thereafter, by rotating the deck at the water's surface in such a manner as to pivot about the single connected leg, the remaining support legs are brought into correct alignment as to be lowered and similarly engage other docking receptacles at the pedestal.

3,716,995
HYDRODYNAMIC TRANSMISSION

Wolfgang Peter, and Hans Hanke, both of Stuttgart, Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart-Unterturkheim, Germany
Filed Sept. 16, 1971, Ser. No. 181,006
Int. Cl. F16d *33/00*
U.S. Cl. 60—54 **25 Claims**

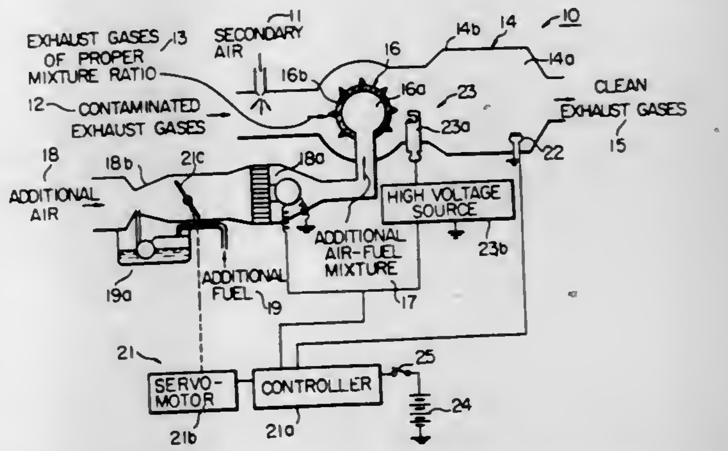
A hydrodynamic transmission whose degree of filling and therewith whose transmission capability is adapted to be controlled by an external circulation equipped with a control valve; a gap is thereby provided at the outer diameter of the working space between the inside of the pump shell and the outside of the turbine shell through which working medium is continuously discharged into a stationary spiral housing that is



connected with the external circulation terminating at its other end directly in the inlet of the pump; the external circulation is connected with the control valve by way of a single line while the circulation containing the filling pump is also connected with this control valve.

3,716,996
AFTERBURNER FOR INTERNAL COMBUSTION ENGINE

Hiroyuki Maruoka, Yokohama, Japan, assignor to Nissan Motor Company Limited, Yokohama, Japan
Filed Oct. 13, 1971, Ser. No. 188,959
Claims priority, application Japan, Oct. 30, 1970 45/122778
Int. Cl. F01n *3/12*
U.S. Cl. 60—286 **10 Claims**



An afterburning system for minimizing hydrocarbon and carbon monoxide, content left unburned in engine exhaust gases of an internal combustion engine. In the afterburning system, an improved afterburning stabilizer is provided including a porous enclosure for uniformly admixing an additional air-fuel mixture, which is burned to form a premixed flame therearound for anchoring the main combustion of the contaminated exhaust gases. A number of projections are mounted upon the porous enclosure for producing small disturbances in the flow of the exhaust gases and for acting as a stable heat source for the main combustion when the premixed flame is formed close to the tips thereof.

ERRATUM

For Class 61—46 see:
Patents Nos. 3,716,993 and 3,716,994

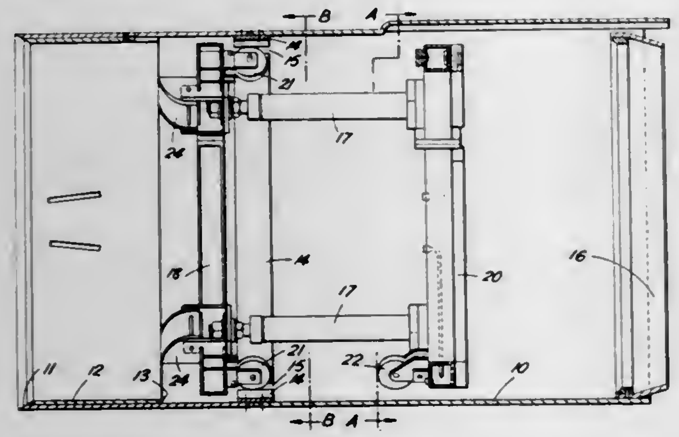
3,716,997
TUNNEL BORING EQUIPMENT

Donald Frank Rees, Wentworth, and Michael Alexander Richardson, Hindhead, both of England, assignors to William F. Rees Limited, Surrey, England

Filed May 19, 1971, Ser. No. 144,858

Int. Cl. E21d *19/04*

U.S. Cl. 61—85 **5 Claims**



The specification discloses tunnel boring equipment comprising a tubular shield having reaction points therein, and a plurality of rams mounted on a carriage which is movable along the shield and has pawls 24 which can be engaged with the reaction points to transmit thrust from the rams to the shield to advance the shield along the tunnel.

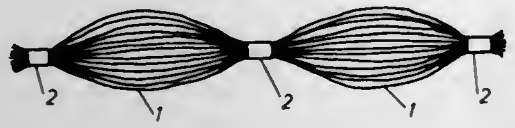
3,716,998
MEANS FOR NEUTRALIZING SUBMARINE EROSION

Flemming Lerche-Svendsen, Skovholmvej 11, Charlottenlund, Denmark, and Erik Nielsen, Strandvejen 15, Frederikshavn, Denmark

Filed July 19, 1971, Ser. No. 163,809

Int. Cl. E02b *3/12*

U.S. Cl. 61—38 **7 Claims**



A means for neutralizing submarine erosion by providing materials which are obtainable at a low cost easily positioned on the sea-bed, and resistant to the action of the water. This is achieved when endless strips or narrow lengths of thin, non-woven fabrics, having a maximum density somewhat higher than the specific gravity of the water, are positioned near the sea-bed, in bundles parallel to each other, and in the main parallel to the sea-bed, the strips in each bundle being joined together at intervals, and the individual lengths of the strips in a bundle between one joining point and the following being varied at least in the case of some of the strips.

3,716,999
MECHANICAL BUFFER OF RESILIENT MATERIAL SUCH AS RUBBER, IN PARTICULAR FENDER FOR SHIPS

Cornelis G. Middelbeek, 12 Gooland, Nootdrop, Netherlands

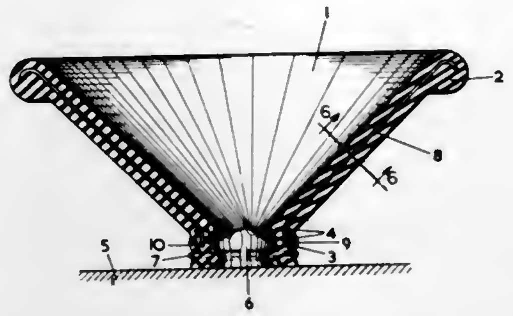
Filed April 14, 1970, Ser. No. 28,372

Claims priority, application Netherlands, April 21, 1969, 6906141

Int. Cl. E02b *3/22*

U.S. Cl. 61—48 **14 Claims**

A resilient buffer such as a fender for ships having a frustoconical cup-shaped body of resilient material. Rigid reinforcement bars are preferably moulded within the conical wall so as to prevent buckling of the walls. Circumferential rings prevent radial movement of adjacent bars at only one end so the other ends are free to spread apart when the resilient material is deformed by an axial pressure.



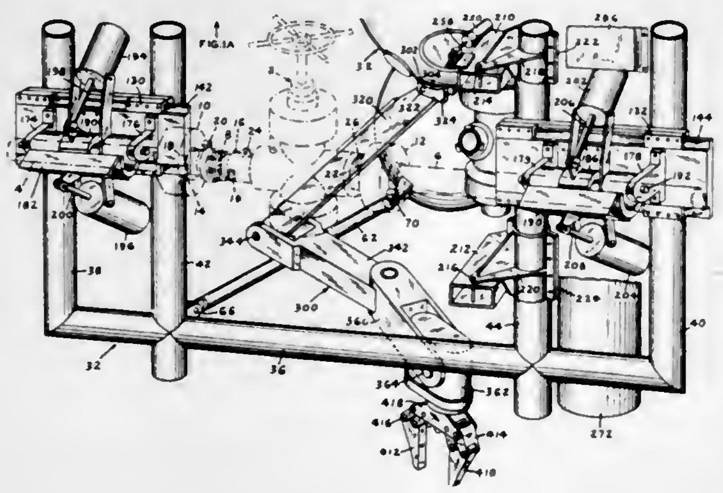
3,717,000
JIG FOR PERFORMING WORK IN A WEIGHTLESS MEDIUM

Guy N. Rothwell, Jr., Kaneohe, Hawaii, assignor to Telecheck International, Inc., Honolulu, Hawaii

Division of Ser. No. 808,158, March 18, 1969, Pat. No. 3,636,615. This application April 26, 1971, Ser. No. 137,521

Int. Cl. B22d *19/10;* **B23p** *7/00*

U.S. Cl. 61—69 R **12 Claims**



A jig for positioning a work performing member relative to an installation in a medium in which said member is essentially weightless and on which installation said work performing member is to perform work, for example, changing a component, such as a valve, in an under water pipeline in which the jig has clamping means for engagement with the installation structure and for moving the jig and vehicle attached thereto longitudinally along the structure for aligning the jig and vehicle with the component in the installation upon which work is to be performed, an arm and clamp for holding the replacement component and for positioning such replacement component in the installation, and an arm and clamp for engaging and removing the component to be replaced and a remote controlled unit associated with said jig for disconnecting the component to the under water installation and the method for operating such jig.

3,717,001
OFFSHORE STORAGE STRUCTURE

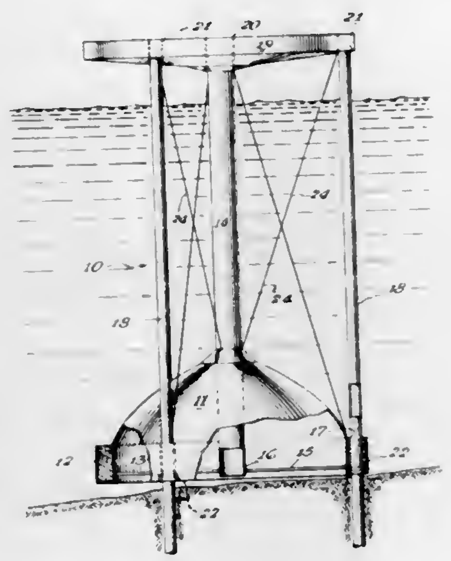
William A. Tam, Warrenville, Ill., assignor to Chicago Bridge & Iron Company, Oak Brook, Ill.

Filed Dec. 27, 1971, Ser. No. 212,224

Int. Cl. E02b *21/00;* **B63b** *35/44;* **B65g** *87/00*

U.S. Cl. 61—46.5 **8 Claims**

Stable offshore storage structures including: a first, ringwall-reinforced tank disposable adjacent the sea floor; a vertically extending shaft centrally disposed within the first tank and extending upwardly therefrom; a second, annularly-shaped tank disposable above the first tank, through the central orifice of which the shaft may pass; at least three support legs which may pass through leg retaining wells associated with both the ringwall and the second tank; and, means for securing and vertically moving the legs relative to the ringwall and second tank. There may also be provided means associated with the second tank for securing and vertically moving it relative to the shaft.



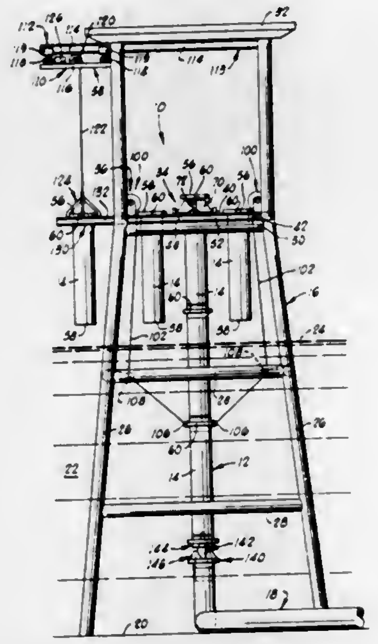
3,717,002
METHOD AND APPARATUS FOR CONSTRUCTING AND CONNECTING UNDERWATER RISERS

Billy L. O'Brien, 1400 Pine Street, and Heber P. O'Brien, 730 East 14th Street, both of Ada, Okla.

Filed March 8, 1971, Ser. No. 121,788

Int. Cl. F16l *35/00;* **E02b** *17/00;* **B23q** *1/08*

U.S. Cl. 61—72.3 **38 Claims**



An improved method and apparatus for constructing an underwater riser from a support member, the constructed riser being formed from a plurality of interconnected riser-sections, and for moving the lowermost end of the constructed riser into an interconnecting relationship with one end of an underwater pipeline, wherein one end of each riser-section is rigidly supported by a riser support assembly, in one position of each riser-section and in a support position of the riser support assembly, and another riser-section is positioned in a connecting relationship with respect to the riser-section being supported in the riser support assembly by a positioning assembly. In this position, the two riser-sections are secured in an interconnecting relationship. The connecting end portions of each riser-section are constructed such that two riser-sections can be quickly and guidingly positioned in an interconnecting relationship, and to facilitate a more sealingly secure interconnection therebetween. The riser-sections thus interconnected are lowered generally through the riser support assembly to a position wherein the uppermost end portion of the last connected riser-section is supported in the riser support assembly in a position to be interconnected to another riser-section. A predetermined number of riser-sections are thus interconnected to form the constructed riser, and the constructed riser is then lowered to a position wherein the lowermost end thereof is aligned with one end of the underwater pipeline. The lowermost end of the constructed riser is guided into an interconnecting relationship with the end of the underwater pipeline generally aligned therewith by a guide coupling assembly which is removably secured in the underwater pipeline.

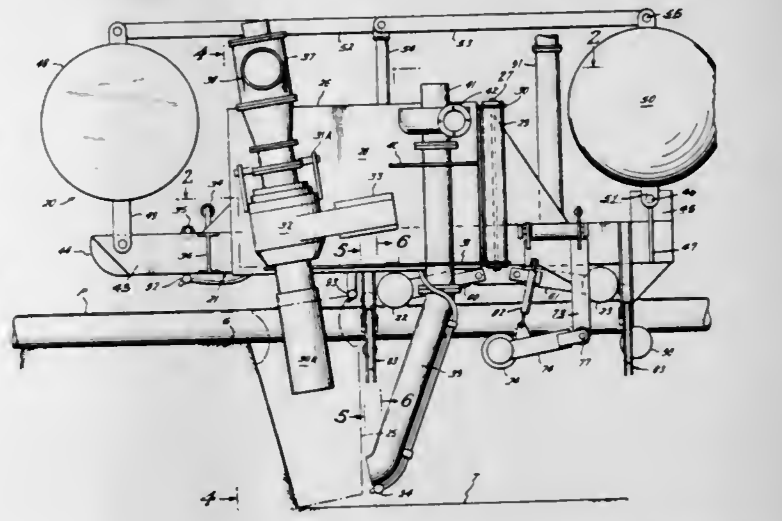
3,717,003
TRENCHING APPARATUS

Howard J. Bates, Jr., and Jack O. Hill, Houston, Tex., assignors to Oceanoics, Inc., Houston, Tex.

Filed Oct. 26, 1970, Ser. No. 83,806

Int. Cl. E02f *5/02;* **F16l** *1/00*

U.S. Cl. 61—72.4 **24 Claims**



A pair of rotatable cutter heads are supported from the carriage for disposal at least partially beneath the pipeline as the carriage moves forwardly along the pipeline, and cuttings dug by the cutter heads are removed from the trench through suction conduits.

3,717,004
METHOD AND APPARATUS FOR MINIMIZING MOTIONAL HEAT LEAK IN CRYOGENIC APPARATUS

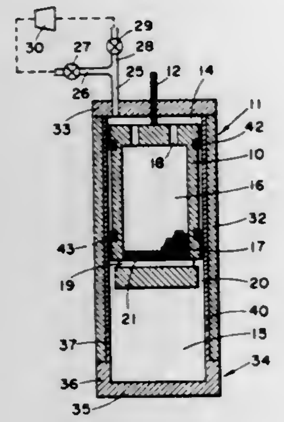
James A. O'Neil, Bedford, Mass., assignor to Cryogenic Technology, Inc., Waltham, Mass.

Filed June 23, 1971, Ser. No. 155,914

Int. Cl. F25b *9/00*

U.S. Cl. 62—6 **20 Claims**

Method and apparatus for reducing thermal losses due to motional heat leak brought about when a piston reciprocates between two different temperature levels to define one or more chambers of variable volume within the fluid-tight housing of a valved expansion engine, e.g., a cryogenic refrigerator, a thermal compressor or a Stirling engine. A sleeve liner formed of a nonmetallic material exhibiting low heat conductivity and low thermal capacity is located within the housing wall to present a continuous surface therewith, thereby effectively decreasing the transfer of energy between the piston and its housing as the piston reciprocates. If such thermal losses can be tolerated, then it is possible to reduce the void volume, or to partially reduce such thermal losses and also reduce void volume.



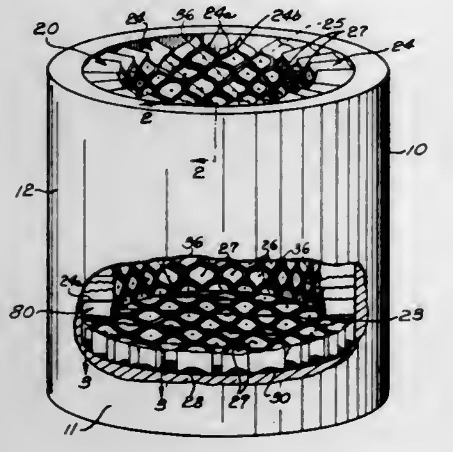
3,717,005
CAPILLARY INSULATION

Jay L. McGrew, Littleton, Richard A. Sharp, Lakewood, Eugene C. Mowrey, Denver, and Donald A. Thomas and John P. Gille, Littleton, Colo., assignors to Martin Marietta Corporation

Filed Oct. 16, 1970, Ser. No. 81,441

Int. Cl. F17c *1/12*

U.S. Cl. 62—45 **18 Claims**



An insulation provides a gas insulating layer between the walls of a container and liquid having a low boiling temperature in the container. The insulation comprises a plurality of panels mounted on the walls of the container. Each of the panels comprises a honeycomb structure defining a plurality of cells for maintaining a gas column between the wall of the container and the liquid. A covering closes the end of the cells adjacent the liquid and has an opening therein for providing a stable capillary gas-liquid interface therein between gas in the cell and liquid in the container. Means is provided for securing the panels to the container for providing a seal therebetween to block the flow of the liquid between the panels and into contact with the walls of the container. A right angle joint in the insulation is provided at right angles of the container and which effectively blocks flow of liquid into contact with the container walls thereat.

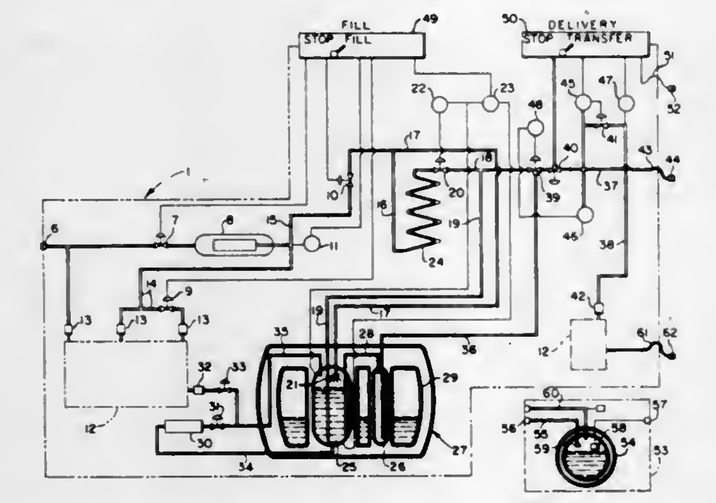
3,717,006
TRANSIT HANDLING SYSTEM FOR VOLATILE FLUIDS

Cleve C. Kimmel, Torrance, and John H. Moll, Hawthorne, both of Calif., assignors to Parker-Hannifin, Cleveland, Ohio

Continuation of Ser. No. 844,971, July 25, 1969, abandoned. This application May 27, 1971, Ser. No. 147,614

Int. Cl. F17c *11/00*

U.S. Cl. 62—48 **13 Claims**



A portable system for refilling aircraft dewars with liquid nitrogen for fuel tank inerting and with liquid oxygen for emergency breathing. In the case of filling of the oxygen dewar, the system has a filling sub-system which removes moisture and particulate matter from the fluid stream, a saturating sub-system which controls the vapor-liquid equilibrium temperature of the incoming fluid from the filling sub-system, a storage sub-system of which the liquid nitrogen storage portion provides a heat sink for the oxygen to eliminate evaporation losses and to maintain the liquid oxygen at two different temperatures, and a delivery sub-system which transfers the stored liquid into the aircraft dewar at any preselected condition between the two storage temperatures.

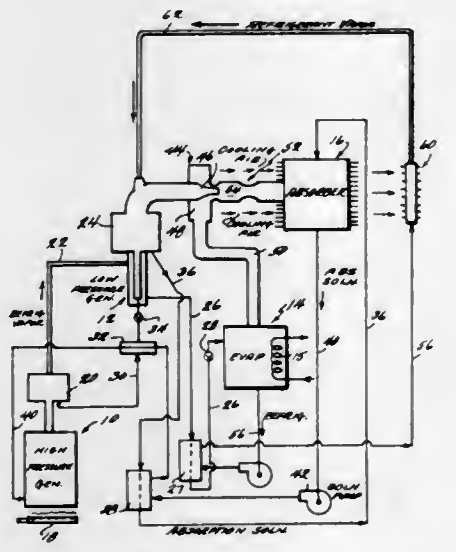
3,717,007
ABSORPTION REFRIGERATION SYSTEM WITH MULTIPLE GENERATOR STAGES

Donald Kuhlenschmidt, Evansville, Ind., assignor to Arkla Industries, Inc., Evansville, Ind.

Filed April 2, 1971, Ser. No. 130,659

Int. Cl. F25b *15/06*

U.S. Cl. 62—101 **7 Claims**



An air-cooled double-effect salt solution absorption refrigeration machine having high and low pressure generator stages is operated with a lower pressure in the evaporator than in the absorber. This achieves a desired low evaporator temperature while permitting the absorber to use an absorbent salt solution having a lower salt concentration and hence a lower crystallization temperature than would otherwise be necessary for the same cooling effect. In order to maintain the pressure differential between the evaporator and the absorber the vapor from the evaporator is compressed to absorber pressure before passing to the absorber. The compression is effected with an ejector device which employs refrigerant vapor flowing from the lower pressure generator stage as the driving fluid.

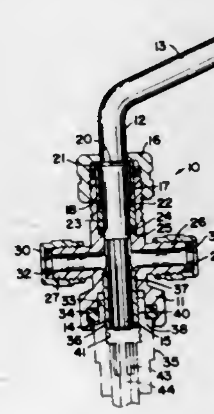
3,717,008
CHARGING VALVE TOOL

Charles Robert Bandy, 2416 S. Goldenrod Road, Orlando, Fla.

Filed June 23, 1971, Ser. No. 155,716

Int. Cl. F25b *45/00*

U.S. Cl. 62—292 **6 Claims**



A charging valve tool apparatus for use in charging refrigeration units such as air conditioners, in which the tool is connected to the system to be charged and to compressed gas tanks for charging the system. The tool has a shaft running therethrough formed into a handle on one end and a plug engaging portion on the other end thereof. The shaft is adapted to slide through the casing into engagement with the plug and for rotation for opening the plug for charging of the system. Special seals are provided along with means to limit the sliding movement of the shaft.

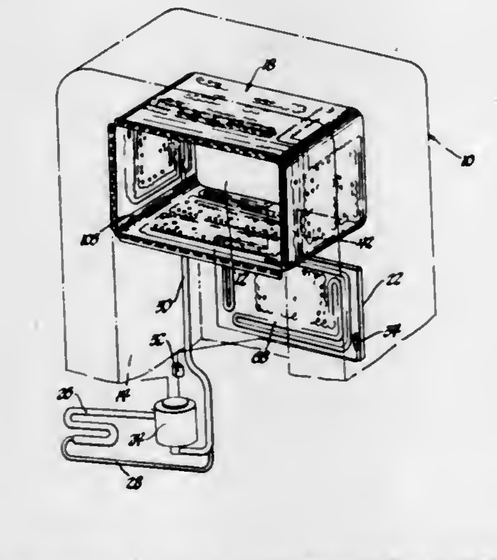
3,717,009
REFRIGERATION EVAPORATOR ASSEMBLY

Mervin R. Butts, West Milton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed April 26, 1971, Ser. No. 137,405

Int. Cl. F25b *39/02*

U.S. Cl. 62—523 **3 Claims**



This invention relates to integral sheet metal refrigerator evaporator assemblies of the roll-forged type in final form having one section extending in a complete rectangular loop enclosing the freezing compartment and a depending plate section located in the above-freezing compartment. As an intermediate product a pair of evaporator assemblies are formed of two superposed planar sheets forming a composite panel having two L-shaped patterns of stop-weld material interposed between the sheets arranged in invertedly nested fashion for subsequent lancing from the panel with a minimum of scrap material.

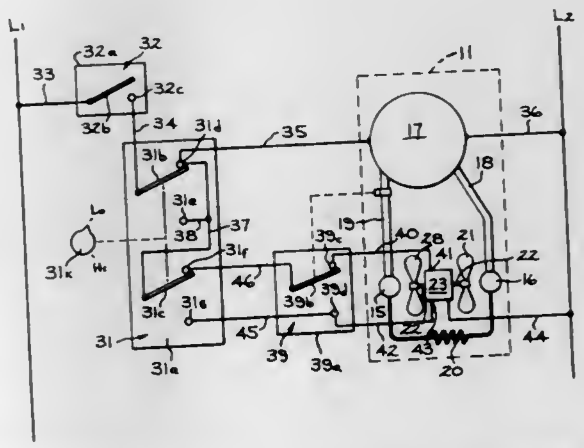
3,717,010
AIR CONDITIONER

John P. Slattery, Louisville, Ky., assignor to General Electric Company

Filed July 2, 1971, Ser. No. 159,239

Int. Cl. F25b *39/04*

U.S. Cl. 62—184 **2 Claims**



This invention provides an improved air-conditioner. Basically, it comprises: a casing mountable in an opening into a room and having openings communicating with indoor and outdoor air; a refrigeration system mounted in the casing and comprising a compressor, a condenser and an evaporator interconnected in a refrigerant flow relationship by conduit means including a discharge tube connected to the compressor outlet for delivering high pressure, hot gaseous refrigerant to the condenser; and a fan mounted in the casing for circulating outdoor air over the condenser. However, in accordance with the present invention, a multi-speed electric motor is mounted in the casing with its output shaft connected to the condenser fan. The motor has a slower first speed and a faster second speed. In particular accordance with the present invention, thermally-responsive switch means are mounted on the compressor discharge tube and have a movable switch member that will remain in a first position causing the motor to operate the condenser fan at the slower and consequently quieter first speed unless the discharging gaseous refrigerant temperature is sufficiently high to cause the switch means to sense a temperature exceeding a first predetermined temperature. Then, the switch member will move to a second position causing the motor to operate the condenser fan at the faster and consequently louder second speed, but only until the discharging gaseous refrigerant temperature becomes sufficiently low to cause the switch means to sense a second predetermined temperature that is lower than the first. Then, the switch member will return to its first position causing the motor to resume operation of the condenser fan at the slower and quieter first speed.

3,717,011
IMPULSE UNIT

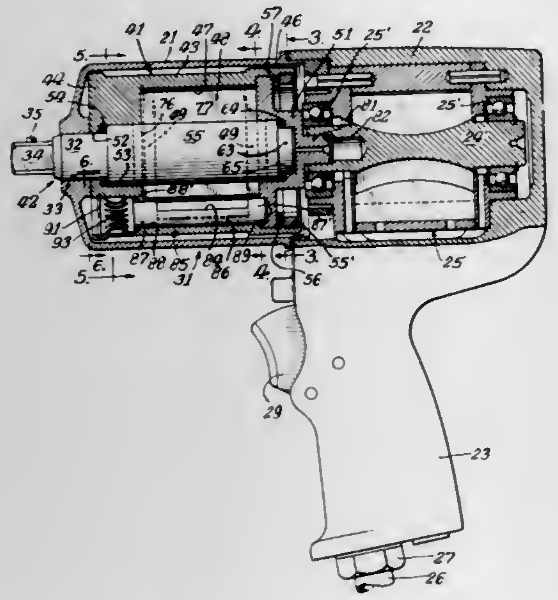
Vladimir J. Vana, La Grange, Ill., assignor to Thor Power Tool Company, Aurora, Ill.

Filed April 30, 1971, Ser. No. 138,976

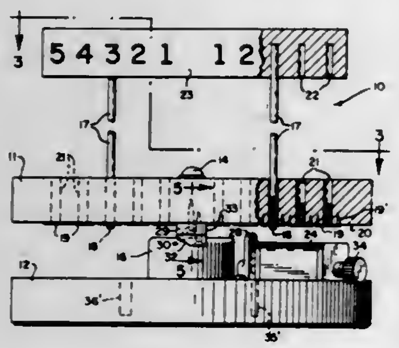
Int. Cl. F16d *3/80*

U.S. Cl. 64—26 **14 Claims**

An impulse unit having a variable torque output and suitable for use in an impulse tool having a housing and a motor, is rotatably mounted in the tool housing and driven by the tool motor. The impulse unit comprises a casing assembly having an impulse cavity therein which is filled with a liquid and a spindle having blade means mounted rotatably with respect to the casing assembly. The blade means carried by the spindle divides the cavity into high and low pressure portions. A regulator valve is provided in the impulse unit to control the torque output of the unit and varies the size of an orifice or passage connecting the high and low pressure portions of the impulse cavity. The cavity, spindle and regulator valve may each be of simple cylindrical configuration.

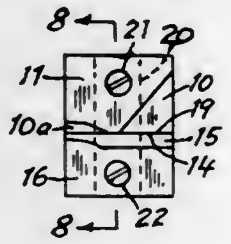


3,717,012
HAIRPIN LACE LOOM
James P. Misner, and Evelyn K. Misner, both of 8930 Sheridan Drive, Clarence, N.Y.
Filed Aug. 27, 1970, Ser. No. 67,345
Int. Cl. D04b *3/00*
U.S. Cl. 66—1 A **9 Claims**



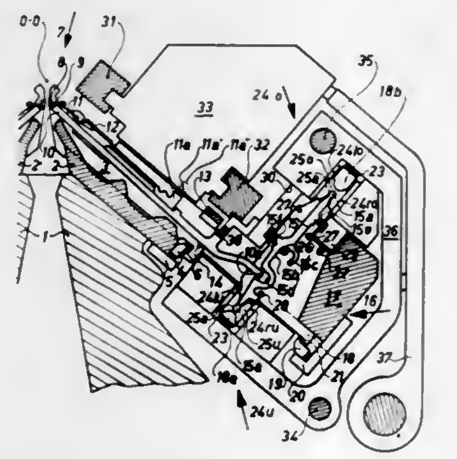
A hairpin lace loom for fabricating hairpin lace including a stationary base adapted to be placed on the lap of the user or on a table, a rotatable base mounted on the stationary base, a plurality of elongated yarn-receiving rods extending upwardly from the rotatable base, a number of apertures spaced along a diameter on the rotatable base for receiving the rods in different spaced positions to permit the fabrication of loops of different width, a brace mounted at the top of the rods to rigidize them and hold them parallel, a counter mounted relative to the rotatable base for recording the number of revolutions thereof, thereby to obviate the counting of the loops, said brace being removable so that the hairpin lace can be slipped off the top of the rods, and aligned apertures in the rotatable and stationary bases for receiving a crochet hook which functions as a pin to lock the rotatable base relative to the stationary base when the loom is not being used.

3,717,013
CAMS FOR KNITTING MACHINES
Norishige Sumitomo, Toyonaka, Japan, assignor to Precision Fukuhara Works, Ltd., Higashinada Kobe City, Hyogo, Japan
Filed Feb. 9, 1971, Ser. No. 114,002
Claims priority, application Japan, Mar. 2, 1970, 45/17,832
Int. Cl. D04b *15/32*
U.S. Cl. 66—57 **1 Claim**



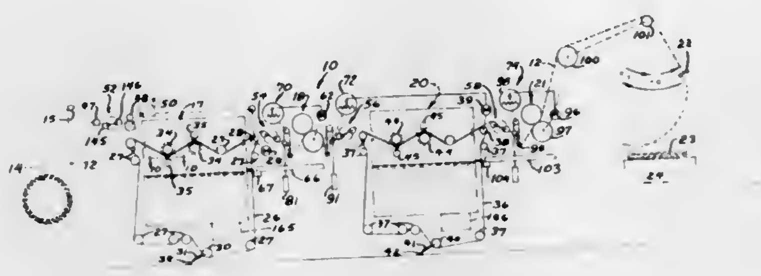
Post mounted cam formed of a rectangular block wherein the profile of the cam is formed by removing portions of one side of the block to a depth less than the depth of the block whereby the cam profile extends upwardly from the surface surrounding the cam profile, wherein a vertically extending keyway is formed in the other side of the block for the full height thereof, and wherein the cam block is mounted upon and is secured to the post by a flat head screw extending through a countersunk hole in the cam block and into threaded engagement with the post. A stitch cam and a guard cam formed of a pair of blocks are mounted upon and are secured to a common post by flat heat screws with the cam profiles spaced from each other to provide a needle butt pathway therebetween and with the near sides of the cam blocks pressed together and extending perpendicular to the post.

3,717,014
JACQUARD RECTILINEAR KNITTING MACHINES
Fritz Kohler, Couvet, Switzerland, assignor to Edouard Dubied Et Cie (Societe Anonyme)
Filed Sept. 13, 1971, Ser. No. 179,815
Int. Cl. D04b *7/00, 15/66*
U.S. Cl. 66—75 **11 Claims**



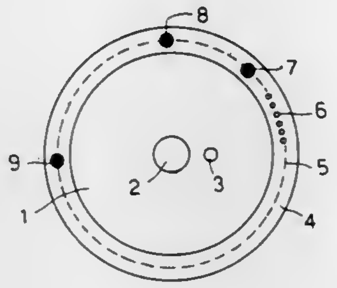
A Jacquard rectilinear knitting machine with loop transfer and roof shaped multiple machine beds is equipped with a needle selecting device in which the commands from a knitting program are transmitted to the performing needles by means of electro-magnetic heads activating selection plates in order for the selection plates to assume a position selected from three discrete positions.

3,717,015
JET SPRAY TREATING MACHINE
Donald B. Spencer, Cincinnati, Ohio, assignor to McGraw-Edison Company, Elgin, Ill.
Filed July 26, 1971, Ser. No. 166,006
Int. Cl. B05c *5/00*
U.S. Cl. 68—18 F **12 Claims**



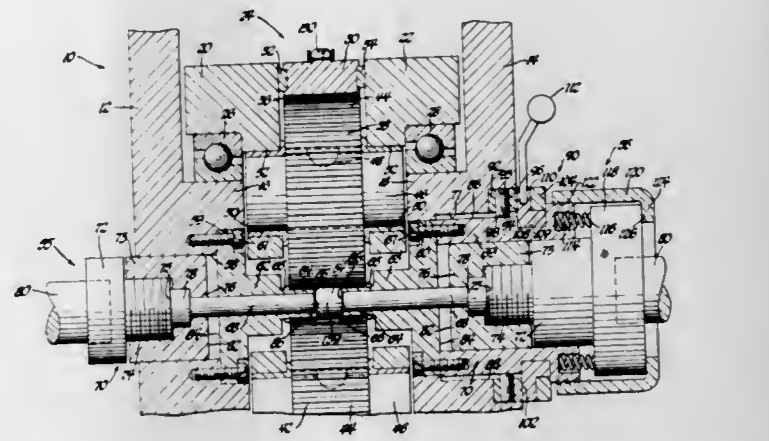
A machine for washing, scouring or otherwise spray treating one or more continuous webs or pieces of fabric, either tubular or as slit open width, including selectively retractable uncurling rolls, including web feed or drive means and controls for automatically varying the ratio or drive speeds to accommodate piece bulking or the like in passing through the machine, including means for infinitely adjusting spray discharges to suit the specific purpose or fabric requirements, and including improved spray recovery and filter structures for reliable trouble-free machine operation.

3,717,016
BENDING MACHINE
Carl Ullrich Peddinghaus, Obere Lichtenplatzer Str. 276, 56 Wuppertal-Barmen, Germany
Filed May 13, 1970, Ser. No. 36,990
Int. Cl. B21b *37/08*
U.S. Cl. 72—21 **6 Claims**



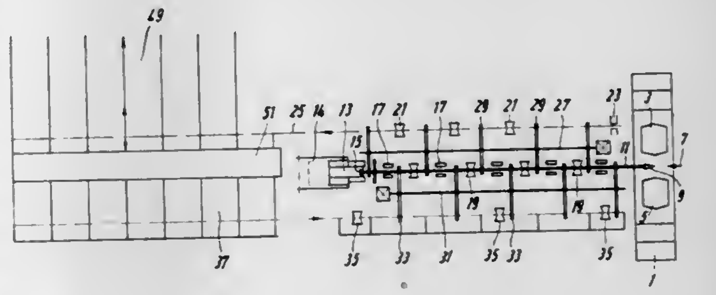
A bending machine having a rotatable bending plate which supports bending tools, setting means for setting various principal bending angles, a drive motor for rotating the bending plate and a starting switch for the drive motor, there being also provided an electric pre-selector switch which controls the starting switch and the setting means comprising an annular disc which is arranged to rotate in the same direction and at the same speed as the bending plate, together with a plurality of setting elements in the form of setting pins which can be inserted in predetermined circumferential positions in the annular disc, there being also provided a single pulse transmitter which is engageable by the setting pins to generate a series of pulses as the annular disc is rotated with the bending plate, pulse counting means being also provided and being connected to the pulse transmitter and being arranged to cut out the starting switch of the drive motor after a pre-selected number of pulses has been counted by said pulse counting means.

3,717,017
GEAR FORMING
William J. Vukovich, Ann Arbor, Mich., assignor to General Motors Corporation, Detroit, Mich.
Filed March 18, 1971, Ser. No. 125,583
Int. Cl. B21h *5/02*
U.S. Cl. 72—68 **7 Claims**



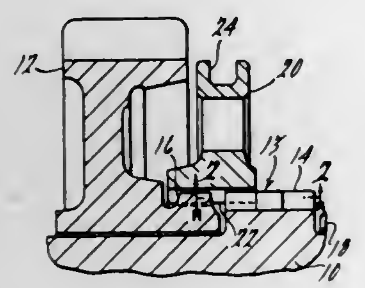
A mechanism and method for pressure-forming teeth on the periphery of a cylindrical workpiece, the mechanism including support members for a planetary gear set wherein the planet pinions serve as toothed forming rolls driven by the outer ring gear, and a workpiece on which gear teeth are to be formed serves as the sun member mounted at the center of rotation of the toothed forming rolls. A punch assembly is mounted adjacent each end face of the workpiece, each punch assembly including (1) a punch guide abutting against a face of the workpiece to enable the latter to serve as a reaction member and to prevent any outward axial displacement of the metal of the workpiece, (2) a punch slidably mounted within the punch guide, and (3) cylinder means for slidably moving the punches through the punch guides into pressure contact with the end faces of the workpiece to cause the metal of the workpiece to flow radially outwardly to conform the periphery thereof to the spaces between the teeth of the rotating forming rolls. In lieu of the planetary gear set, a pair of parallel rack bars, with the workpiece mounted in between, may be employed in conjunction with the punch assemblies to form the gear teeth on the workpiece.

3,717,018
METHOD AND MILL FOR SKEW ROLLING
Manfred Bellman, Ratingen, and Gerd Pfeiffer, Mulheim, (Ruhr), both of Germany, assignors to Mannesmann Aktiengesellschaft, Dusseldorf, Germany
Filed Jan. 29, 1971, Ser. No. 111,000
Claims priority, application Germany, Jan. 30, 1970, P 20 05 029.7
Int. Cl. B21b *19/06, 25/06*
U.S. Cl. 72—97 **11 Claims**



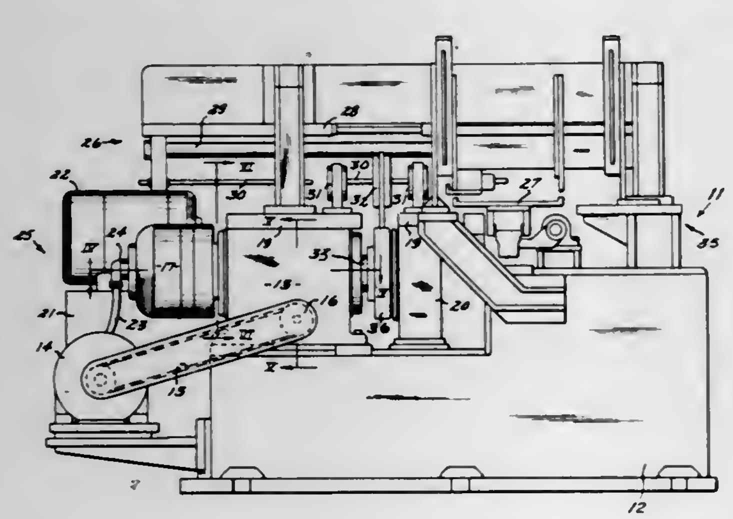
A mill for rolling seamless tubular billets on a mandrel and mandrel rods. Plural rods circulate through the machine for stripping off the billet from one, pierce-rolling on another, and preparing a third rod for replacement, more or less concurrently.

3,717,019
ROLLING OF GEAR LOCKS
Carl H. Motz, Harper Woods, Mich., assignor to Lear Siegler, Inc., Santa Monica, Calif.
Filed Feb. 25, 1971, Ser. No. 118,696
Int. Cl. B21h *5/00*
U.S. Cl. 72—102 **11 Claims**



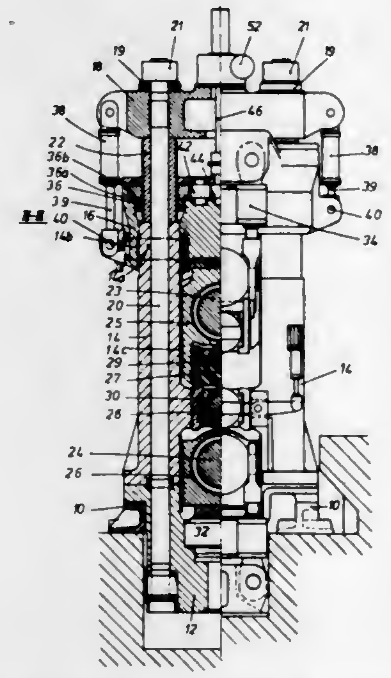
A method of forming a gear lock construction in clutch gear teeth which comprises rolling the clutch gear in tight mesh with a gear-like rolling die to form recesses or recessed areas in the teeth of the gear which provide shoulders extending generally between the roots and crests of the teeth.

3,717,020
PROCESS FOR STRAIGHTENING ELONGATE MEMBERS
Edward E. Judge, Sr., and Edward E. Judge, Jr., both of Lansing, Mich., assignors to Industrial Metal Products Corporation, Lansing, Mich.
Filed Oct. 15, 1968, Ser. No. 767,605
Int. Cl. B21d *9/05*
U.S. Cl. 72—389 **5 Claims**



The disclosure is directed to a straightening device for elongate elements such as shafts, rods, bars, tubes and the like and a process for straightening such members in which a member to be straightened is subjected to a progressive eccentric and oscillating force in relation to a point or points establishing an ultimate true center position, the resulting oscillating movement and displacement of the elongate member being such as to exceed the yield point of the material thereof and then returns the elongate member to a true axial position as established between the fixed true centers. The processes also comtemplate straightening to plural axes simultaneously. A trace of the movement of the shaft, for example, describes an increasing progressive spiral outward and a following decreasing regressive inward spiral return to the true center. The machine provides a variably eccentric spindle which is progressively movable from zero eccentricity during continuous rotation to a maximum eccentricity sufficient to deform the stock beyond the yield point thereof and the compound consequence of rotation with eccentric displacement is an oscillation imparted to the elongate members by a member encircling pitman or arm. In this action the workpiece is rotated or oscillated at least once after its yield point is exceeded before regressive eccentricity gradually returns the workpiece to a zero deflection position. Both rotational movement and eccentric control are transmitted to twinned adjacent spindles so as to accommodate plural shafts in the same action and the pitman arm is common to both spindles. The disclosure is also directed to the transfer aspects of the shafting for insertion and removal. The disclosure is also directed to such devices paired in face to face synchronized motion admitting of plural applications of eccentric and rotating force to parallel shafts as required.

3,717,021
ROLL STANDS FOR ROLLING MILLS
Erich Wilhelm Gross, Scheidt-Saar, Germany, assignor to Moeller & Neumann GmbH, Ingbert/Saar, Germany
Filed Nov. 19, 1970, Ser. No. 91,055
Claims priority, application Germany, Nov. 22, 1969, P 19 58 701.0
Int. Cl. B21b *31/04*
U.S. Cl. 72—248 **4 Claims**

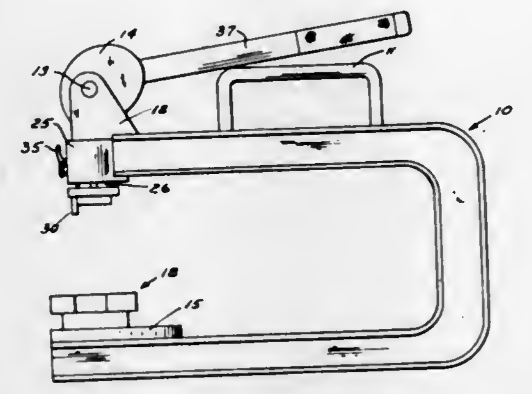


A roll stand for rolling mills utilizes roll frames having frame caps held down by means of pre-stressed tie rods. In one construction four tie rods in all are used and receive at their upper ends a stationary top plate seating against pre-stressing units at the upper ends of the tie rods. The top plate bears against screw-threaded sleeves seating against column embers of the frame. A support frame for the frame caps seats against ring nuts rotatable in screw-threaded sleeves for screwdown adjustment, and hydraulic cylinder piston units are provided between the top plate and the frame cap support frame to maintain pressure between the ring nuts and the sleeves or to release said pressure during screwdown which is effected by rotating the ring nuts from a common drive.

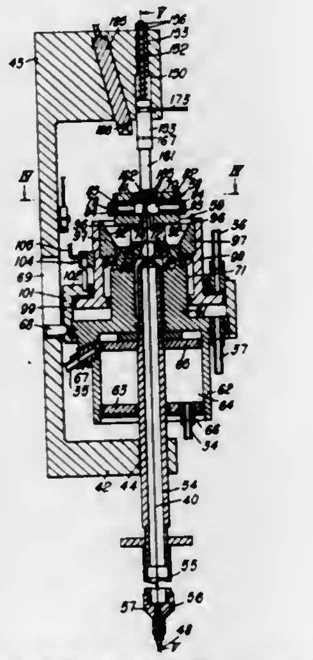
3,117,022
PRESS DEVICE
Edward M. du Bois, 5054 Pensacola Blvd., Dayton, Ohio 45439
Filed Mar. 7, 1972, Ser. No. 232,361
Int. Cl. B21j *9/04*
U.S. Cl. 72—386 **5 Claims**

A press device for forming louvers includes a tool-carrying spindle and a die both of which are indexably

mounted on a C-frame for forming in a panel a succession of louvers having their respective edges either parallel to or angularly disposed relative to the sides of the panel regardless of the length of the panel.



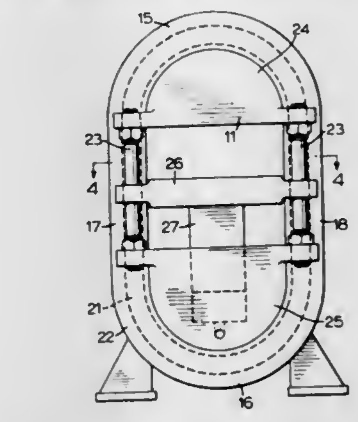
3,717,023
BLIND RIVETING APPARATUS
Paul Edward Prosser, Hemel Hempstead; John Stewart Sanders; Donald Stanley Savage, both of St. Albans, and Frederick Arthur Summerlin, Harpenden, all of England, assignors to Aerpat A.G.
Filed Aug. 19, 1971, Ser. No. 173,092
Claims priority, application Great Britain, Sept. 16, 1968, 43,859/68
Int. Cl. B21j *15/10*
U.S. Cl. 72—391 **14 Claims**



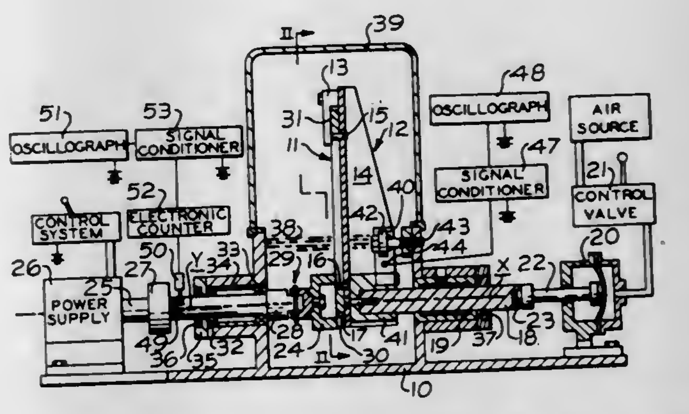
The disclosure relates to a blind riveting machine of the type including a pull-through mandrel having an enlarged head which is pulled through tubular rivets in succession to expand and place the rivets. The tail end of the mandrel is gripped by two pairs of jaws spaced apart along the mandrel. The pairs of jaws are opened successively, but not both at the same time, so that rivets can be fed, one at a time, past each pair of jaws in succession, whilst the mandrel remains gripped by at least one of the pairs of jaws.

3,717,024
LINK-SHAPED STRUCTURE FOR A PRESS FRAME
Ernest Davison, Cooksville, Ontario, Canada, assignor to Fluid Power Limited, Rexdale, Ontario, Canada
Filed May 27, 1970, Ser. No. 40,801
Claims priority, application Great Britain, May 30, 1969, 27,446/69
Int. Cl. B21j *13/04*
U.S. Cl. 72—455 **1 Claim**

A link-shaped member having semi-circular ends and a pair of parallel straight side portions is made of a filamentary and/or fibrous reinforced plastic or resinous material, the filaments or fibers of which are oriented in the direction of the loop. The member may be a press frame which is adapted to withstand tensile stresses during use, the filaments or fibers being prestressed and the stresses therein being locked into the material, whereby a desired stress distribution across the cross section of the member is obtained.



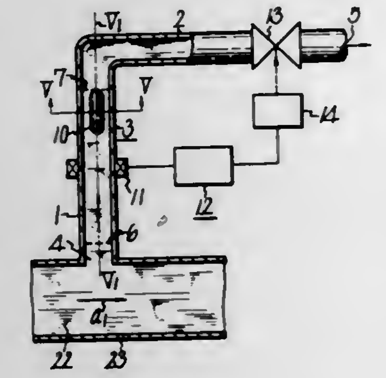
3,717,025
APPARATUS AND METHOD FOR DETERMINING COEFFICIENT OF FRICTION
Francis E. Kronenberg; Alexius B. Olson, both of Peoria; James Poirot, Morton; Gerald D. Rohweder, Peoria, and Harold W. Winkler, East Peoria, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.
Filed March 1, 1971, Ser. No. 122,598
Int. Cl. G01n *19/02*
U.S. Cl. 73—9 **12 Claims**



An apparatus for obtaining data equatable to the static and dynamic coefficients of friction of the working surface of a friction disc comprises fixture means for mounting and holding the disc for limited pivotal movement about an axes disposed parallel to the central, longitudinal axis of the disc, load application means for urging the working surface of the disc into engagement with a rotating surface to induce pivoting of the fixture and disc, and means for indicating and ascertaining the torque applied to the disc by the rotating surface, including a strain-gaged torque link and associated recording equipment.

3,717,026
VISCOSIMETER
Koshiro Ito, Tokyo, Japan, assignor to Kabushikikaisha Tokyo Keiki, Tokyo, Japan
Filed Feb. 16, 1971, Ser. No. 115,234
Claims priority, application Japan, Feb. 24, 1970, 45/17559; Sept. 17, 1970, 45/92152; Dec. 18, 1970, 45/128131
Int. Cl. G01n *11/12*
U.S. Cl. 73—57 **7 Claims**

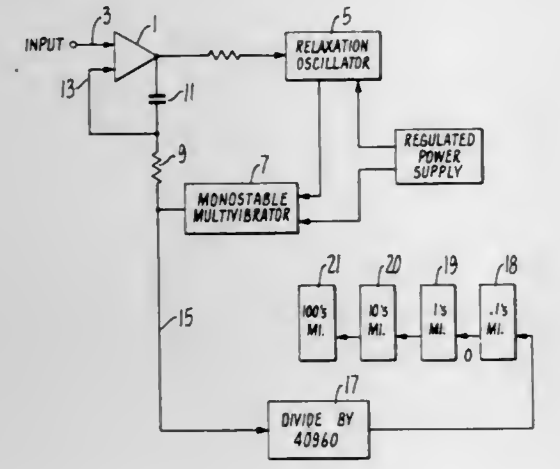
A viscosimeter having a tube for permitting the passage therethrough of a liquid to be measured, a falling slug disposed in the tube in a manner to be movable in its axial direction, a detecting coil mounted on the outside of the tube, a measuring circuit supplied with the output from the detecting coil, a valve mounted in the tube for controlling the flow of the liquid in the tube and a programmer for controlling the measuring circuit. In this case, the tube is made of a non-ferromagnetic material, one end of which is connected with a pipe through which the liquid flows, and the measuring circuit includes a waveform converter circuit for converting the output from the detecting coil and a time measuring and indicating circuit for measurement and indication with the output of the waveform converter circuit.



3,717,027
DIGITAL DISPLAY DISTANCE LOG

Walter J. Greene, Reading, and Robert R. Perron, Beverly, both of Mass., assignors to The Eastern Company, Naugatuck, Conn.

Filed June 9, 1971, Ser. No. 151,378
Int. Cl. G01c *21/10*
U.S. Cl. 73—181 **6 Claims**



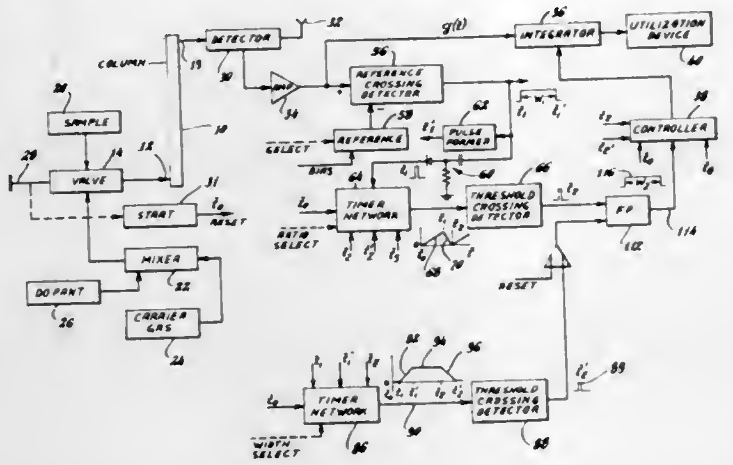
A distance log having a digital readout is provided wherein an electronic speed sensor actuates a voltage controlled oscillator so that the frequency of the oscillator output is proportional to speed; the distance traveled is obtained by accumulating the output pulses over a period of time and displaying the sum.

3,717,028
CHROMATOGRAPHIC PEAK SELECTOR

Raymond Annino, Plainville; William E. Jordan, Foxboro, and William E. Earle, North Easton, all of Mass., assignors to The Foxboro Company, Foxboro, Mass.

Filed June 2, 1969, Ser. No. 829,682
Int. Cl. G01n *31/08*
U.S. Cl. 73—23.1 **33 Claims**

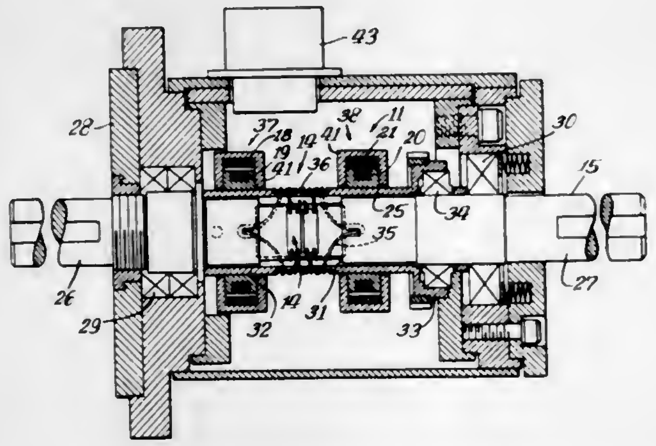
A chromatographic apparatus and technique are described wherein a peak of interest in the output chromatogram is selected for integration by a timing circuit controlled by a preceding reference peak. The timing function starts when the sample mixture is injected into the column, and the time of appearance of the reference peak is used as the basis for computing a predicted time for appearance of the peak of interest. A similar technique is used to compute a predicted width of the peak of interest in order to control the period of integration.



3,717,029
TORQUEMETER

Richard S. Tveter, Glenview, Ill., assignor to S. Himmelstein and Company

Filed Oct. 23, 1968, Ser. No. 769,904
Int. Cl. G01l *3/10*
U.S. Cl. 73—136 A **7 Claims**



A torquemeter for use in measuring torque in a rotary drive including a rotary transformer having a rotor portion on a carrier formed of material having high electrical conductivity and low magnetic characteristics for effectively precluding cross talk or flux leakage paths through the shaft and effectively precluding spurious signals being generated in the torquemeter control as from shaft magnetostriction effects and the like. The torquemeter further includes a control comprising a standard strain gage carrier system. The rotary transformer comprises a high performance wide band transformer. The control avoids the use of resonant circuits and includes means for electrical balancing thereof on the stationary side of the rotary transformer.

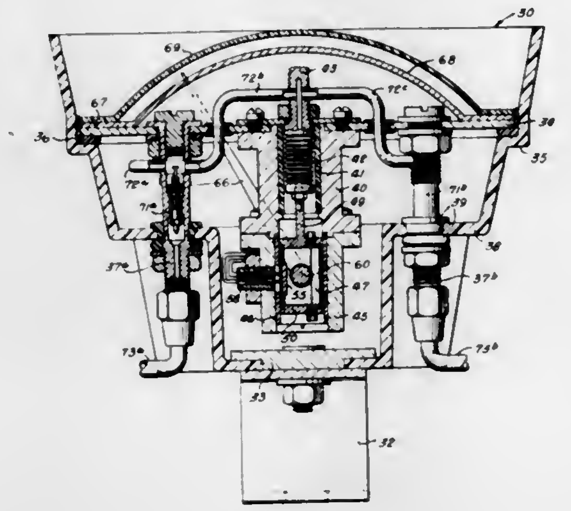
3,717,030
TIRE PRESSURE INDICATING APPARATUS

Clarence L. McGhee, 1702 Hilltop Lane, Arlington, Tex., and Dennis C. Enders, 2309 Carmel Drive, Colorado Springs, Colo.

Filed Jan. 4, 1971, Ser. No. 103,500
Int. Cl. B60c *23/04*
U.S. Cl. 73—146.3 **8 Claims**

For monitoring tire pressures on a vehicle such as a passenger automobile, truck or bus, individual hub units are

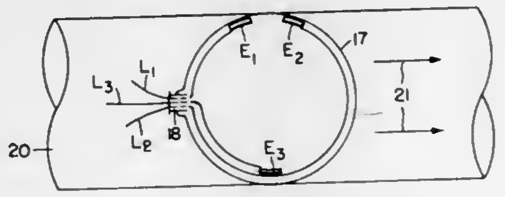
mounted on each wheel unit, each hub unit including a radio transmitter, and a radio receiver is positioned leading to the vehicle operator. Each hub unit includes bellows means responsive to tire pressure to operate a visual pressure gauge on the hub unit which may be observed by the operator when the vehicle is stopped, and to energize the transmitter when the pressure decreases to a preselected value. For dual wheel units used on heavy duty vehicles, a common bellows means may respond to the lower pressure of the two tires to indicate the lower pressure on the gauge and transmit the fault signal. The dual wheel unit may include two bellows means for actuating separate visual gauges for the two tires, with the two bellows mechanisms energizing a common transmitter, or alternatively energizing respective separate transmitters. The hub unit may include valve means for equalizing tire pressures.



3,717,031
THREE ELECTRODE FLOW METER

Jean P. Biscar, Laramie, Wyo., assignor to The Regents of the University of California, Berkeley, Calif.

Filed Feb. 22, 1971, Ser. No. 117,478
Int. Cl. G01f *1/00;* A61b *5/02*
U.S. Cl. 73—194 EM **4 Claims**

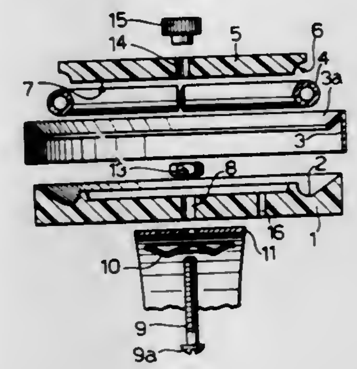


An improved electromagnetic flow meter is provided which includes means for nulling out the transformer or quadrature electromotive force which is independent of fluid flow and which is in quadrature phase with the useful flow signal. This nulling is achieved by juxtaposing to one of the electrodes of the flow meter a pair of electrodes (instead of a single electrode as is standard practice). This electrode pair is connected to the end points of an external potentiometer, and the wiper is connected to one of the amplifier input terminals. By adjusting the wiper position, a zero signal may be obtained from the amplifier at zero flow. External circuitry may also be provided for a manual or servo controlled fine adjustment of the quadrature electromotive force compensation.

3,717,032
DEPTH GAUGE

Carlo Alinari, Corso Vittorio Emanuele 200, Turin, Italy

Filed March 23, 1971, Ser. No. 127,150
Int. Cl. G01f *23/14*
U.S. Cl. 73—300 **2 Claims**

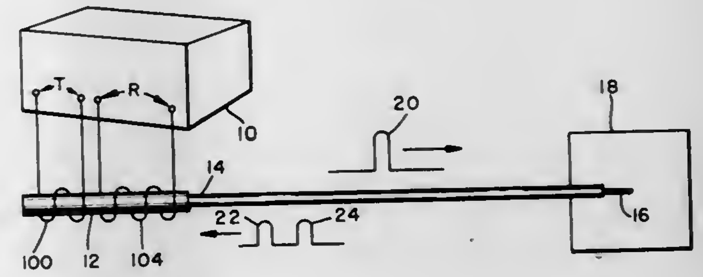


A manometer type depth gauge has a curved manometer tube with its open end spaced slightly apart from its closed end; It is received in a groove on the edge of a base member of dark color, being clamped in place by a cover member that is removably attached to the base member. The cover member contacts the tube but leaves part of the tube uncovered to by struck directly by incident light.

3,717,033
ULTRASONIC APPARATUS, PARTICULARLY FOR THERMOMETRY

Bernard M. Gordon, Magnolia; Leopold Neumann, Lexington, and Ivan H. Kirsch, Hyde Park, all of Mass., assignors to Gordon Engineering Company, Wakefield, Mass.

Filed May 15, 1970, Ser. No. 37,752
Int. Cl. G01k *11/24*
U.S. Cl. 73—339 A **13 Claims**



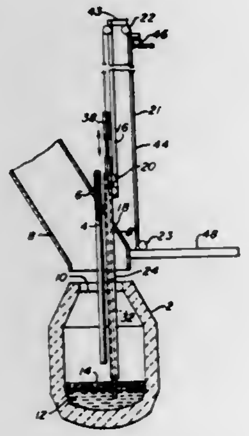
A transmitter pulse generator and a receiver detector analyzer electrically communicate with a transmit/receiver ultrasonic transducer which is connected to a lead-in-line having a sensor at one end thereof. Driving pulses generated by the transmitter are applied to the transducer, in consequence ultrasonic pulses propogate down the lead-in-line toward the sensor. Each ultrasonic pulse is reflected partly upon reaching a discontinuity in the sensor and partly upon reaching the termination of the sensor. The reflected pulses or sensor echo pulse pairs are applied to the receiver detector analyzer via the lead-in-line and transducer. A first peak detect and hold circuit and a second peak detect and hold circuit are charged individually to a reference level by the first and second pulse, respectively, of initial sensor echo pairs. The time interval during which the first and second pulses of subsequent sensor echo pairs exceed their correlative reference levels is detected by a first comparator and a second comparator, respectively. The detected time interval is measured by a reference oscillator and a gated counter. The measure interval is presented on a display as an indication of the temperature of the sensor.

3,717,034

APPARATUS FOR IMMERSING AND WITHDRAWING BATH EXAMINATION MEANS INTO AND FROM A MOLTEN BATH

Donald A. Dukelow, Mt. Lebanon Township, Allegheny County; Michael A. Orehoski, Duquesne Borough, and Nick Veselinovich, North Huntingdon Township, Westmoreland County, all of Pa., assignors to United States Steel Corporation

Filed Feb. 12, 1971, Ser. No. 114,856
Int. Cl. G01k *1/14*
U.S. Cl. 73—343 R **12 Claims**



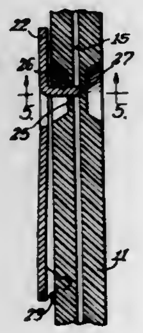
Apparatus for immersing and withdrawing a sensor and a sample into and from a molten metal bath has a sensor and a sampler mounted on the lower end of a probe which is mounted for vertical movement inside a cooled jacket. The jacket is movable along a vertical runway which is pivoted from a service position to an operating position over the molten metal bath. The jacket is lowered along the runway to the surface of the bath and an air cylinder mounted on the jacket plunges the probe into the bath. When sensor readings and a sample are obtained, the air cylinder withdraws the probe back into the jacket where the protection and cooling effect of the jacket makes a liquidus arrest temperature for molten steel readily available. The jacket is then withdrawn from the bath and the runway pivoted back to the service position.

3,717,035

THERMOMETER WITH MEANS FOR SELECTIVELY CLOSING THE CAPILLARY BORE

Josef F. Klingler, Wilmette, Ill., Theodore Braverman, Bayside, N.Y., and Charles E. Klingler, Chicago, Ill., assignors to Thermex Inc.

Filed Feb. 19, 1971, Ser. No. 116,971
Int. Cl. G01k *5/04*
U.S. Cl. 73—371 **27 Claims**



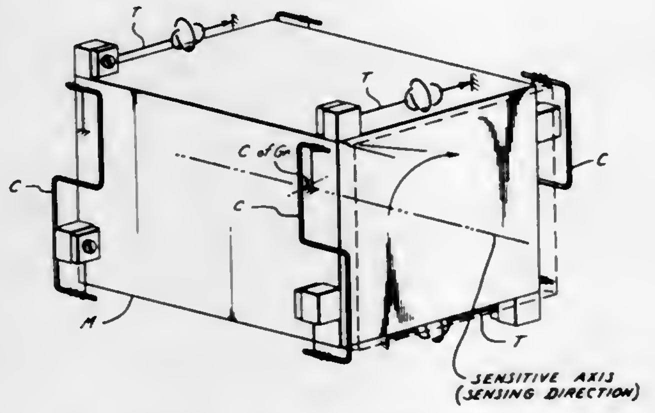
A thermometer having an open ended capillary bore and means for selectively closing the bore. The bore closing means may comprise an element arranged to pierce the capillary element and extend across the bore. The bore closing means may be movably carried on the capillary element.

3,717,036

FORCE MEASURING DEVICE

Lucien J. B. LaCoste, Austin, Tex., assignor to LaCoste and Romberg, Inc., Austin, Tex.

Continuation-in-part of Ser. No. 700,533, Jan. 25, 1968. This application April 6, 1970, Ser. No. 25,915
Int. Cl. G01v *7/04*
U.S. Cl. 73—382 **15 Claims**



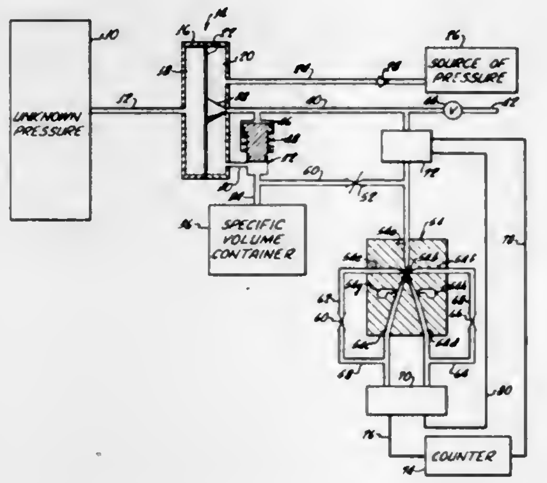
A force measuring device including a mass, a frame and substantially equal length links supporting said mass with respect to said frame so as to permit only translation of the mass in a line accompanied by a rotation about an axis parallel to the direction of translation. The abstract hereinbefore set forth is neither intended to define the invention of the application which, of course, is measured by the claims, nor is intended to be limiting as to the scope of the invention in any way.

3,717,037

PRESSURE MEASURING SYSTEM

Charles L. Buddecke, Fullerton, Calif., assignor to Charles L. Buddecke, Orris A. Flatten, Oscar E. Hyman, and John Le Valley

Filed Oct. 14, 1971, Ser. No. 189,181
Int. Cl. G01l *7/08*
U.S. Cl. 73—388 R **11 Claims**



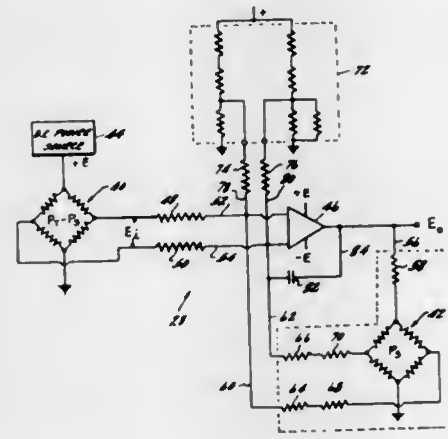
A container of specific volume is pressurized to the level of an unknown pressure. A diaphragm exposed to the unknown pressure and to the container is utilized to control a valve for making the pressure in the container equal to the unknown pressure. After the container is pressurized to the desired level, it is isolated from its pressurizing source and the fluid in the container is processed through a fluidic bistable oscillator in a manner to produce oscillating mass-flow pulses. These pulses are counted as incremental and accumulating pressure values in suitable registers to provide a digital display of the pressure in the container, and hence the unknown pressure. A pressure operated switch is provided to reset the counters when the container is isolated from its pressurizing source.

3,717,038

DIRECT CURRENT PRESSURE RATIO CIRCUIT

Don A. Plett, Cincinnati; Louis L. Owen, West Chester, and Robert H. Tenkman, Cincinnati, all of Ohio, assignors to General Electric Company

Filed April 30, 1971, Ser. No. 139,050
Int. Cl. G01l *9/02*
U.S. Cl. 73—398 AR **8 Claims**



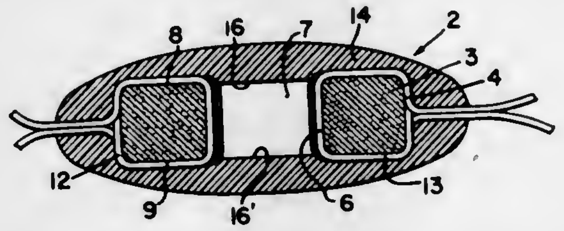
An electrical circuit is disclosed which provides an output which indicates the ratio of a sensed pressure differential to a sensed absolute pressure and thereby approximates the Mach number of air flow in a duct. A pair of transducers respectively sense the differential between total and static pressure, and static pressure, per se, in the duct. The pressure differential signal provides an input to an operational amplifier circuit, while the absolute pressure signal forms part of a feedback loop to the operational amplifier. A non-linear compensation network is provided to prevent null drift of the operational amplifier.

3,717,039

METHOD AND MEANS FOR AMPLIFYING THE STRESS AND STRAIN IN A STRESS-SENSITIVE COMPONENT

Norman Zinker, Santa Clara, Calif., assignor to International Technical Industries, Santa Cruz, Calif.

Filed Aug. 4, 1969, Ser. No. 847,192
Int. Cl. G01l *9/16*
U.S. Cl. 73—398 R **1 Claim**



Presented is a transducer assembly including a stress-sensitive body conditioned to render additive the radial and tangential stresses imposed on the body.

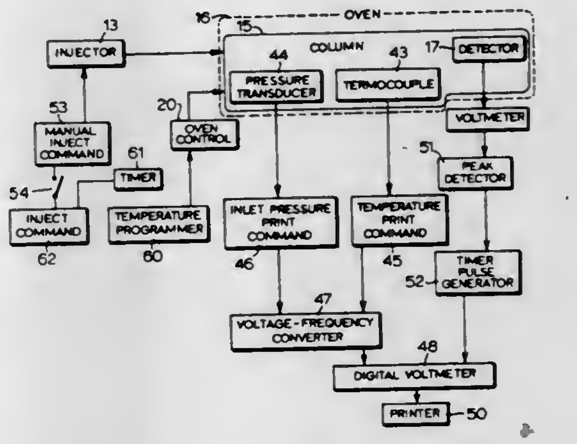
3,717,040

MOLECULAR PROBE APPARATUS

James Edwin Guillet, Don Mills, Ontario, Canada, assignor to The Governors of the University of Toronto, Toronto, Ontario, Canada

Filed Sept. 14, 1970, Ser. No. 71,948
Int. Cl. G01n *15/08*
U.S. Cl. 73—432 PS **8 Claims**

Apparatus for determining physical characteristics of particulate material in which the material whose characteristics are to be determined are deposited in a heated tube which is connected through an inlet with an inert carrier gas source. Probe molecules in a vapor source are injected into the carrier gas stream at predetermined intervals or temperatures. The retention time of the probe molecules with respect to the material is measured by a gas detector positioned downstream of the tube adjacent the outlet. The temperature may be varied linearly or progressively and the injection mechanism may respond either to time, to the expiry of the retention time, or to a combination of these factors to provide automatic measurement.

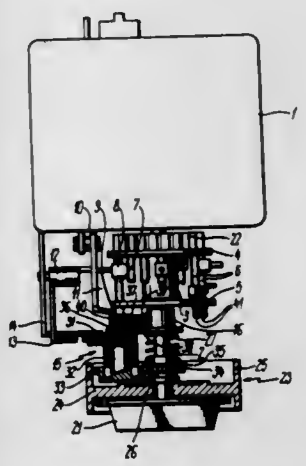


3,717,041

ADJUSTING DEVICE FOR TUNER UNITS

Lothar Stemke, Rottweil, Germany, assignor to Hopt Electronic GmbH, Rottweil, Germany

Filed Sept. 1, 1971, Ser. No. 177,012
Claims priority, application Germany, Sept. 4, 1970, P 20 43 979.6
Int. Cl. F16h *35/18*
U.S. Cl. 74—10.6 **9 Claims**

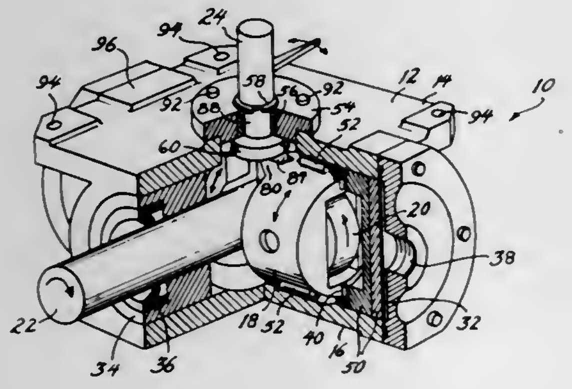


A tuner unit particularly for television receivers has an adjusting device comprising a plurality of tuning spindles mounted preferably in an indexable rotatable drum for displacement relating to an adjuster shaft an end of which can be moved into engagement with an end of any one of the tuning spindles by longitudinal displacement of the shaft, for the purpose of setting any one of the spindles to a selected tuning portion to be stored. A further tuning spindle is provided which is displaceable into operative connection with the adjuster shaft in the next portion of the latter, whereby the further tuning spindle can be adjusted to any one of a continuous band of tuning positions.

3,717,042

LINEAR ACTUATOR WITH YOKE ACTUATED PITCH CONTROL

Wenzel Zaruba, East Patterson, N.J., assignor to Textol Systems, Inc., Calstadt, N.J.
Continuation-in-part of Ser. No. 851,421, Aug. 19, 1969, Pat. No. 3,638,504. This application June 29, 1970, Ser. No. 50,621
Int. Cl. F16h *21/16*
U.S. Cl. 74—25 **9 Claims**



A linear actuator with yoke actuated pitch control having a housing for receiving a plurality of yokes each including a wheel, the housing further having an opening to permit the passage of a rotatable power driven shaft with each of said wheels being resiliently urged against said shaft and means being provided to vary the pitch of the wheels with respect to said shaft. Each of the pitch varying means are interconnected to a control shaft that extends from the housing. The control shaft is turned by movement of a lever connected to the control shaft which affords a relatively large mechanical advantage. The pressure of the wheels against the power shaft is changed by means of fluid pressure. The entire device is contained in an impervious housing.

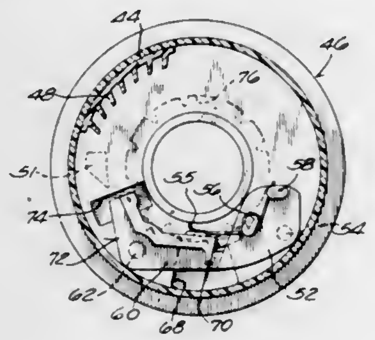
3,717,043

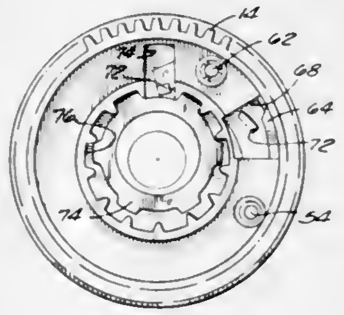
TIMER STEPPING MECHANISM HAVING STRETCHED INTERVALS

Roger J. Cartier, Hoffman Estates, Ill., assignor to Controls Company of America, Melrose Park, Ill.
Filed Oct. 1, 1971, Ser. No. 185,549
Int. Cl. F16h *27/00*
U.S. Cl. 74—112 **5 Claims**

The continuously driven drive disc has a crank provided with a drive pawl on one end and a depending finger or feeler on the other end. A retracting lever is also carried by the drive disc and includes a depending cam portion which is adapted to engage a splitter fixed on the end plate of the timer. A single spring acts on the lever to force it against the pawl crank to hold the pawl in retracted position against the bias of the same spring acting on the pawl in the engaging direction. However, when the cam depending from the positioning lever engages the splitter the retracting lever is moved to a position allowing the pawl to move into engagement with the ratchet teeth on the inside of the timing cam drum. Initially, however, the pawl is prevented from moving into contact with the ratchet teeth due to a portion of the crank engaging the splitter. When the sensing portion of the crank drops off of the splitter the spring force drives the pawl towards the ratchet. In one version this causes the pawl to engage the teeth and drive the timing cam drum until the cam depending from the lever clears the splitter, at which time the net spring force returns the pawl to a retracted position as the spring returns the lever to its restraining position.

In another version the feeler portion of the pawl crank may engage a mask carried by the drive disc and prevent the pawl from engaging the ratchet teeth, thus prolonging the interval until the mask has been moved out of its blocking position. Selective use of this interval extending concept is achieved by making some of the ratchet teeth longer than others so that even if the mask is in the blocking position the pawl can reach a tooth and index the timing cam. Spacing of the teeth can be varied so long as the longest interval does not exceed any two adjacent small steps. The long tooth, short tooth, and variable step features may be combined in a different ratchet configuration. The mask may be mounted on a plate which can be actuated on each step to disengage the mask from the drive disc and permit a return spring to return the mask to a zero position to insure full availability of the interval stretching feature.

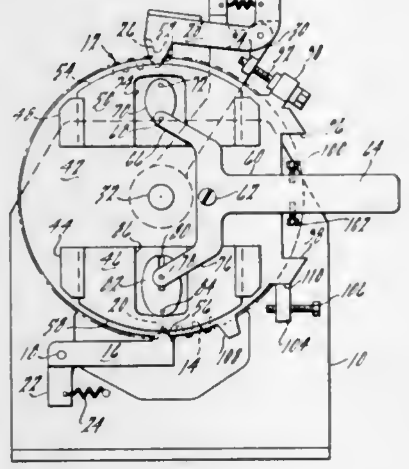




3,717,044

INDEX DEVICE

Arthur B. Bassoff, Oak Park, Mich., assignor to Lear Siegler, Inc., Santa Monica, Calif.
Filed Feb. 4, 1971, Ser. No. 112,705
Int. Cl. F16h *27/02*
U.S. Cl. 74—142 **9 Claims**

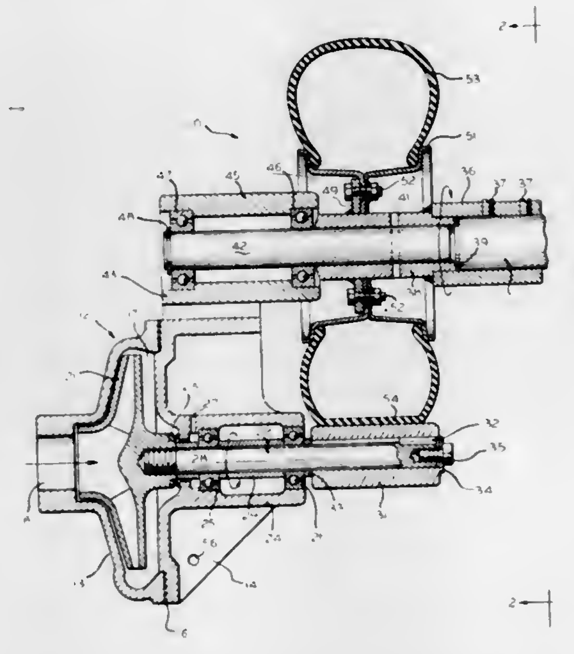


An index device including a locating or indexing pawl and a driving pawl, and means for effecting timed engagement and disengagement between said pawls and an index plate to maintain positive control of the index plate at all times.

3,717,045

TRACTOR POWER TAKE-OFF DRIVE FOR CENTRIFUGAL PUMP

Thomas I. Burenga, Evanston, Ill., assignor to TSC Industries Inc., Chicago, Ill.
Filed Oct. 12, 1971, Ser. No. 188,100
Int. Cl. F16h *37/00, 13/02*
U.S. Cl. 74—15.6 **4 Claims**

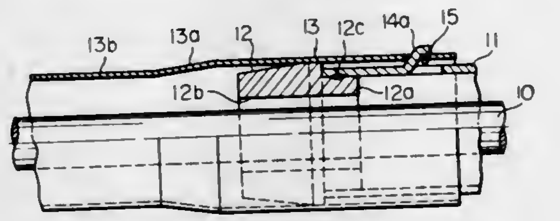


A centrifugal pump assembly driven from the power take-off shaft of a farm tractor, comprising a drive roller affixed to the pump shaft externally of the pump housing, a power take-off coupling connected to the tractor PTO shaft and having a drive shaft projecting outwardly of the coupling with the end of the drive shaft mounted in a drive shaft support. The drive shaft support is affixed to the pump housing, so that the drive shaft is maintained in parallel spaced relation to the pump shaft. A small rubber tire, supported by the drive shaft and driven from the PTO coupling, engages the drive roller to drive the centrifugal pump; the tire diameter is at least three times the diameter of the drive roller to afford a high speed pump drive.

3,717,046

AUTOMOTIVE STEERING COLUMN

Hiroshi Takao and Hiroshi Seino, Yokohama, Japan, assignors to Nissan Motor Company Limited, Yokohama, Japan
Filed Sept. 10, 1970, Ser. No. 71,146
Claims priority, application Japan, Sept. 10, 1969, 44/71,199
Int. Cl. B62d *1/18*
U.S. Cl. 74—492 **1 Claim**

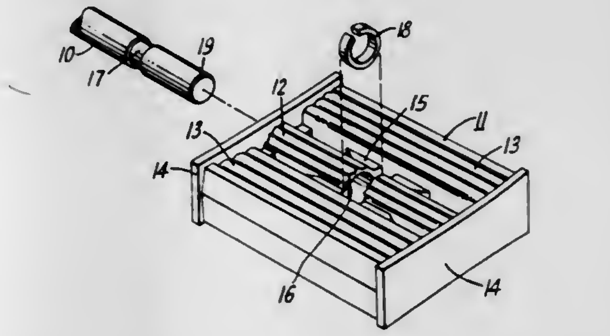


A steering column for a motor vehicle adapted to damp a violent mechanical impact carried thereto as in case of a collision of the motor vehicle, which steering column is provided with an inner sleeve enclosing the steering column, an outer sleeve into which the inner sleeve is inserted partly slidably in an axial direction, and at least one shear pin or retaining member constraining the inner and outer sleeves to each other, the shear pin or the retaining member being made inoperative when subjected to a violent mechanical impact so that the inner sleeve is permitted to slide within the outer sleeve through a limited length, whereby a portion of the mechanical impact is absorbed when the shear pin or the retaining member is made inoperative and the remaining portion of the impact which is damped at this instant is absorbed while the inner sleeve is being moved through the limited length and brought to a full stop in the outer sleeve.

3,717,047

PEDAL ATTACHMENT

Loran R. Hill, Olney, Ill., assignor to AMF Incorporated
Filed June 9, 1971, Ser. No. 151,456
Int. Cl. B62m *3/08*
U.S. Cl. 74—594.4 **5 Claims**

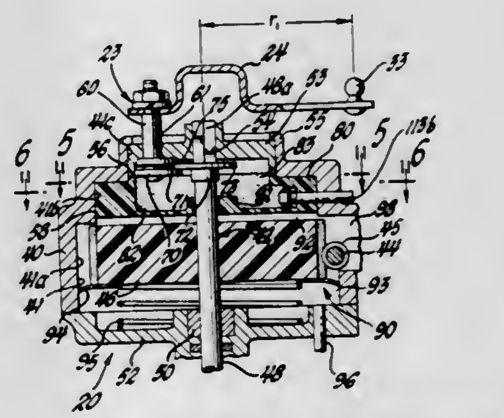


A molded single piece plastic foot pedal member having a lengthwise extending center bushing for rotatably mounting the pedal member on the outer end of a crank has a slot formed in the bushing which extends transversely across the central portion of the bushing. The slot is adapted to have locking means inserted therein to lock the pedal to the crank after the outer end of the crank is inserted into the bushing past the slot.

3,717,048

DEPRESSED PARK WIPER MECHANISM

Keith H. Carpenter, Kettering, Ohio, assignor to General Motors Corporation, Detroit, Mich.
Filed Oct. 4, 1971, Ser. No. 186,308
Int. Cl. B60s *1/24*
U.S. Cl. 74—600 **3 Claims**

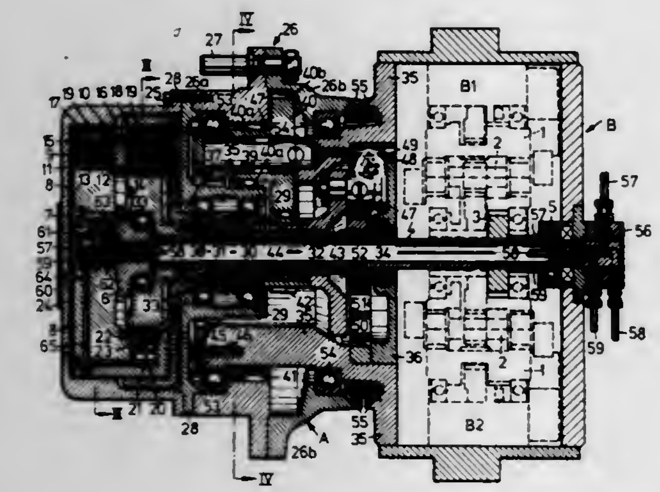


In a preferred form, this disclosure relates to an actuating mechanism for oscillating a pair of windshield wipers across the windshield between inboard and outboard positions during running operation and for moving the wipers to a depressed park position when running operation is being terminated. The actuating mechanism comprises a housing means, an annular drive member rotatably supported by the housing means, a drive shaft rotatably supported by the housing means for rotation about its axis and drivingly connected with the annular drive member and a drive means operatively connected with the drive shaft for rotating the same. The actuating mechanism further comprises a crank assembly including a crank arm which is adapted to be connected with the wipers and a crank shaft which is supported by the annular drive member at an eccentric location for both rotational and axial movement relative thereto. The actuating mechanism further includes a stationary annular cam track carried by the housing means and an eccentric cam follower means carried by the crank shaft and a means operatively connected with the cam follower means for shifting the same between a first position in which it cooperably engages the annular drive member to cause the crank shaft to be rotated in unison with the annular drive member and through an orbit of a given radius during running operation of the wipers and a second position in which said eccentric cam follower is disengaged from the annular drive member and received within the stationary cam track to cause the annular drive member to rotate relative to the crank arm to increase the throw of the crank arm to cause the wipers to be moved toward their depressed park position when wiper operation is being terminated.

3,717,049
MULTISTAGE WHEEL HUB TRANSMISSION

Heinrich Brandt, Wiehl, Germany, assignor to Bergische Achsenfabrik Fr. Kotz & Sohne, Am Ohlerhammer, Wiehl, Germany

Filed Aug. 18, 1971, Ser. No. 172,778
Claims priority, application Germany, Aug. 20, 1970, P 20 41 287.7
Int. Cl. F16h *3/44*; **B60k** *17/06*
U.S. Cl. 74—750 R **21 Claims**



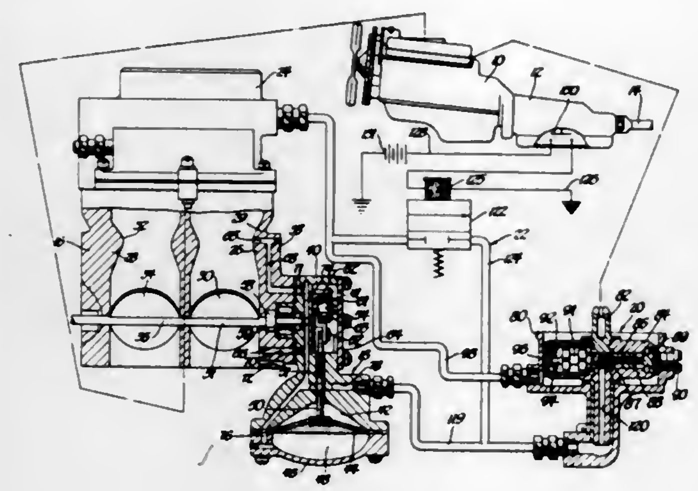
The specification discloses a multistage transmission, especially for driving a wheel hub in which a rotatable shaft coaxial with the hub has mounted thereon a coupling member. Two transmission stages are provided, each with a coupling drum adjacent the coupling member and a further drum connected to the wheel hub is adjacent the coupling member. Coupling elements in the coupling member are adapted for frictionally engaging the drums to couple the drums to the rotatable shaft.

3,717,050
ENGINE GOVERNOR BYPASS SYSTEM

Calvin F. Lundbom, Southfield, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Sept. 1, 1971, Ser. No. 176,861
Int. Cl. B60k *21/00*; **F02d** *31/00, 11/08*
U.S. Cl. 74—859 **4 Claims**

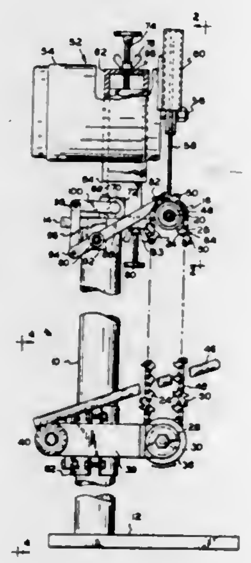
In a vehicle having a power train including an engine and an automatic transmission wherein an engine governor operates to limit maximum vehicle speed there is provided a bypass system which is controlled by the transmission to bypass the engine governor to enable engine speeds in excess of the governed speed to permit transmission shifts that would otherwise not be permitted.



3,717,051
SAW CHAIN DEPTH GAUGE GRINDER

Elmer R. Silvey, Rte. 1, P.O. Box 138, Eagle Point, Oreg. 97524

Continuation of abandoned application Ser. No. 39,731, May 22, 1970. This application May 24, 1971, Ser. No. 146,510
Int. Cl. B23d *63/16*
U.S. Cl. 76—37 **9 Claims**

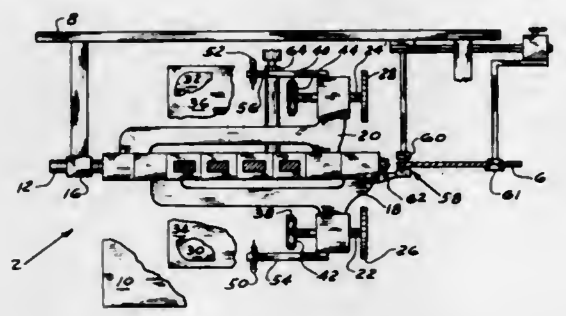


A machine primarily useful for accurately grinding the depth gauges of the cutter links of saw chains to a predetermined height is provided with a pair of spaced pulleys for supporting the saw chain under tension. One of the pulleys is power driven for continuously driving the chain in the forward direction. A grinding wheel is positioned to grind the depth gauges as the cutter links progress around one of the sprockets. A cam member engaged by a depth gauge which has just been ground causes the grinding wheel to be lifted over the cutter element following each depth gauge. The machine can also be employed for sharpening the cutter elements of top sharpening chain and for grinding the tops of the trailing portions of the cutter elements of chipper and chisel chain to improve the boring properties of such chains.

3,717,052
AUTOMATIC GRINDING MACHINE

Jonathan R. McKinney, 4831 S. W. 11th Court, Plantation, Fla.

Filed June 14, 1971, Ser. No. 152,936
Int. Cl. B23d *63/08*
U.S. Cl. 76—48 R **7 Claims**

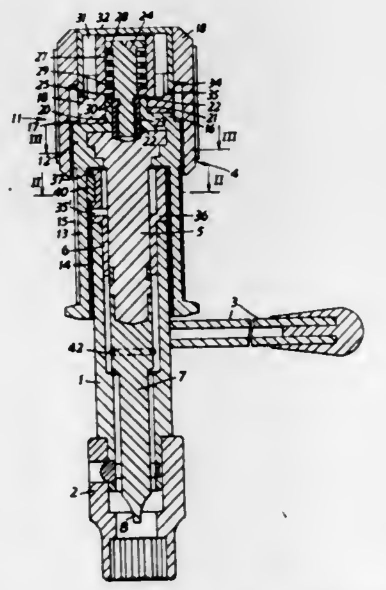


An automatic grinding machine for simultaneously grinding both sides of tungsten carbide tips on a circular saw blade to provide a compound side clearance angle. The compound side clearance angle includes a tangential side clearance and a radial side clearance on each side of each tungsten carbide tip. The grinding machine includes two spindle arms supported on a guide means and reciprocally movable on the guide means and moveable toward and away from one another, a rotatable grinding wheel connected to the distal end of each spindle arm, a moveable clearance cam positioned between the distal ends of the spindle arms and reciprocally moveable along a path at a predetermined angle to the guide rod, clearance cam follower means on each spindle arm, an adjustable indexing means for indexing and locating the carbide tipped saw blade in the proper grinding position, and drive means for driving the reciprocally moveable spindle arms, the clearance can, the grinding wheels to grinding tungsten carbide tips, and the indexing means.

3,717,053
HAND TOOL

Frederick William Sturges, Hampshire, England, assignor to S.P.Q.R. Engineering Limited, Rowlands Castle, Hampshire, England

Filed July 31, 1970, Ser. No. 59,997
Claims priority, application Great Britain, June 26, 1970, 31,126/70
Int. Cl. B25b *13/48*
U.S. Cl. 81—3 F **12 Claims**

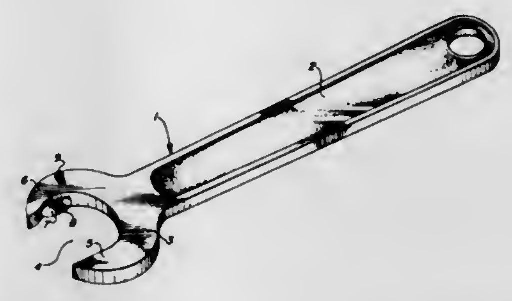


A hand tool suitable for adjusting the tappet clearance of overhead valves in an internal combustion engine in which a member for engaging the nut of the valve and a member for engaging the screw of the valve are attached to parts which are receivable one within the other, and indexing means are provided between the parts to locate the parts in any one of a number of equiangularly spaced positions relative to one another.

3,717,054
OPEN-END WRENCH WITH INTEGRAL RATCHETING MEANS

Robert J. Thompson, Phoenix, Ariz., assignor to Stuart J. Shoob, a part interest

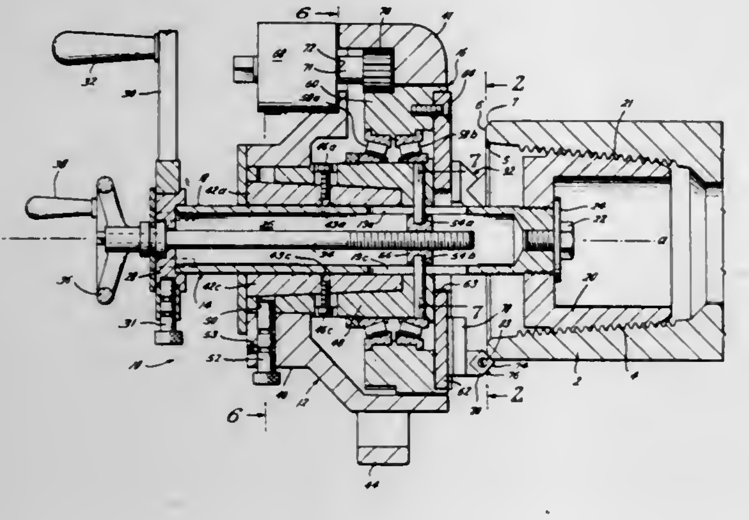
Filed July 19, 1971, Ser. No. 163,698
Int. Cl. B25b *13/12, 13/00*
U.S. Cl. 81—179 **5 Claims**



In order to provide an open-end wrench which will ratchet in one direction to permit sequential strokes of the wrench without removing it from the element being tightened or loosened, one of the jaws is rendered controllably retractable. The retractable jaw is biased toward the unretracted position by means of a compression spring disposed behind the retractable jaw element which is oriented to move linearly in a guide slot angularly toward and away from the element being operated upon as the ratcheting function is carried out. A detent pin extends through the retractable jaw element in a direction normal to a flat surface grasped within the jaws and is spring loaded toward the jaw surface. The other end of the detent pin comprises an enlarged head portion which restrains the detent pin compression spring on its undersurface and is curved on its upper surface to function as a detent cooperating with a recess in the stationary portion of the jaw carrying the retractable jaw element. The detent pin serves to lock the retractable jaw element in the grasping position so long as a flat area of the grasped element is flush with the detent pin end which causes the head end of the pin to remain locked in the detent bore. However, when the direction of the wrench is reversed, the natural tendency of the flat area of the element being operated upon to move away from the jaw surface proximate the detent pin coupled with pressure exerted on the retractable jaw element in an area nearer the open end of the wrench permits the pin to lift slightly and relax the retractable jaw element which is pushed angularly rearwardly from its locked position and ratchets until the direction is again reversed at which time a flat area of the element being operated upon will again constrain the detent pin, and hence the retractable jaw element, in the locked position. A locking pin is incorporated into the mechanism for preventing retraction of the ratcheting jaw in order that the wrench can function as an ordinary open-end wrench. To facilitate working "blindly," a spring loaded retractable ball is disposed in the stationary jaw proximate the tip thereof to provide a slight locking effect once the nut or the like is located and the wrench is slid into position. Similarly, two small retractable pins are provided, one above the other, at the base of the nut-receiving opening and function to assist in maintaining the wrench engaged with the nut or the like being operated upon by providing a "stop" function against raising or lowering the working end of the wrench sufficiently to "lose" the nut. By engaging the nut in such a manner that one of the two superimposed pins is retracted and the other functions as a stop, slight pressure against the stop assists in maintaining engagement between the tool and the nut.

3,717,055
PORTABLE TOOL FOR REFACING DRILL PIPE

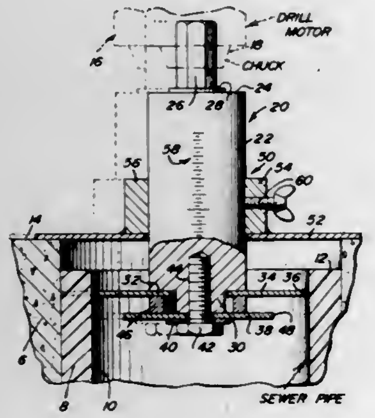
Earl M. Pendleton, 5446 Apple Creek, Houston, Tex.
Filed Feb. 1, 1971, Ser. No. 111,356
Int. Cl. B23b *3/22*
U.S. Cl. 82—4 C **11 Claims**



Apparatus is provided for refacing pipe sections, the apparatus including a housing, a rotatable cutting head mounted on the housing by means of roller bearings and including thereon plural replaceable and adjustable cutting elements for cutting the desired surfaces of the pipe section, a feed screw for moving the cutting head longitudinally toward and away from the pipe section, and a threaded section operable to detachably secure the apparatus to the pipe section by rotation of said section. Rotation of the cutting head is provided by a ring gear which is operably connected to a source of power such as a small electric motor.

3,717,056
PIPE CUTTING TOOL

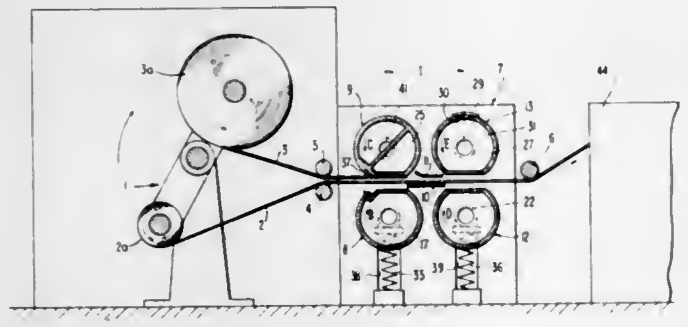
William J. Gracin, and Roy Lee Jones, both of Carmichael, Calif., assignors to Raymond L. Stanford, Sacramento, Calif., a part interest
Filed July 2, 1970, Ser. No. 51,907
Int. Cl. B23b *3/04, 3/22, 5/14*
U.S. Cl. 82—82 **8 Claims**



A shiftable and positionable tool characterized by an arbor having a removable saw blade of a diameter slightly less than the inside diameter of an embedded plastic sewer pipe. The lower end of the arbor has guide means proportional with the diameter of the blade and so mounted that its outer marginal edge rolls in an orbital path and functions to prevent the teeth of the blade from gouging into the concrete or equivalent foundation. Depth regulating and controlling means is adjustably mounted on a median portion of the arbor. An upper terminal end of the sewer pipe is cut-off parallel to the level of the floor at a controlled depth below the floor's level whereby to prepare the pipe-end for installation of a plumbing adapter in a sewage system.

3,717,057
WEB CUTTING DEVICE IN AN APPARATUS FOR SPLICING AN OLD WEB AND A NEW WEB

Hisashi Takimoto, Ashigara-Kamigun, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Feb. 17, 1971, Ser. No. 116,016
Claims priority, application Japan, Feb. 17, 1970, 45/13668
Int. Cl. B26d *1/32;* **B65h** *21/00*
U.S. Cl. 83—98 **4 Claims**

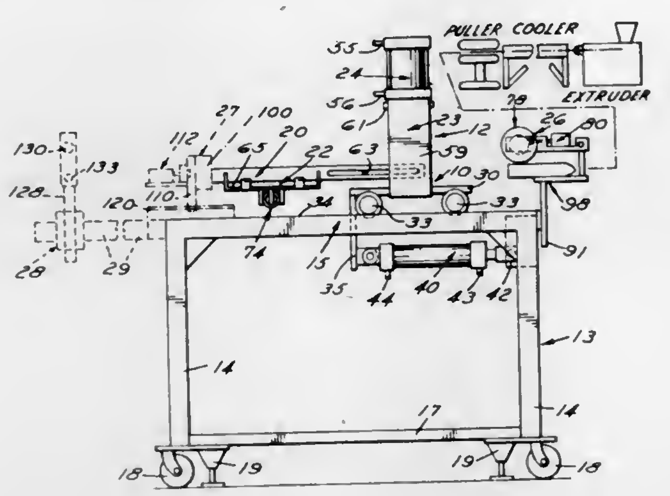


Apparatus for splicing an old and a new web in abutting relation, comprising a web feed out station, a web cutting station and a web splicing station. The old and new webs are fed from the feed out station into substantially parallel relation and pass between a pair of rotatable drums at the cutting station and a pair of rotatable drums at the splicing station. One of the drums at the cutting station has a blade for cutting the old and new webs, and a perforated old web holding and releasing portion disposed adjacent one side of the blade. The other drum at the cutting station has a perforated new web holding and releasing portion that is disposed on the side of the blade opposite to the one side when the cutting drums are in positions such that the blade is disposed adjacent to the other drum. One of the drums at the splicing station has a perforated portion adapted to retain a splicing tape thereon for application to the abutted new and old webs at the splicing station.

3,717,058
FLYING CUT-OFF PRESS

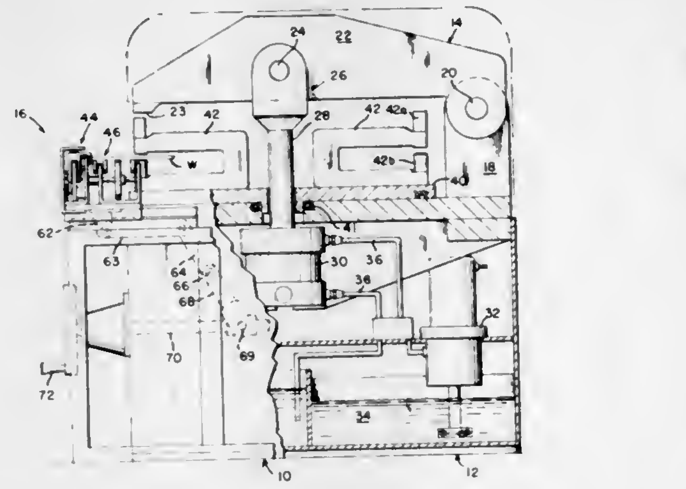
Donald E. McMinn, Romeo, Mich., assignor to Eagle Manufacturing Corp., Warren, Mich.
Filed June 2, 1970, Ser. No. 42,847
Int. Cl. B23d *25/16;* **B26d** *1/56, 5/40*
U.S. Cl. 83—157 **7 Claims**

A continuously traveling plastic extrusion passes in line through a cut-off and/or tooling unit mounted on a carriage which travels a limited stroke at the same speed as the extrusion, during which a tooling operation is performed on the extrusion, whereupon the carriage returns to its initial position. Such operation of the tooling is optionally triggered and timed by any one of: (a) a metering wheel which rolls on the advancing extrusion and has a circumference substantially equalling an extrusion length to be cut off and/or tool-formed, the wheel periodically cam-operating a control microswitch; or (b) an end gauging control microswitch which is periodically operated for a limited interval by an extrusion passing through the press; or (c) a photoelectric control switch which is tripped for a limited time by the traveling extrusion interrupting the photoelectric cell beam. The mechanical operations of the tooling unit and carriage are controlled by solenoid controlled valve and cylinder means; and a tooled extrusion piece is automatically discharged from the equipment by synchronized fluid pressure-operated dump means.



3,717,059
IRONWORKER

Dennis Daniels, Williamsville, N.Y., assignor to U.S. Amada Ltd., Seattle, Wash.
Filed March 18, 1971, Ser. No. 116,123
Int. Cl. B26d *7/16, 5/02, 5/12*
U.S. Cl. 83—401 **9 Claims**

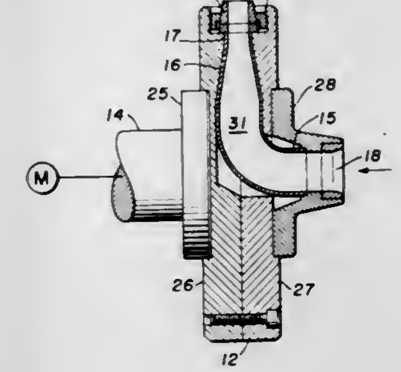


A plurality of unitized tools are positioned on a rotatable turret for moving the tools to a fixed punching station. Workpiece positioning means are provided and include a plurality of rollers for supporting the workpiece and means for moving the rollers to locate the workpiece in the Y axis. A gaging system is provided for locating the workpiece in the X axis and includes a sliding end gage actuated by the workpiece.

3,717,060
ROTOR TUBE FOR A BERIA-TYPE CUTTER

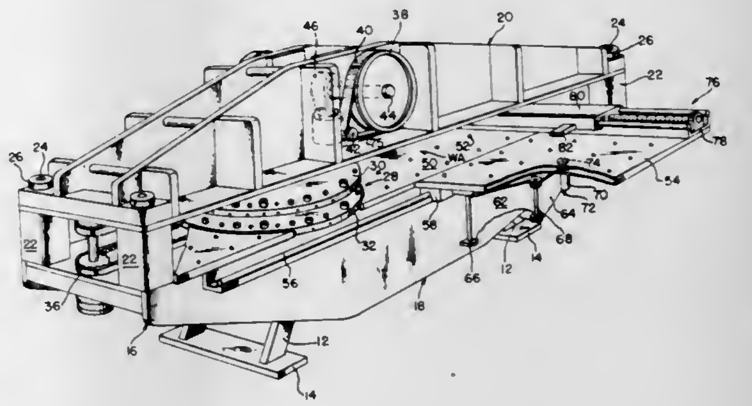
Charles H. McGill, Decatur, Ala., assignor to Monsanto Company, St. Louis, Mo.
Filed Dec. 21, 1970, Ser. No. 99,936
Int. Cl. B23d *33/02*
U.S. Cl. 83—403 **1 Claim**

Apparatus for cutting lengths from an advancing tow having a rotatable disc formed with a passageway leading from the center of one of its faces and terminating on its periphery. A stationary cutting blade positioned adjacent the periphery of the disc cuts the tow into short lengths as the disc is rotated at high speed. The passageway in the disc includes a tube having three distinct portions, the first portion being an L-shaped opening of cylindrical cross-section, a second portion forming a conical section tapering away from the first portion and a third portion of cylindrical cross-section being in axial alignment with the first and second portions, the third portion being of smaller diameter than the first portion.



3,717,061
PUNCH PRESS

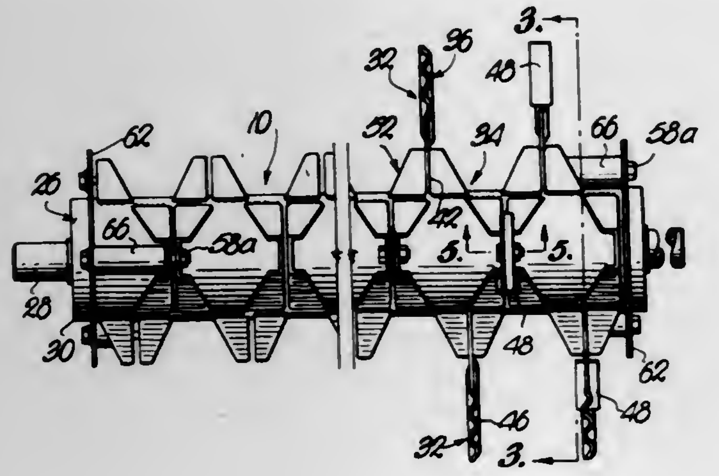
Dennis Daniels, Williamsville, N.Y., assignor to U.S. Amada Ltd., Seattle, Wash.
Filed Feb. 19, 1971, Ser. No. 113,042
Int. Cl. B26d *7/26*
U.S. Cl. 83—409 **13 Claims**



A turret punch press of the type in which the workpiece is movable in both the X and Y axes within a work area defined by upper and lower aligned frames joined at their four corners. The workpiece is supported on a fixed table and laterally extending movable side tables. The workpiece is moved relative to the fixed central and movable side tables along the X axis and is moved relative to the central table but with the side tables in the Y axis. The side tables are supported by swinging support members which allow movement only in the horizontal plane. Workpiece supporting rollers are lowered out of the path of the workpiece holding clamps.

3,717,062
ROTOR FOR CHOPPING RESIDUE FROM COMBINES

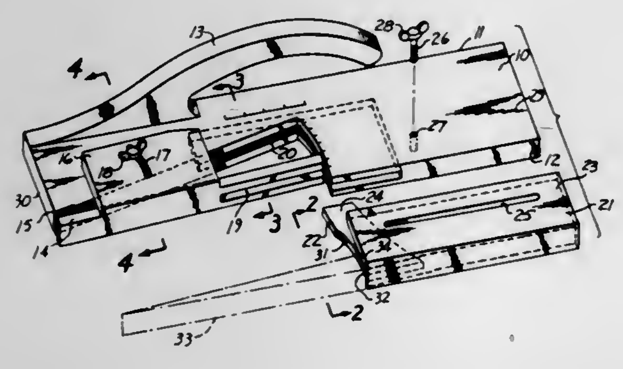
Melvin V. Gaeddert, Newton, Kans., assignor to Hesston Corporation, Hesston, Kans.
Filed Oct. 6, 1970, Ser. No. 78,446
Int. Cl. A01d *55/18*
U.S. Cl. 146—107 **12 Claims**



The rotor of a residue-chopping unit for combines cuts wider paths by virtue of the provision of laterally corrugated blades for increasing the amount of surface area in the knife-like edges which contact the residue during rotation of the rotor, all without appreciably increasing the masses of the blades. Each blade is shaped to concentrate the mass thereof at its outermost free end outside its center of gravity. A vane on certain of the blades creates an increased airflow through the chopping unit.

3,717,063
SAW GUIDE FOR CUTTING WEDGES

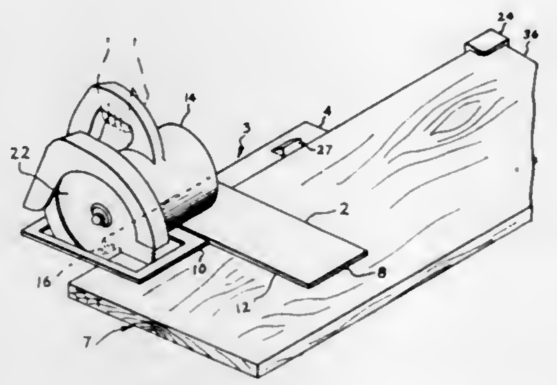
Conrad L. Roberts, P.O. Box K571,
Twentynine Palms, Calif. 92277
Filed June 22, 1971, Ser. No. 155,509
Int. Cl. B27b *27/06*
U.S. Cl. 83—477.2 **9 Claims**



An adjustable saw guide for cutting wedges which is in the shape of a flat base, having a handle attached to one side. The base is cut out on a diagonal from one corner to accommodate a hinged adjustable guide member to adjust the angularity on a wedge. A second guide member has a tenon stop engaging a slot in the base and is adjustable longitudinally along the base for the tenon stop to be adjusted for the length of the wedge cut. The face of the stop is curved to prevent creep of the wedge into the saw blade under the pressure of the cut and the effect of the tooth set of the saw.

3,717,064
GUIDES FOR HAND POWER SAWS

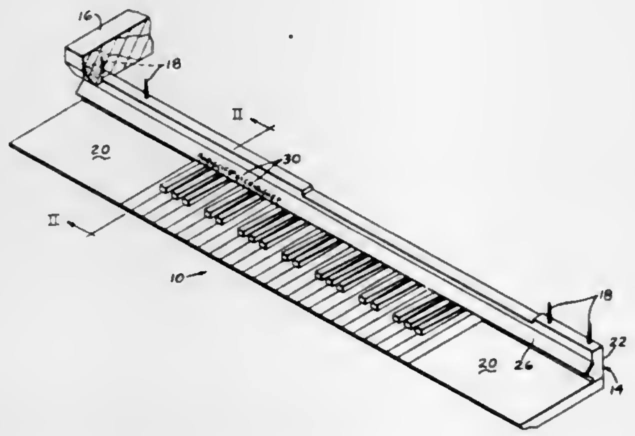
Naaman Shelton, 16601 Taylorsville Road,
Fisherville, Ky. 40208
Filed Aug. 17, 1970, Ser. No. 64,505
Int. Cl. B27b *9/04, 27/06*
U.S. Cl. 83—761 **5 Claims**



One of the disadvantages of electric hand saws is the difficulty of cutting perfectly straight lines with them. Saw guides are available but they are difficult to hold and they must be carefully spaced from the line being cut. A guide is known which can be readily held, and which has an edge adapted to be aligned with the line being cut. However it is still necessary separately to measure and mark off a cutting line. This invention simplifies this measuring operation by the provision of a saw guide which includes a measuring means.

3,717,065
KEY INDICATING DEVICE

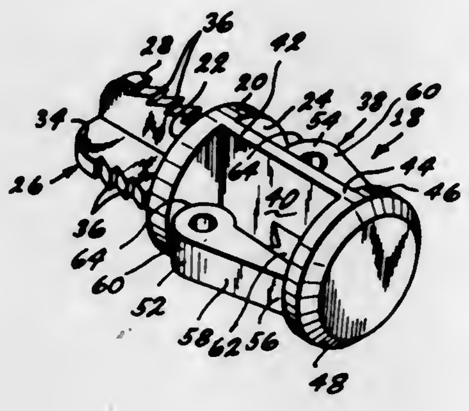
Richard M. Hebeisen, and Samuel C. Voelkel, both of Jasper, Ind., assignors to Jasper Electronics Manufacturing Co., Jasper, Ind.
Filed Sept. 2, 1971, Ser. No. 177,578
Int. Cl. G09b *15/08*
U.S. Cl. 84—478 **10 Claims**



The specification disclosed a device for indicating keys, especially keys of the lower keyboard of an electronic organ, in which a strip bearing key indicia is mounted in an inclined location above the keys at the back thereof. The indicia are not normally visible to the organ player but become visible when the strip is illuminated from the rear. Illumination of the strip is accomplished by lamps and a bar-like light conducting lens behind the strip with the lamps being energized when the organ is adjusted to play chords. The indicia indicate the chords which will sound when the keys indicated by the indicia are depressed.

3,717,066
CONNECTOR FOR CONNECTING TOY PARTS TOGETHER

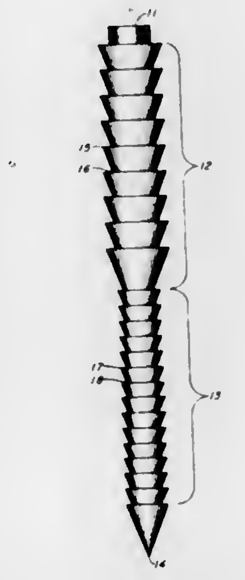
Donald J. Maurer, Torrance, Calif., assignor to Mattel, Inc., Hawthorne, Calif.
Filed July 16, 1971, Ser. No. 163,191
Int. Cl. F16b *21/00*
U.S. Cl. 85—5 R **3 Claims**



A resilient, plastic connector for connecting toy parts together includes a barbed portion adapted to be press fit into a first counterbore in one toy part and a plastic spring portion adapted to frictionally, removably engage a second counterbore in another toy part.

3,717,067
UNDERLAYMENT FASTENING DEVICE

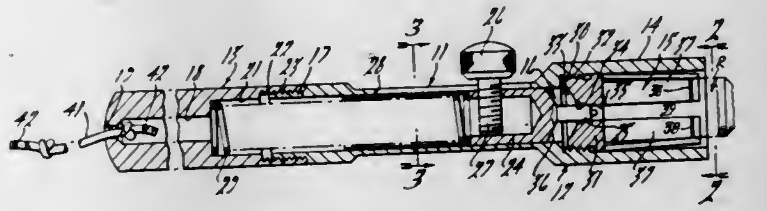
Charles B. Vick, and Roy M. Walker, both of Athens, Ga., **assignors to the United States of America as represented by the Secretary of Agriculture**
Filed Jan. 7, 1971, Ser. No. 104,607
Int. Cl. F16b *15/06*
U.S. Cl. 85—21 **1 Claim**



A nail-like device to securely fasten plywood underlayment to plywood subflooring without the accompanying nail popping and dimpling problems that often occur when nails of conventional design are used. The device is comprised of a shaft divided along its length into two sections of different diameters with each section having a plurality of annular grooves. The upper section of the shaft, which is normally embedded in the underlayment, has a larger diameter and coarser annular grooves than the lower section, which is normally embedded in the subflooring. The driving head at the top of the shaft is completely embeddable. These elements cooperate to prevent the device from withdrawing from the underlayment or otherwise causing surface irregularities which would be visible through a thin resilient tile floor.

3,717,068
ROCKET LAUNCHER

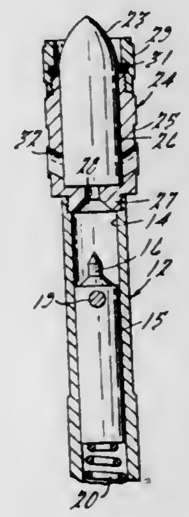
David L. Cochran, Danville, and Steven J. Salter, Walnut Creek, both of Calif., assignors to MB Associates
Filed Aug. 5, 1970, Ser. No. 61,102
Int. Cl. F41f *3/04*
U.S. Cl. 89—1.806 **4 Claims**



The disclosure relates to a hand supported distress flare rocket launcher. The launcher comprises a tubular body having a spring which urges a plunger carrying a firing pin on its forward end into engagement with the ignition cap of a rocket propelled flare mounted at the forward end of the launcher. The forward end of the launcher is provided with gripping fingers which retain the rocket against movement until sufficient gas pressure has been built up to launch and propel the rocket into trajectory.

3,717,069
ROCKET LAUNCHER

Robert Mainhardt, Diablo, and Joseph J. Cammorata, Danville, both of Calif., assignors to MB Associates, San Ramon, Calif.
Continuation of Ser. No. 746,589, July 22, 1968. This application Sept. 28, 1970, Ser. No. 76,314
Int. Cl. F41f *3/04*
U.S. Cl. 89—1.806 **6 Claims**



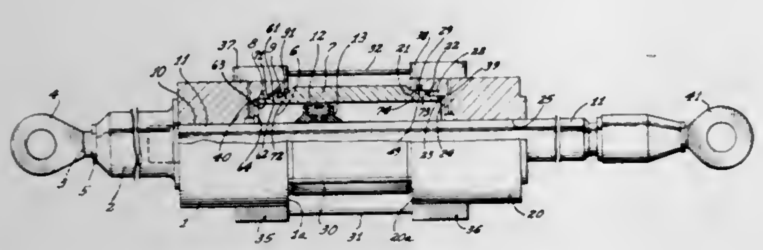
A hand-held device in the nature of a tube has a spring pressed plunger with a firing point on the end which is releasable from a latched position to move forwardly to have the firing point engage the cap of a rocket to ignite the motor propellant therein. A cylindrical barrel on the forward end of the sleeve chambers the rocket which has means to retain it therein until sufficient pressure has been built up to maintain the rocket on a desired trajectory when launched.

ERRATUM

For Class 91—388 see:
Patent No. 3,717,073

3,717,070
HYDRAULIC DRIVE AND ACTUATOR

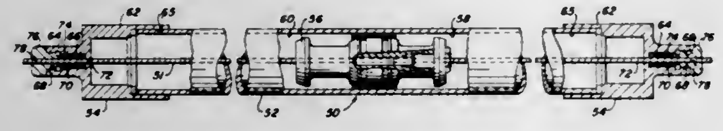
Werner Paul, 2874 Lemwerder, and Dierk Schumann, 2800 Bremen, both of Germany, assignors to Vereinigte Flugtechnische Werke-Fokker GmbH, Bremen, Germany
Filed April 15, 1971, Ser. No. 134,133
Int. Cl. F01b *29/08, 31/00*
U.S. Cl. 92—128 **7 Claims**



An actuator having two heads and a pipe as cylinder chamber, releasably mounted between the heads. The pipe is selected from a plurality of differently wide and/or differently long pipes to provide different dimensions for the cylinder chamber. The heads are provided to accommodate the differently wide pipes and a matching piston is removably mounted on the piston rod.

3,717,071
ROPE FEED PISTON ASSEMBLY

John Edward Gordon, 337 Main St. E., Galt, Ontario, Canada
Filed June 2, 1970, Ser. No. 42,789
Int. Cl. F01b *9/00*
U.S. Cl. 92—137 **4 Claims**

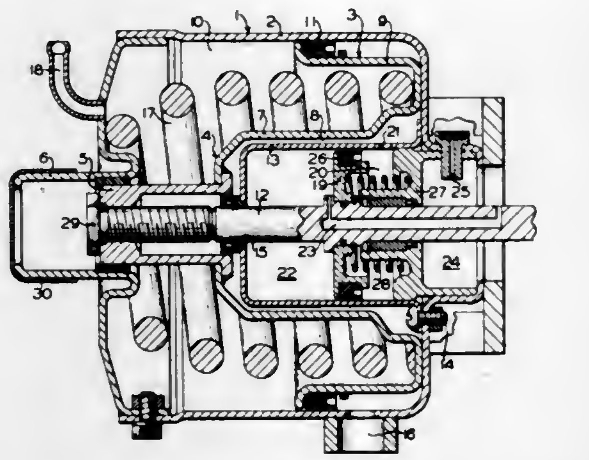


A feed cable piston assembly and more particularly means for keeping the feed cable relatively free from dirt build-up and means for securing the feed cable to a driving piston head.

3,717,072
BRAKE CYLINDER FOR VEHICLES

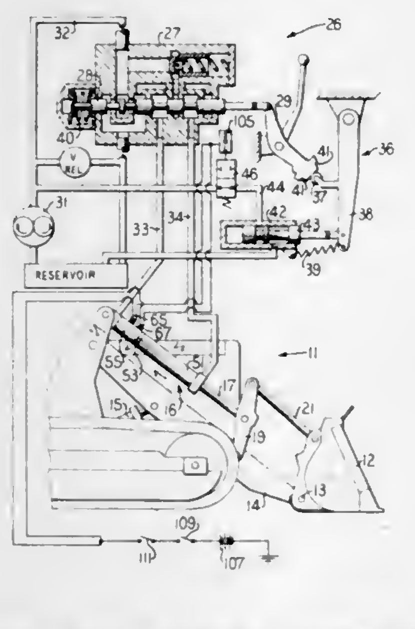
Wolfgang Kaltenthaler, Hannover, and Horst Mylius, Garbsen, both of Germany, assignors to Westinghouse Bremsen-und Apparatebau, GmbH, Hannover, Germany
Filed Dec. 21, 1970, Ser. No. 100,185
Claims priority, application Germany, Nov. 12, 1970, P 20 00 369.4
Int. Cl. F01b *7/00*
U.S. Cl. 92—152 **6 Claims**

A brake cylinder device of the spring actuated and fluid pressure released type characterized by a compound piston having a smaller cylinder and piston nested within a cup-like central portion of a larger piston, all being disposed within an outer cylinder casing of dimensions equivalent to those of the cylinder casing of a conventional single-piston brake cylinder.



3,717,073
PROXIMITY SWITCH MAGNET CONTROL FOR BUCKET POSITIONER

Joe E. Fuzzell, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.
Continuation of Ser. No. 832,775, June 12, 1969, abandoned. This application June 23, 1971, Ser. No. 156,095
Int. Cl. F15b *13/16, 13/044*
U.S. Cl. 91—388 **8 Claims**



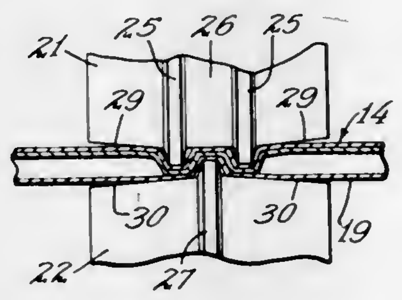
A bucket position limiting switch controlled by a magnet fastened between a pair of springs, one of which is fastened to the cylinder and the other of which is fastened to the piston rod of a loader bucket dump control cylinder. The control of the switches relative to the full travel of the cylinder rod in the small space of the switch mounting area is accomplished by mounting the magnet with a predetermined number of active coils in each of the springs so that the magnet moves only a predetermined proportion of the distance the cylinder rod travels.

3,717,074
DEADENED CREASE

Walter H. Rasmussen, St. Paul, Minn., assignor to Hoerner-Waldorf Corporation, St. Paul, Minn.
Filed Dec. 4, 1967, Ser. No. 687,669
Int. Cl. B31b *1/00*
U.S. Cl. 93—1 G **6 Claims**

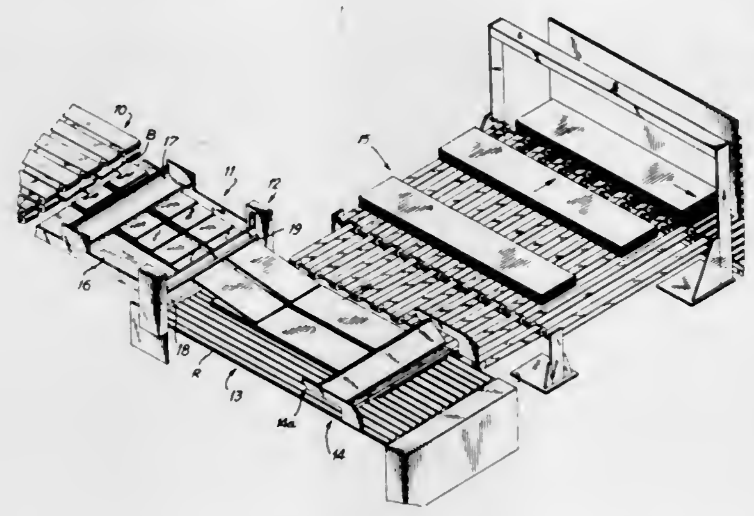
The present invention relates to a deadened crease in corrugated paperboard, and particularly a crease extending transversely of the corrugations. The crease is formed

by crushing a relatively wide area of the corrugated along the crease, preferably between a pair of male creasing rollers, and then adding a narrower crease along the center line of tne crushed area. The second crease is formed by male and female creasing rollers in preferred form, and provide an offset area extending longitudinally of the crushed area at the center thereof, the paperboard folding along the edges of the offset area.



3,717,075
STACKER APPARATUS FOR MULTIPLE CORRUGATED SHEETS

John Lopez, Westfield, N.J., assignor to Koppers Company, Inc., Pittsburgh, Pa.
Filed Oct. 4, 1971, Ser. No. 186,310
Int. Cl. B65h *31/34, 33/00*
U.S. Cl. 93—93 M **17 Claims**



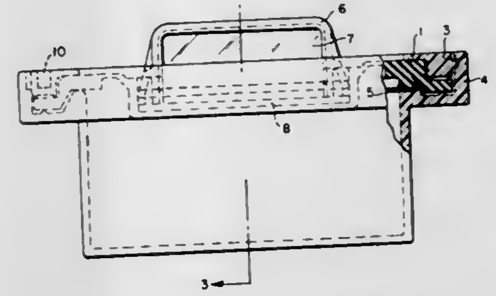
A stacker apparatus for forming at an unloading zone a plurality of stacks of corrugated sheets, said stacks having their lead edges aligned, the stacks being free of interleaving. The stacker incorporates a takeoff table and a transversely directed alignment bar, the sheets to be stacked being serially fed beneath a squaring belt assembly including a transverse belt overlying and driven to feed a plurality of side by side sheets at one time against the bar. The lower peripheral portion of the belt engages the upper surfaces of the sheets under controlled downward pressure and urges the sheets continuously against the bar, the sheet engaging portion of the belt being guided against tilting movement and being constrained to be shifted in a vertical plane only by the progressive accumulation of sheets against the alignment bar.

Means are provided for clearing the alignment bar and belt assembly at the completion of the formation of a series of stacks of desired height.

The progressive urging forces of the squaring belt assembly, coupled with the vertical movement and non-tiltability of the feed portion of the squaring belt assembly eliminate any interleaving of the stacks stored against the alignment bar.

3,717,076
TRAFFIC LANE INDICATOR

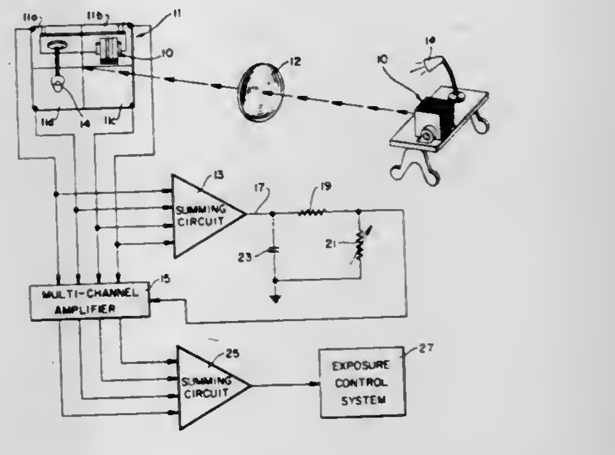
John Shields, Wilmington, and James Mengason, Hockessin, both of Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.
Filed Aug. 6, 1971, Ser. No. 169,676
Int. Cl. E01c *23/16*
U.S. Cl. 94—1.5 **7 Claims**



A reflector-type lane marker comprising a base cup, a resilient elastomeric diaphragm peripherally anchored on the rim of said cup, means for sealing said diaphragm to said rim; an upright traffic lane indicator mounted on a retaining member having a channel for receiving said indicator and a plurality of titted projections at right angles to said channel and cooperatively molded into the center of said elastomeric diaphragm.

3,717,077
EXPOSURE CONTROL APPARATUS

Donald Malcolm Harvey, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
Filed Feb. 22, 1972, Ser. No. 227,968
Int. Cl. G01j *1/44*
U.S. Cl. 95—10 CE **5 Claims**

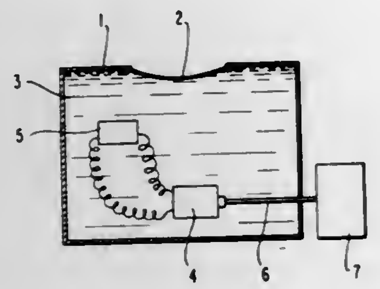


A multiple segmented photocell has its segments connected to a multichannel amplifier to which is also applied a reference signal representative to the total scene illumination and is operative to limit the output signal from any portion of the photocell which may result from a portion of the scene which has an inordinately high amount of illumination.

3,717,078
PRESSURE RESISTANT UNDERWATER CASING

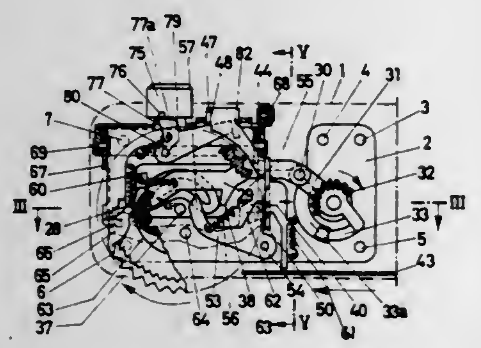
Shuichi Ogura, Tokyo, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed April 2, 1971, Ser. No. 130,749
Claims priority, application Japan, April 3, 1970, 45/28426
Int. Cl. G03b *17/08*
U.S. Cl. 95—11 W **6 Claims**

A housing or casing having a pressure balancing mechanism such as a diaphragm or bellows is filled with a suitable fluid, such as oil, to both prevent erosion and to permit the casing structure to be immune to the effects of ambient pressure. The casing is designed specifically to protect such devices as cameras used underwater.



3,717,079
ARRANGEMENTS FOR FILMTRANSPORT, EXPOSURE LOCKING AND RELEASING, WITH FLASHLIGHT-CUBE TRANSPORT MEANS AND SHUTTER LOCKING MEANS

Karl Heinze Lange, Westphalia, Germany, assignor to Baida Werke, Photographische Gerate und Kunststaff, R. Gruta Kommanditgesellschaft, Bunde Westphalia, Germany
Continuation-in-part of Ser. No. 762,753, Sept. 29, 1968, abandoned. This application June 4, 1971, Ser. No. 150,127
Claims priority, application Germany, Oct. 7, 1967, B 94865
Int. Cl. G03b *1/14, 17/42*
U.S. Cl. 95—31 AC **12 Claims**

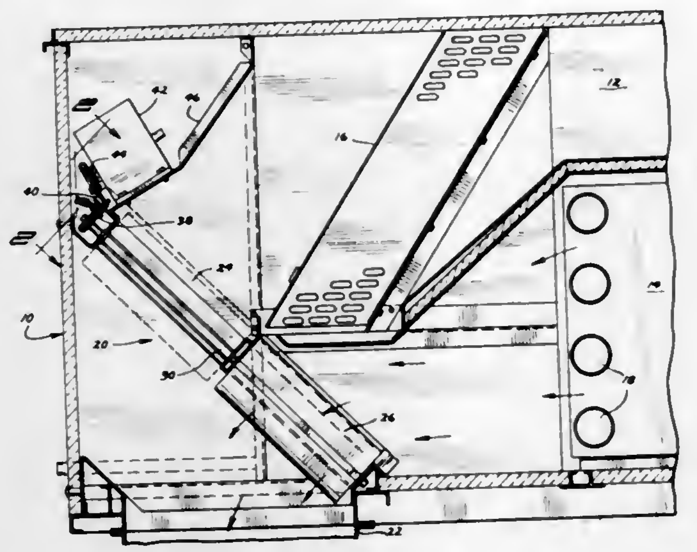


In a camera with means for simultaneously locking and unlocking the film transport device and the exposure releasing mechanism, the disc-like transport handle has a plurality of tooth-shaped driver means which are engageable by a pin attached to a governing member for both the film transport device and the locking and unlocking device, further for the exposure-releasing mechanism and for means for a flash cube transport and for locking of the shutter of the camera, whereby the governing member has the shape of a linkage bar and is guided by the pin in a stationary guide cam having an operating circular section and a non-operating return section.

3,717,080
DAPER DRIVE FOR VENTILATOR SYSTEM

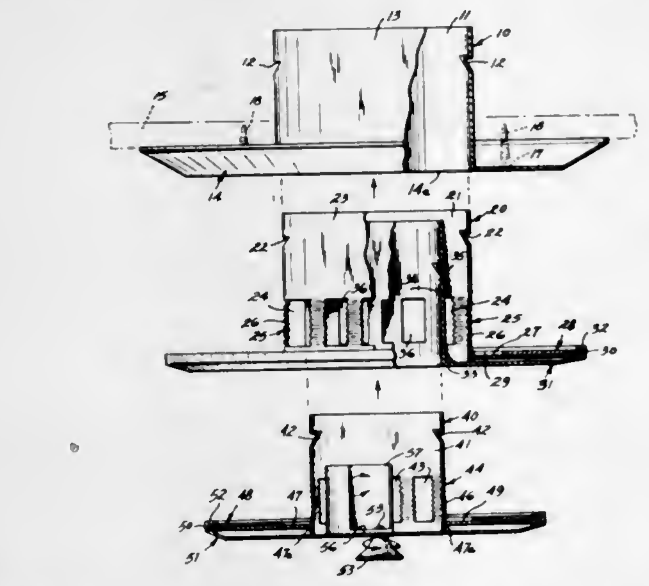
James V. Foty, Minneapolis, Minn., assignor to Lear Siegler, Inc., Minneapolis, Minn.
Filed April 12, 1971, Ser. No. 133,247
Int. Cl. F24f *13/04*
U.S. Cl. 98—38 **7 Claims**

A damper drive for a ventilator system in which modulation at frequent intervals occurs between air flow in a pair of adjacent inlet ducts leading to a common duct, the modulation occurring by movement of a pair of damper sections, having blades mounted on common damper shafts. The drive includes a first quadrant gear mounted on a shaft of a damper motor which drives a second quadrant gear which in turn moves a damper driving rod connected to the individual damper shafts. The quadrant gears lie in planes which form an obtuse angle.



3,717,081
AIR CONDITIONER DIFFUSER

John A. Jakimas, 82 Joseph St., Newark, N.J.
Filed Sept. 9, 1971, Ser. No. 179,017
Int. Cl. F24f *13/06*
U.S. Cl. 98—40 B **9 Claims**



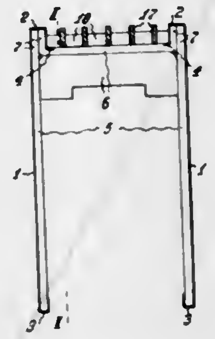
An air conditioner diffuser having a plurality of telescopic tiers or sleeves with apertures surrounding the peripheries thereof for permitting the passage of conditioned air therethrough. The sleeves not only are capable of being moved in a vertical direction but are provided with means for movement in any horizontal direction so as to adjustably control the volume and flow of conditioned air therethrough in any desired direction.

3,717,082
CONVECTOR HOOD

Otto Josef Jung, 4653 Obergosgen, Canton Solothurn, Switzerland
Filed Feb. 9, 1971, Ser. No. 113,819
Claims priority, application Switzerland, Feb. 10, 1970, 1858/70
Int. Cl. F24f *13/08;* **A47b** *47/00*
U.S. Cl. 98—114 **6 Claims**

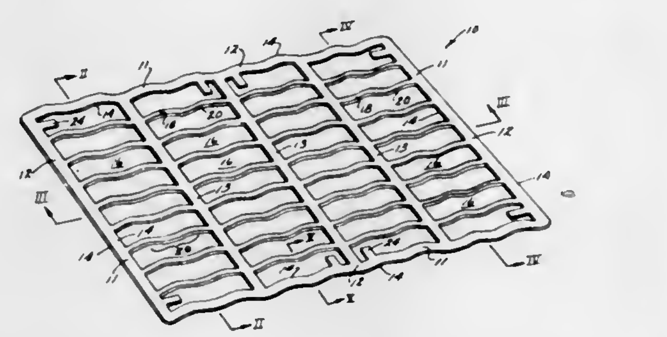
A convector hood for heating and/or cooling convectors is disclosed wherein two parallel side walls are clamped together, in spaced relation to each other, by means of U-

shaped stirrups. The upper and lower longitudinal edges of the side walls are each bent over on the inside to form a groove of U-shaped cross section, and the free ends of the two legs of each U-shaped stirrup are inserted in the lower grooves of the two side walls whilst projections at the upper ends of these legs project into the upper grooves. In this manner the two side walls are held together without the use of additional fastening means such as rivets or screws, and at the same time the cross pieces of the U-shaped stirrups can serve for supporting the hood on a convector. The free sides of the upper grooves may be bent over inwards perpendicularly to the side walls for supporting a covering grid and cover parts, which cover parts may be formed on end walls insertable between the side walls. Openings may be provided in the cover part and/or in the end wall for receiving a pipe or a regulating valve projecting from the convector.



3,717,083
SECONDARY BARBEQUE GRILL

Carl Karapetian, 19975 Roslyn Road, Detroit, Mich.
Filed Oct. 6, 1971, Ser. No. 187,081
Int. Cl. A47j *37/06*
U.S. Cl. 99—450 **9 Claims**

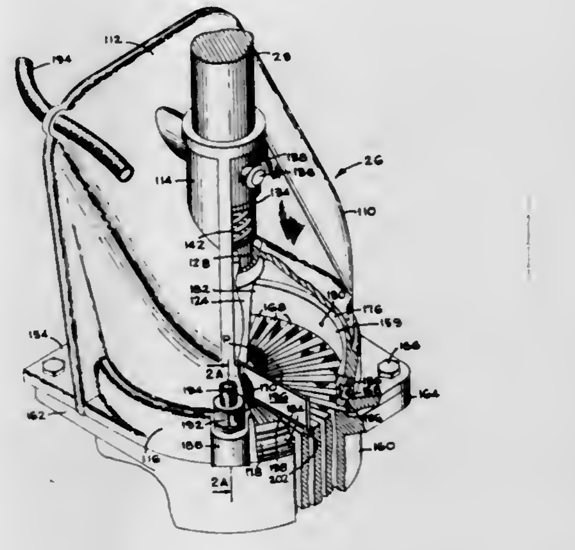


An improved disposable secondary grill for use with a primary or permanent grill to allow the barbequing of foods without contact with the surfaces of such primary grills. The improved secondary grill comprises a unitary body having top surfaces with openings therein to allow the passage therethrough of radiant heat, such openings being defined by bar-like strips having cross-sectional widths in the shape of an open C and lengthwise undulations to vertically space the food to be cooked from the surfaces of the primary grill.

3,717,084
WATER SPRAY RING FOR CITRUS FRUIT PROCESSING APPARATUS

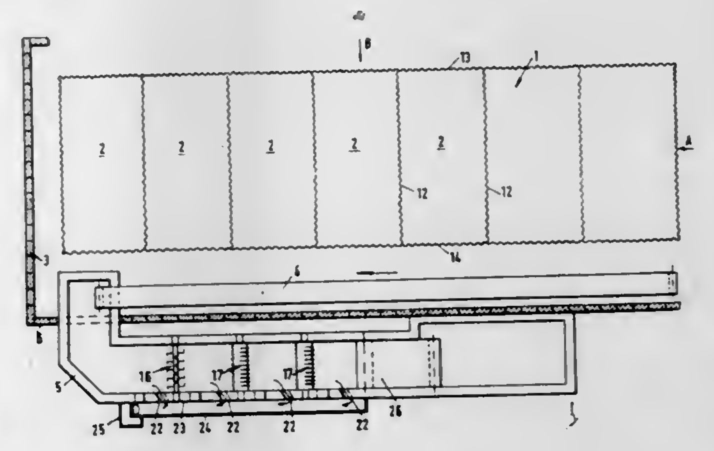
Robert P. Robbins, Lakeland, Fla., and Thierry N. Thys, Oakland, Calif., assignors to FMC Corporation, San Jose, Calif.
Filed Jan. 18, 1971, Ser. No. 107,212
Int. Cl. A23n *1/02;* **B30b** *9/02*
U.S. Cl. 146—3 R **6 Claims**

A device for aiding in the recovery of peel oil from the skin of citrus fruit comprises a band or ring having a groove in its outer circumferential surface with radially directed openings which connect the groove to the inner circumferential surface of the band so that, when the band is placed in a fruit processing apparatus with the groove closed and sealed, liquid can be pumped into the groove causing a spray of liquid to be emanated radially inwardly through the openings onto fruit skins which have been scored to expose the peel oil sacs in the skin.



3,717,085
INSTALLATION FOR BEAN SPROUT PRODUCTION

Taketoshi Sato, Tokyo, Japan, assignor to San Ritsu Company Limited, Tokyo, Japan
Filed Jan. 12, 1971, Ser. No. 105,845
Int. Cl. A01g *31/02*
U.S. Cl. 99—516 **8 Claims**

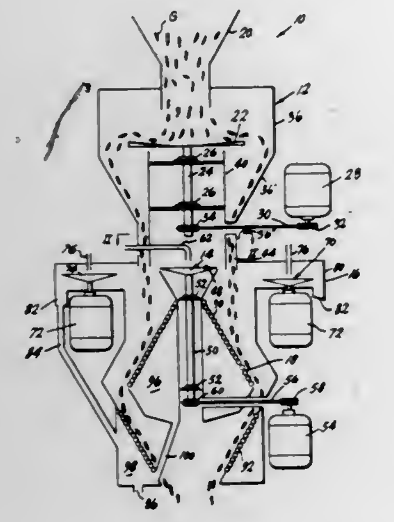


After germination and growth of a batch of beans in a station including a water spray, the sprouted beans are conveyed to a trough through which water flows. In the trough, the beans are agitated to release the sprouts from the bean shells, which float to the surface of the water. The shells are removed from the surface of the water, and the sprouts are removed from the trough to a packing station.

3,717,086
LIQUID MIST APPLICATOR

Richard Murray Hough, Sunfield, Mich.
Filed Feb. 22, 1971, Ser. No. 117,648
Int. Cl. A23k *1/00*
U.S. Cl. 99—516 **10 Claims**

Apparatus for applying liquid mist to granules, causing the granules to drop in an annular curtain, with a central spinning disc applying a mist radially outwardly and satellite spinning discs applying a mist radially inwardly, the granules falling onto perforate frustoconical

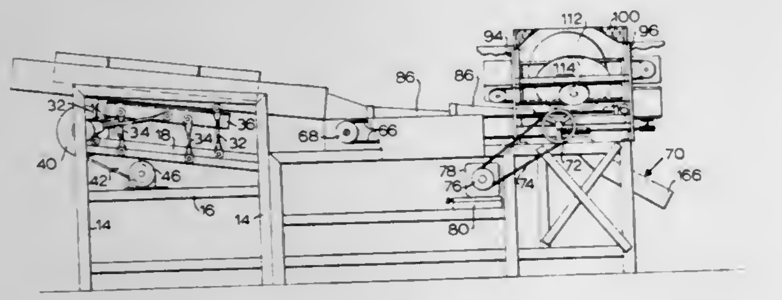


means having a pressure differential thereacross for separating excess liquid from the granules.

3,717,087

PEACH FEEDING AND SLICING MEANS

Joseph A. Amori, 1270 Pine Avenue, San Jose, Calif.
Filed Nov. 27, 1970, Ser. No. 93,071
Int. Cl. B26d *4/04;* **A23n** *15/00*
U.S. Cl. 99—538 **5 Claims**



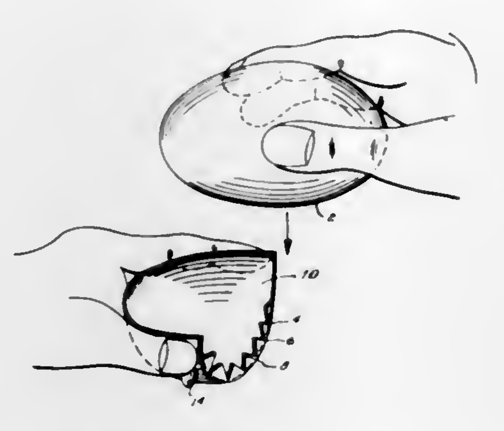
In combination: feeding means for serially feeding a plurality of peach halves to a predetermined first location and slicing means at said first location for cutting each of said peach halves into a plurality of slices, said slicer means comprising a plurality of rotary blades lying in angularly offset planes radiating generally outwardly from said first location. The blades engage the peach halves and transport said halves from said first location to a second location while said halves are being cut.

3,717,088

APPLIANCES FOR CUTTING AN EGG SHELL

Algie J. Urbonas, 3 Surrey Lane,
West Peabody, Mass. 01960
Filed Feb. 8, 1971, Ser. No. 113,261
Int. Cl. A47j *43/14*
U.S. Cl. 99—568 **1 Claim**

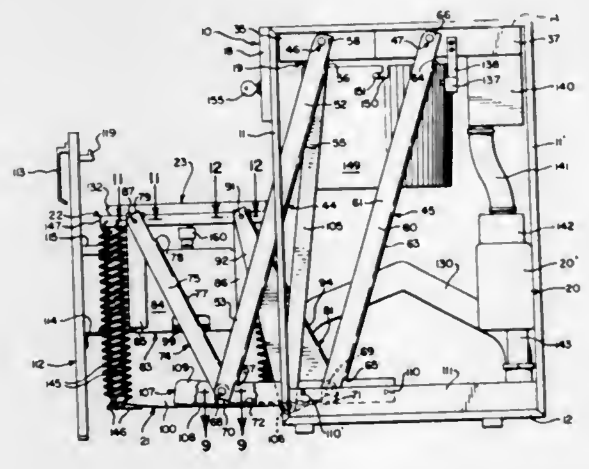
A plurality of pointed cutting teeth supported in arcuately disposed converging relationship to one another provide a cutting edge against which an egg shell may be struck to form a relatively thin sharp line of cutting which divides the egg shell into two partially severed halves. Portions of the egg shell are pierced by thin sharp pointed tips of the teeth and are therefore cut without small fragments of the shell breaking off. The cutting teeth, in their arcuately disposed relationship to one another, are preferably combined with a holder body, but they may also be formed as an integral part of a cutting utensil or other working surface. The holder body cooperates with the teeth when engaged in an egg shell to facilitate manually pulling apart partially severed halves of the shell while edible portions of the egg are being removed.



3,717,089

HOUSEHOLD REFUSE COMPACTOR

Herbert E. Oles, Williamsville, and John W. Thiesen, Jr., Buffalo, both of N.Y., assignors to American Precision Industries Inc., Buffalo, N.Y.
Filed Sept. 27, 1971, Ser. No. 183,978
Int. Cl. B30b *15/16*
U.S. Cl. 100—52 **9 Claims**

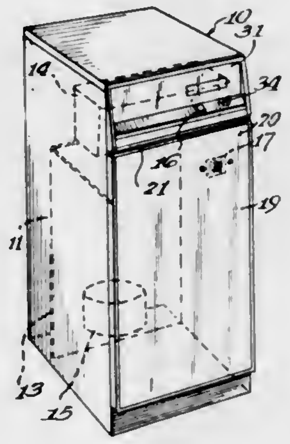


A trash compactor comprising a frame, a stationary ram mounted on said frame, a trash receptacle, a hydraulic container for mounting said trash receptacle, linkage means secured relative to said frame and said hydraulic container for moving said hydraulic container and said receptacle carried thereby between a first position wherein said trash may be loaded into said receptacle and a second position wherein said receptacle is in axial alignment with said ram, a reservoir for hydraulic fluid contained within said ram, pump means in communication with said reservoir, said hydraulic container being expandible and in communication with said pump means whereby the pumping of hydraulic fluid from said reservoir into said hydraulic container will move said receptacle toward said ram so as to compact trash therein, and control means for selectively energizing said pump means, said control means including pressure responsive valve means in communication with said pump means for breaking an electric circuit to said pump means and thus deenergizing said pump means in response to the sensing of a predetermined pressure in the hydraulic container.

3,717,090

REFUSE COMPACTOR WITH COOPERATING EXPOSED AND HIDDEN CONTROL MEANS

Frank E. Miller; Erwin G. Smith, and Charles E. Sulcek, all of Danville, Ky., assignors to Whirlpool Corporation, Benton Harbor, Mich.
Filed Sept. 8, 1971, Ser. No. 178,607
Int. Cl. B30b *15/14*
U.S. Cl. 100—53 **13 Claims**

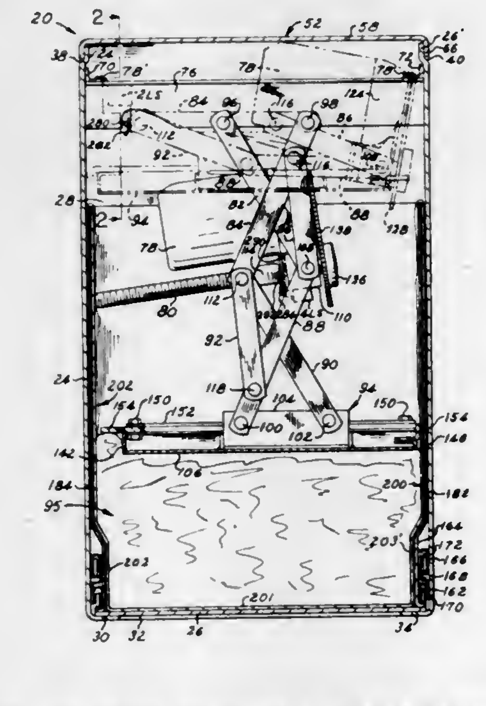


A refuse compactor having a ram for compacting refuse placed in a receptacle movably received in a cabinet, and control means for controlling the operation of the ram including a first manually operable element in an exposed disposition, and a second manually operable element in a hidden disposition when the receptacle is in a compacting position within the cabinet. The second control element may comprise a lock having a removable key for preventing undesirable operation of the compactor, such as by children.

3,717,091

REFUSE COMPACTOR

Jerry W. Moon, 2735 Alveston, Bloomfield Hills, Mich.
Division of Ser. No. 148,879, June 1, 1971. This application Nov. 24, 1971, Ser. No. 201,930
Int. Cl. B30b *1/10*
U.S. Cl. 100—53 **1 Claim**

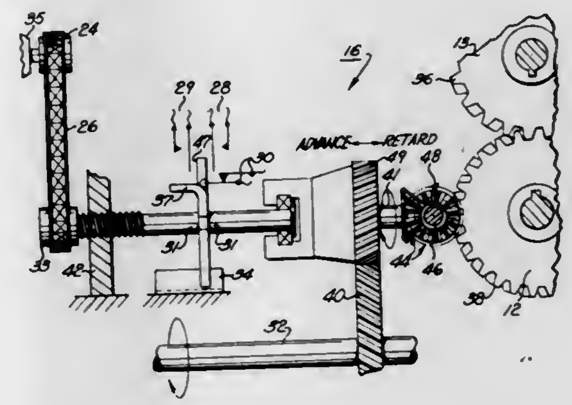


A refuse compactor including a receptacle removably contained within a cabinet wherein refuse is compacted by a ram to a fraction of its normal volume. The refuse is compacted within a specially constructed bag supported by the receptacle and cabinet, permitting the compacted refuse to be removed as a wrapped package for convenient and tidy disposal. The ram includes a refuse-compressing platen actuated through a toggle linkage to which force is applied by a single screw driven by an electric motor coupled to the screw through a reduction drive. The screw and its motor drive train are carried as a unit by the toggle linkage and move bodily therewith to provide a very compact and high ratio force multiplication system of reliable and inexpensive construction. Additional features relating to control circuitry, a safety lock, and bag, receptacle and drawer construction are also disclosed.

3,717,092

REGISTERING MECHANISM FOR PRINTING PRESS

James N. Crum, Stonington, Conn., assignor to Harris-Intertype Corporation, Cleveland, Ohio
Filed Nov. 23, 1970, Ser. No. 91,675
Int. Cl. B41f *13/14*
U.S. Cl. 101—248 **14 Claims**



Printing press in which digital control equipment is utilized to effect register adjustments and automatic positioning of plate cylinder in a make-ready position. When lateral adjustments are made, circumferential adjusting mechanism is operated to compensate for changes in circumferential position which would occur because of lateral adjustment.

3,717,093

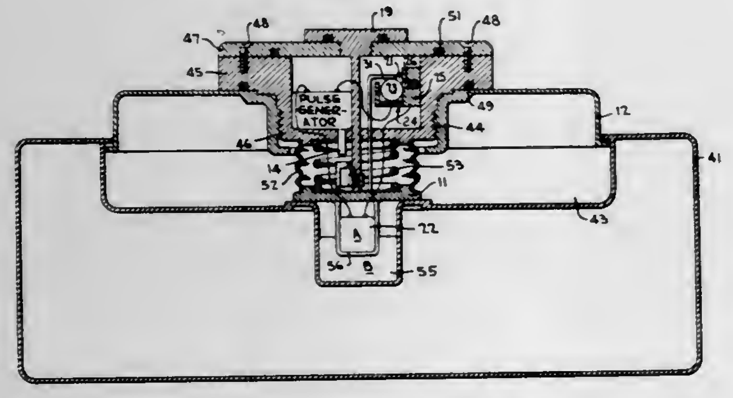
THERMOGRAPHIC METHOD OF SPIRIT DUPLICATION AND TRANSFER SHEET FOR USE THEREIN

Peter Bruck, Encino, Calif., assignor to Bell & Howell Company, Pasadena, Calif.
Filed Oct. 12, 1971, Ser. No. 188,271
Int. Cl. B41m *5/00;* **B41c** *1/06;* **B41n** *5/00*
U.S. Cl. 101—469 **17 Claims**

A transfer sheet for use in a thermographic transfer process in which the color forming component of the transfer material is a tetrakis(p-dimethylaminophenyl)ethylene salt. The salt is initially infrared translucent, but upon heating darkens to a substantially black color. Copy sheets, carrying solvent-transferred salt from a thermographically produced master, are heated to darken the salt, thereby producing black on white copies.

3,717,094
MINE FUZE

Warren P. Morrow, Wheaton, Md., assignor to The United States of America as represented by the Secretary of the Army
Filed Dec. 3, 1962, Ser. No. 243,193
Int. Cl. F42b *23/26, 21/34*
U.S. Cl. 102—19.2 **2 Claims**



1. A pressure activated mine fuze comprising:

a. a mine casing and a pressure plate attached to said mine casing, said pressure plate free to move relative to said mine casing when a force is applied to said pressure plate,

b. an electrical signal generator attached to said pressure plate, said electrical signal generator having a lever extending therefrom, said electrical signal generator generating an electrical signal when said lever is moved relative to said electrical signal generator, said lever being caused to move by the relative movement of said pressure plate relative to said mine casing,

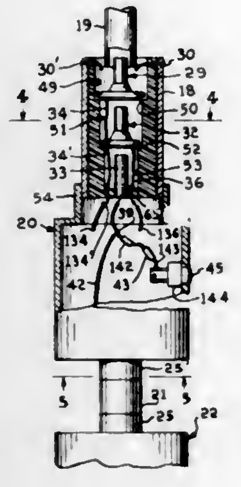
c. means to adjust the distance traveled by said pressure plate relative to said mine casing to cause movement of said lever, said means to adjust operable from outside said mine casing,

d. an inertia switch connected between said electrical signal generator and said detonator means, said inertial switch allowing said electrical signal to reach said detonator when the acceleration of said pressure plate is below a predetermined amount, and said inertia switch means preventing said electrical signal from reaching said detonator when the acceleration of said pressure plate exceeds said predetermined amount.

3,717,095
SELECT FIRE JET PERFORATING APPARATUS

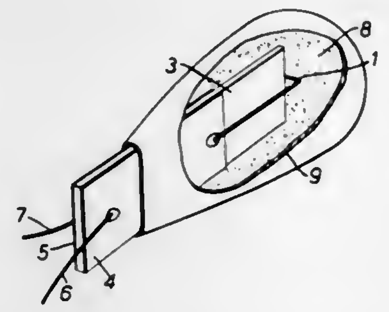
Roy R. Vann, Midland, Tex.
(Box 40–A, Star Rte. W., Artesia, N. Mex. 88210)
Filed June 7, 1971, Ser. No. 150,304
Int. Cl. E21b *43/116*
U.S. Cl. 102—21.6 **15 Claims**

A perforating apparatus having separate chambers formed therein, and within which there is disposed electrically actuated explosive perforating means. The apparatus includes a firing head having a plurality of electrodes received therein and superimposed one upon another and electrically insulated from one another. One of each electrode is electrically connected to at least one of the perforating means so that when a source of current is applied to the electrode it detonates the perforating means, whereafter the electrode is removed from the firing head so as to operatively expose the next below adjacent electrode which can be subsequently contacted by a source of current so as to detonate the perforating means to which it is electrically connected.



3,717,096
FUSEHEADS

Norman Reginald Ward, Stevenage, England, assignor to British Aircraft Corporation Limited, London, England
Filed March 16, 1971, Ser. No. 124,761
Claims priority, application Great Britain, March 16, 1970, 12550/70
Int. Cl. F42b *3/12*
U.S. Cl. 102—28 M **9 Claims**

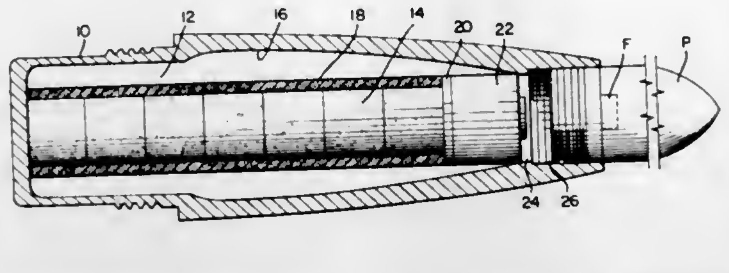


A dipped fusehead has its dipped head of ignitible material inserted into a protective cap of heat-shrinkable plastics material, for example irradiated thermally stabilized polyethylene, which is heat-shrunk around and into close contact with the head and is sealed around the body of the fusehead by means of a polyethylene sealing ring in the open mouth of the cap.

3,717,097
IMPLOSION COLORED MARKER

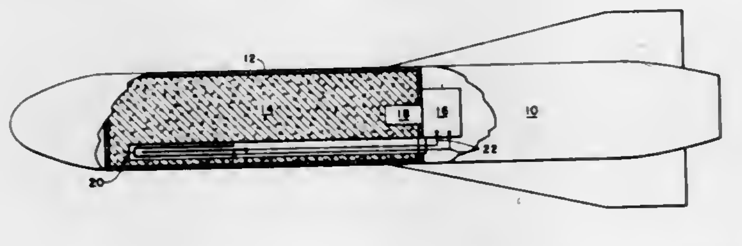
Adolph A. Wronka; Bernard R. Banker; John E. Andrews, Jr., all of Dover, N.J., and Bernd W. A. Kliem, Newtonville, Mass., assignors to The United States of America as represented by the Secretary of the Navy
Filed Nov. 21, 1969, Ser. No. 879,002
Int. Cl. F42b *13/44*
U.S. Cl. 102—66 **13 Claims**

Implosion type colored marker for use by military personnel, comprising non-carcinogenic dyes either surrounded by or incorporated within a rock salt composition, such that, upon ignition of an explosive exteriorly the dye, the latter will condense upon minute salt particles caused to be dispersed into the atmosphere to form a colored cloud.



3,717,098
WARHEAD BREAKUP SENSOR

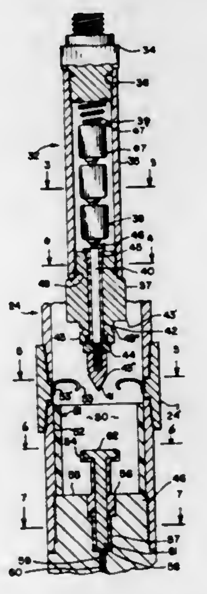
Edward J. Davis, Riverside, and Paul E. Cordle and Melvin J. McCubbin, China Lake, Calif., Donald W. Lockwood, Corvallis, Oreg., and Richard L. Higuera, Riverside, Calif., assignors to the United States of America as represented by the Secretary of the Navy
Filed May 20, 1966, Ser. No. 552,677
Int. Cl. F42c *11/00*
U.S. Cl. 102—70.2 R **5 Claims**



A sensing means located within the explosive warhead of a missile to detect only actual breakup damage of the warhead and being unaffected by other missile body damage.

3,717,099
ELECTRICAL POWER PACKAGE FOR SUB-SURFACE DETONATION OF EXPLOSIVES

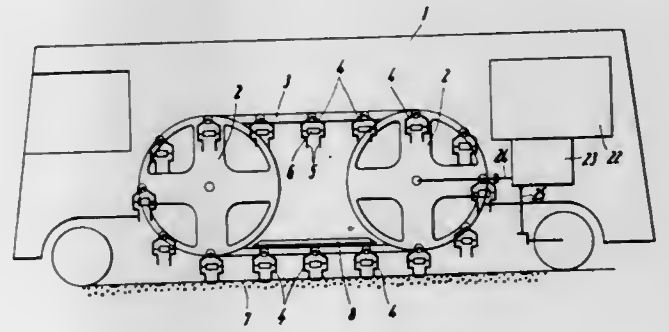
Roy R. Vann and Clyde R. Vann, Midland, Tex. (Box 40–A, Star Route West, 1112–B Hermosa Drive, both of Artesia, N. Mex. 88210)
Filed Jan. 25, 1971, Ser. No. 109,382
Int. Cl. F42c *19/12;* **F42d** *5/00;* **H01h** *3/16*
U.S. Cl. 102—70.2 R **3 Claims**



A power package for actuating sub-surface devices, such as detonating sub-surface explosives, which requires no external electrical connections, and which can be freely dropped into a borehole, or alternatively lowered into the borehole on a slick line. The sub-surface device has an electrical connection means thereon which cooperates with an electrode of the power package so as to complete the circuitry thereof and detonate or actuate a sub-surface device.

3,717,100
MOVABLE TAMPING MACHINES FOR RAILROADS

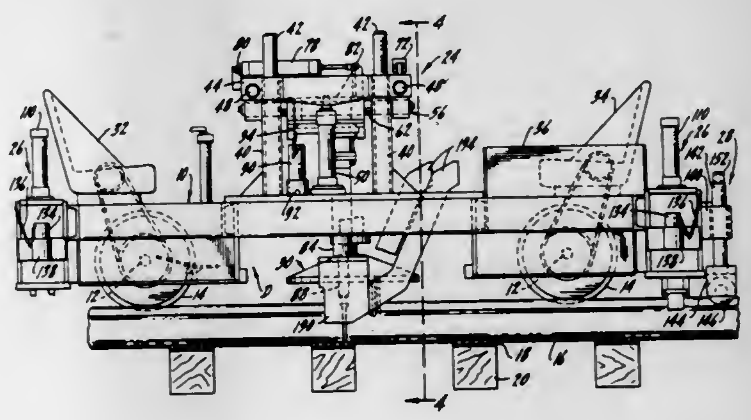
Helmut Sieke, An der Truft 5, Wulferode, and Rainer Sieke, Dorfstr. 36, Isernhagen, both of Germany
Filed May 14, 1971, Ser. No. 143,365
Claims priority, application Germany, May 16, 1970, P 20 24 168.3
Int. Cl. E01b *27/16*
U.S. Cl. 104—12 **10 Claims**



A tamping machine for railroad beds comprises a car running on the rails of the railway and a plurality of individually operable tamping devices mounted on a common carrier in the car and means for moving the carrier relative to the car so that while they are in operation the tamping devices are moved rearwardly relative to the car at the same speed that the car is moving forwardly on the rails. The tamping devices are thus stationary relative to the ground while operating even though the car is moving. When a tamping device has completed its tamping operation, it is raised and moved forwardly in the car to a position where it is again lowered to operating position. Rapid and continuous tamping of the road bed is thereby achieved.

3,717,101
RAIL GANG SPIKER

Frank F. Katcha, and Dieter Moericke, both of Milwaukee, Wis., assignors to Rex Chainbelt Inc., Milwaukee, Wis.
Filed Dec. 4, 1969, Ser. No. 881,945
Int. Cl. E01b *29/16*
U.S. Cl. 104—17 **22 Claims**

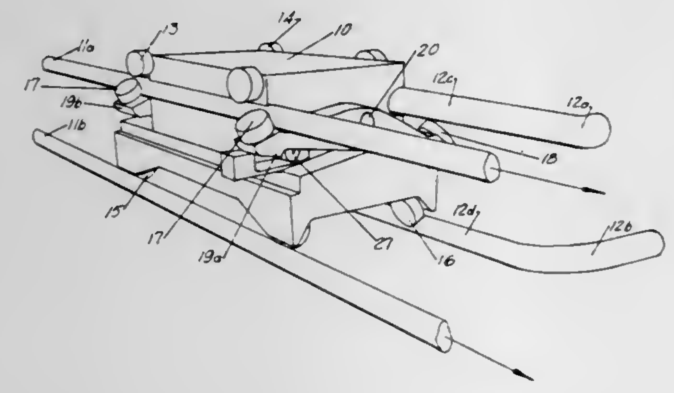


This is a spike driving method, mechanism and/or machine which is specifically constructed to rapidly drive spikes for use in a rail gang with various adjustment mechanisms for the spike driving mechanism, and for the rail clamps. It is constructed so tat a minimum of lost motion takes place when the machine drives spikes in a step-by-step manner from one tie to the next.

3,717,102
PARTS CONVEYOR PALLET AND MEANS FOR SUPPORTING SAME ON AN INITIAL PAIR OF RAILS AND SWITCHING SAME TO A SECOND PAIR OF RAILS

George T. Lott, Wyoming, and Francis H. Little, Cincinnati, both of Ohio, assignors to Lott Tool Corporation, Cincinnati, Ohio

Filed May 3, 1971, Ser. No. 139,672
Int. Cl. E01b *25/26*
U.S. Cl. 104—130 **6 Claims**



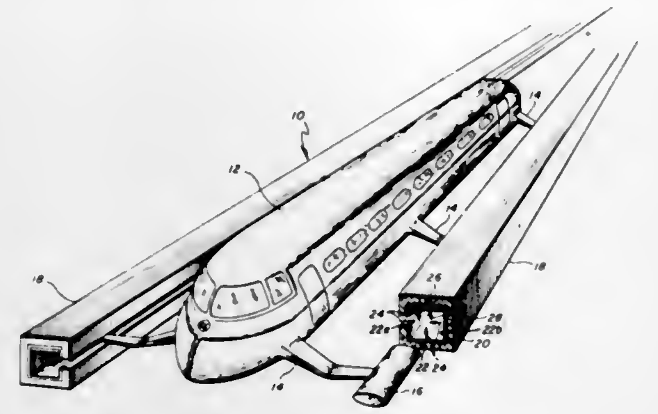
A pallet for conveying parts through a succession of work stations. The primary support for the pallet comprises a pair of vertically aligned tubular rails. The pallet is supported on these rails by a pair of upper rollers mounted on said pallet and riding on the upper rail and a pair of lower rollers mounted on said pallet and riding on the lower rail along with a third pair of intermediate or clamping rollers, shiftably mounted on said pallet, which cooperates with the upper rollers to clamp the pallet to the upper rail. In this manner the pallet is cantilevered from the top rail. The first mentioned rails are disposed in a continuous path. Each work station is mounted to one side of said path. For each work station there is a side pair of vertically aligned rails extending closely adjacent to and parallel to said first mentioned rails a relatively short distance, then leaving said first mentioned rails to lead to a said work station, and then extending back to said first mentioned rails wherein said side pair of rails is again closely adjacent to and parallel to said first mentioned rails a relatively short distance. Said pallet has mounted thereon a second pair of upper rollers, and a second pair of lower rollers, disposed to engage said side pair of rails when the pallet is brought to that position wherein the side pair of rails is parallel to said first mentioned rails. At this last mentioned point means are actuated to disengage said third pair of rollers from clamping engagement with said first mentioned upper rail while immediately causing a similar pair of clamping rollers to engage the upper of said side pair of rails whereby said pallet is then cantilevered from said side pair of rails by virtue of said second pair of upper rollers, said similar pair of clamping rollers and said second pair of lower rollers.

3,717,103
LOW DRAG MAGNETIC SUSPENSION SYSTEM

Charles A. Guderjahn, Northridge, Calif., assignor to North American Rockwell Corporation

Filed Dec. 11, 1970, Ser. No. 97,232
Int. Cl. B61b *13/08*
U.S. Cl. 104—148 SS **7 Claims**

An improved magnetic suspension system including an improved guide-way channel for moving bodies including vehicles of eddy current repulsion between said magnets and said guide-way channel containing nonferromagnetic conductors and attraction to a ferromagnetic member.

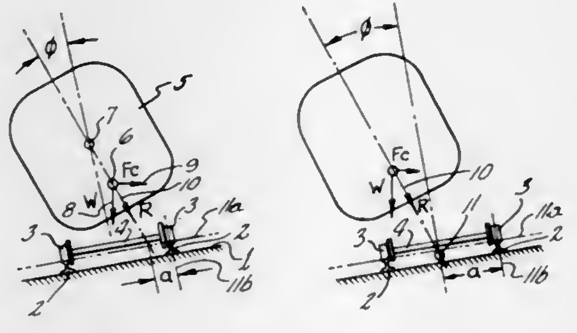


This combination suspension system provides effective lift at low speeds and greatly improved lift/drag ratios.

3,717,104
ACTIVE ROLL CONTROLING TRUCK STABILIZING MECHANISM

Ernest Harry Law, Marlborough, and James William Clark, Glastonbury, both of Conn., assignors to United Aircraft Corporation, East Hartford, Conn.

Filed July 8, 1970, Ser. No. 53,050
Int. Cl. B61f *3/08, 5/24, 5/40*
U.S. Cl. 105—164 **8 Claims**



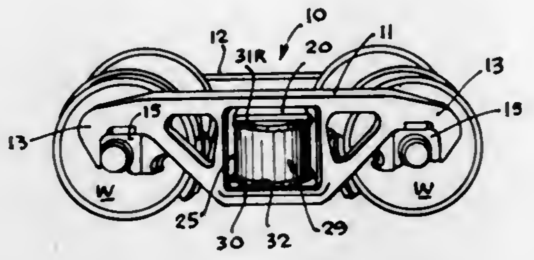
A stabilizing railway vehicle suspension apparatus incorporates swing arms, actuators, springs and a control system so disposed as to automatically impart both rolling and lateral transverse motions to the car body when operating on curved track. The swing arms are mounted on the truck bolster and are directed upwardly and outwardly to their pivotal mountings on the roll platform upon which the car body is suspended by springs. Upon signal from an accelerometer mounted on the roll platform or truck the control system actuates the mechanism so as to roll and translate the car body in a manner that provides improved passenger comfort and improved stability against overturning.

3,717,105
FLUID BOLSTER SPRING

Raymond J. Novotny, Sparta, N.J., assignor to Abex Corporation, New York, N.Y.

Filed Dec. 22, 1970, Ser. No. 100,617
Int. Cl. B61f *5/10;* **F16f** *5/00, 9/08*
U.S. Cl. 105—197 B **3 Claims**

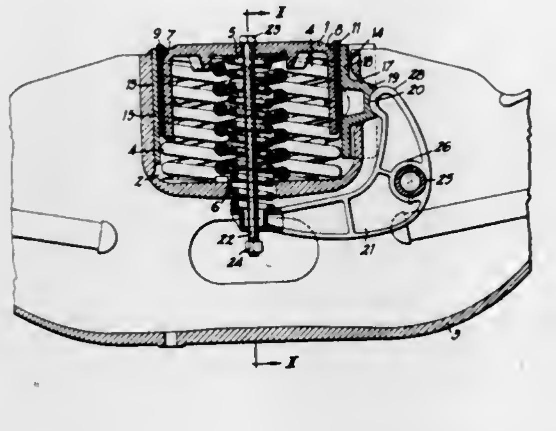
A suspension for the bolster of a railroad car is characterized by two relatively movable chambers, separated by an elastomeric sleeve constituting the main spring. The two chambers communicate through normally open damping passages through which oil may bleed from one chamber to the other when the spring is compressed, and a one-way valve system allows unrestricted oil flow in a return sense when the spring distends upon removal of a kinetic load.



3,717,106
DAMPENED RAILWAY CAR TRUCK BOLSTER

Paul Emile Ernest Alfred Andre Henricot, Ceroux-Mousty, Belgium, assignor to Societe Anonyme Usines Emile Henricot, Court-Saint-Etienne, Belgium

Filed Dec. 21, 1970, Ser. No. 100,180
Claims priority, application Belgium, Sept. 15, 1970, 50453
Int. Cl. B61f *5/06, 5/12, 5/24*
U.S. Cl. 105—197 D **4 Claims**



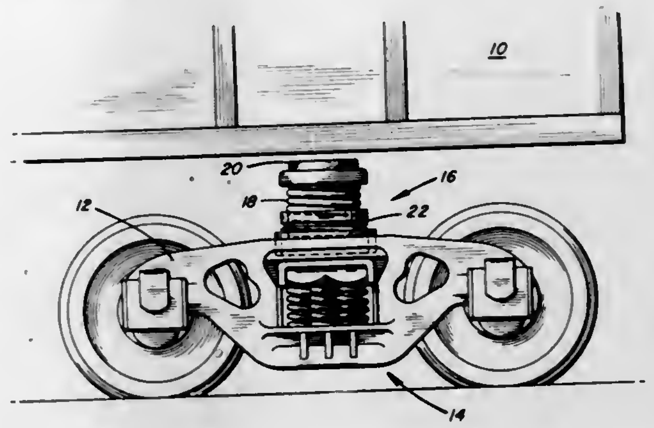
Damping and control device for a bogie bolster, of the type wherein each end of the bolster engages a housing formed on a side-frame, bears upon resilient elements, is laterally interfitted on both sides with adjoining portions of the side-frame, bears, on one side, directly upon the side-frame and, on the other side, upon the side-frame through the intermediary of a moving insert which is resiliently actuated, wherein said moving insert comprises a bent lever linked to an axis bearing upon the side-frame, one of the legs of the bent lever functioning as a support for a resilient element, whereas the second leg is contacting the moving insert.

3,717,107
RAILING CAR ROLL STABILIZATION

Frans V. A. Pangalila, Matawan Township, N.J., assignor to John J. McMullen Associates, Inc., New York, N.Y.

Filed Feb. 9, 1970, Ser. No. 9,927
Int. Cl. B61f *5/06, 5/14;* **F16c** *19/10*
U.S. Cl. 105—199 CB **12 Claims**

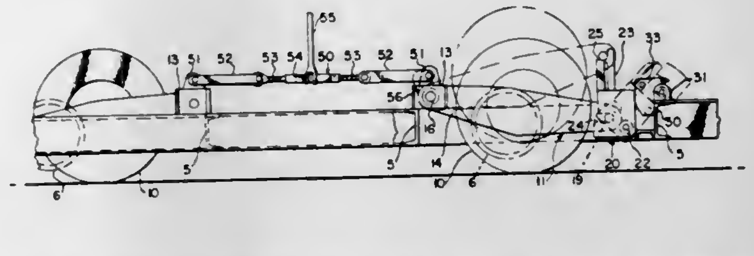
A stabilization device for limiting the roll in railway cars for avoiding excessive and dangerous roll amplitudes. In one embodiment, the device comprises a spring which is substantially compressed while in its relaxed state mounted on the truck of a railway car, the spring having a rubber pad on its end nearest the car. In a second embodiment, a solid post is mounted on the truck of a railway car and a ball-bearing system is provided on the end of the post nearest the car. And, in a third embodiment, a trough is rotatably mounted on a support rod associated with the truck. A ball is positioned in the trough and is free to roll in the direction of travel of the railway car.



3,717,108
CONVERTIBLE RAIL-HIGHWAY MINE CAR

Thompson, Jr., Earl B., Fairmont, W. Va., assignor to Industrial Pneumatic Systems, Inc., Fairmont, W. Va.

Filed Nov. 20, 1970, Ser. No. 91,253
Int. Cl. B61d *15/00;* **B61f** *9/00;* **B62d** *61/12*
U.S. Cl. 105—215 C **5 Claims**

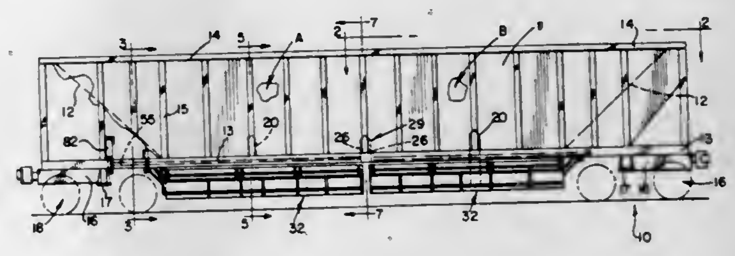


A rail mine car having rail wheels for operation on rails is provided with a pair of road wheels on each side which may be lowered into contact with the ground for road operation or raised out of ground contact for operation on the rail wheels. The pair of wheels on each side are journalled on a pair of levers, one end of each lever being supported on a support member in either position of the road wheel, with a locking member holding the support member in position. A force applying mechanism is connected between the two levers for raising the wheels off the ground to allow rail operation.

3,717,109
MOTOR ACTUATED HOPPER DOOR

Roy W. Miller, Highland, Ind., assignor to Pullman Incorporated, Chicago, Ill.

Filed July 19, 1971, Ser. No. 163,849
Int. Cl. B61d *7/04, 7/18, 7/28*
U.S. Cl. 105—284 **13 Claims**



A discharge arrangement for railway hopper cars includes pivoted bottom doors relatively movable with respect to each other for opening and closing a discharge opening. The doors each include inner and outer sections pivotally connected which in a closed position extend substantially linearly and during open position extend in relatively angular relation. A force transmitting mechanism is provided for each pair of doors and includes lever and linkage arrangements connected to the inner and outer sections which upon actuation move the doors to their relative selective positions.

3,717,110

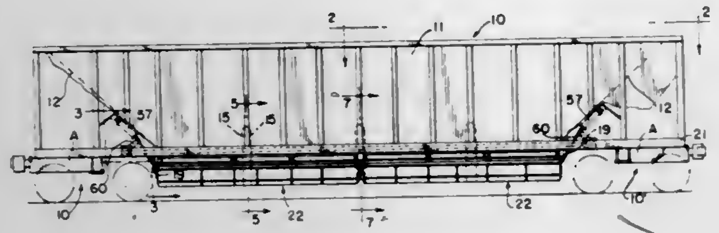
MOTOR ACTUATED HOPPER DOORS

Roy W. Miller, Highland, Ind., assignor to Pullman Incorporated, Chicago, Ill.

Filed July 19, 1971, Ser. No. 163,852

Int. Cl. B61d *7/04, 7/18, 7/28*

U.S. Cl. 105—284 **15 Claims**



A discharge arrangement for railway hopper cars includes pivoted bottom doors relatively movable with respect to each other for opening and closing a discharge opening. The doors each include inner and outer sections pivotally interconnected which in a closed position extend substantially linearly and which during open position extend in relative angular relation. A force transmitting mechanism is provided for each door, including lever and linkage arrangements connected to the inner and outer sections, which upon actuation by a power unit mounted on the hopper car move the doors to their selective positions.

3,717,111

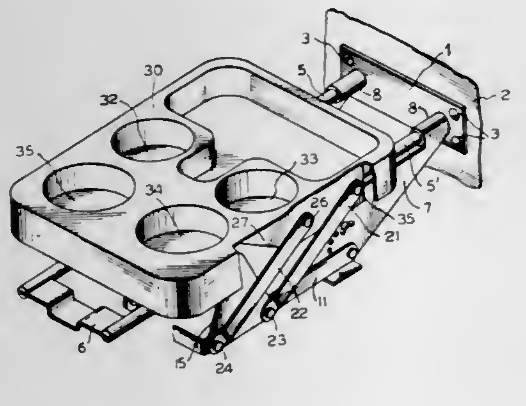
ADJUSTABLE SNACK TRAY

William L. Volberding, 1844 Eckerman Avenue, West Covina, Calif.

Filed June 4, 1971, Ser. No. 150,057

Int. Cl. A47b *23/00*

U.S. Cl. 108—45 **9 Claims**



A horizontally and vertically adjustable tray or shelf and support means therefor particularly suitable for installation in a motor vehicle in such a manner that it can be stored in a compact form out of the way of the occupants, and which maintains the tray or shelf level while permitting its position to be adjusted horizontally and vertically so as to position it convenient to the occupants of the vehicle for placing snacks or other articles thereon. In the preferred embodiment, the device comprises a pair of guide rods, or other suitable guide means, adapted to be attached to the vehicle, preferably to the dash (or fire wall between the engine and the passenger compartment) and which extend horizontally therefrom back toward the passenger compartment. A slide element or member is mounted on these guide means and is slidable longitudinally thereon. One end of each of a pair of primary parallel links are pivotally attached with their pivots disposed vertically to a vertical plate on the slide member. The other end of each of the pair of primary parallel links are attached and pivoted, with the pivots disposed vertically, to a triangular, vertical connecting plate. One end of each of a pair of secondary parallel links are attached and pivoted, with the pivots disposed horizontally to the connecting plate while the other end of each of the pair of secondary parallelogram links are attached and pivoted, with the pivots disposed horizontally, to a vertical plate extending down from the tray or suitable support for the tray.

3,717,112

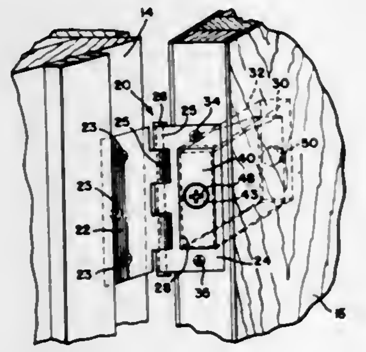
HINGE SAFE

Wilbert N. Welty, 4125 Banning Ave., Dayton, Ohio 45405

Filed Sept. 27, 1971, Ser. No. 183,988

Int. Cl. E05g *3/00*

U.S. Cl. 109—23 **4 Claims**



A small jewel safe is combined with a hinge and is received in an opening formed in the edge of a closet door or the like which is unobtrusive, inconspicuous, and fully concealed when the closet door is closed.

3,717,113

FLOTATION AND ACCESS APPARATUS FOR SUB-SEA DRILLING STRUCTURES

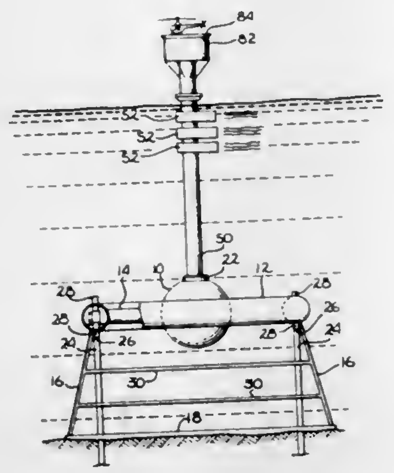
Arthur E. Wilde, Garden Grove, Calif., assignor to Fluor Drilling Services, Inc., Los Angeles, Calif.

Filed Oct. 19, 1970, Ser. No. 82,020

Int. Cl. B63b *35/00, 21/00*

U.S. Cl. 114—0.5 D **4 Claims**

The present invention is an apparatus to provide access from the water surface to a submerged structure anchored or moored to the floor of the ocean. This apparatus may be employed, for example, as mining or well drilling rigs having internal compartments and passageways maintained free of water and within which one or more persons may work. The entry is provided by an entry tube of approximately ten feet in diameter with an arrangement on the lower end thereof adapted to provide sealed, flexible attachment to an adjoining portion of the sub-sea structure. Located near the upper end of the entry tube are one or more buoyant members of controllable buoyancy for providing a net positive or negative buoyancy to the entire access apparatus. The buoyant members are rotatably affixed to the entry tube and are shaped with an air-foil like cross-section. The rotatable mounting of the foil to the entry tube is at a point in the foil cross-section located ahead of the center of pressure of the foil so that the foil will rotate in response to ocean currents to present a minimal cross-sectional area to the current and to cause a minimum drag resulting therefrom. The upper end of the entry tube will, in general, contain a removable cover for access to the interior of the entry tube and may further include moorings to facilitate boat landing to the entry tube, a diesel power room and/or a helicopter landing deck.



3,717,114

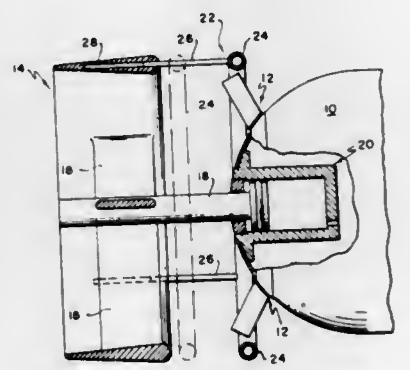
TELESCOPING GUARD FOR HAZELTON PROPELLERS

Henry J. Bernaerts, Amberley, Md., assignor to the United States of America as represented by the Secretary of the Navy

Filed Feb. 23, 1971, Ser. No. 118,001

Int. Cl. B63g *8/00*

U.S. Cl. 114—16 R **2 Claims**



A guard to protect divers from the blades of a Hazelton propeller wherein the guard is a telescoping ring mounted on the stability shroud of an underwater vehicle. The ring telescopes forward to surround the propeller.

3,717,115

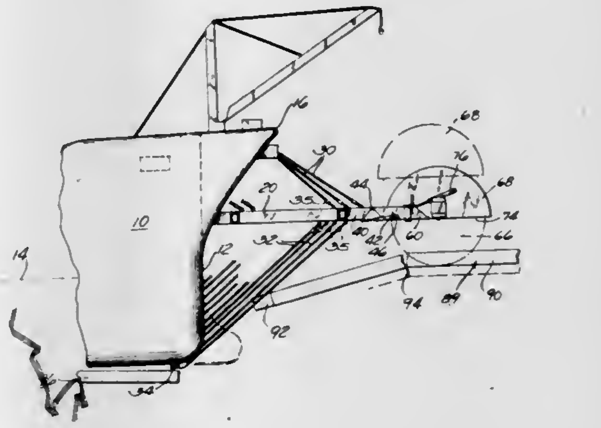
ICE-CHANNEL CUTTING ATTACHMENT FOR SHIPS

John C. Abendroth, 4238 W. Hawthorne Trace Road, Milwaukee, Wis.

Filed Feb. 8, 1971, Ser. No. 113,328

Int. Cl. B63b *35/08*

U.S. Cl. 114—42 **19 Claims**



A ship is equipped with a skeletonized bow projecting forwardly from the hull and comprising a trussed frame from which generally parallel corrosion-resistant cables extend from an elevation above water level to the level of the bottom of the hull. In the preferred arrangement, this frame carries individually powered ice cutting saws in an array materially wider than the ship, the saws being mounted for vertical and lateral tilting adjustment responsive to automatically functioning leveling devices and equipped with semi-circular guards. The saws cut beam-like strips of ice from which the cables break off and deflect sections of an ice floe.

3,717,116

APPARATUS FOR STEERING A SHIP

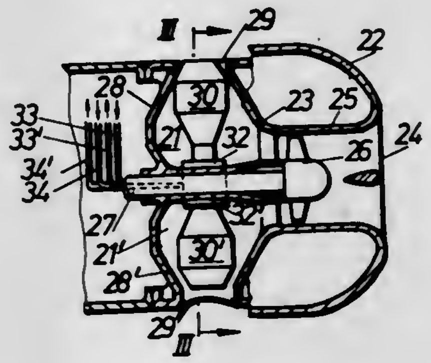
Alexander Hofmann, Heidenheim (Brenz), Germany, assignor to Firma J. M. Voith GmbH, Heidenheim, Germany

Filed Feb. 25, 1971, Ser. No. 118,618

Claims priority, application Germany, Feb. 27, 1970, P 20 09 332.7

Int. Cl. B63h *25/46*

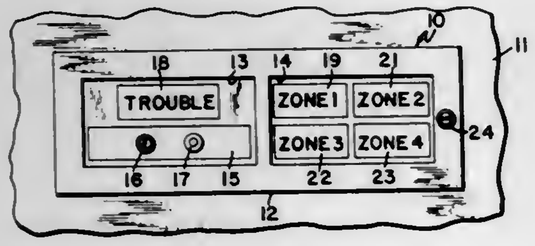
U.S. Cl. 114—151 **4 Claims**



A ship is steered by means of a stream of water discharged from a passage branching from a flow passage from a point downstream of an impeller mounted within the flow passage. The flow passage opens onto the surface of the hull so that water is drawn into the flow passage and pumped through the branch passage by means of the impeller. The portion of the branch passage adjacent the discharge opening converges toward the opening and may be closed by a needle valve member positioned within the branch passage opening. The needle valve member may be movable or the convergent portion of the discharge passage may be provided with a movable shroud which slides axially with respect to a fixed needle member to adjust the stream of water discharged therefrom.

3,717,117
ANNUNCIATOR

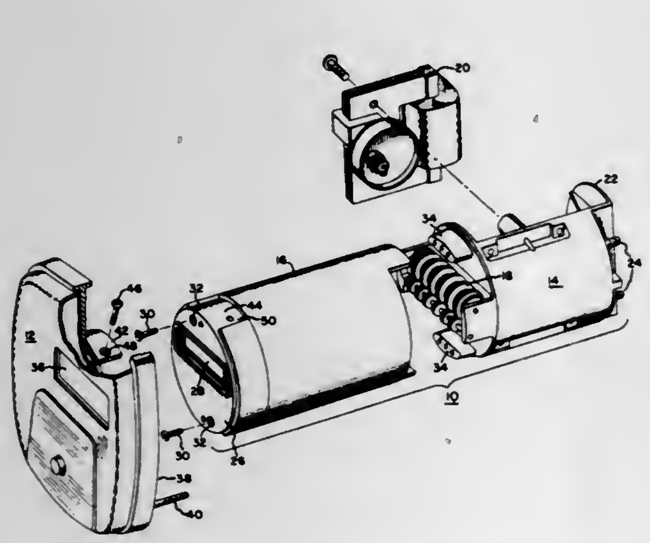
Lawrence G. Stanley, Westminster, Mass., assignor to Simplex Time Recorder Company, Gardner, Mass.
Filed Oct. 23, 1970, Ser. No. 83,281
Int. Cl. G08b *5/00*
U.S. Cl. 116—128 **4 Claims**



This invention relates to an annunciator and, more particularly, to apparatus for indicating the condition of remote stations, the apparatus consisting of a face plate having a plurality of windows behind each of which is a lamp.

3,717,118
INDICATING INSTRUMENT WITH INTERCHANGEABLE FACE ASSEMBLY

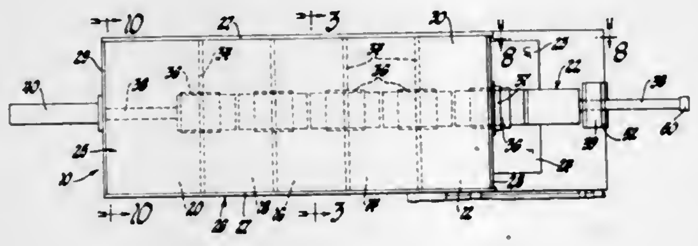
Carl Frederick Vanbennekom, and William James Schultz, both of Lynnfield, Mass., assignors to General Electric Company, Lynn, Mass.
Filed Nov. 27, 1970, Ser. No. 93,184
Int. Cl. G01f *9/00*
U.S. Cl. 116—129 **4 Claims**



An electrical indicating instrument including a mechanism, a housing for the mechanism, and a face assembly through which an indicator driven by the mechanism is viewed. The face assembly is removably secured to the housing to permit the mechanism-cover assembly to be used interchangeably with face assemblies of different styles.

3,717,119
VACUUM PROCESSING MACHINE FOR ALUMINIZING HEADLAMP REFLECTORS

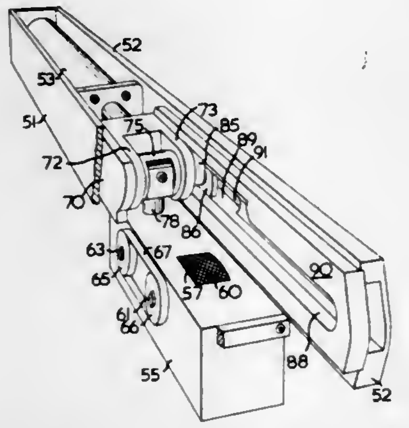
Donald R. Boys, and Ernest W. White, both of Anderson, Ind., assignors to General Motors Corporation, Detroit, Mich.
Filed July 30, 1971, Ser. No. 167,755
Int. Cl. C23c *13/10*
U.S. Cl. 118—49 **6 Claims**



A vacuum processing machine for continuously aluminizing headlamp reflectors wherein a reciprocating transfer shuttle and a transverse transfer carriage cooperate to alternately shift finished and unfinished reflectors between a loading and unloading station at one end of the machine to a high vacuum processing chamber at the other end of the machine for application of an aluminized reflective coating. For each forward stroke of the transfer shuttle, unfinished reflectors are shifted toward the processing chamber through a plurality of holding chambers of progressively increasing vacuum. For each reverse stroke, finished reflectors are carried from the processing chamber through the holding chambers for exit to atmosphere at the unloading station.

3,717,120
APPARATUS PARTICULARLY ADAPTED FOR MARKING PRODUCTS

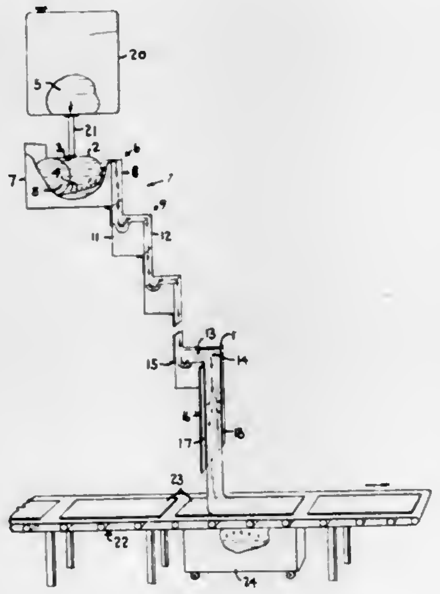
Gordon Alexander Way, Windsor, Ontario, Canada, assignor to Dynamic Manufacturing Limited, Windsor, Ontario, Canada
Filed Sept. 19, 1969, Ser. No. 859,537
Claims priority, application Canada, Sept. 20, 1968, 30,488
Int. Cl. B05c *1/02*
U.S. Cl. 118—263 **6 Claims**



A marking unit particularly for use in a system of production line quality control, characterized by an inspection station including a sensing device for gauging a property of each workpiece passing along the production line, the sensing device being linked to the marking unit which is arranged to apply marks to the individual workpieces dependent on their acceptability. The marking unit includes an extendible marking head attached to a plunger reciprocal along a straight path, the marking head carrying a stamp rotatable from the marking position (transverse to the direction of plunger movement), to a wetting position in which it wipes across a roller on its movement towards the workpiece.

3,717,121
CURTAIN COATING HEAD

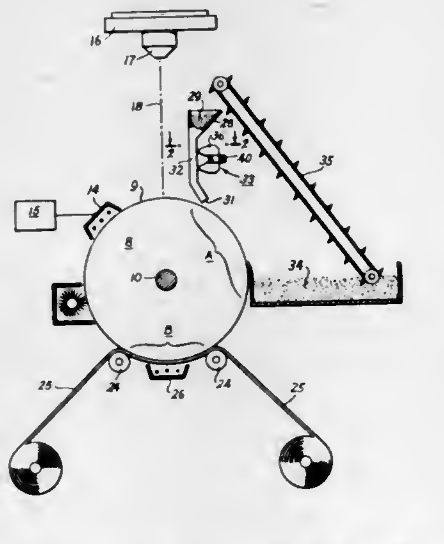
Gerald J. Bruckbauer, Plainfield, and Michael E. Corty, Matteson, both of Ill., assignors to PPG Industries, Inc., Pittsburgh, Pa.
Filed June 12, 1970, Ser. No. 45,690
Int. Cl. B05c *5/00*
U.S. Cl. 118—324 **7 Claims**



A high speed uniform coating method may be carried out with the use of a curtain coating head comprising a means for dispersing coating material in a first of a laterally disposed succession of open reservoirs each reservoir disposed at a lower elevation than the next and the last reservoir terminating in a vertically disposed smooth continuous face plate containing two vertically disposed rods along the face and width of the face plate.

3,717,122
MAGNETIC GATE

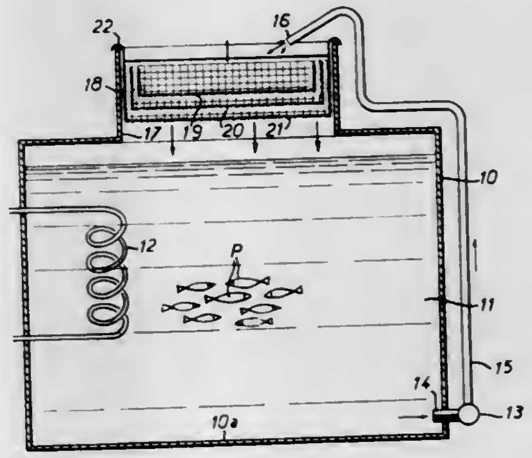
Frederick W. Hudson, West Henrietta, N.Y., assignor to Xerox Corporation, Rochester, N.Y.
Filed March 1, 1971, Ser. No. 119,774
Int. Cl. B05b *5/02;* **G03g** *13/06*
U.S. Cl. 118—636 **6 Claims**



In an electrostatic copying apparatus, a flow control for a cascade developer material having ferromagnetic carrier particles comprising a means for selectively establishing a magnetic field in he flow path of the developer material. The developer material does not contact moving elements in the described control and malfunctions resulting from the particulate characteristic of the material are eliminated.

3,717,123
INSTALLATION FOR THE PRESERVATION OF FISH ESPECIALLY ON BOARD FISHING BOATS

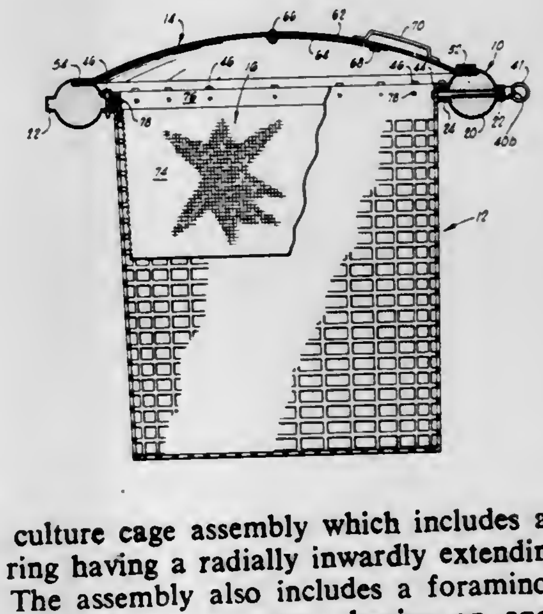
Paul Regnier, Dieppe, France, assignor to Ateliers & Chantiers de la Manche, Dieppe, France
Filed Feb. 17, 1971, Ser. No. 116,023
Claims priority, application France, March 3, 1970, 7007488
Int. Cl. A01k *61/00, 63/00*
U.S. Cl. 119—3 **2 Claims**



An installation for the preservation of fish, especially on board fishing boats comprising a tank containing a liquid such as brine and receiving the fish directly, a heat-exchanger inside said tank in order to cool the liquid, and a device for circulating the liquid inside the tank. The circulation device has a pump of the turbid liquid type drawing-in the liquid directly from the vicinity of the bottom of the tank and delivering said liquid into a conduit which returns it to the tank through a discharge orifice. The installation also comprises a filtering means including a plurality of foraminous baskets of substantial size mounted on the top of the tank in such manner as to be removable during operation, the size of the passage holes of said baskets decreasing progressively from the top to the bottom of the filtering means, said basket being interposed between the discharge orifice of said conduit and the tank so as to retain the fish-scales and other solid foreign matter.

3,717,124
FISH CULTURE CAGE ASSEMBLY

Karl F. Jacobs, 28 Circle Drive, Chickasha, Okla. 73018
Filed Feb. 18, 1971, Ser. No. 116,458
Int. Cl. A01k *61/02, 97/04*
U.S. Cl. 119—3 **21 Claims**



A fish culture cage assembly which includes an annular float ring having a radially inwardly extending flange thereon. The assembly also includes a foraminous, generally cylindrical cage structure, having an open upper end and a closed lower end, detachably depending from said flange, and a lid detachably secured to said float ring and covering the open top of said cage structure. A cylindrical feeding ring may be detachably suspended from projections inside the foraminous cage in the upper portion thereof. The feed ring has a plurality of openings which are substantially smaller than the openings through the cage, the feed ring being open at its upper and lower ends.

3,717,125

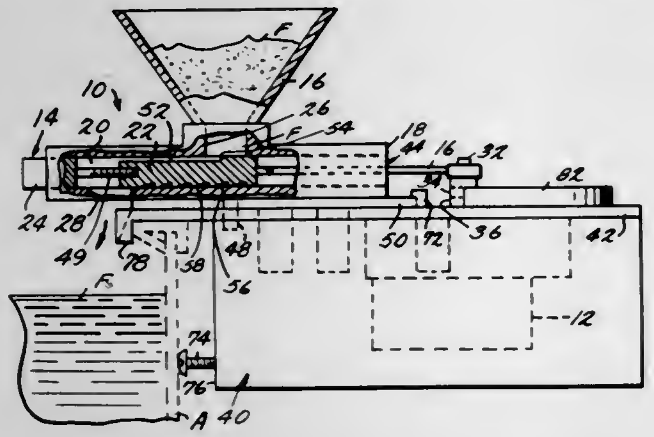
AUTOMATIC FEEDER FOR FISH AQUARIUM

Howard E. Sanders, 3 Kiswick Lane, Hampton, Va.

Filed Nov. 30, 1970, Ser. No. 93,744

Int. Cl. A01k *61/02*

U.S. Cl. 119—51.11 **9 Claims**



A piston having a slot of variable length is mounted in a horizontal cylinder and caused to pass slowly under a hopper where the slot is filled with fish food, then slowly over the aquarium to dispense the fish food. The piston makes e.g. one round trip per day. Lighting for the aquarium may be keyed to the piston movement to establish periods when the aquarium is lighted. The piston is shaped to minimize the build up of fish food between the bottom of the piston and cylinder.

3,717,126

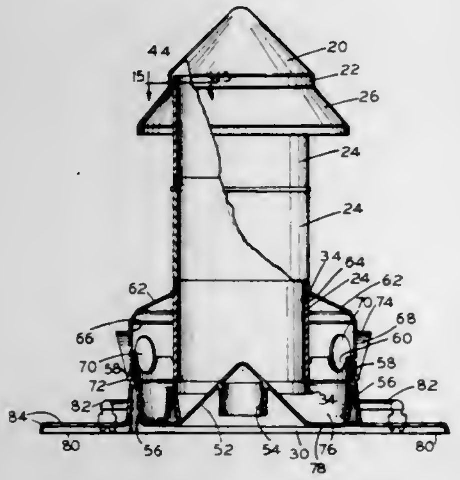
FEEDER

Joseph R. Falcone, 217 Cooper Lane, Dewitt, N.Y. 13214, and Anthony Falcone, Jr., 207 Oak Ridge Drive, Camillus, N.Y. 13031

Filed Sept. 14, 1970, Ser. No. 71,981

Int. Cl. A01k *39/00*

U.S. Cl. 119—52 R **4 Claims**



Bird feeder with silo type magazine in sections, and annular feeder trough having side wall apertures of different size for different size birds, and with perches arranged at different radii to correspond to the aperture size, to encourage birds of different sizes to segregate to different sectors to minimize conflicts between large and small birds.

3,717,127

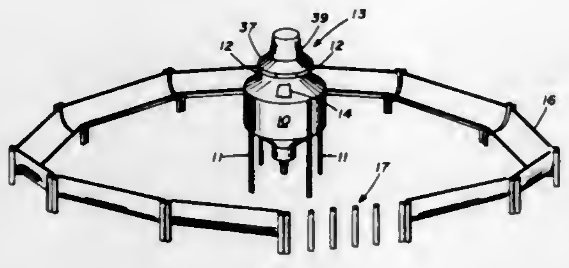
ANIMAL FEEDING DEVICE

D. G. Porterfield, 1025 Glenhaven, Abilene, Tex.

Filed Feb. 18, 1971, Ser. No. 116,371

Int. Cl. A01k *5/00*

U.S. Cl. 119—52 B **12 Claims**



A vertical auger delivers animal feed pellets from a hopper to a rotating feed distributing chute located at the top of the hopper. The auger and rotating chute are periodically energized for a predetermined length of time, distributing a corresponding amount of feed. The rotating chute, which is directed toward a given point for a preselected trajectory throws the feed by centrifical force in a narrow band along the path of a circle about the hopper - either onto firm ground, turf, or into an annularly disposed feed trough which forms a ring about the hopper.

3,717,128

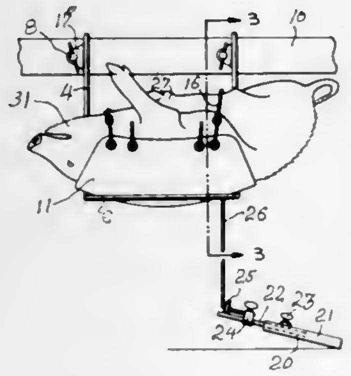
ANIMAL HOLDER

Grady E. Pearman, and Marvin S. Pearman, both of Route 1, Chula, Ga.

Filed Jan. 29, 1971, Ser. No. 110,824

Int. Cl. A61d *03/00*

U.S. Cl. 119—103 **2 Claims**



An animal holder to support the animal in a position for treatment restrained from movement. The holder comprises a frame member with means to support the animal in a cradle member and means to hold the animal in position accessible for treatment. The holder also has a treadle member which includes a tubular casing adjustably supporting an elongated rod. A flexible tie member has one end attached to the cradle and its other end passes through a support on the frame and is secured to a collar adjustably mounted on the rod.

3,717,129

METHOD AND APPARATUS FOR REDUCING ENGINE EXHAUST POLLUTANTS

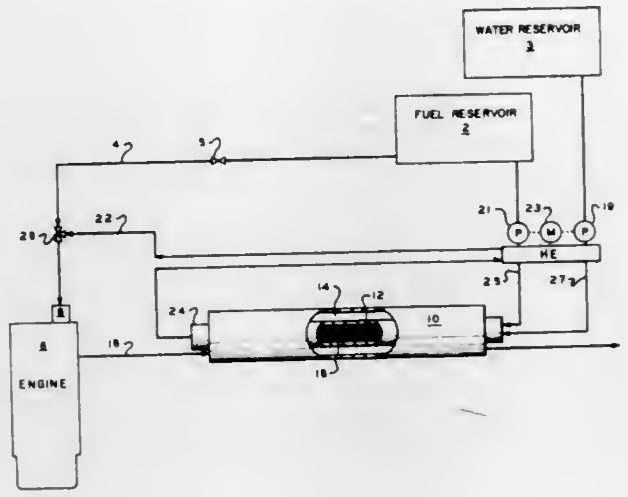
Homer M. Fox, Bartlesville, Okla., assignor to Phillips Petroleum Company

Filed Sept. 28, 1970, Ser. No. 76,099

Int. Cl. F02d *19/00;* **F02c** *7/22*

U.S. Cl. 123—1 A **10 Claims**

This invention resides in passing exhaust gases from an engine through a fuel regenerator in indirect heat exchange with fuel and steam in contact with a catalytic bed for steam reforming the fuel, bringing the reformed fuel into heat exchange relationship with the fuel and water entering the fuel regenerator and thereafter operating the engine utilizing this reformed fuel for lowering the amount of pollutant species discharging from the engine.



3,717,130

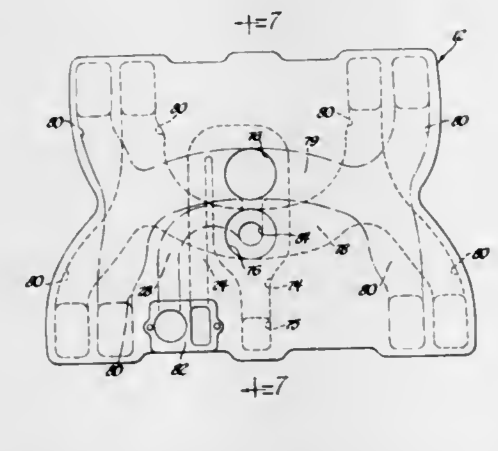
INTAKE MANIFOLD FOR EXHAUST GAS RECIRCULATION AND METHOD OF MANUFACTURE

William F. Thornburgh, Rochester, Mich., assignor to General Motors Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 43,537, June 4, 1970, abandoned. This application Oct. 14, 1971, Ser. No. 189,345

Int. Cl. F02m *25/06*

U.S. Cl. 123—52 MV **3 Claims**



In an internal combustion engine, exhaust gas is recirculated from the intake manifold exhaust gas crossover passage to the induction passages. The exhaust gas recirculation passage is cast integrally in the intake manifold structure, extending from the exhaust crossover passage to a recirculation control valve and then to the induction passages.

3,717,131

INTAKE MANIFOLD FOR EXHAUST GAS RECIRCULATION

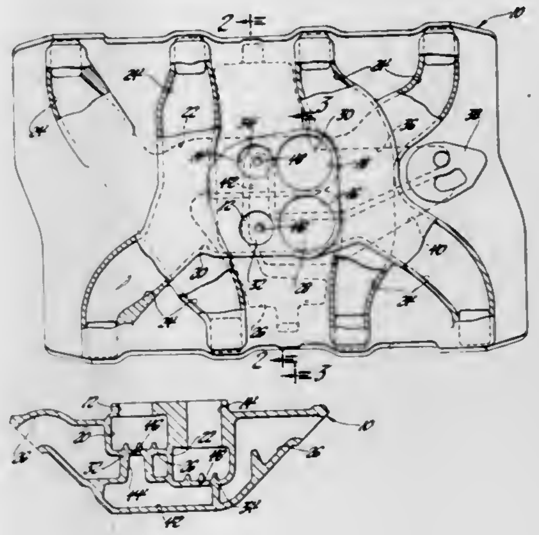
Howard E. Chana; Joseph Rado, both of Flint, and Harold D. White, Fenton, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Nov. 10, 1971, Ser. No. 197,299

Int. Cl. F02m *25/06*

U.S. Cl. 123—52 MV **3 Claims**

In an internal combustion engine, exhaust gas is recirculated from the intake manifold exhaust gas crossover passage to the induction passages. The exhaust gas recirculation passage is cast integrally in the intake manifold structure, extending from the exhaust crossover passage to a recirculation control valve and then to the induction passages below the primary riser passages. The exhaust gas crossover passage circumvents the recirculation passage in the region below the primary risers.



3,717,132

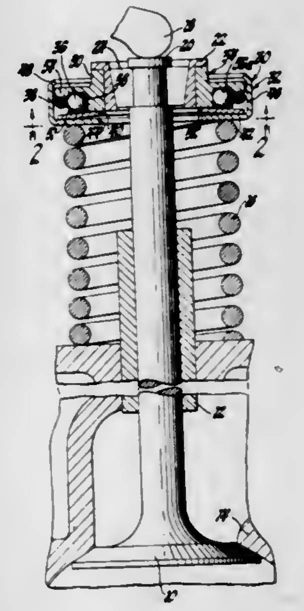
VALVE ROTATOR

Louis J. Van Slooten, West Olive, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 5, 1971, Ser. No. 195,982

Int. Cl. F01l *1/32;* **F16k** *29/00*

U.S. Cl. 123—90.3 **7 Claims**



A valve rotator having a spring washer interposed between a spring retainer collar and a retainer cap, a plurality of radial ball-ramps being provided in the retainer cap with a ball positioned in each of the ramps in rolling contact with the spring washer, the balls being retained therein and biased radially inward by means of an annular spring engaging all of the balls.

3,717,133
INSTALLATION FOR PRODUCING A ROTARY MOVEMENT OF A VALVE IN AN INTERNAL COMBUSTION ENGINE

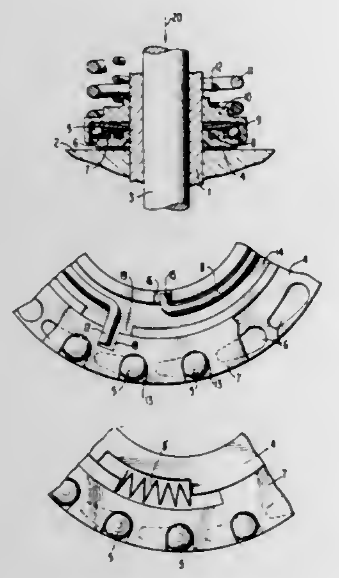
Kurt Enke, Kirchheim/Teck, and Werner Altmann, Stuttgart, both of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart-Unterturkheim, Germany

Filed Oct. 23, 1970, Ser. No. 83,443

Claims priority, application Germany, Oct. 24, 1969, P 19 53 571.8

Int. Cl. F01l *1/32*

U.S. Cl. 123—90.3 **13 Claims**



An installation for producing a rotary movement in a valve of an internal combustion engine which is composed of a non-rotatable pressure plate, of balls that are supported in inclined tracks on the pressure plate, of springy means which force the balls in a circumferential direction, of a cup spring supported on the balls and on the pressure plate, and of a rotatable part supported on the cup spring; the valve springs engage at the rotatable part while the balls are arranged in a cage at which engages the springy means.

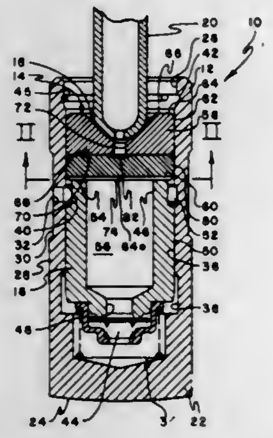
3,717,134
TAPPET PUSH ROD SEAT AND METER MEANS

Richard D. Cornell, Muskegon, Mich., assignor to Johnson Products, Inc., Muskegon, Mich.

Continuation-in-part of Ser. No. 29,915, April 20, 1970, Pat. No. 3,614,942. This application Sept. 13, 1971, Ser. No. 179,856

Int. Cl. F01m *9/10*

U.S. Cl. 123—90.35 **23 Claims**



In a push rod seat for use in a tappet adapted for metering oil to a push rod, the passageways for conducting the oil are formed by constructing the seat of upper and lower parts. At least one of the parts has grooves or slots formed therein which in cooperation with the other part forms the passageways. In one embodiment, the lower part in cooperation with the inner bore in which it is located determines the degree of metering by the size of its diameter and its thickness. In another embodiment the size and configuration of slots or grooves in one or both of the parts can provide and determine the degree of metering.

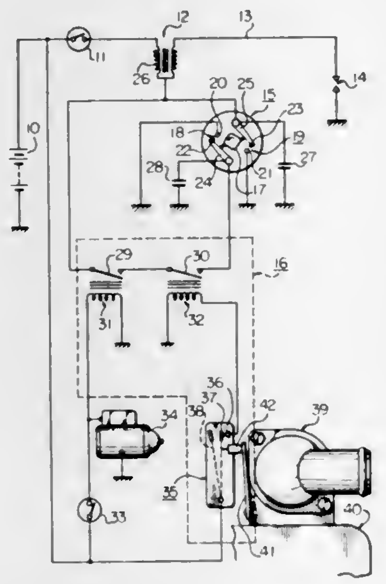
3,717,135
IGNITION TIMING CHANGE-OVER DEVICE

Yoshimasa Mayashi, and Yukihiro Toh, both of Yokohama, Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Oct. 22, 1970, Ser. No. 82,948

Int. Cl. F02n *17/00;* **F02p** *5/04*

U.S. Cl. 123—117 R **1 Claim**



An ignition timing change-over device adapted for use with a dual-point distributor to improve engine operation during engine starting and warm-up. The retarding breaker contact of the distributor is connected to the primary side of the ignition coil by way of first and second serially connected relay switches which are normally closed. The first relay switch is adapted to open when its solenoid coil is energized by closing of a starting switch. The second relay switch has a solenoid coil connected to a d.c. voltage source by way of a thermostatically controlled switch which remains closed to energize the solenoid coil of the second relay switch to open during the warm-up operation of the engine. During the engine starting and warm-up operations, either or both of the two relay switches is kept open to interrupt the retarding breaker circuit so that an ignition advance takes place.

3,717,136
SPRING ACTUATED PROJECTOR HAVING GRAVITY FED MAGAZINE

Derek J. Gay, Palos Verdes Peninsula, William H. Smedley, Garden Grove, and Anthony D. Miller, Torrance, Calif., assignors to Mattel, Inc., Hawthorne, Calif.

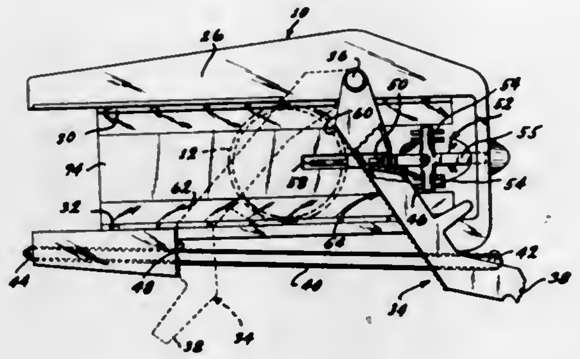
Filed Nov. 5, 1970, Ser. No. 87,036

Int. Cl. F41b *7/08*

U.S. Cl. 124—21 **5 Claims**

A simple flying saucer launcher which rapidly rotates the saucer as it projects it in a forward direction, comprising a pair of spaced rails for guiding the saucer and a pivotally mounted arm that is powered by a rubber band

to thrust a saucer along the rails. Each saucer has corrugations at its periphery, and the arm has corresponding corrugations to facilitate rotation of the saucer as it is thrust forward. A trough is formed between the rails for receiving pencils or other articles that do not span the rails, to prevent the launcher from being used to project dangerous objects. A forwardly opening funnel is mounted on the toy to enable a child to catch flying saucers, the funnel leading to a magazine above the arm to feed saucers automatically into the toy.



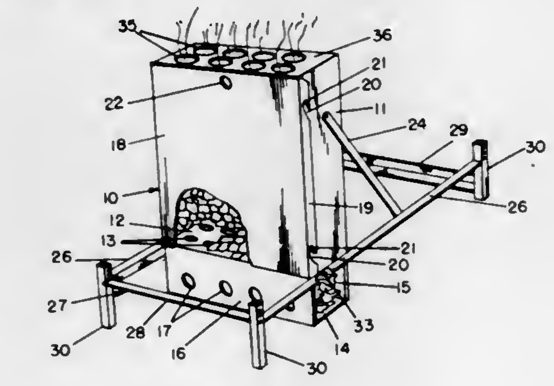
3,717,137
CHARCOAL-TYPE COOKER ASSEMBLY WITH PIVOTALLY MOUNTED FIRE BOX

John H. Moline, 2425 Balsam Drive, and Robert J. Locher, 2475 Forest Avenue, both of Boulder, Colo.

Continuation-in-part of Ser. No. 18,859, March 12, 1970, abandoned. This application Dec. 7, 1970, Ser. No. 95,748

Int. Cl. A47j *37/00;* **F24b** *3/00*

U.S. Cl. 126—25 B **13 Claims**



Charcoal fuel-type cooker assemblies are disclosed which have a support base, and a fire box which contains the fuel is supported on the base to swing between an upright position and a horizontal position. The fire box defines a substantially airtight enclosure for the fuel, except for openings at opposite ends, and a compartment at one end of the fire box receives a starting material so that in the upright position a draft is created upwardly through the fire box to increase burning for fuel starting purposes. The fire box has a movable cover which is held closed when upright to seal off a wall of the fire box and the cover affords access into the fire box when horizontally disposed.

3,717,138
SHIELDED WINDOW ARRANGEMENT FOR A HEAT CLEANING OVEN DOOR

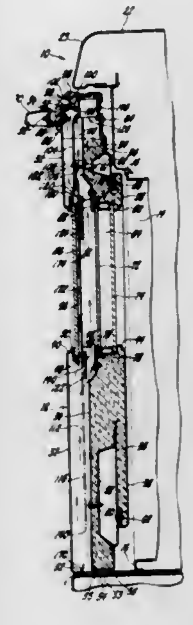
Donald L. Upp, Trotwood, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 27, 1971, Ser. No. 193,097

Int. Cl. F23m *7/00;* **F24c** *15/04*

U.S. Cl. 126—200 **4 Claims**

A sliding shielded window arrangement for a self-cleaning oven door having an outer glass panel and a pair of aligned inner glass panels forming a sealed hot air cavity. The door structure supporting the glass panels includes an inner panel defining with a spaced outside panel of the door a vertical air flow channel in the shield well. A plain or uninsulated flat plate reflective shield is movable in the channel to a raised blocking position adjacent the outer glass panel such that when the shield is in its raised position it defines a relatively large air wash channel for the exposed inner glass panel and a relatively small cool air channel communicating respectively with a pair of front and rear laminar air flow passages to provide an air barrier for the door area above the outer glass panel to attain allowable outer panel temperatures.



3,717,139
SUBMERGED COMBUSTION HEAT-GENERATOR

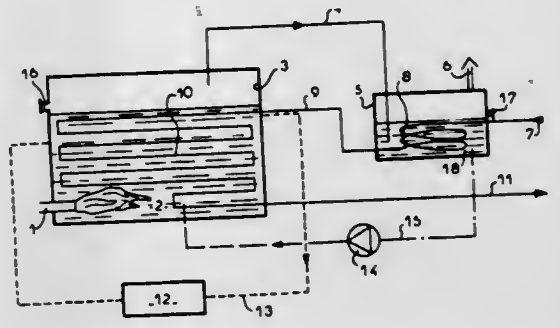
Remi Pierre Leon Alain Guillet, Saint-Mande, and Luc Clement Dominique Glachant, Brunoy, both of France, assignors to Gaz de France, Paris, France

Filed Nov. 30, 1970, Ser. No. 93,766

Claims priority, application France, Nov. 28, 1969, 6941279

Int. Cl. F24h *1/20*

U.S. Cl. 126—360 A **5 Claims**

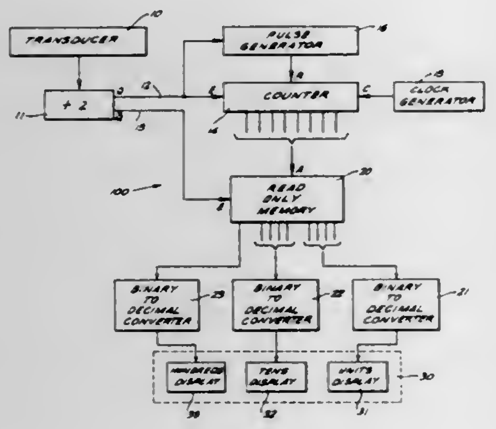


A submerged combustion heat-generator enabling the obtention of a high-temperature heat-carrying fluid under very good efficiency conditions, as well as practically dry and possibly "neutral" combustion products. The heat generator of the invention uses a burner operating on submerged combustion in a liquid bath, for instance of water, which is subjected to a pressure of several bars.

3,717,140
HEART RATE COUNTER WITH DIGITAL STORAGE AND NUMERICAL READOUT

Eugene C. Greenwood, 468 Prospect Street, Newport Beach, Calif.

Filed Nov. 13, 1970, Ser. No. 89,245
Int. Cl. A61b *5/02*
U.S. Cl. 128—2.05 T **10 Claims**



Apparatus for determining heart rate based upon the occurrence of two consecutive heart beats and for immediately displaying the determined heart rate in beats per minute. A transducer responsive to the occurrence of a heart beat generates an electrical pulse indicative of such occurrence. The heart beat pulses are applied, together with a train of clock pulses, to a counter which counts the number of clock pulses occurring between consecutive heart beats. A fully decoded, static, read-only memory has stored therein the different pulse rates which correspond to the different numbers of clock pulses which may occur between consecutive heart beats. By applying the output of the counter to the memory, the pulse rate which corresponds to the counted number of clock pulses may be selected. Such selected pulse rate is applied to a display device which visually displays the pulse rate in beats per minute.

3,717,141
SYSTEM FOR PROVIDING A MULTI-LEVEL CURRENT DENSITY DIAGRAM OF A HUMAN BODY ORGAN

Lawrence H. Krohn, 905 Robin Rd., Ann Arbor, Mich., and Angelo L. Merlo, Troy, Mich., assignors to said Krohn, by said Merlo

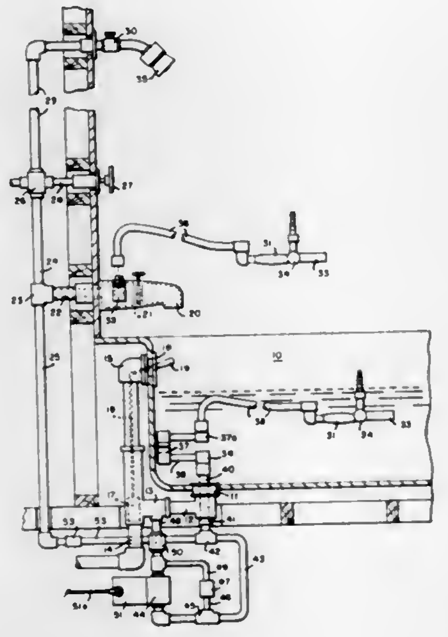
Filed Sept. 15, 1970, Ser. No. 72,432
Int. Cl. A61b *5/04*
U.S. Cl. 128—2.06 R **34 Claims**

The system includes means for obtaining potential signals from discrete locations on the skin surface surrounding the organ in question. These signals, which are analog in nature, are converted to digital form and recorded. This digital information is then fed to a digital computer wherein the computer converts the recorded digital data into a series of multi-level current density diagrams. These diagrams represent functioning of the organ and may be compared, either automatically or visually, with corresponding diagrams of normal organ operation to facilitate medical diagnosis of the organ in question. Means are also provided to display the digital information in analog form.

3,717,142
HYDROTHERAPEUTIC APPARATUS

Thomas V. Mickelson, 169 Anne Way,
Los Gatos, Calif. 95030
Filed Nov. 8, 1971, Ser. No. 196,464
Int. Cl. A61h *9/00*
U.S. Cl. 128—66 **4 Claims**

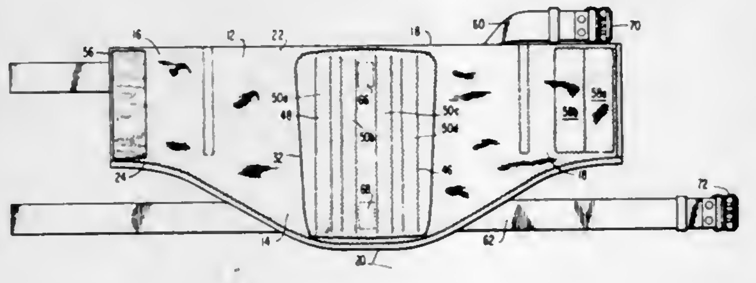
Hydrotherapy equipment adapted for use with a conventional bathtub. The nozzle of the aspirator of this device may be attached to the water spout of the tub or it may be attached to a small pipe that extends into the tub through the drain. This small pipe is connected to a water supply line through a check valve located below the tub and it is also connected to the pressure side of a rotary gear pump which has the sunction side thereof connected to the drain pipe of the bathtub so that the device may be used with water supply pressure or with water pump pressure or with these pressures combined as desired. Alternatively, the aspirator unit may be connected to the bathtub water spout which is provided with a vacuum breaker and connection therefor.



3,717,143
LUMBO-SACRAL SUPPORT

Curt H. Johnson, Largo, Fla., assignor to Curty, Inc., Clearwater, Fla.

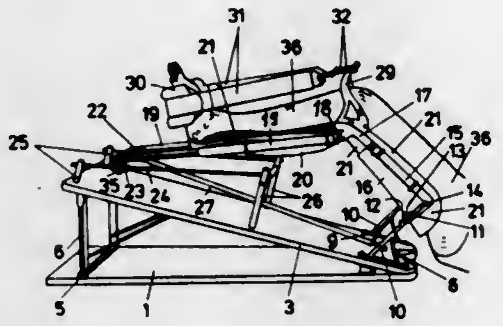
Filed April 7, 1971, Ser. No. 131,897
Int. Cl. A61f *5/02*
U.S. Cl. 128—78 **1 Claim**



The support includes a therapeutic corset for encompassing the lower torso of a patient. The corset has an enlarged intermediate portion comformable to the lumbar region and a pair of end portions. The end portions carry fasteners for tightly securing the support about the lower torso. The intermediate portion includes a pad and a plurality of laterally spaced elongated vertically extending stays formed of metal, the stays being prebent to approximate the contour of the lumbar region. A pair of straps are provided along the upper and lower edges of the support and are secured on the front side of the corset.

3,717,144
ORTHOPEDIC LEG SUPPORT

Rudolf Bimler, Deichstrasse 9, Cuxhaven, Germany
Filed March 17, 1971, Ser. No. 125,030
Claims priority, application Germany,
March 28, 1970, P 20 15 054.3
Int. Cl. A61f *3/00*
U.S. Cl. 128—80 A **10 Claims**

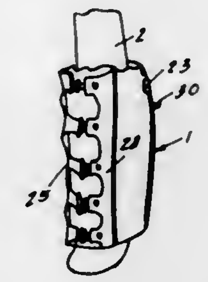


The specification describes an orthopedic leg supporting appliance which can be supported on a bed. The appliance comprises several supports for the lower and upper part of a leg of a patient and these parts are arranged to be capable of being articulated in relation to each other.

3,717,145
COLD PRESSURE BANDAGE

Wilbur C. Berndt, and Harry J. Hardenbrook, both of 3419 So. Harlem Ave., Berwyn, Ill.

Filed May 3, 1971, Ser. No. 139,684
Int. Cl. A61f *9/00*
U.S. Cl. 128—82.1 **14 Claims**

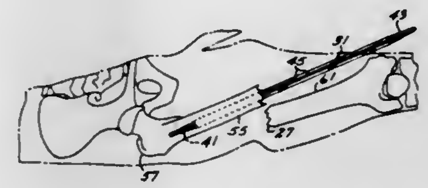


A cold bandage made of various sizes and shapes for application to various portions of the body of a patient, which patient may be either animal or human. The bandage includes outer enclosing means containing at least one bag of volatile refrigerant with an opening in that bag to enhance vaporization of the refrigerant. Where the outer enclosing means are in the form of an envelope, sealed gas tight, with at least one bag opening into the interior of that envelope, the bandage will become inflated by virtue of the refrigerant volatilizing and intimately conform to the portion of the body to which the bandage is applied, thus providing both reduced temperature and pressure. The bandage is highly desirable for use to relieve a traumatized area, reduce inflamatory edema and pain, rapidly decrease hemorrhage, reduce the possibility of infection, minimize tissue damage, and effectively treat burns, among many other applicatory uses.

3,717,146
THREADED INTRAMEDULLARY COMPRESSION AND FIXATION DEVICE

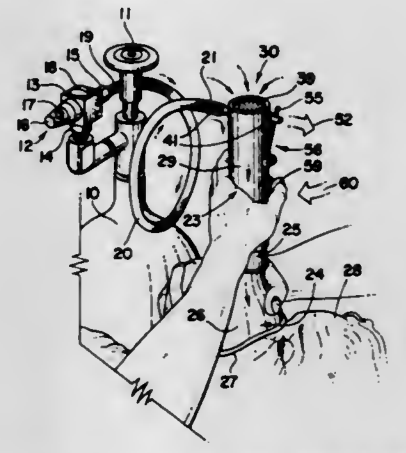
William X. Halloran, 440 Fair Drive, Costa Mesa, Calif.
Continuation-in-part of Ser. No. 765,608, Oct. 7, 1968, abandoned. This application Feb. 1, 1971, Ser. No. 111,206
Int. Cl. A61b *17/18;* **A61f** *5/04*
U.S. Cl. 128—92 BC **10 Claims**

An intramedullary compression and fixation device for compressing a long bone of a predetermined length which has been fractured medially to form first and second bone segments. The compression and fixation device includes an elongated intramedullary rod of sufficient length to project from one end of the bone past the fracture site and which is formed with a cross section of sufficient size to substantially occupy the cross section of the medial portion of the medullary canal of the bone. Peripheral thread means are formed on such rod and are of sufficient size to engage the cancellous bone forming the interior wall of the medullary canal to drive the rod axially in such canal upon rotation of the rod. Coupling threads are formed on one end of the rod for connection with an intramedullary rod driver-retractor device whereby an opening may be formed in one end of the bone and the end of the rod opposite the one end passed through the open end, the driver-retractor device engaged with the coupling threads and such device rotated to screw the rod through the one bone segment and into the second bone segment to thereby span the fracture and maintain the bone segments in fixed relationship with respect to one another.



3,717,147
RESUSCITATOR

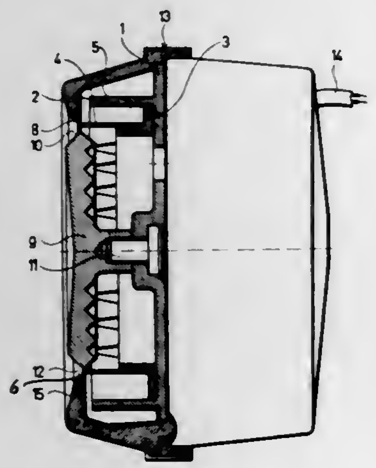
Stephen Donald Flynn, 481 Caithness Street East, Caledonia, Ontario, Canada
Continuation-in-part of Ser. No. 839,326, July 17, 1969, abandoned. This application March 25, 1971, Ser. No. 128,017
Int. Cl. A62b *7/02*
U.S. Cl. 128—145.8 **10 Claims**



A resuscitation apparatus for use with a face mask or the like and a supply of oxygen having a body portion with an air inlet open to atmosphere and an outlet opening for connection to the mask, a mixing chamber positioned within the body portion connected with the outlet opening of the body portion, at least one air delivery port connecting with the mixing chamber, at least one oxygen inlet port in the mixing chamber arranged and oriented adjacent to the air delivery port to procure induction of air into the chamber by venturi action responsive to the flow of oxygen through the oxygen inlet passage, conduit means connected with the oxygen inlet port and connected to a source of oxygen, and manually operated valve means in the oxygen inlet passage for controlling the flow of oxygen from the conduit means to the oxygen inlet port in the chamber. In this way, the mask is always directly open to atmosphere through the air inlet port regardless of oxygen delivery. Delivery of oxygen inducts additional air which is mixed and supplied to the mask under slight pressure. Excess pressure escapes to atmosphere through the air inlet port.

3,717,148
AEROIONIZER

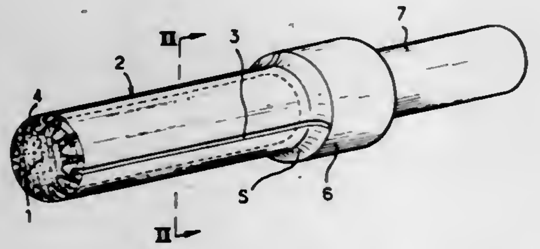
Ferenc Svab, Budapest, Hungary, assignor to Medicor Munek, Budapest, Hungary
Filed Oct. 28, 1970, Ser. No. 84,559
Claims priority, application Hungary, Oct. 29, 1969, ME-1142
Int. Cl. A61m *15/02*
U.S. Cl. 128—190 **3 Claims**



An aeroionizer which can be run from a battery or electric supply mains, operates with a high voltage produced by a voltage multiplier, and has a set of ionization electrodes and a deflecting electrode. The set of ionization electrodes consists of a metal strip such that the lower part of the metal strip forms a continuous strip while the upper, free-standing end is in the saw tooth formation. The set of ionization electrodes is fixed to the outside of the inner of two rings fixed concentrically to an electrically insulating disc, the deflecting electrode being mounted on the outside of the outer ring, and the insulating disc and the electrodes are surrounded with a housing made of insulating material in the roof of which there is an opening into which is inserted a disc made of insulating material. The housing and disc are made antistatic. The opening in the roof of the housing is cut with an edge sloping towards the center of the housing while the rim of the disc is cut with an edge sloping in the opposite direction to the edge of the housing roof so that a gap is formed between the two edges, the set of ionization electrodes being arranged in this gap.

3,717,149
INJECTOR PACKAGE FOR CATAMENIAL TAMPON

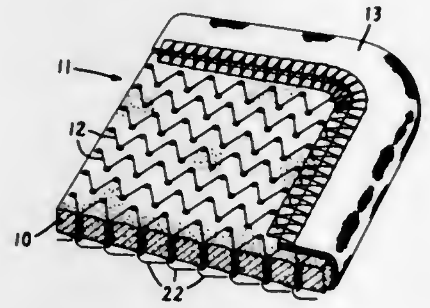
Bruno P. Morane, Paris, France, assignor to L'Oreal, Paris, France
Filed Nov. 2, 1970, Ser. No. 86,175
Claims priority, application France, Nov. 7, 1969, 6938453
Int. Cl. A61f *13/20*
U.S. Cl. 128—263 **7 Claims**



Injector for holding a catamenial tampon consists of a cylinder of flexible material having a plurality of inwardly projecting axial folds, a piston at one end, and a plurality of inwardly projecting fingers at the other.

3,717,150
ABSORBENT STRETCHABLE FABRIC

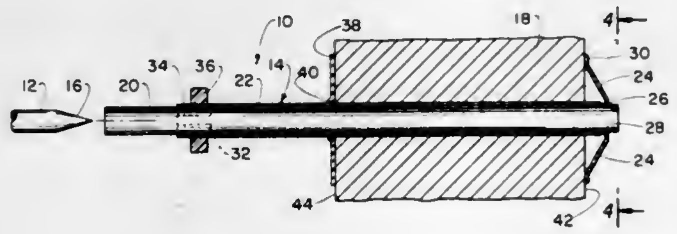
Samuel M. Schwartz, El Paso, Tex., assignor to Farah Manufacturing Company, Inc., El Paso, Tex.
Filed Sept. 9, 1970, Ser. No. 70,650
Int. Cl. A61f *13/16*
U.S. Cl. 128—284 **16 Claims**



An absorbent fabric, preferably used as a diaper, comprised of an absorbent shrinkable web encased in a warp knitted fabric of relatively non-shrinkable yarn. The fabric is substantially non-stretchable when made, but becomes stretchable after washing and drying. A method of making a stretchable fabric is also disclosed.

3,717,151
FLESH PENETRATING APPARATUS

Robert M. Collett, 927 North Hunnington, San Fernando, Calif.
Filed March 11, 1971, Ser. No. 123,291
Int. Cl. A61b *17/34;* **A61m** *27/00*
U.S. Cl. 128—347 **8 Claims**

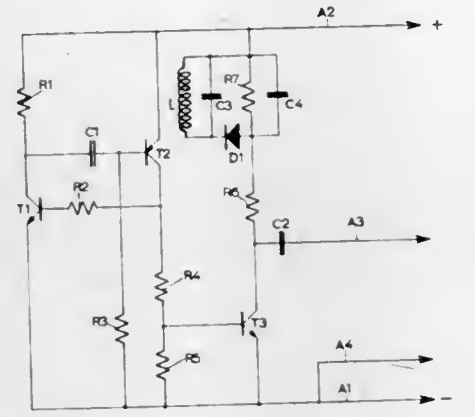


A catheter apparatus for retention within the body of an animal employing a sleeve assembly composed of an inner sleeve telescopingly supported within an outer sleeve, a multiple radially expandable finger assembly hingedly integrally connected at one end to the outer sleeve and capable of being maintained in the radially outermost position by the inner sleeve, the fingers being movable substantially in line with the outer sleeve upon disassociation of the inner sleeve.

3,717,152
CARDIAC PACEMAKER

Janwillem Van Den Berg, Groningen, Netherlands, assignor to Vitatron N.V., Dieren, Netherlands
Continuation of Ser. No. 773,439, Nov. 5, 1968, abandoned. This application April 8, 1971, Ser. No. 132,577
Claims priority, application Netherlands, Nov. 16, 1967, 6715556
Int. Cl. A61n *1/36*
U.S. Cl. 128—419 P **8 Claims**

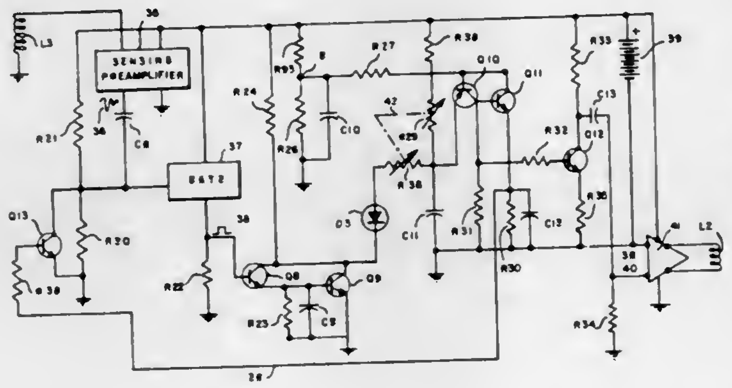
A heart stimulator comprises a built-in resonant circuit and an associated rectifier. By means of an oscillator outside the body of the patient, oscillations with a proper frequency may be induced in the resonant circuit, so that the rectifier



produces a d.c. voltage. This d.c. voltage is used to reduce the available operating voltage for the final stage of the heart stimulator in order that the safety margin may be checked.

3,717,153
STANDBY EXTERNAL RATE CONTROL AND IMPLANTED STANDBY HEART PACER

David L. Bowers, Milwaukee County, Wis., assignor to General Electric Company
Filed Oct. 19, 1970, Ser. No. 81,846
Int. Cl. A61n *1/36*
U.S. Cl. 128—419 P **9 Claims**

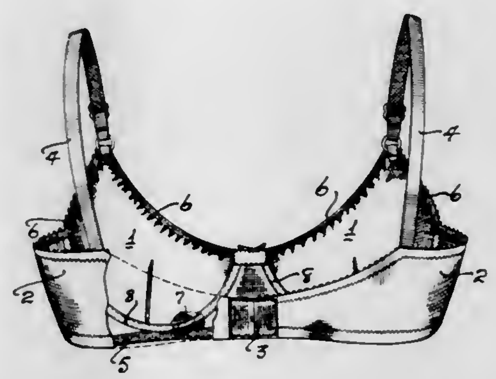


The pacing pulse rate of a body implanted standby heart pacer is selectively controlled with a remote rate control device. The pacer has a coil which transmits a signal to the device whenever a natural heartbeat occurs or when an artificial stimulus is delivered to the heart. The same coil receives signals from the remote control device, and, if these signals are faster than the set rate of the pacer, the remote rate control will establish the rate of the pacer. The pacer paces the heart, when it requires artificial stimulation, at whatever rate the remote control is set. Signals radiated from the pacer are sensed by the remote rate control and are used to inhibit the remote transmitter for a specific period after each natural beat so there can be no competition between natural and artificial heart stimuli.

3,717,154
BRASSIERE

Mack Spetalnik, Rutherford, N.J., assignor to Maidenform, Inc., New York, N.Y.
Filed April 15, 1971, Ser. No. 134,357
Int. Cl. A41c *3/00*
U.S. Cl. 128—494 **2 Claims**

A brassiere constructed to provide improved fit and inherent adjustment for the wearer, by a combination of elements including two elastic cups, two curved and covered wire under-cup supports, an elastic back band construction comprising two back band areas, one for each cup and secured to the appropriate cup supports together with an elastic wedge-shaped area between the cups, each support having its outer



end rising above the cup center point to the top of a connected back band, each cup being fulled at its upper margins by means of the contraction of elastic tape means at said margins and leading to the tops of the curved wire under-cup supports so that the latter provide fulcrum points.

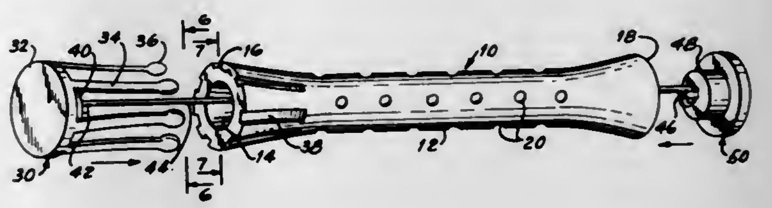
3,717,155
RECONSTITUTED TOBACCO PRODUCT

Harry Jacin, Norwalk, and Joseph Vincent Fiore, Fairfield, both of Conn., assignors to AMF Corporation
Filed May 18, 1970, Ser. No. 48,749
Int. Cl. A24b *3/14, 15/08*
U.S. Cl. 131—17 AC **1 Claim**

A reconstituted tobacco product is disclosed which is essentially free of the polyphenols. which are held responsible for undue darkness in the finished tobacco following treatment operations. The reconstituted tobacco consists essentially of an extracted tobacco which is reimpregnated with substantially all the substances extracted from the tobacco with the exception of the polyphenol fraction.

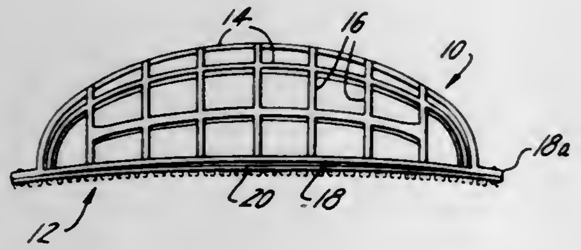
3,717,156
LOCK-ON HAIR CURLER ASSEMBLY

Arthur J. McKeown, 30 Cedar Avenue, Patchogue, N.Y.
Filed June 22, 1971, Ser. No. 155,552
Int. Cl. A45d *2/14*
U.S. Cl. 132—40 **8 Claims**



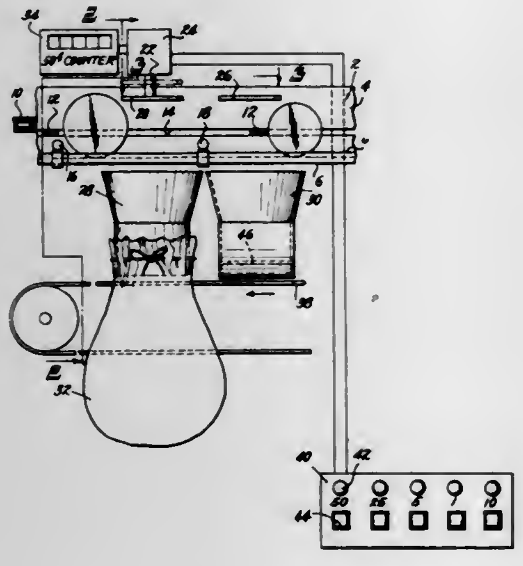
A hair curler assembly has a tubular body formed with an axial passage and shaped for supporting a wound strand of hair. At least one of a pair of end caps may have a head formed with circumferentially spaced axially extending spring fingers which have rounded tips to slide on the wound strand of hair and grip the same frictionally under spring bias in the flexed fingers. An elastic cord extends through the passage and connects the caps under spring tension in the stretched cord.

3,717,157
SELF-SECURED FOUNDATION
Abraham Sidelman, Manchester, Ga., assignor to H. Goodman & Sons, Inc., Kearney, N.J.
Filed Nov. 29, 1971, Ser. No. 202,829
Int. Cl. A41g *5/00*
U.S. Cl. 132—54 9 Claims



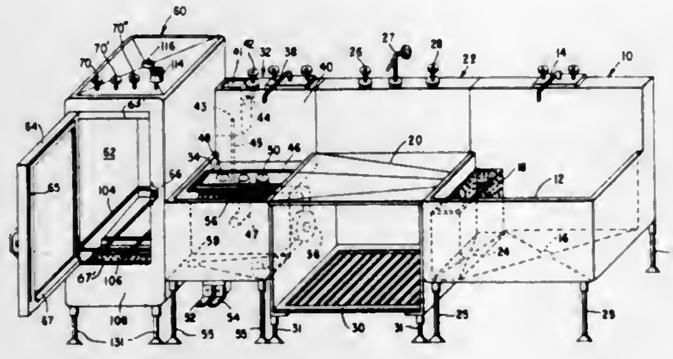
The disclosed foundation for use on a lady's head, to be covered by hair for enlarging the coiffure, has a lightweight convex plastic frame of intersecting ribs and an oval base, and an anchoring strip extending from end to end of the base. The anchoring strip has a base layer and innumerable resilient filamentary hooks, projecting from the base layer for securely holding the foundation in position, with comfort to the wearer.

3,717,158
COIN COUNTER CUT-OFF AND RECYCLING APPARATUS
Thomas J. Black, Reston, Va., assignor to Werner F. Westerman, Falls Church, Va.
Filed June 14, 1971, Ser. No. 152,693
Claims priority, application Germany, May 13, 1971, P 21 23 727.4
Int. Cl. G07d *9/00*
U.S. Cl. 133—8 6 Claims



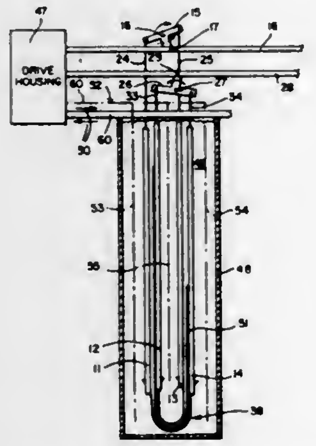
A series of coins, of randomly different denominations, is advanced along a path in controlled spaced relation. At successive stations along said path coins of respectively different predetermined denominations are counted and deflected from said path and accumulated in corresponding receivers. When any receiver has accumulated a predetermined number of coins, further coins of that denomination are deflected from the path, at that station, to a second receiver which recycles them back to a coin supply while the apparatus continues to operate to count and deflect coins of other denominations.

3,717,159
POT WASHER AND STERILIZER
Mario Cavicchioli, 164 Vanderbilt Ave., Island Park, N.Y. 11558
Filed July 28, 1971, Ser. No. 169,568
Int. Cl. B08b *3/02*
U.S. Cl. 134—58 DL 8 Claims



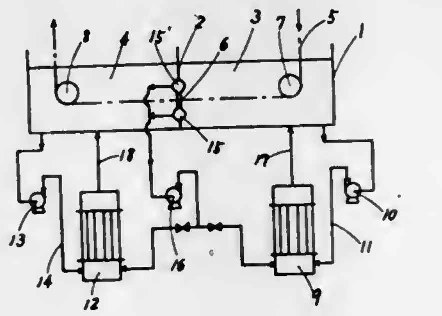
A soaking station, a scraping station, a washing station, and a sterilizing station for pots and pans are arranged generally in a line. Each station comprising a detachable independent assembly which may be selectively chosen in accordance with the predetermined functions to be performed. The basic assembly is a soaking station which includes a sink for soaking pots and pans containing adhering refuse. The addition of a scraping station provides a convenient area for storing and scraping cooking utensils containing adherent refuse. A washing station includes a second sink and provides agitation and washing structure for removing any remaining refuse from the utensils. The addition of a sterilizing station provides for sterilizing the utensils with live steam and, if desired, provides for a hot and cold rinse.

3,717,160
AUTOMATIC SHEET MATERIAL TRANSPORT MACHINE
Philip E. Tobias, 1872 Watson Road, Abington, Pa.
Filed Aug. 20, 1971, Ser. No. 173,573
Int. Cl. B08b *11/00;* G03d *3/08*
U.S. Cl. 134—122 11 Claims



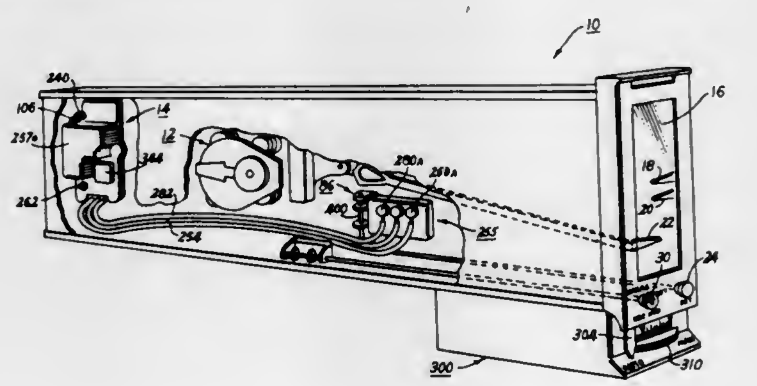
The present machine employs a plurality of perforated plates which are disposed in pairs so that each pair defines a channel therebetween. The channels, when considered together, form a transport path along which film (or paper or webbing of some kind) is moved to be processed (or otherwise treated). Each of the plates, of a pair of plates which forms a channel, is incrementally moved along the forward direction of the transport path and rapidly returned along the reverse direction of the transport path. The plates, forming a channel, are moved out of phase with each other but in phase with selected other plates along the path. The arrangement of plates is held in a tank of fluid (or tanks of fluid) which is to be applied to the film (or paper) and the fluid is moved transversely with respect to, and in synchronism with, the plates so that the film is always held against a plate which is experiencing the forward movement. Hence the film is carried forward along the transport path through the fluid. The tank employs a shroud arrangement to prevent undesirable currents in the fluid. In addition the system employs a feed mechanism to feed the film or material into the system in synchronism with the movement of the plates.

3,717,161
APPARATUS FOR LIQUID TREATMENT OF SHEET MATERIAL
Akimasa Fukai, Toyonaka, Tuneaki Fujiwara, Kurashiki, and Takao Abe, Soja, Japan, assignors to Kuraray Co., Ltd., Kurashiki, Japan
Filed Oct. 19, 1971, Ser. No. 190,577
Int. Cl. B65h *23/24;* B05c *3/132*
U.S. Cl. 134—64 13 Claims



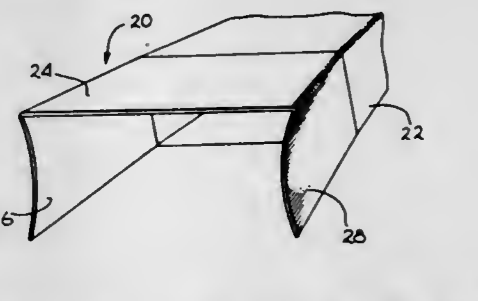
Apparatus for a liquid treatment of sheet material wherein the treatment tank is divided into front and rear tanks, with a partition wall provided with a space permitting a sheet material to pass through the wall without contacting any portion thereof, and the liquid which has a tendency to move from the front tank to the rear tank through the space together with the sheet material and any of the liquid in either liable to flow through the space is sucked by a suction pipe positioned at the space, and returned to the front and rear tanks respectively.

3,717,162
CASCADE CONTROL SYSTEM
Robert C. Prescott, Foxboro, Mass., assignor to The Foxboro Company, Foxboro, Mass.
Filed July 19, 1971, Ser. No. 163,951
Int. Cl. F15b *5/00*
U.S. Cl. 137—14 26 Claims



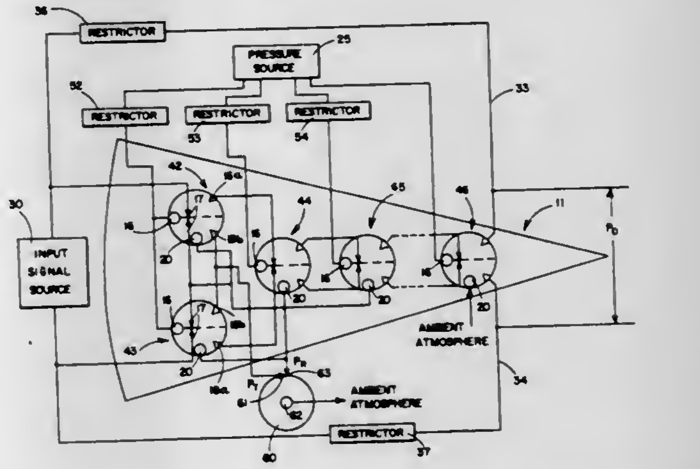
A pneumatically operated cascade control system comprising a primary controller producing an output signal as the set point for a cascaded secondary controller which controls the setting of a process valve. The secondary controller incorporates planar pneumatic technology wherein a thin sheet or plate of metal is formed with openings to define pressure-receptive segments which are pivotable about pivot axes at selected regions. This plate forms part of a laminar sandwich having wall means which cooperate with the plate segments to define pressure chambers to some of which various pressure signals are directed to cause the plate segments to pivot about their pivot axes. Output pressure signals are derived from other of the pressure chambers. The cascade control system comprises transfer switching means for transferring between automatic and manual modes in a bumpless, balanceless fashion. All of the controls required by the process operator are available at the front panel of the instrument, while additional controls for the specialized purposes of maintenance personnel are located in the interior of the instrument with restricted availability.

3,717,163
PRECOMPRESSION SHROUD FOR INLETS
Frank M. Herr, Chatsworth, Calif., assignor to CCI Aerospace Corporation, Van Nuys, Calif.
Filed Oct. 8, 1970, Ser. No. 79,141
Int. Cl. F02k *11/00*
U.S. Cl. 137—15.1 3 Claims



In combination with an air inlet for an air breathing engine, a shroud located ahead of the inlet cowl to effect precompression of the air prior to entrance into the inlet, the shroud having a break in the shroud wall structure, the break being located substantially opposite the surface of the shroud upon which compression of the air occurs.

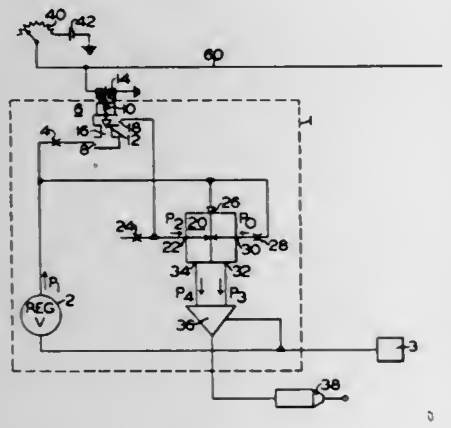
3,717,164
VENT PRESSURE CONTROL FOR MULTI-STAGE FLUID JET AMPLIFIER
William S. Griffin, Manhattan Beach, Calif., assignor to Northrop Corporation, Los Angeles, Calif.
Filed Mar. 29, 1971, Ser. No. 129,013
Int. Cl. F15c *1/12, 1/16*
U.S. Cl. 137—81.5 3 Claims



In a multi-staged fluid amplifier, the vent pressures of the input and intermediate stages are maintained at a higher pressure than the vent of the output stage to provide optimum gain and linearity in the operation of the amplifier. This end result may be achieved by connecting the vents of the input and intermediate amplifier stages to a suitable flow restrictor while the vent of the output stage is connected to the ambient atmosphere. In a preferred embodiment this flow restrictor includes a vortex amplifier responsive to the output of the input stage such that the vent pressure is automatically adjusted in accordance with variations in the average value of the control port pressure of the input stage.

3,717,165
CONTROL SYSTEM FOR FLUID PRESSURE BRAKE APPARATUS

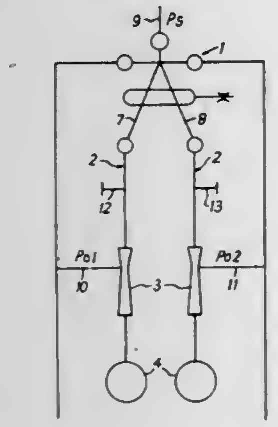
Minoru Nagase, Kobe, Japan, assignor to The Nippon Air Brake Co., Ltd., Kobe, Japan
Filed March 22, 1971, Ser. No. 126,854
Claims priority, application Japan, March 23, 1970, 45/24340
Int. Cl. F15c *3/00*
U.S. Cl. 137—81.5 **9 Claims**



A control system is provided for controlling high fluid operating pressure by utilizing a low fluid pressure control circuit embodying an electro/fluidic convertor which generates a low pressure control signal corresponding to an electrical input and a pure fluid proportional amplifier responsive to the control signal generated for driving a fluidic/pneumatic relay, the high pressure output of which is proportional to the electrical input. The system may also include additional valve means for further adjusting the low pressure control signal in accordance with some variable function by which the high pressure output is to be regulated.

3,717,166
PURE FLUIDIC DEVICES

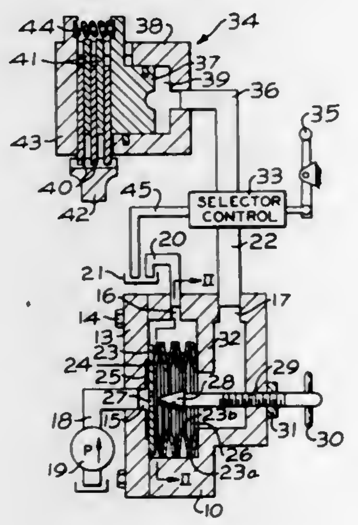
Guy Edward Davies, Fareham, and Cristopher Guy Scott Wilson, Cowplain, both of England, assignors to Plessey Handel Und Investments A.G., Gartenstrasse, Switzerland
Filed May 11, 1971, Ser. No. 142,165
Claims priority, application Great Britain, May 15, 1970, 23,671/70
Int. Cl. F15c *1/08*
U.S. Cl. 137—81.5 **4 Claims**



The two outlet branches of a bistable wall-adhesion amplifier are each connected through a Venturi to a capacitor volume chamber, while the throat of each Venturi is coupled back to that control inlet of the amplifier which when pressurized switches the jet to the other branch. Different triangular-wave outputs are obtainable from the throat of each Venturi, between the throats of the two Venturi's, or between the two amplifier branches, the last-mentioned output supplying a square waveform.

3,717,167
FLOW LIMITER AND RELIEF VALVE-BELLEVILLE WASHER

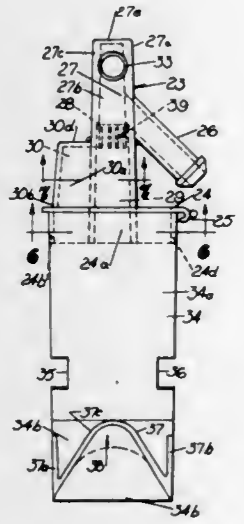
Thomas E. Allen, Mustang, Okla., assignor to Caterpillar Tractor Co., Peoria, Ill.
Filed July 19, 1971, Ser. No. 163,594
Int. Cl. F16k *17/22*
U.S. Cl. 137—117 **7 Claims**



A combination flow limiter and relief valve comprises a plurality of conically shaped spring washers which are arranged in series against an orificed plate to bias the plate against flow from an inlet. The washers and plate are preloaded in a chamber in a housing to form a resilient barrier between inlet and outlet openings. Pressure differential across the plate alters the bias of the washers and thus the pressure at which they will open to permit fluid flow past their outer diameter.

3,717,168
WATER INLET UNIT FOR APPLIANCES

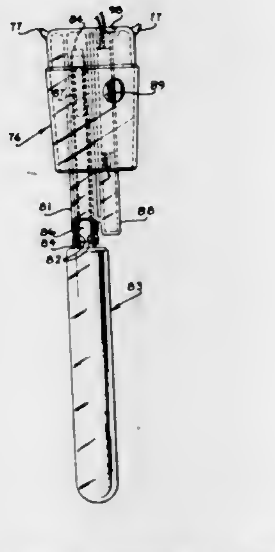
William H. Yake, Connersville, Ind., assignor to Design and Manufacturing Corporation, Connersville, Ind.
Filed May 12, 1971, Ser. No. 142,440
Int. Cl. F16l *55/06*
U.S. Cl. 137—216.1 **12 Claims**



A water inlet unit for the vat of a dishwashing machine or the like comprising an inlet nozzle for conducting water from a water valve to an upper chamber of the unit. The outlet of the upper chamber of the water inlet unit is connected to a lower chamber by a passage provided with an air gap. The lower chamber has an outlet communicating with the appliance vat and means therein to assure the smooth and bubble-free flow of water therethrough. The lower chamber is configured to provide a water trap for suds and steam. The upper chamber may be provided at its outlet with a flow guide to remove turbulence from the water passing therethrough.

3,717,169
GAS SUPPLY SYSTEM APPARATUS

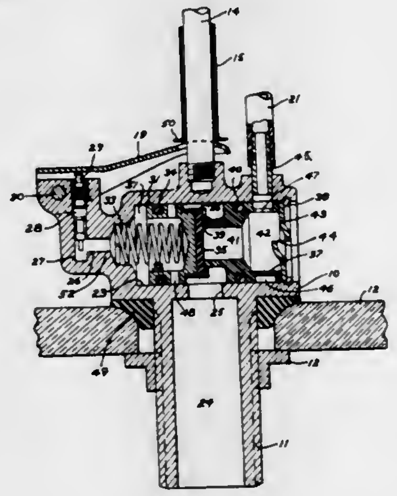
Henry L. Schoger, Sunnyvale, Calif., assignor to H. L. Schoger & Associates, Inc., Santa Clara, Calif.
Division of Ser. No. 57,482, July 23, 1970, Pat. No. 3,645,292. This application Aug. 11, 1971, Ser. No. 170,715
Int. Cl. F16k *33/00*
U.S. Cl. 137—412 **1 Claim**



An improved gas supply system for supplying nitrogen and/or oxygen or other gases to semiconductor doping systems via liquid, such as water, boiling in a flask in a manner whereby the supply of gas remains consistent as to its characteristics, for example, moisture content, purity, etc. A double check valve arrangement, with one check valve weighted to a closed position, permits a gas, such as oxygen, to be supplied selectively wet or dry to a doping furnace as employed in semiconductor manufacture. Liquid is maintained at a constant level in the boiling water flask by means of a magnetic element carried in the elongated stem of a float riding in the water. The magnetic element serves to activate a reed switch for electrically controlling a solenoid operated water supply valve.

3,717,170
BALL COCK VALVE

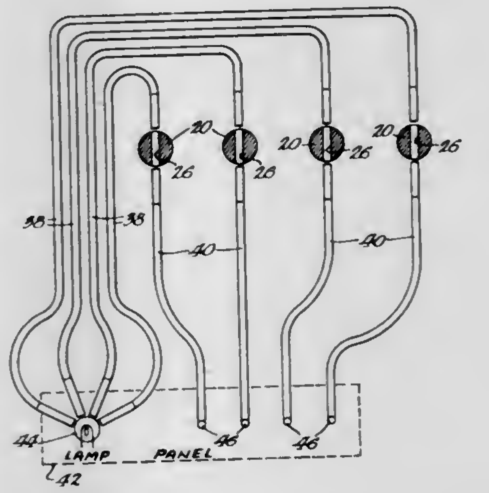
Edwin C. McRae, Route 1, Cusseta, Ala.
Filed Oct. 12, 1971, Ser. No. 188,326
Int. Cl. G05d *9/00*
U.S. Cl. 137—413 **8 Claims**



A ball cock valve is shown having a reciprocating piston therein which forms the main valve closure and wherein the annular space between the piston and its associated cylinder forms a metered passageway into a chamber in back of the piston and wherein a servo operated valve opens and closes said chamber to the atmosphere to cause said piston to move to its closed position when said servo valve is closed and to allow said piston to move to its open position when said servo valve is open.

3,717,171
LIGHT OPERATED VALVE POSITION INDICATING SYSTEM

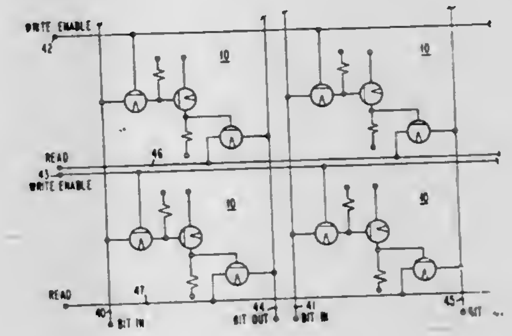
Donald G. Fawkes, Aurora, Ill., assignor to Henry Pratt Company
Filed Sept. 20, 1971, Ser. No. 181,907
Int. Cl. F16k *37/00*
U.S. Cl. 137—552 **4 Claims**



A valve position indicator particularly suited for use with valves having a first shaft driven by an operator and a second stub shaft for journaling the valve member. Either one of the shafts is provided with a transverse light transmitting portion, normally in the form of an aperture therethrough and that portion of the shaft is flanked by a pair of aligned light pipes. One of the light pipes may be associated with a light source while the other is provided with an indicating end with the result that when the valve is in one position, light may pass from the source to the indicator through the aperture in the shaft, while for al other positions of the valve, the light transmitting path will be broken. Observance of the indicating end of the light pipe provides a remote indication of the position of the valve.

3,717,172
FLUIDIC INFORMATION STORAGE CELL

Jack R. Dailey, Apalachin; Donald F. Jensen, Endicott, and Harry C. Kuntzleman, Newark Valley, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Dec. 16, 1970, Ser. No. 98,513
Int. Cl. F15c *3/04*
U.S. Cl. 137—561 **7 Claims**

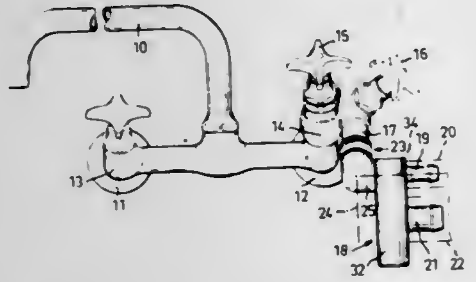


Fluidic circuit using diaphragm valves having particular utility as an information storage cell in either an associative or functional memory in computers. Information is stored in the cell by coincident actuation of a gating line and input bit line to set a latch. Cell interrogation is accomplished by pressurizing either the read line or output bit line depending upon whether searching or readout functions are undertaken. A modification of the cell permits consolidation of input and output bit lines into a single bit line.

3,717,173
CONNECTING ASSEMBLY FOR DISH-OR CLOTHES WASHING MACHINES

Carl Erik Josef Nyberg, deceased, late of Skovde, Sweden; Anna Ingegerd Nyberg; Karl Ove Nyberg; Bo Erik Nyberg; Kent Olof Nyberg, and Inger Margaretha Allerbjer (nee Nyberg), all of Skovde, Sweden (heirs), assignors to Karl Ove Nyberg, Skovde, Sweden

Filed Jan. 8, 1971, Ser. No. 104,892
Claims priority, application Sweden, Jan. 13, 1970, 344/70
Int. Cl. F16k *11/00*
U.S. Cl. 137—562 **8 Claims**



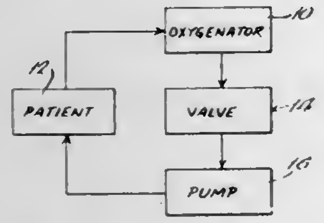
Connecting assembly for connecting a dish- or clothes washing machine to a faucet above a sink, basin or the like, the connecting assembly being rotatably connectible with the outlet part of the cock body by means of a swivel device such as an automatic coupling having a coupling sleeve and a nipple in order to make possible rotation of said connecting assembly around the center axis of said swivel device to a desired angular position. Said connecting assembly comprises a hollow journal part which is provided with a through-flow channel and, at its one end, is connected with said swivel device and which extends laterally out from the center axis of said swivel device and which is provided at its outlet end with a hose nipple for connection of the water inflow hose.

The journal part is externally cylindrical along a portion of its length in order to form a bearing for a hub that supports an arm extending out from said hub and having a water outlet channel which opens at the outer end of said arm in order to direct the waste water down into the sink in the direction adjusted for by the angular adjustment of said journal part around the swivel axis and the angular adjustment of the hub around the center axis of said journal part. The arm supports a hose nipple that is connected with the outlet channel in said arm and is adapted to be connected to the outflow hose of the machine.

3,717,174
PERFUSION SAFETY VALVE

Richard A. Dewall, 247 Northview Rd., Dayton, Ohio

Filed Aug. 3, 1971, Ser. No. 168,642
Int. Cl. A61m *5/16*
U.S. Cl. 137—565 **3 Claims**

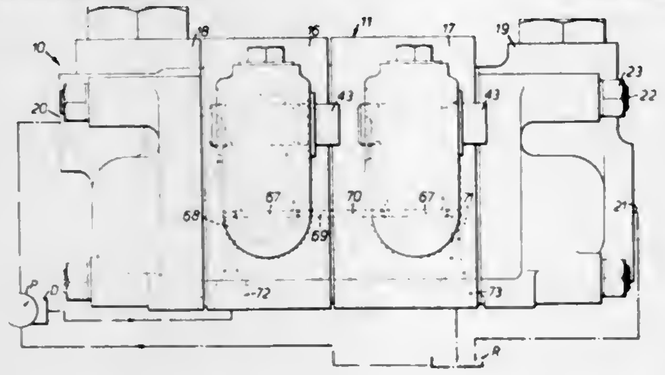


A perfusion safety valve for use in blood oxygenating systems. The valve includes an elongated, rigid, perforated tube and interiorly disposed therein is a collapsible membrane-like wall which may collapse to cut off the flow of blood through the tube. Exteriorly of the tube is a second membrane-like wall and the space between the two membrane walls is filled with a liquid. When a slight vacuum is pulled against the inner membrane wall, the liquid will pass through the perforations of the tube into the interior of the tube to cause collapse of the interior wall to shut off the flow through the valve to preclude the pumping of air into the arterial system of a patient using the oxygenating system.

3,717,175
SELECTOR VALVES

Kenneth Raymond Boydell, Tewkesbury, England, assignor to Dowty Technical Developments Limited, Cheltenham, England

Filed April 8, 1971, Ser. No. 132,478
Int. Cl. F16k *11/00*
U.S. Cl. 137—596.13 **12 Claims**

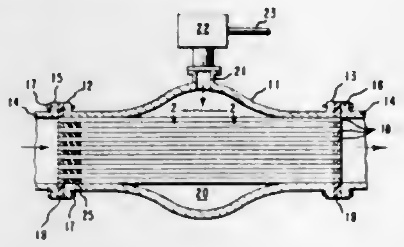


A selector valve having a valve element and a first unloader passage and a subsidiary unloader passage both communicable with exhaust and respectively associable with a first inlet connection and a second inlet connection. The valve element is movable from a first position, in which the first inlet connection is in communication with the first unloader passage and in which the element co-operates with the subsidiary unloader passage to produce a first fluid pressure at the second inlet connection, to another position, in which the first inlet connection is in communication with a service-line connection and in which the element co-operates with the subsidiary unloader passage to produce a change in pressure at said second inlet connection.

3,717,176
HYDRAULIC VALVE

Robert D. Smith, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Feb. 26, 1971, Ser. No. 119,251
Int. Cl. F16k *7/07*
U.S. Cl. 137—599 **8 Claims**



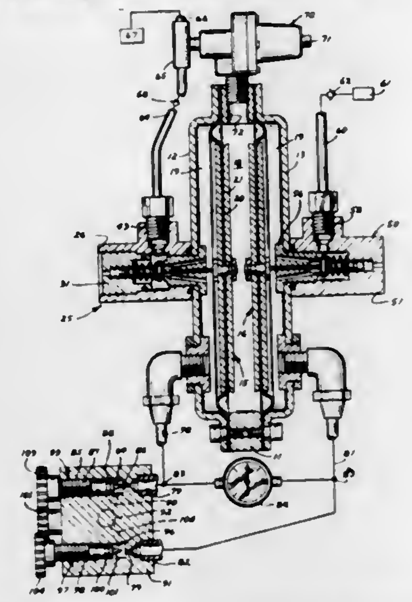
The use of a plurality of small fluid tight tubes made from a polyfluorinated plastic in place of the collapsible elastomeric bladder in a hydraulically activated valve, provides a valve which can be used to shut off or control the flow of corrosive liquids in a fluid line.

3,717,177
PROPORTIONAL GAS MIXING APPARATUS

Donald E. Giesmann, St. Paul, Minn., assignor to Tescon Corporation, Minneapolis, Minn.

Filed March 22, 1971, Ser. No. 126,700
Int. Cl. F16k *19/00*
U.S. Cl. 137—607 **14 Claims**

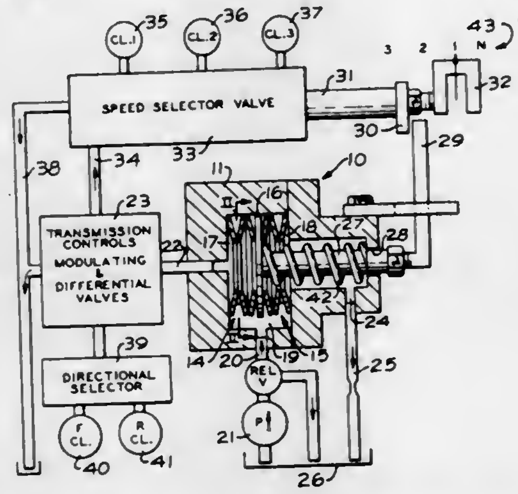
Proportional gas mixing apparatus having a housing separated into first, second and third chambers by two spaced diaphragms, a first and a second balanced valve assembly respectively operated by a first and a second of said diaphragms to control the gas pressure in the first and third chambers respectively, a pressurized source of the first gas supplying gas through the first valve assembly to the first chamber and through a pressure regulator to the second chamber, a pressurized source of a second gas for supplying gas through the second valve assembly to the third chamber, a mixer assembly having first and second inlets in fluid communication with the first and third chambers respectively, an outlet, first and second variable area orifices mechanically coupled to selectively provide a proportional inverse area relationship between each orifice for controlling fluid flow from the first and second inlets respectively to the outlet, and a null meter fluidly connected for indicating any pressure differential between the first and third chambers, one of the valve assemblies having a null adjustment.



3,717,178
SAFETY VALVE — BELLEVILLE

Thomas E. Allen, Mustang, Okla., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed July 19, 1971, Ser. No. 163,595
Int. Cl. F16k *11/14*
U.S. Cl. 137—610 **6 Claims**



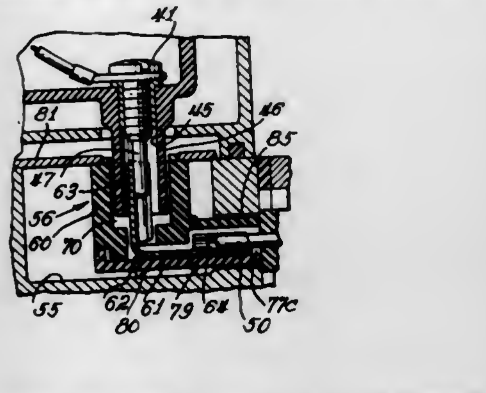
A safety valve for use in conjunction with the controls of a hydraulic transmission utilizes alternate stacks of Belleville springs which are selectively biased to divert a flow of fluid to or away from the activating elements of the transmission. The valve is pre-biased to divert fluid away from the controls when the vehicle engine is started until the drive selector is put in the neutral position.

3,717,179
SOLENOID OPERATED VALVE

Richard J. Clark, Sarasota, Fla., assignor to Rex Chainbelt Inc.

Filed April 29, 1971, Ser. No. 138,709
Int. Cl. F16k *11/00*; **H01f** *7/08*
U.S. Cl. 137—625.65 **7 Claims**

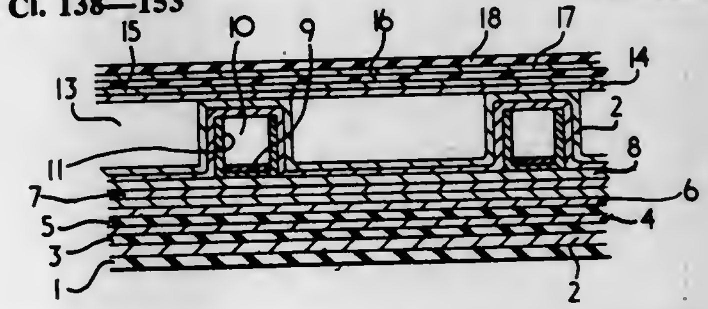
A solenoid operated valve having plug-in electrical connections wherein a solenoid positioned at an end of the valve body for controlling the valve spool has electrical connection pins extending into plug means positioned in the valve body. The plug means also receive electrical connection pins extending from a wiring box associated with the valve body.



3,717,180
FLEXIBLE HOSE

John Ambrose, New Waltham, and Edmund J. Shepherd, Holton-le-Clay, England, assignors to The Dunlop Company Limited, London, England

Filed Jan. 11, 1971, Ser. No. 105,298
Claims priority, application Great Britain, Jan. 14, 1970, 1,758/70; June 10, 1970, 28,111/70
Int. Cl. F16l *9/14*
U.S. Cl. 138—153 **5 Claims**

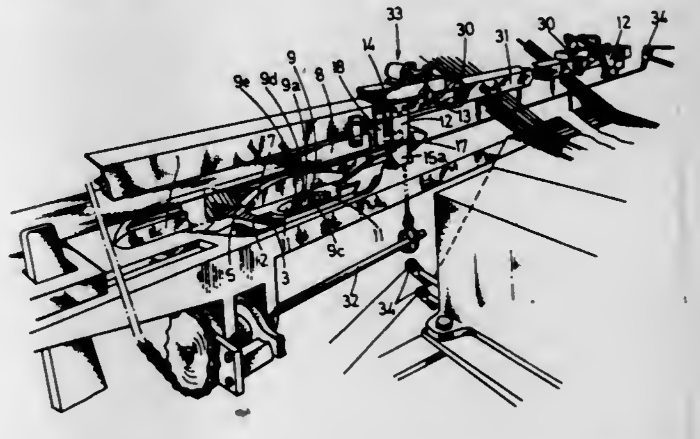


A process for manufacturing flexible hose in which spaced-apart reinforcement rings are fitted to the hose. The rings are of resinous material and contain reinforcement filaments. The resinous material may be applied in an uncured condition and may be applied into channel-section rings which act as moulds for the reinforcement rings, the resinous material being subsequently cured during vulcanisation of the hose assembly, of which the following is a specification.

3,717,181
LOOMS WITH A STATIONARY WEFT SUPPLY AND A WEFT CARRIER WITH GRIPPER

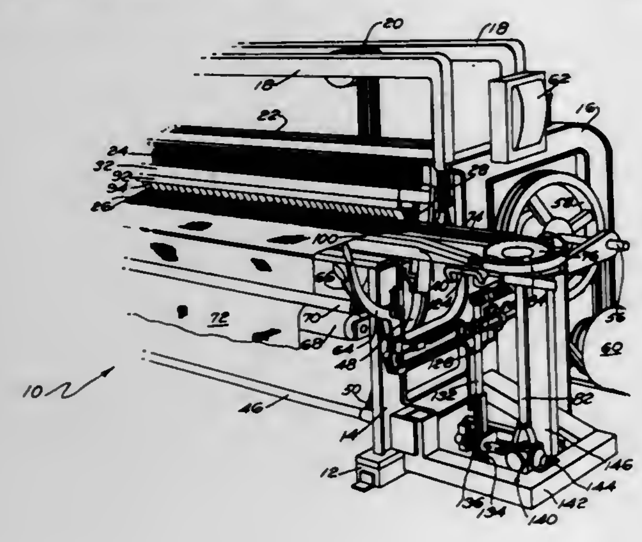
Aime Fabre, Montalieu, France, assignor to "Manta", Waasmunster, Belgium

Filed May 28, 1971, Ser. No. 147,932
Int. Cl. D03j *5/06*
U.S. Cl. 139—125 **3 Claims**



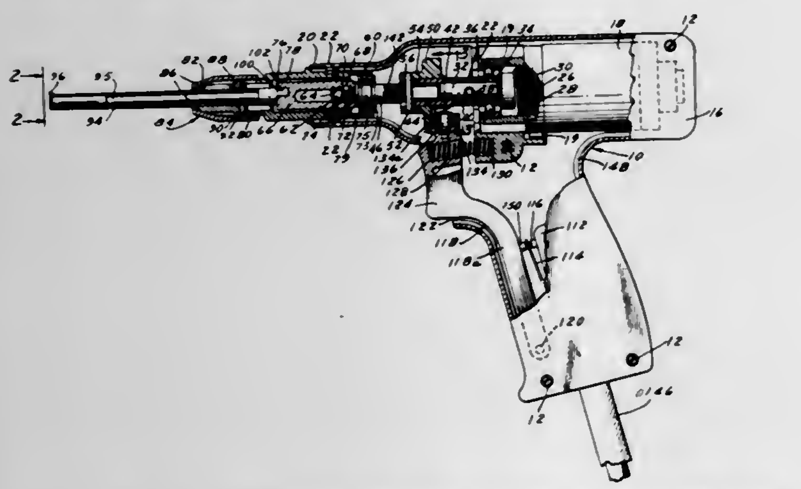
In a loom with a stationary weft supply and a weft carrier with gripper, the provision on the one hand of a detent, carried on the weft carrier, forcing the weft thread to be turned back around said detent between the portion of the thread drawn in the shed behind the weft carrier and the end of the thread locked in the gripper of the weft carrier and, on the other hand, of a holding gripper arranged on either side of the loom in the path of the said detent in order to seize the weft thread when it is released by the gripper of the carrier and of means to open said holding gripper after closure of the shed.

3,717,182
RAPIER LOOM
Robert O. Sparling, 20 Austin Ave., Smithfield, R.I.
Filed May 18, 1970, Ser. No. 38,137
Int. Cl. D03d *47/18*
U.S. Cl. 139—127 R **14 Claims**



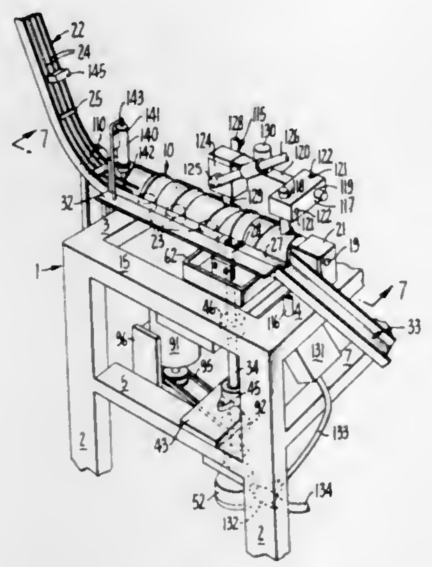
A rapier, or shuttleless, loom comprising a flexible rapier or tape, there being means for supporting, feeding and retracting the tape on its edge, there being additional guide means associated with the lay of the loom for maintaining the tape in juxtaposition to the front side of the reed as the tape is fed into and retracted from the shed. The means for feeding and retracting the tape is directly responsive to and is controlled by the means which rock the lay, whereupon the feed and retraction of the tape are in a predetermined time sequence to the rocking motion of the lay.

3,717,183
WIRE WRAPPING TOOL
Ronald G. Coss, Santa Ana, Calif., assignor to Standard Pneumatic Motor Company, Whittier, Calif.
Filed Nov. 2, 1970, Ser. No. 86,091
Int. Cl. B21f *15/04*
U.S. Cl. 140—124 **12 Claims**



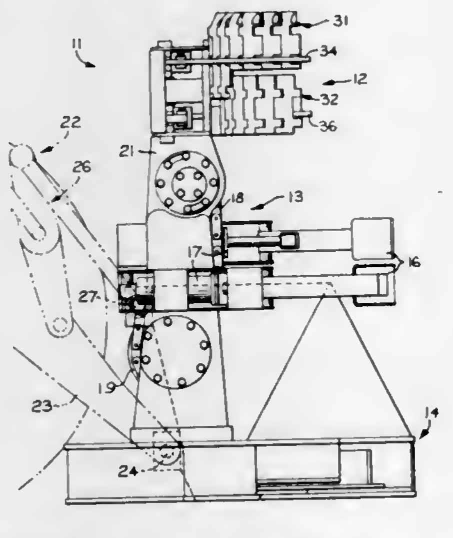
An electric power driven tool for making a solderless connection between a wire and an electrical terminal by wrapping the wire in successive convolutions about and in intimate engagement with the terminal. A wrapping bit is indexed to the proper point for quick, easy insertion of the wire and operates positively and quickly to reduce the time required for the complete wrapping cycle.

3,717,184
SEALING COMPOUND APPLYING MACHINE AND METHOD
Kaspar Bischof; Robert D. Hoskins, and John M. Shepherd, all of Modesto, Calif., assignors to Midcal Aluminum, Inc., Modesto, Calif.
Filed Sept. 18, 1970, Ser. No. 73,551
Int. Cl. B65b *1/04, 3/04*
U.S. Cl. 141—1 **11 Claims**



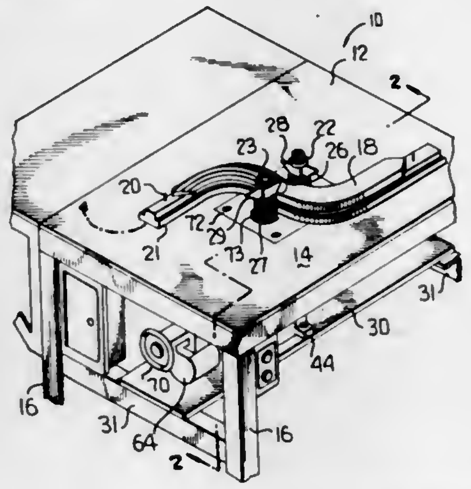
Machine for lining container closures including: a rotable worm gear having a thread with a root shape adaptable to engage a substantial portion of the periphery of the closure, a portion of said thread having a lead angle of zero degrees; a passageway adjacent said worm gear for guiding the closures into engagement with the worm gear thread and maintaining such engagement; a lining dispensing nozzle positioned above said passageway coplanar with the zero degree lead angle portion of the thread; and timing means controlled by the radial position of the worm gear and associated with the nozzle to cause the lining material to be dispensed into the closure while it is engaged by the zero degree lead angle portion of the thread.

3,717,185
DELIMBING ASSEMBLY FOR TREE HARVESTERS
Raymond L. Moser, Tremont, and Dorrance Oldenburg, Peoria, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.
Filed July 27, 1970, Ser. No. 58,467
Int. Cl. A01g *23/02*
U.S. Cl. 144—2 Z **6 Claims**



A delimbing assembly as part of a tree harvester, the harvester preferably also including a drive mechanism for gripping trees and axially moving them through the delimber and a shear assembly enabling the harvester to cut standing trees and delimb them, the delimbing assembly including a pair of flexible blades made up of pivoted links each having a sharpened edge, one end of each flexible blade being secured to a frame member in offset relation to each other, the free ends of the blades being connected to levers which are pivoted to the frame and controlled by a hydraulic motor for separating the blades to receive a tree and then overlapping them to provide a substantially continuous cutting edge about the periphery of the tree.

3,717,186
SHAPER APPARATUS FOR WOODWORKING
Burnice D. Davis, Jasper, Tex., assignor to Visador Company, Jasper, Tex.
Filed Jan. 8, 1971, Ser. No. 104,862
Int. Cl. B27c *5/06*
U.S. Cl. 144—145 A **18 Claims**

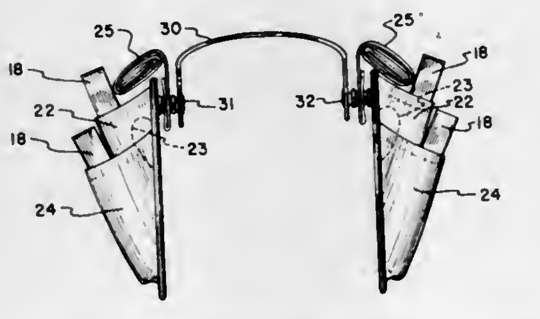


Apparatus for woodworking including first and second feed rolls coaxially mounted with respective first and second shaper spindles carrying knife means for engaging a workpiece carried through the work station on a template driven by the feed rolls. A first drive means is connected to the feed rolls and a second drive means is connected to the shaper spindles and adjustable mounting means are provided for adapting the device to different sized workpieces. The feed rolls are differentially driven, in opposite directions, while tool means carried by the shaper spindles are rotated in the same direction, in timed relation to each other, so that the cutting strokes of the tools can overlap.

3,717,187
WOOD FORMING METHOD
Francis C. Beall, State College, Pa., assignor to Research Corporation, New York, N.Y.
Filed Aug. 6, 1971, Ser. No. 169,865
Int. Cl. B27h *1/00*
U.S. Cl. 144—327 **3 Claims**

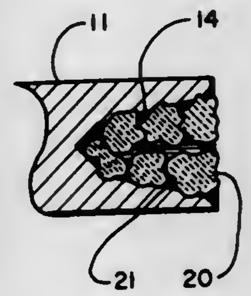
Wood is plasticized for forming operations by treatment with loweralkyl amines containing one to two carbon atoms.

3,717,188
CASSETTE CADDY
Morris L. Green, 239 Paramount Avenue, Salt Lake City, Utah
Filed June 28, 1971, Ser. No. 157,094
Int. Cl. A45c *11/00*
U.S. Cl. 150—1 **1 Claim**



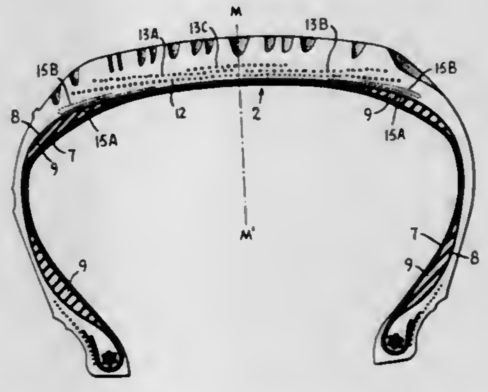
A caddy for storage, display and transport of magnetic tape cassettes. The caddy has attachment means thereon for releasable connection with corresponding attachment means on a vehicle. A plurality of flexible receiving pockets from one or more rows on a front surface and the top receiving pocket in each row of pockets has a pillow projecting across its mouth. The pillow supports a cassette stored in the upper pocket, to cant the top of the cassette outwardly from the caddy body. Each cassette serves to cant the one beneath outwardly and all of the cassettes, because the tops thereof are projecting outwardly of the caddy body, are easily grasped and removed from the pockets of the caddy. A removable flap means covers the cassettes housed in the caddy and is arranged to be rolled and stored, and removable straps allow a pair of the caddys to be connected for use as saddle bags.

3,717,189
METHOD AND APPARATUS FOR TIRE STUDS
Charles E. Gutshall, Ellwood City, Pa., assignor to Textron, Inc., Providence, R.I.
Filed Mar. 2, 1971, Ser. No. 120,223
Int. Cl. B60c *11/16*
U.S. Cl. 152—210 **9 Claims**



The tire stud includes a cylindrical casing having an enlarged head at one end and a substantially conical-like shaped blind bore extending inward from the other end. The largest cross-section of the bore is at the terminus of the casing. The bore is filled with a particulate ceramic abrasive and a matrix which bonds the bore materials therein. By bell mouthing the casing and then reducing the effective diameter thereof after filling the bore with the particles, a stud which mechanically retains the particles within the bore is produced.

3,717,190
RADIAL TIRE HAVING INTERPOSED PLIES AT TREAD REINFORCEMENT EDGES
Jacques Boileau, Clermont-Ferrand, France, assignor to Compagnie Generale des Etablissements Michlen, raison sociate Michelin & Cie, Clermont-Ferrand (Puy-de-Dome, France
Filed March 1, 1971, Ser. No. 119,689
Claims priority, application France, March 2, 1970, 7007456
Int. Cl. B60c *9/64*
U.S. Cl. 152—361 **7 Claims**



A radial tire has a tread reinforcement of two plies with staggered edges. Fittings of wedge-shaped cross section are interposed between the carcass and the tread reinforcement at each edge of the tread reinforcement. Each fitting comprises two interposed plies of different widths. The interposed plies comprise cords forming a triangulated structure with the radial carcass cords and extending laterally beyond the tread reinforcement.

3,717,191

PNEUMATIC TIRE WITH A BREAKER OF VARIABLE STIFFNESS

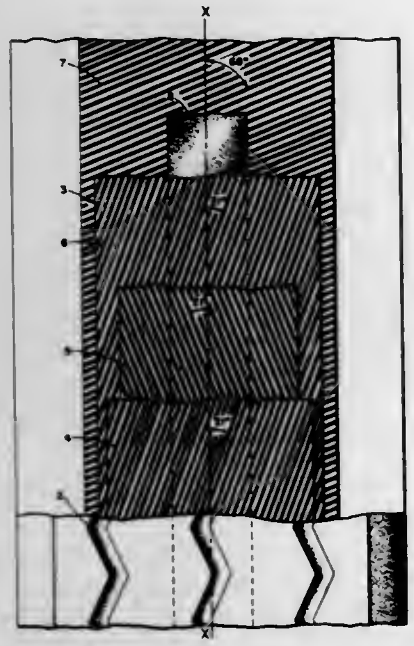
Wilfred H. Harrington, Solihull, and Alfred H. Grossett, Lichfield, England, assignors to The Dunlop Company Limited, London, England

Filed Sept. 8, 1970, Ser. No. 70,157

Claims priority, application Great Britain, Sept. 18, 1969, 46,011/69

Int. Cl. B60c *9/18*

U.S. Cl. 152—361 **11 Claims**



A pneumatic tire of the kind having a carcass, tread and breaker assembly. The breaker assembly comprises at least one layer of cords of high bias angle and at least two layers of cords of low bias angle. A layer of rubber compound of width less than the adjacent breaker layers is interposed between a pair of the breaker layers, preferably between the high bias angle layer and an adjacent low bias angle layer.

3,717,192

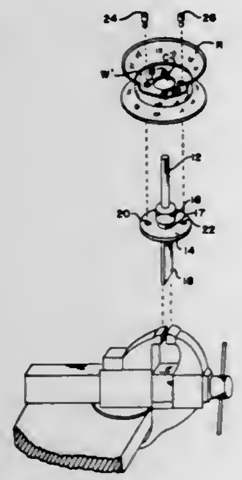
TIRE CHANGING APPARATUS FOR SMALL UTILITY TRAILER WHEELS

Donald R. Hoover, Rte. 3, Gastonia, N.C. 28052, and Glenn P. Kelly, 332 Lancelot Circle NE., Concord, N.C. 28025

Filed Apr. 7, 1971, Ser. No. 132,113

Int. Cl. B60c *25/06*

U.S. Cl. 157—1.1 **5 Claims**



A support plate having locking openings therethrough includes a downwardly extending securing means and an upwardly extending fulcrum post. A collar concentrically surrounds and is secured to the fulcrum post at a point spaced slightly above the upper surface of the support plate. As the wheel is initially received on the support plate, the locking openings in the plate are not in registry with the bolt openings in the wheel, so that the wheel must be shifted laterally to bring the bolt openings and the locking openings into alignment. The lateral shifting moves a portion of the wheel beneath the collar, and upon insertion of one or more locking pins through the bolt openings in the wheel and into the support plate, the wheel is securely held against lateral or vertical displacement during the tire changing operation. A tire tool includes at least one recess along the longitudinal edge thereof for the purpose of improving the lever angle of the tool when in operative engagement with the rim of the wheel.

3,717,193

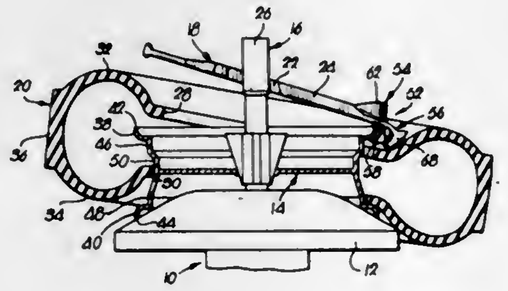
TIRE MOUNTING TOOL

Roger L. Craft, St. Joseph, Mo., assignor to FMC Corporation

Filed Feb. 5, 1971, Ser. No. 112,852

Int. Cl. B60c *25/04*

U.S. Cl. 157—1.3 **4 Claims**



A tool for mounting a tire upon a wheel having a drop center, the tool having a handle and head means on the handle, the head means including a leading element and a trailing member, the element and the member being angularly disposed on opposite sides of the center line of the handle of the tool, the tool being engageable with the wheel whereby the leading element is placed into engagement with the tire for moving successive edge portions thereof to a position outwardly of the wheel, the trailing member having means thereon for also engaging the tire whereby to push the tire into the drop center of the wheel.

3,717,194

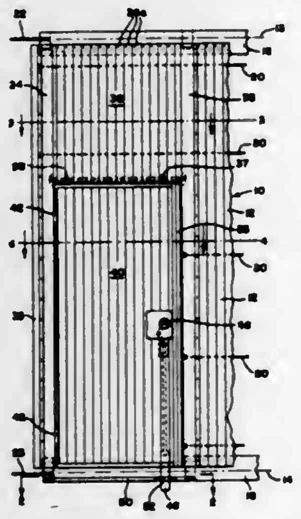
COILABLE PARTITION WITH PASSDOOR

Carl F. Gerken, New Castle, Ind., assignor to American Standard Inc., New York, N.Y.

Filed March 8, 1971, Ser. No. 121,863

Int. Cl. E06b *9/08*

U.S. Cl. 160—25 **5 Claims**



A coilable partition of the type which is stored within a coil box and movable in translation across a wall opening incorporates a passdoor at the leading end thereof in which the intermediate door stile and the lintel section above the door are coilable.

3,717,195

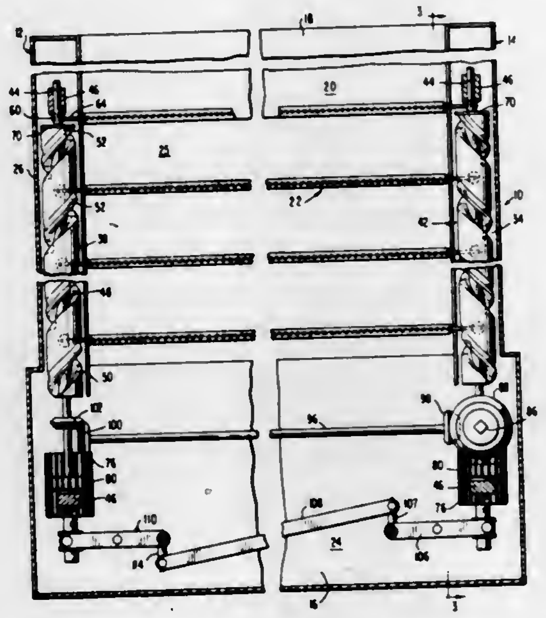
AUTOMATIC METAL LOUVERED SAFETY BLIND

Gaston A. Larranaga, 261 Congressional Lane, Rockville, Md.

Filed May 14, 1971, Ser. No. 143,340

Int. Cl. E06b *9/302*

U.S. Cl. 160—169 **14 Claims**



Lightweight, rigid, steel shell slats extend between rigid elongated rectangular box-like frame members mounted on opposite sides of the window opening. The slats include integral heads at each end, positioned within respective frame members and captured between pairs of helically grooved contiguous worms which are both rotatably mounted within the frame members allowing driving of the same while allowing axial shifting of one worm with respect to the other to effect tilting of all of the slats simultaneously. Manual or motor means allow manual or powered, automatic tilting of the slats.

3,717,196

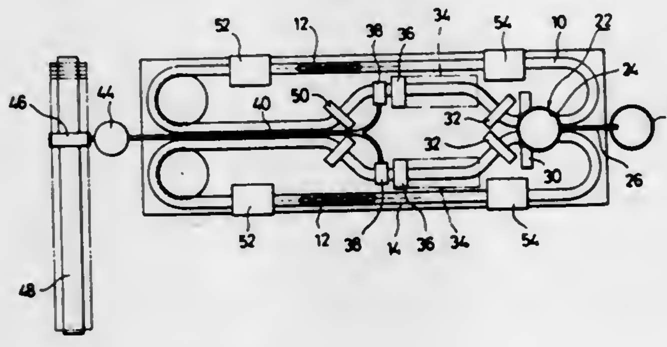
CONTINUOUS INGOT CASTING SYSTEM FOR THE INGOT MILL

Ichiro Kishi; Kazuyuki Matsui, and Yutaka Fujisawa, all of c/o Itoh Iron & Steel Works Co., Ltd., No. 4-1, 5-chome Matsue, Edogawa-ku, Tokyo, Japan

Filed May 19, 1971, Ser. No. 144,739

Int. Cl. B22d *5/00*

U.S. Cl. 164—270 **3 Claims**



A continuous ingot casting system for the ingot mill wherein the ingot molds are circulated throughout an endless mold travelling track providing along its pertinent portions all the necessary apparatus for the ingot casting including from a teeming device of the liquid steel to an ingot carrier for the cogging mill.

3,717,197

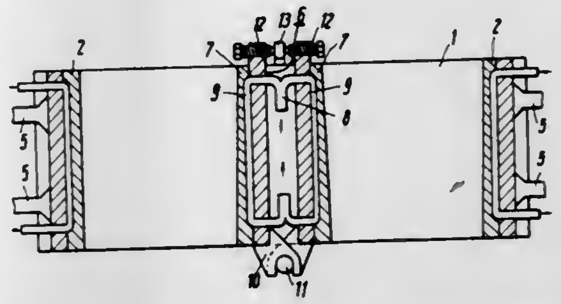
MOLD FOR CONTINUOUS CASTING OF SLAB INGOTS

Friedhelm Strack, Duisburg; Erich Keuper, 4 Dusseldorf, and Klaus Frenken, Mulheim-Ruhr, all of Germany, assignors to Mannesmann Aktiengesellschaft, Dusseldorf, Germany

Filed Jan. 15, 1971, Ser. No. 106,696

Int. Cl. B22d *11/00*

U.S. Cl. 164—273 **5 Claims**



Twin cavity mold with adjustable cross-sectional dimensions and variable cavity taper.

3,717,198

ADJUSTABLE DUMMY BAR HEAD FOR CONTINUOUS CASTING

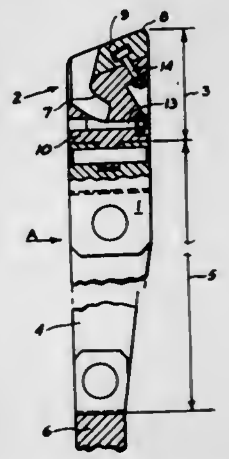
Heinrich Marti, Zurich; Josef K. Zeller, Weesen, and Ferdinand Fiala, Thalwil, all of Switzerland, assignors to Concast AG, Zurich, Switzerland

Filed Jan. 25, 1971, Ser. No. 109,316

Claims priority, application Switzerland, Jan. 27, 1970, 1066/70

Int. Cl. B22d *11/08*

U.S. Cl. 164—274 **10 Claims**



A dummy bar head for use in continuous casting machines which is adjustable to castings of different widths comprises a coupling member and an intermediate member which links the coupling member to the dummy bar. The coupling member includes at least one end member which is adjustable thereon. The coupling member is provided with an elongated groove of hook-shaped profile to receive molten metal. The end member which is adjustable thereon is also provided with a corresponding hook-shaped profile so that as the end member is adjusted with respect to the coupling member the effective length of the groove is altered correspondingly.

3,717,199

ORGAN ENCLOSURE MANTLE

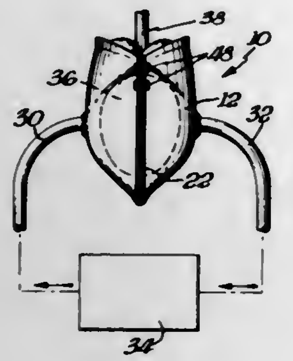
Stanley G. Dienst, Birmingham, Mich., assignor to Extracorporeal Medical Specialties, Inc.

Continuation-in-part of Ser. No. 91,247, Nov. 20, 1970, abandoned. This application Oct. 5, 1971, Ser. No. 186,641

Int. Cl. F28f *7/00*

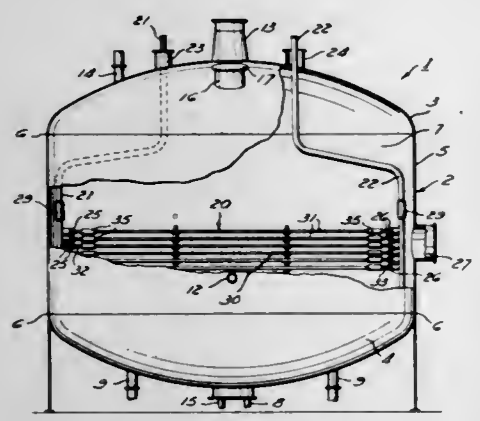
U.S. Cl. 165—46 **17 Claims**

An organ enclosure mantle comprises a flexible sac with a pocket-like membrane disposed therein and secured thereto along its top wall to form a closed chamber between the sac and membrane. The membrane includes an opening to permit an organ to be inserted therein. The membrane is made of a material which is expandable and heat exchangeable so that upon supplying a refrigerant to the chamber the membrane is caused to move into intimate contact with the organ and to maintain the organ at a cold temperature.



3,717,200
TUBE STRUCTURE REPAIR

Stanley J. Pavilon, Shaker Heights, Ohio, assignor to Arthur G. McKee & Company, Cleveland, Ohio
Division of Ser. No. 19,611, March 16, 1970, Pat. No. 3,638,684. This application June 2, 1971, Ser. No. 149,213
Int. Cl. F28d *1/06*
U.S. Cl. 165—75 **9 Claims**

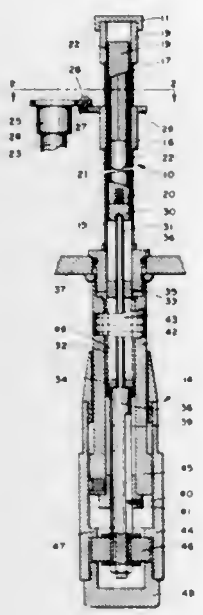


A method and apparatus for repairing tubes that, during use, develop on the tube surfaces contaminating layers that prevent joining of new tube sections, as in fluid circulating heat transfer installations for chemical reactors. At least two surrounding protective sleeves are initially joined as by welding, to a tube at spaced locations on the tube to protect underlying portions of the tube from development of such layers. If a defect occurs between the sleeves, the defective tube may be removed by cutting through the sleeves and the tube underneath, removing the cut tube section, removing the remaining cut sleeve portions from the adjacent tube ends, and then joining a replacement tube section to the portions of the unremoved tube that were protected by the sleeves, preferably with new sleeves fixed in place over the resulting joints.

3,717,201
CRYOGENIC THERMAL SWITCH

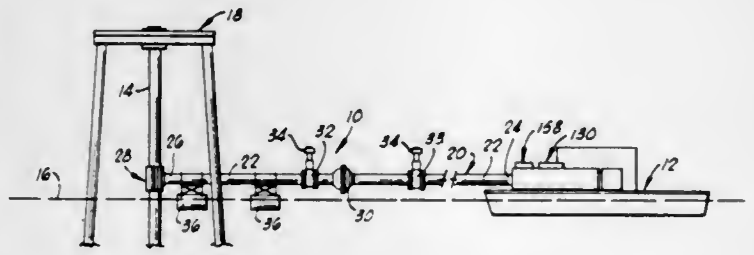
Thomas P. Hosmer, Concord, and John F. Peterson, Lynnfield, both of Mass., assignors to Cryogenic Technology, Inc., Waltham, Mass.
Filed April 30, 1971, Ser. No. 139,057
Int. Cl. F28f *27/00*
U.S. Cl. 165—96 **11 Claims**

A thermal switch for linking a source of cryogenic refrigeration to a load. A copper plunger operating in a pressurized helium atmosphere provides a thermal link between a heavy-walled copper heat station cooled by a refrigeration source and one or more successive thick walled copper heat stations thermally separated by thin-walled stainless steel sections. Movement of the plunger can be used to control the temperature of the successive heat stations and the load associated with them. The thermal switch and its linear driving mechanism may be located within different physical environments and the switch itself is adapted to cross barriers defining different physical environments.



3,717,202
REMOTE WELL PLUGGING APPARATUS

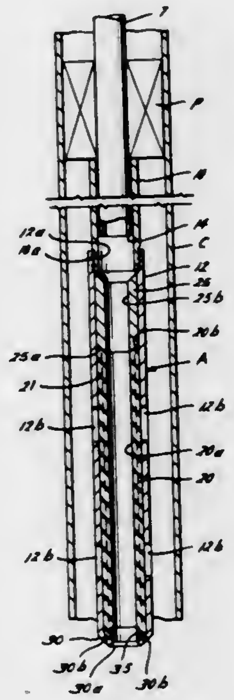
Melvin N. Burrow, Route 1, Box 127, Tryon, Okla.
Filed Aug. 30, 1971, Ser. No. 175,872
Int. Cl. E21b *29/00, 35/00*
U.S. Cl. 166—55 **21 Claims**



A remote well plugging apparatus for plugging a well casing to stop the flow of fluid therethrough from a remote location with respect to the well casing including: an extension assembly having a communication path extending therethrough, the extension assembly extending between the well casing and the remote location; and a clamping assembly connected to one end of the extension assembly for engaging a portion of the well casing and securing the extension assembly in a fixed position relative to the well casing in a clamped position thereof, the clamping assembly being actuated to the clamped position and securedly affixed to the well casing from the remote location, so that a cutting apparatus and a plugging apparatus can be moved from the remote location to an engaging position with the well casing at a fixed position on the well casing via the communicating path through the extension assembly.

3,717,203
AUTOMATIC WELL SHUT-OFF APPARATUS

Maurice Kirkpatrick, 4734 Briarbend, and Donnell E. Waggener, 5035 Yarwell, both of Houston, Tex.
Filed Feb. 10, 1971, Ser. No. 114,228
Int. Cl. E21b *33/00*
U.S. Cl. 166—224 **7 Claims**



An automatic well shut-off apparatus which is adapted to be disposed in a well below a single or multiple string packer for automatically shutting off the flow of fluid upwardly in a well when the pressure differential between the well fluid externally of the apparatus and the pressure in the apparatus reaches a predetermined amount. The apparatus includes a collapsible sleeve which collapses to a closed or shut-off position only when the predetermined pressure is reached and it is sufficient to overcome the collapse resistance of the sleeve.

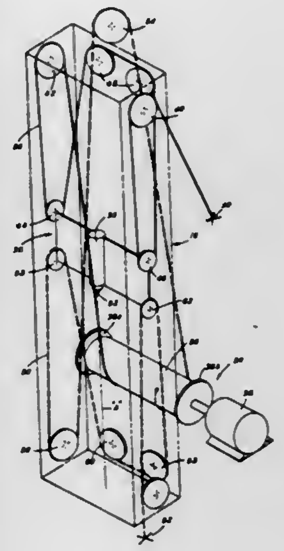
3,717,204
METHOD AND COMPOSITION FOR TREATING HIGH-TEMPERATURE SUBTERRANEAN FORMATIONS

John W. Scheffel, Fullerton, and Paul W. Fischer, Whittier, Calif., assignors to Union Oil Company of California, Los Angeles, Calif.
No Drawing. Filed July 6, 1971, Ser. No. 160,091
Int. Cl. C08f *21/04, 45/52;* **F21b** *33/138*
U.S. Cl. 166—283 **23 Claims**

A water-insoluble particulate composition having controlled slow oil-solubility at elevated temperatures is disclosed. The composition is comprised of solid particles of homogeneous mixture of (1) about 2 to 15 weight percent of a polymer selected from the class consisting of polyethylene and ethylene-vinyl acetate containing about 15 to 30 weight percent vinyl acetate, or a combination of both, (2) about 75 to 90 weight percent of a paraffin wax having a melting point between about 130° F. and 175° F., and (3) about 1 to 20 weight percent of a solubility retarding agent selected from the group consisting of long chain aliphatic hydrocarbons, aliphatic amides and oxidized hydrocarbon waxes melting at a temperature between about 250° F. and 325° F. Also disclosed is a process employing this particulate composition in drilling wells into high-temperature subterranean formations, and in fracturing and treating such formations.

3,717,205
DRAW WORKS FOR DRILLING RIG

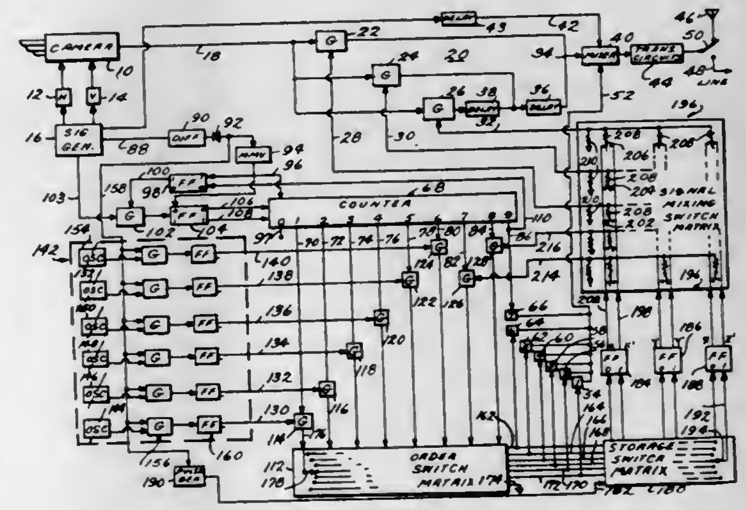
Giles H. Wilderman, Calgary, Alberta, Canada, assignor to Kenting Drilling Limited, Calgary, Alberta, Canada
Filed Jan. 27, 1971, Ser. No. 110,116
Int. Cl. E21b *19/08*
U.S. Cl. 173—147 **5 Claims**



A drilling apparatus includes a mast having a drill head arranged for travel longitudinally thereof. The drill head is capable of rotatably supporting a string of drill pipes within the mast. Hoisting and draw down cables are connected to the drill head for applying lifting or draw down forces to the latter. The hoisting and draw down cables are connected to a single winch drum in such a fashion that when the drum is rotated one of the cables is tensioned and wraps on the drum in a single layer while the other cable unwraps therefrom whereby lifting or draw down forces are applied to the drill head so that the latter is caused to travel along the mast in a direction determined by the direction of rotation of the drum. The drum is dimensioned such that not more than one layer of cable need wrap on a drum regardless of the position of the drill head within the mast. The hoisting cable is connected adjacent one end of the drum while the draw down cable is connected adjacent its other end.

3,717,206
SCRAMBLED TELEVISION

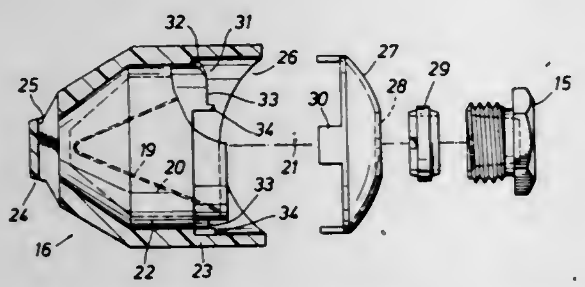
Vincent R. Zopf, Commack, and William J. Shanahan, Northport, N.Y., assignors to Skiatron Electronics & Television Corporation, New York, N.Y.
Filed Nov. 2, 1970, Ser. No. 85,917
Int. Cl. H04n *1/44*
U.S. Cl. 175—5.1 **19 Claims**



A television scrambling system in which the video and synchronizing signals are time shifted on a randomly coded basis. The code is partially generated by periodically occurring counter signals being randomly gated to an order switch matrix which is manually changeable to any of numerous available orders for different programs of the randomly gated counter signals, and the ordered signals are applied both to a set of tone generators and a storage switch matrix. The resulting tones are transmitted to convey an unscrambling code to receivers, while the signals in the storage switch matrix are manually changed for different programs to cause different sets of flip-flop output signals which are then mixed by another switch matrix and applied to different video signal delay lines for gating same for transmission.

3,717,207
PERFORATING APPARATUS

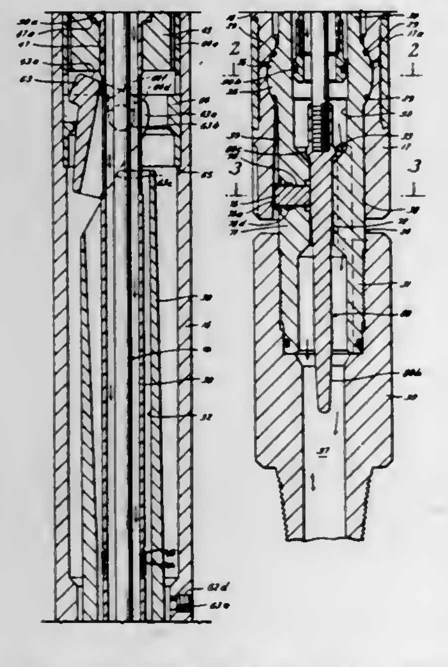
James B. Shore, Friendswood, Tex., assignor to Schlumberger Technology Corporation, New York, N.Y.
Filed June 23, 1971, Ser. No. 155,963
Int. Cl. E21b *43/117*
U.S. Cl. 175—4.6 **16 Claims**



In the representative embodiment of the present invention disclosed herein, shaped charges adapted for installation in a typical end-loaded carrier are respectively provided with a rigid annular retainer member which is movably disposed on the forward end of each charge. Camming surfaces are cooperatively arranged for shifting the retainer member forwardly in relation to the shaped charge once it is installed in the carrier facing and aligned with a lateral port therein. In this manner, when the port plug is installed in the port, it will engage the retainer and tightly anchor the shaped charge in position.

3,717,208
SEAL AND EQUALIZING ARRANGEMENT FOR A DIRECTIONAL DRILLING APPARATUS

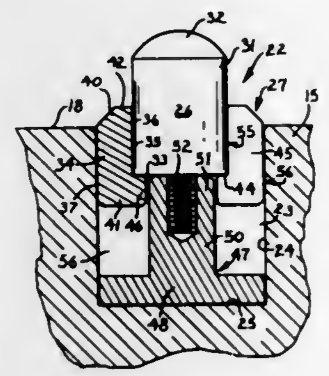
Edwin A. Anderson, 1104 Chimney Rock Road, Houston, Tex.
Filed Aug. 5, 1971, Ser. No. 169,311
Int. Cl. E21b *7/08*; **F16b** *27/04*
U.S. Cl. 175—74 **19 Claims**



A deflection tool including a lower tubular assembly pivotally mounted within an upper tubular assembly, which upper assembly is provided with a piston and lever mechanism for urging the lower tubular assembly to pivot relative thereto, is provided with a seal and equalizing arrangement to inhibit fouling and to balance hydraulic pressures to better enable the lower tubular assembly to return to a nonpivoted relationship when the desired deflection in a well bore has been accomplished.

3,717,209
REPLACEABLE WEAR-RESISTANT ELEMENT AND METHOD FOR REPLACING SAME

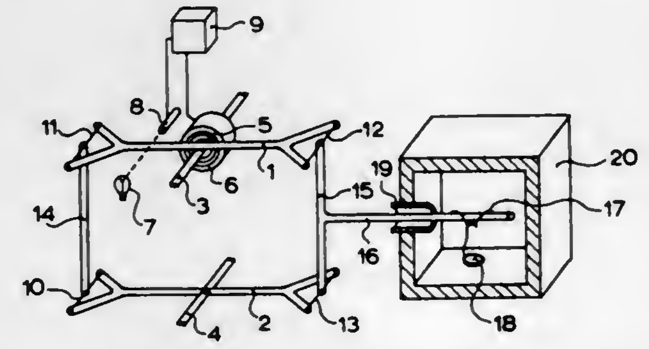
Gary L. Sheldon, Moscow, and Rex F. Kimberling, Lewiston, Idaho, assignors to Pacific Tooling and Engineering Company, Lewiston, Idaho
Filed June 10, 1971, Ser. No. 151,859
Int. Cl. E21c *13/00*
U.S. Cl. 175—413 **19 Claims**



As a preferred embodiment, a drill bit is described containing a plurality of wear-resistant cutting element assemblies, each assembly having a replaceable wear-resistant cutting element support in a bit recess with a split sleeve. The recess has a space behind the sleeve and cutting element with an anvil member located therein to prevent further penetration of the cutting element, but which enables the sleeve to be pushed further into the recess to release the cutting element when a force of sufficient magnitude is applied thereto.

3,717,210
BALANCE

Bauke S. Sieswerda, Geleen, Netherlands, assignor to Stamicarbon N.V., Heerlen, Netherlands
Continuation-in-part of Ser. No. 794,219, Jan. 27, 1969, abandoned. This application March 25, 1971, Ser. No. 77,697
Claims priority, application Netherlands, Jan. 25, 1968, 6801105
Int. Cl. G01g *7/00*
U.S. Cl. 177—196 **2 Claims**

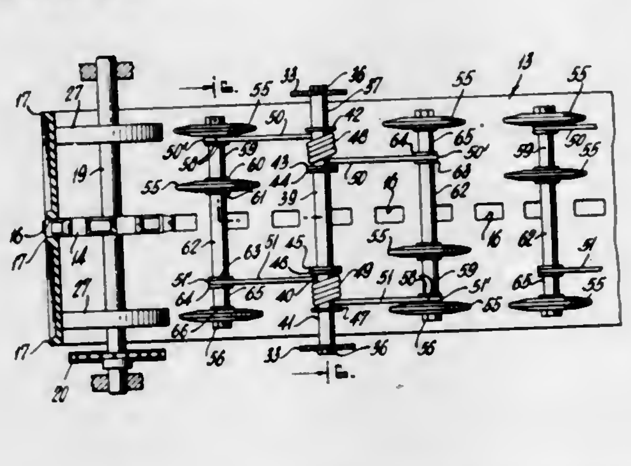


A thermogravimetric balance comprising a vertically disposed load carrying arm connected at each end through tension wires to first and second horizontally disposed balance arms connected at their mid-points to tension strips or wires. The other ends of the balance arms are linked through tension wires to a connecting element so that the balance arms, load carrying arm and connecting element comprise a vertically

disposed parallelogram. Rotation of said first balance arm out of its equilibrium position will actuate a control circuit which will effect the application of a restoring movement to the balance arm, the amount of current required to restore the balance arm being used as a measure of the weight value. Dimensional variations due to temperature changes in the load carrying arm are compensated for by effecting compensating movement in the parallelogram structure.

3,717,211
SPRING MOUNTING FOR SNOWMOBILE BOGIE WHEELS

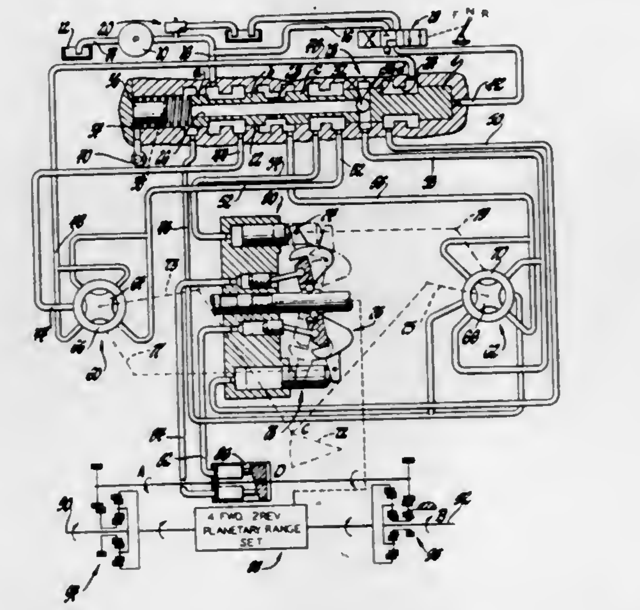
Harry R. Carter, Moscow, Pa., assignor to Poloron Products, Inc., New Rochelle, N.Y.
Filed March 18, 1970, Ser. No. 20,729
Int. Cl. B62d *55/16*
U.S. Cl. 180—5 R **11 Claims**



An improved bogie wheel structure for snowmobiles and similar vehicles utilizing helical springs carried by a transverse shaft with the ends of the springs extending outwardly and carrying axles, each supporting a plurality of bogie wheels.

3,717,212
STEER CONTROL FOR HYDROSTATIC SYSTEM

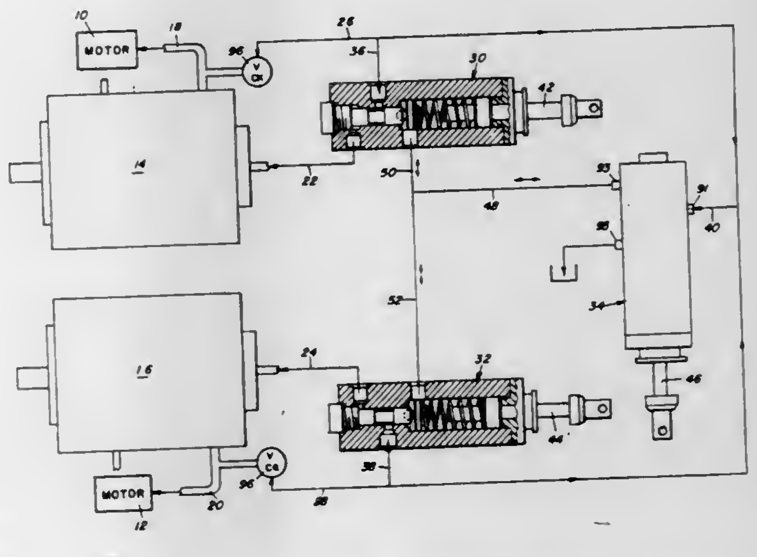
Carl Richard Potter, Indianapolis, Ind., assignor to General Motors Corporation, Detroit, Mich.
Continuation-in-part of Ser. No. 869,316, Oct. 24, 1969, abandoned. This application Sept. 20, 1971, Ser. No. 181,884
Int. Cl. B62d *11/18*
U.S. Cl. 180—6.44 **4 Claims**



A servo control system for use with a steer by driving vehicle in which the steer propulsion is generated by a hydrostatic drive which provides steer bias to the propulsion. A pair of operator controlled servo mechanisms control the displacement of the pump for the hydrostatic drive. One of the servos is effective during forward driving and the other is effective during reverse driving thus permitting the operator to move the steer control lever in one direction for right turn and another direction for left turn. A spool valve controls the distribution of the control fluid to the pump displacement control motors from the servo mechanisms.

3,717,213
VEHICLE DRIVE SYSTEM AND CONTROL MEANS THEREFOR

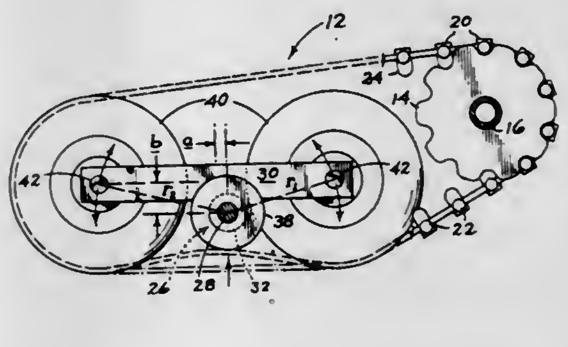
Robert A. Roe, and Gerald C. Anderson, both of Oconomowoc, Wis., assignors to Applied Power Industries, Inc., Milwaukee, Wis.
Filed July 17, 1970, Ser. No. 55,729
Int. Cl. B62d *11/04*
U.S. Cl. 180—6.48 **4 Claims**



A hydraulic drive system for motor vehicles, particularly track vehicles, of the type having hydraulic motors for each of the tracks and pumps for each of said motors, with each pump being driven by a prime mover. The output of each pump is inversely proportional to the pressure of a fluid control signal fed back from the output line of the pumps through a pressure regulator which regulates the pressure of the control signal. A governor-regulator communicates with the first-mentioned regulators and sets the lower limit of the pressure range of the control signal and thereby sets the upper limit on the speed of the vehicle because of the inverse relationship between the output of the pumps and the pressure of the control signals.

3,717,214
TRACKED VEHICLE WALKING BEAM ASSEMBLY WITH EQUALIZING MEANS FOR GROUND PRESSURE AND TRACK LENGTH

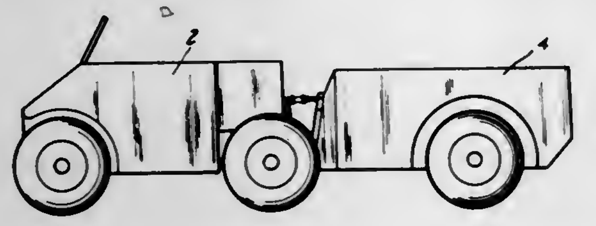
Richard H. A. Schoonover, West Linn, Oreg., assignor to Formac International Inc., Seattle, Wash.
Filed July 31, 1970, Ser. No. 60,057
Int. Cl. B62d *55/08*
U.S. Cl. 180—9.5 **5 Claims**



A sprocket-driven, endless track drive for tracked vehicles has a walking beam assembly provided with equalizing means for equalizing variations in ground pressure and track length. The assembly comprises a support shaft extending laterally from the vehicle centrally of the track. A walking beam is pivotally mounted on the shaft. Forward and rearward bogey wheels substantially aligned horizontally on a plane below the sprocket are rotatably mounted on the ends of the walking beam, rearwardly of the sprocket. The mounting means mounting the walking beam is positioned forwardly of the longitudinal center of the walking beam a distance predetermined to stiffen the forward wheel against vertical displacement as the track transverses an obstacle. It also is positioned below the plane of the walking beam a distance predetermined to move the rear wheel outwardly and inwardly with upward and downward movement of the forward wheel, respectively. In this manner compensation is afforded for ground pressure and track length variations during operation of the vehicle.

3,717,215
CROSS-COUNTRY VEHICLE

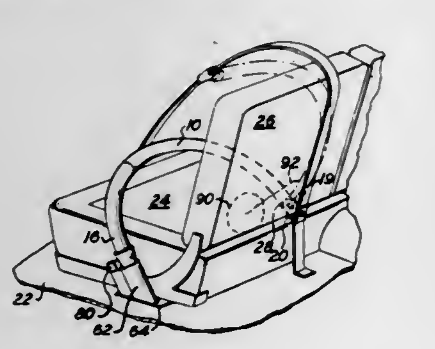
Russell L. Nigg, Troy, Mich., and Guy R. Olinger, Dallas, Tex., assignors to The United States of America as represented by the Secretary of the Army
Filed Nov. 30, 1970, Ser. No. 93,678
Int. Cl. B60d *7/00*
U.S. Cl. 180—14 R **14 Claims**



A three-axle vehicle is provided in two parts, two axles under the forward part and one under the rear part, and the two parts are articulated so as to have pitch and roll capabilities of the parts relative to each other. These capabilities are negatived by two truss structures securable between the parts, one on each side of the roll axis and each truss comprising a triangle of which one side is the structure of one of the two parts. A tension member for each ground-engaging member of the intermediate axle keeps the ground-engaging members off the ground when the two parts are rigidized by the trusses, so that a tire or wheel may be taken from the intermediate axle to replace a damaged tire or wheel on either of the front or rear axles. Rigidized, the vehicle functions as a four-wheel, two-axle type.

3,717,216
VEHICLE RESTRAINT ASSEMBLY

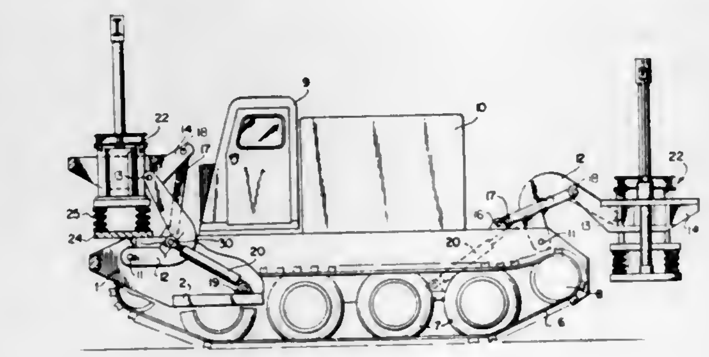
Barbara G. Rothschild, 2134 Springdale Drive, Columbus, Ga. 31906
Filed Nov. 3, 1971, Ser. No. 195,297
Int. Cl. B60r *21/10*
U.S. Cl. 180—82 C **11 Claims**



A restraint formed of a pair of sections that are relatively movable towards and away from each other between a contracted and an expanded position with both sections being movable between an open and a closed position. A tongue coacts with the restraint to lock the restraint in closed and contracted position. The restraint is restrained from expansion when in its closed position. The movement of the tongue to release the restraint for opening movement also operates a mechanism to release the restraint for expansion.

3,717,217
MECHANISMS FOR MOUNTING AND STOWING SEISMIC VIBRATORS ON A VEHICLE

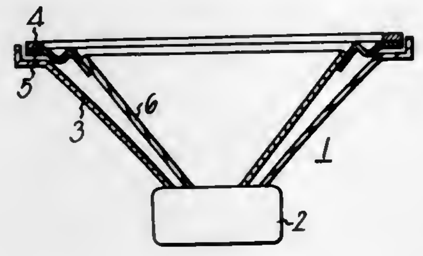
Kurt H. Muecke, and Marchall A. Milnes, both of Calgary, Alberta, Canada, assignors to Flextrac Nodwell Ltd., Calgary, Alberta, Canada
Filed June 5, 1970, Ser. No. 43,711
Int. Cl. G01v *1/14*
U.S. Cl. 181—.5 VM **8 Claims**



A vehicle particularly a tracked vehicle adapted to carry at least one seismic vibrator and including a mechanism adapted to mount a carrier frame structure for the vibrator on the vehicle for positive displacement of the vibrator between an extended operative position overlying the ground and a retracted stowed position overlying a portion of the vehicle. The mechanism adapted to mount the carrier frame structure comprise a linkage arrangement defining a parallelogram configuration pivotally connected to the vehicle frame and the carrier frame structure actuated by two hydraulic cylinders and arranged for positive and bodily displacement of the carrier frame structure and the vibrator.

3,717,218
LOUDSPEAKER

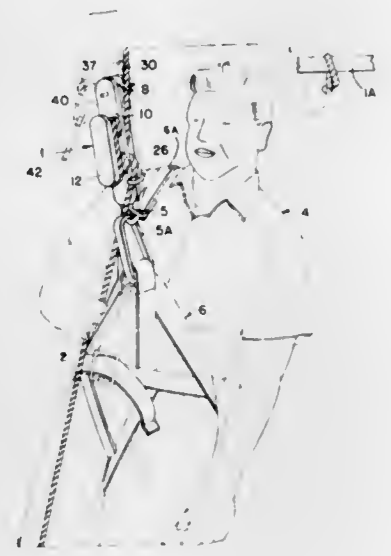
Takeo Shiga, Kawasaki; Toshihiko Takagi, Kanagawa-ken; Yoshihide Arakawa, Kita-ku, and Hisao Sato, Tokyo, all of Japan, assignors to Hisao Sato, Tokyo and Nippon Columbia Co., Ltd., Kanagawa-ken, both of Japan, part interest to each
Filed April 1, 1971, Ser. No. 130,086
Claims priority, application Japan, April 7, 1970, 45/29692
Int. Cl. G10k *13/00;* **H04r** *7/00*
U.S. Cl. 181—32 R **7 Claims**



A loudspeaker having a cone suspension system which is formed of materials such as collagen fiber, a mixture of collagen fiber with other fiber, collagen fiber impregnated with asphalt or latex, or other fibers impregnated with asphalt or latex to improve the frequency response characteristic.

3,717,219
DESCENT AND ASCENT DEVICE FOR USE ON A ROPE

Joseph J. Hoffman, 4133 McGaha, Wichita Falls, Tex.
Filed Nov. 23, 1970, Ser. No. 91,671
Int. Cl. A62b *1/14*
U.S. Cl. 182—6 **12 Claims**

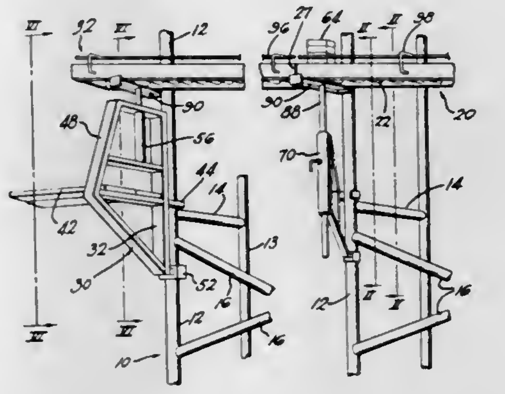


A device to be used for descent and ascent on a rope, which rope is anchored near its upper end. A first rope engaging member adapted to be threaded onto the rope intermediate the ends thereof, without passing the ends of the rope therethrough, and, by the reverse operation, the first rope engaging member may be removed from the rope without passing the ends of the rope therethrough. When the device is used for descent on a rope. Friction on the rope is generated by a plurality of cylindrical members on the device to enable a person to be lowered at a controlled rate of speed, by manipulation of the tension on the loose or free end of the rope. A cam friction member is provided which is utilized to hold the device and the person in static relation with respect to the rope when desired, or to cooperate with a second rope engaging member when ascending the rope. When ascending a rope, which is anchored near its upper end, a rope engaging mechanism is pivotally mounted on the feet of the person doing the climbing, which mechanism has a rope engaging cam associated therewith, so, by movement of the feet laterally, the second rope engaging member may be clamped to the rope to enable a cam actuated friction member supporting the climber to be released from the rope and be moved upwardly to engage with the rope at a higher elevation, so by alternately contracting and extending the legs, the climber can climb upwardly on the rope, coupled with the climber moving the first rope engaging member upwardly and frictionally engaging the member with the rope, the climber may readily ascend the rope to the anchor point.

3,717,220
CONSTRUCTION CONVEYING SYSTEM AND COMPONENTS THEREFOR

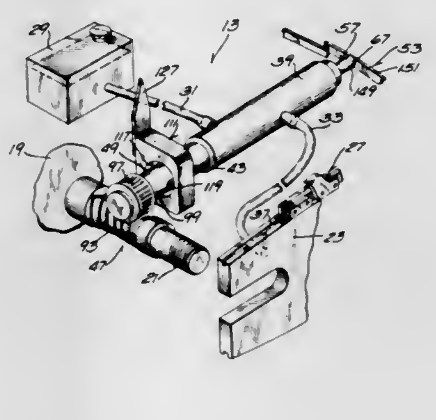
Harvey D. Donker, 7373 Kraft Avenue, Caledonia, Mich., and Warren J. Kuiper, 1311 Richwood Drive, S.E., Grand Rapids, Mich.
Continuation of Ser. No. 805,683, March 10, 1969, abandoned. This application Feb. 12, 1971, Ser. No. 115,043
Int. Cl. E04g *1/15*
U.S. Cl. 182—129 **7 Claims**

A scaffold, a conveyor mounted thereon, a supply station and vertically adjustable mounting brackets supporting the conveyor. One of these brackets also supports one end of the supply station positioned at one end of the conveyor, the conveyor having a railing and being tiltable to force the conveyed material to bear on the railing.



3,717,221
CHAIN SAW WITH OIL PUMPING AND SIGNALING ARRANGEMENT

Ulrich O. Densow, Peterborough, Ontario, Canada, assignor to Outboard Marine Corporation, Waukegan, Ill.
Filed Sept. 4, 1970, Ser. No. 69,686
Int. Cl. F16n *13/02, 29/04*
U.S. Cl. 184—6.4 **12 Claims**

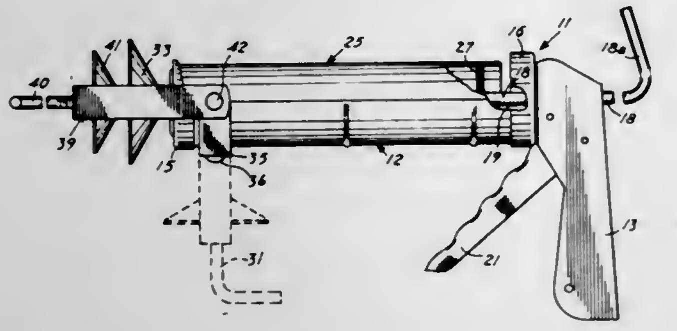


Disclosed herein is an oil pumping system or arrangement including a piston which is arranged for rotating and reciprocating movement in a pumping chamber to effect pumping operation, together with means communicating with the pumping chamber for signaling the absence of oil in the system. The piston and the pumping chamber include means for effecting supply and discharge of oil in response to rotary and reciprocating movement of the piston. Such means includes two axially adjacent flats on the piston and location of the inlet and outlet ports in the pumping chamber in axially spaced relation so that both of the inlet and outlet valves are closed during a portion of the piston travel on the compression stroke, whereby to generate a pumping pressure which is utilized in the signaling system. Also disclosed herein is means for reciprocating the pumping piston in response to rotation thereof and for varying the length of piston pumping reciprocation independently of the speed of piston rotation.

3,717,222

DISPENSING APPARATUS FOR PACKING GREASE IN FRICTION BEARINGS AND THE LIKE

John H. Moline, 2425 Balsam Drive, Boulder, Colo.
Filed Dec. 15, 1970, Ser. No. 98,234
Int. Cl. F01m *11/00*
U.S. Cl. 184—1 D **9 Claims**

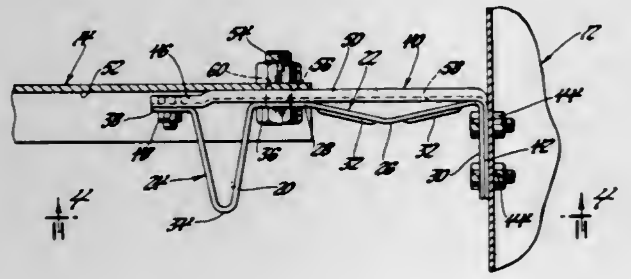


The pressure gun of the present invention can be interchangeably used for dispensing grease, caulking or other viscous materials through utilization of a novel and improved insert nozzle and movable carrier frame.

3,717,223

ENERGY ABSORBER

John A. Alfes, Drayton Plains, Mich., assignor to General Motors Corporation, Detroit, Mich.
Filed Sept. 20, 1971, Ser. No. 182,004
Int. Cl. B60r *19/04;* **F16d** *63/00*
U.S. Cl. 188—1 C **4 Claims**

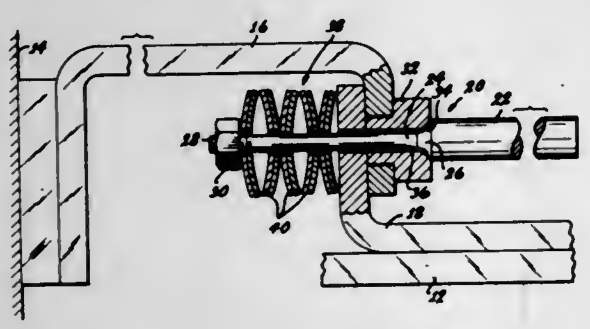


An energy absorber useful for automobile vehicle bumpers of the like includes a first energy absorbing element adapted to buckle under compressive load, a second element adapted to unfold under tensile load, and an impact distributing member adapted to simultaneously compressively load the first element and tensilely load the second element on the application of impact force.

3,717,224

TWO STAGE ENERGY ABSORBER

Austin F. Leach, Portland, and Gary Karl Sandberg, Aloha, Oreg., assignors to Omark Industries, Inc., Portland, Oreg.
Filed Nov. 15, 1971, Ser. No. 198,760
Int. Cl. F16f *7/12*
U.S. Cl. 188—1 C **3 Claims**

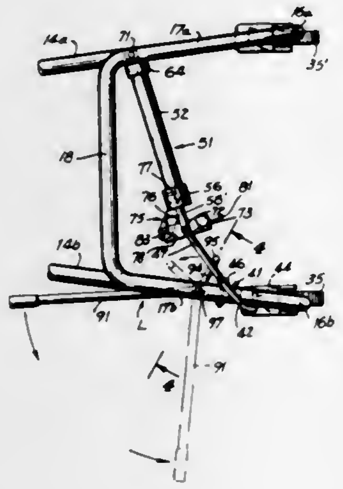


A device for absorbing energy wherein two members are bolted together, said device adapted to absorb energy when one of the members receives an impact urging separation of the members. A resilient pad in the form of a thick elastomeric washer on the bolt absorbs minor impact and a die through which a drawable portion on the bolt is drawn absorbs severe impact.

3,717,225

ANTI-THEFT DEVICE FOR A SHOPPING CART

Abraham Rashbaum, 199-29 22nd Ave., Whitestone 57, N.Y.; Robert Humphrey, Pelham, and Peter Consiglio, Lindenhurst, all of N.Y., assignors to said Rashbaum, by said Humphrey and Consiglio
Filed Jan. 25, 1971, Ser. No. 109,128
Int. Cl. B60t *7/16;* **B62b** *5/04*
U.S. Cl. 188—29 **19 Claims**



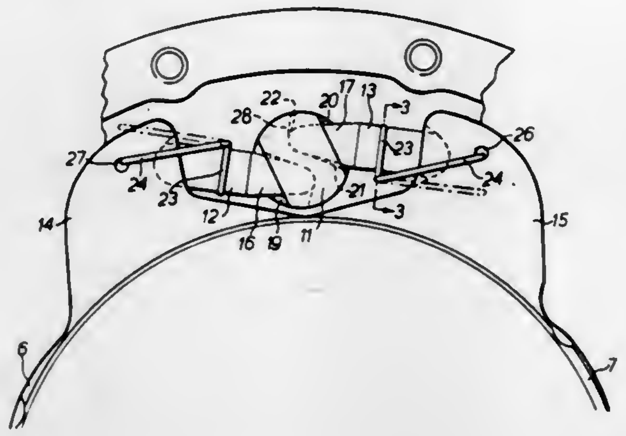
The invention relates to an anti-theft device to be incorporated into a shopping cart of conventional type which includes a wheel carrying frame generally supporting a basket. The device includes an actuator mounted on the frame, said actuator having a movable piston rod having associated means to exert a force normally urging said piston rod inwardly to retracted position, the piston rod being operatively connected to a pivoted locking bar, the latter having a locking finger normally spaced from at least one of the wheels of the cart when the piston rod is in extended or unlocked position and positively engaging said wheel to restrain rotation thereof when said piston rod is in retracted or locked position, said device including releasable means to retain the piston rod in extended position against the force exerting means, and adjustable control means to vary the rate of movement of the piston rod to retracted locked position.

3,717,226

DISC BRAKE, ACTUATOR, AND RESILIENT RETAINING MEANS

John Robert Rees, Halesowen, England, assignor to Girling Limited, Tyseley, Birmingham, England
Filed Feb. 12, 1971, Ser. No. 114,791
Claims priority, application Great Britain, Feb. 19, 1970, 7,991/70
Int. Cl. F16d *55/04*
U.S. Cl. 188—71.4 **3 Claims**

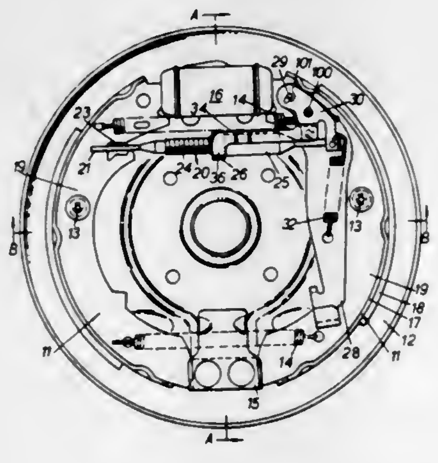
In a brake of the spreading disc type in which relative angular movement of the pressure plates to initiate the application of the brake is effected by push-rods of which the outer ends are in rocking engagement with lugs on the pressure plates and the inner ends are received in pockets in the cam, the push-rods are resiliently urged into the pockets by pre-stressed spring clips engaging the push-rods.



3,717,227

MECHANICAL COUPLINGS

Heinrich Bernhard Rath, 54 Koblenz-Lutzel, Germany, assignor to Girling Limited, Birmingham, England
Filed Jan. 28, 1971, Ser. No. 110,577
Claims priority, application Great Britain, Jan. 30, 1970, 4,456/70
Int. Cl. F16d *65/56*
U.S. Cl. 188—79.5 P **15 Claims**



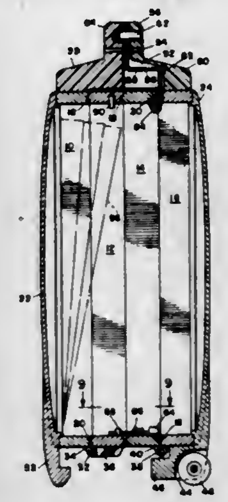
A brake operating mechanism has a variable length strut between the shoes. The strut is adjusted in length by a pawl and ratchet. A pawl carrying arm is moved to engage the ratchet by a rocker-arm pivotally connected between the strut and either one of the brake shoes or a lever of an auxiliary brake actuating means pivotal to said one of the brake shoes.

3,717,228

ATTACHE CASE CONVERTIBLE TO LUGGAGE DOLLY

Charles R. Blair, 24531 Corta Cresta Drive, Lake Forest, Calif.
Filed April 2, 1971, Ser. No. 130,687
Int. Cl. A45c *9/00*
U.S. Cl. 190—1 **7 Claims**

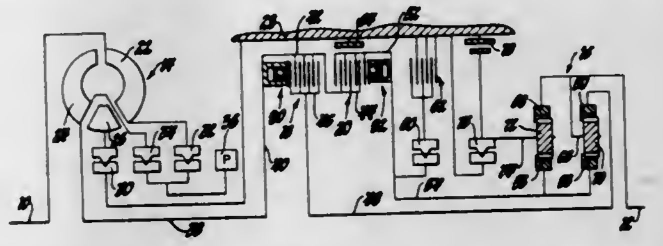
An attache case of conventional proportions and appearance, which can be opened to form a wheeled luggage dolly with a load platform and an upright frame, having a handle at a convenient position. Simple latch and lock elements hold the structure securely in both of its uses.



3,717,229

FLUID CLUTCH WITH ONE WAY TORQUE LIMITING ENGAGER

Mark A. Perlick, Brighton, Mich., assignor to General Motors Corporation, Detroit, Mich.
Filed Aug. 16, 1971, Ser. No. 171,940
Int. Cl. F16d *25/063*
U.S. Cl. 192—85 AA **8 Claims**

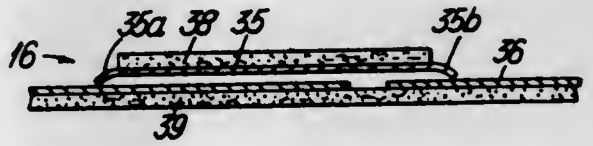


A power transmission capable of providing a plurality of forward speeds and including a torque converter, multi-speed planetary gearing and input clutches between the converter and gearing. The input clutches each include a mechanical energizing mechanism having a ball and ramp spring for mechanically energizing the clutch when the output shaft is being driven by the vehicle wheels. The energizing mechanism also limits the torque capacity of the clutch.

3,717,230

FRICTION CLUTCH PLATE

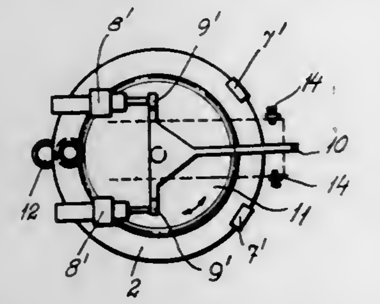
Dieter Hartmann, Langenhain, Germany, assignor to General Motors Corporation, Detroit, Mich.
Filed May 28, 1970, Ser. No. 41,394
Claims priority, application Germany, May 31, 1969, P 19 27 872.9
Int. Cl. F16d *13/60*
U.S. Cl. 192—107 R **9 Claims**



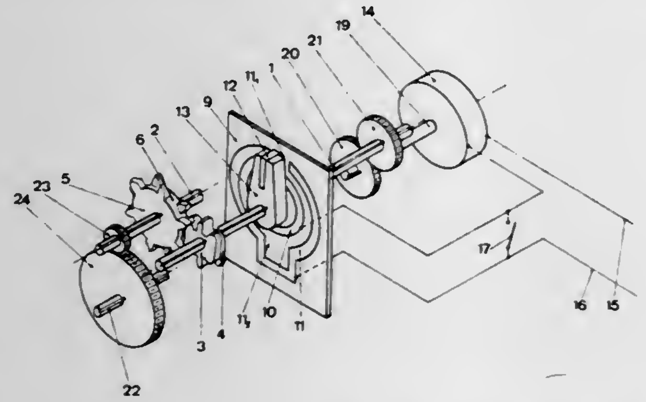
A friction clutch plate having two sets of axially-resilient metal segments, carrying friction material, one set on the side facing the flywheel and the other set on the side facing the thrust plate. The sets are circumferentially staggered one to the other, and, in one set, each of the metal segments includes a flat portion having the friction material secured to it by adhesive, and a resilient portion formed by radial edges on the flat portion which are bent-over towards the second set of segments. The segments of the second set also have friction material secured to them.

3,717,231
POSITIVELY CUSHIONED STOP DEVICE FOR ROBOT SYSTEM
Roland T. A. Kaufeldt, Stambanevagen 81–83, Huddinge, Sweden
Filed Feb. 25, 1971, Ser. No. 118,622
Claims priority, application Sweden, Dec. 28, 1970, 17,543/70
Int. Cl. F16d *71/04*
U.S. Cl. 192—139 **5 Claims**

A system for damping and subsequently stopping the rotative movement of a shaft carrying means for performing a robot function. A support for the shaft is provided with a progressive damper and continuously adjustable stop means, and the rotative shaft is provided with dog means for engaging first said progressive damper and thereafter said stop means when the rotative motion has been damped to a substantial extent.



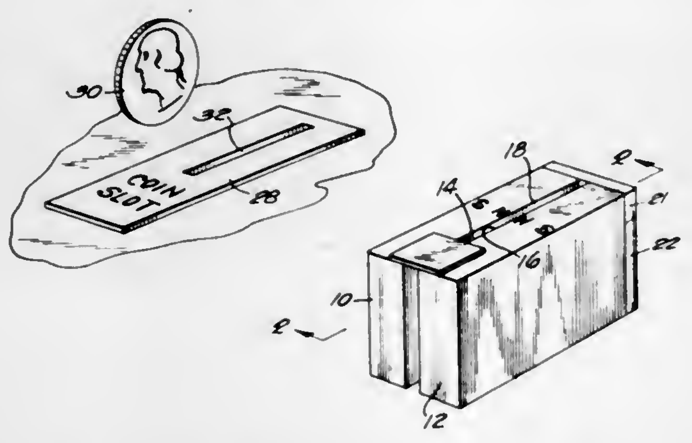
3,717,232
STEP-BY-STEP DRIVING DEVICE
Roger M. Chaveneaud, 92 Levallois-Perret, and Georges Janoska, 92 Courbevoie, both of France, assignors to Societe A Responsabilite Limitee Dite: Societe Lamy D'Etude et de Recherches, Courbevoie (Seine), France
Filed March 15, 1971, Ser. No. 124,040
Int. Cl. F16d *71/00*
U.S. Cl. 192—142 R **9 Claims**



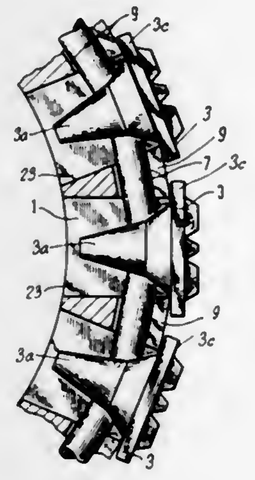
The invention relates to a step-by-step driving device comprising a driving shaft and a driven shaft connected by means transforming the rotary movement of the driving shaft into an intermittent rotary movement of the driven shaft, and means connected to the driving shaft in order to interrupt its rotation, this realization comprising in addition a bistable rotary switch driven by the driving shaft to change the switch from one state to the other depending on the angular position of this driving shaft, this switch controlling the means connected to the driving shaft in order to interrupt its rotation when the rotary switch is positioned angularly in relation to the driving shaft in order to pass from one state to the other and interrupt the drive of the driving shaft when the driven shaft is still.

3,717,233
MAGNETIC SPRING AND COIN REJECTOR
Walter C. Ovsienko, 4332 N. Morris Blvd., Milwaukee, Wis. 53202
Filed Jan. 8, 1971, Ser. No. 104,899
Int. Cl. G07f *3/02*
U.S. Cl. 194—101 **4 Claims**

A slot between magnets having opposed faces of like polarity resiliently rejects a magnetic coin or other object sought to be passed through the slot. Instead of being deflected or mechanicallv obstructed. the coin remains exposed for manual removal from the slot, returning to its exposed position if pressed into the slot.

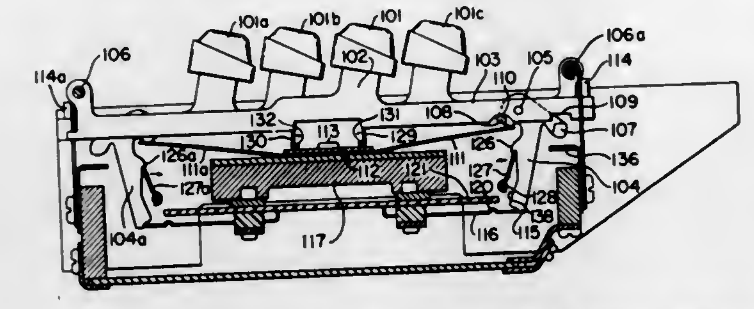


3,717,234
CARRIER FOR TYPE CARRIERS FOR HIGH SPEED PRINTING DEVICE
Rudolf Koller, Munich, Germany, assignor to Siemens Aktiengesellschaft
Filed Sept. 29, 1970, Ser. No. 76,502
Claims priority, application Germany, Oct. 14, 1969, P 19 51 793.2
Int. Cl. B41j *1/32*
U.S. Cl. 197—53 **1 Claim**



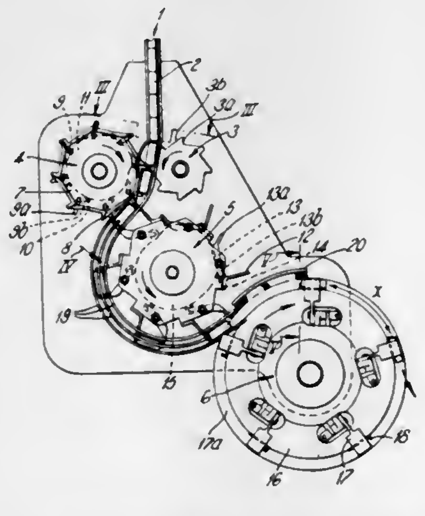
Carrier for type carriers on a type cylinder for a type printing machine as for example a telex or teletype printing machine. The type carriers are biased against the peripheral face of the cylinder by an elastic belt or band, accommodating radial outward movement of the type carriers to make a printing impression and then returning the type carriers to their rest positions after a printing operation. The elastic band may be formed from an elastic belt made from rubber, an elastomer or a like material, which may extend through apertured portions of the type carriers to retain the type carriers to the type cylinder. The belt may also be in the form of a relatively wide flat band having uniformly spaced apertures extending therethrough, and forming a means to accommodate buttoning of the type carriers to the band.

3,717,235
IMPACT CONTACT KEYBOARD
Hugh St. L. Dannatt, Rochester, N.Y., assignor to The Singer Company
Filed July 27, 1970, Ser. No. 58,639
Int. Cl. B41j *5/08*
U.S. Cl. 197—98 **5 Claims**



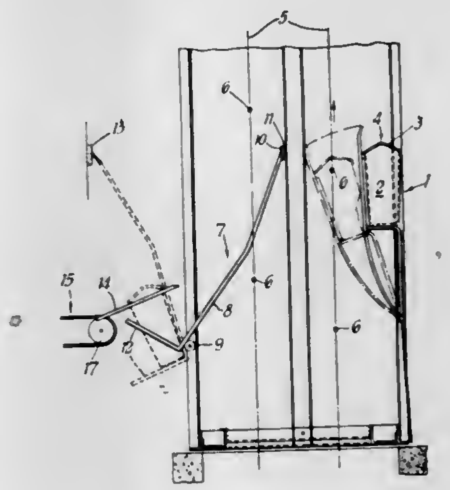
A keyboard is disclosed which produces a signal in response to the depression of a selected key lever. In response to the depression of the selected key lever, a resilient spring contact is deflected away from a relatively fixed contact and released. The resilience of the resilient spring contact causes said spring contact to return towards the relatively fixed contact and make a momentary closure therewith. In response to the momentary closure, an electrical signal is produced during the charge time of a capacitor in series with the closing contacts. The capacitor is so chosen that it will be substantially fully charged in response to the closure of the contacts and no additional signal will result in the event that there should be any contact bounce or multiple closures thereof. An actuating pawl for actuating the resilient contact spring is attached to the key lever and a single spring is used to bias the actuating pawl and the key lever to their at rest positions. A bail which may be selectively positioned in cooperative relationship with a projection on the actuating pawl may be used to lock the key levers against actuation. A frame member is employed to pivot the pawl near the end of the down stroke of the key lever and thereby release the resilient contact spring. The cited frame member, the pawl and the key lever coact to provide a down stop limit for the key lever. Alternate selective means may be provided for locking selected key levers against actuation. In the structure shown, selected key levers are pivoted from a forward position while other key levers are pivoted from a rearward position. The circuit of the cited capacitor is designed to assure discharge of the cited capacitor well within the cycle time of operation of a given key lever.

3,717,236
CONVEYING APPARATUS
John Elliott New, Deptford, England, assignor to Molins Limited, London, England
Filed Jan. 27, 1971, Ser. No. 110,035
Claims priority, application Great Britain, Jan. 29, 1970, 4230/70
Int. Cl. B65g *47/26*
U.S. Cl. 198—25 **6 Claims**



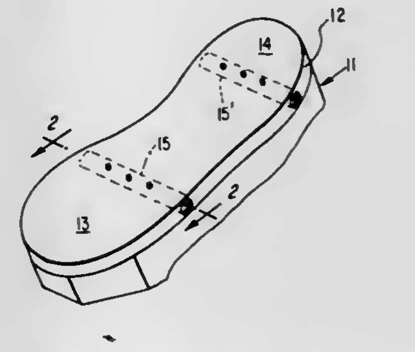
Apparatus for accelerating and spacing apart the articles, e.g. cigarette packets, in a uniformly-moving stream. A toothed rotor adjacent the stream is driven at uniform speed, each tooth on the rotor in turn displacing laterally the foremost article in the stream, and inserting itself behind the article to displace it from the succeeding article and act as a moving stop for the latter.

3,717,237
ELEVATING AND LOWERING CONVEYORS
Ian John Pearson, Erith Kent, England, assignor to Sovex Limited, Kent, England
Filed May 6, 1971, Ser. No. 140,924
Claims priority, application Great Britain, Feb. 8, 1971, 4,174/71
Int. Cl. B65g *47/00*
U.S. Cl. 198—27 **5 Claims**



This invention relates to an unloading device for use with a container elevating and lowering conveyor in which the containers, are hung on inwardly directed pegs secured to a pair of vertical continuously moving endless chains.

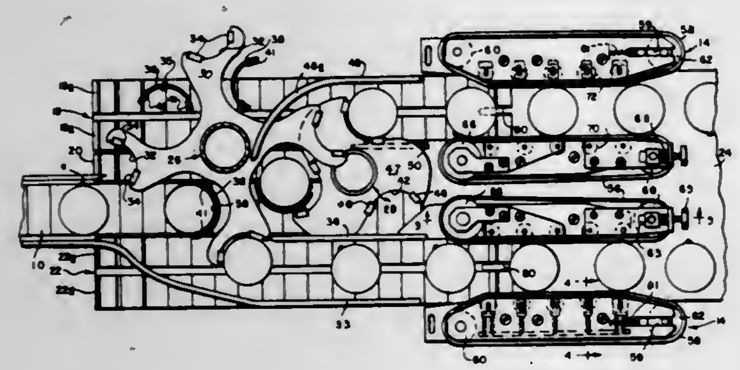
3,717,238
SKI BOOT TRACTION DEVICE
John E. Fox, 2316 Woodlawn, Missoula, Mont.
Substitute for Ser. No. 852,160, Aug. 22, 1969, abandoned.
This application Nov. 16, 1971, Ser. No. 199,346
Int. Cl. A43c *15/00*
U.S. Cl. 36—61 **11 Claims**



A retractable anti-slip device for a ski shoe consisting of a tubular metal casing transversely embedded in the sole or heel of the shoe, the casing having a longitudinal rotatable camming member therein mounted over a longitudinal plate element provided with depending spurs accessible through openings in the bottom wall portion of the casing and being therefore extensible downwardly from the bottom plane of the sole or heel. The plate member is biased upwardly by springs to retract the spurs. The rotatable camming member has a radial handle element at its end which is accessible by the user for manually operating the camming member.

3,717,239
CONTAINER HANDLING APPARATUS

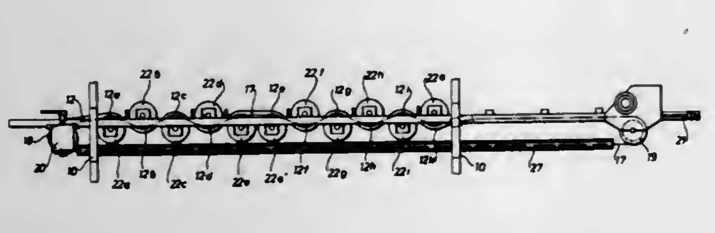
Sidney T. Carter, Shrewsbury, Mass., assignor to ATO Inc., Cleveland, Ohio
Filed Nov. 16, 1971, Ser. No. 199,295
Int. Cl. B65g *47/26*
U.S. Cl. 198—31 AA **48 Claims**



Double discharge conveyor apparatus comprising spaced parallel discharge conveyors arranged to receive containers from a line conveyor, divide them into two rows and deliver them to a work table or tables in the form of a single broad conveyor or two narrow conveyors for inspection. A selector associated with the discharge conveyors alternately transfers one container from the line conveyor onto one of the discharge conveyors and the next onto the other of the discharge conveyors and at the same time rotates the latter containers approximately 180° so that the containers are delivered to the inspection conveyor or conveyors back to back with their labeled sides facing outwardly. The selector effects the division and orientation without interruption of the flow of the containers and is designed so that by the simple expedient of substituting one operating part for another is capable of processing containers of all sizes and cross-section.

3,717,240
ARRANGEMENT IN AN OVERHEAD TRACK FOR CONTROLLED TURNING OF SUSPENDED CARCASSES

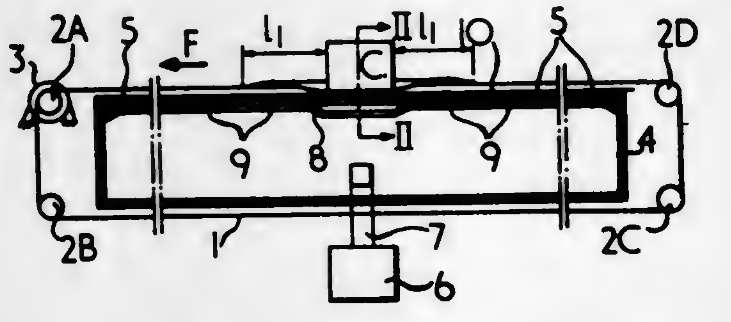
Martin Rudolf Ekstam, Kristianstad, Sweden, assignor to Kontrollhuder Ek. For., Malmo, Sweden
Filed July 12, 1971, Ser. No. 161,651
Claims priority, application Sweden, July 13, 1970, 9690/70
Int. Cl. A22b *5/00;* **B65g** *19/02, 47/24*
U.S. Cl. 198—33 AB **7 Claims**



An overhead track for controlled turning of suspended carcasses comprises a rail which forms a sinuous portion. Trolleys rotatably mounting hangers for suspending carcasses therefrom are positively advanceable along the rail, and stationary abutments are provided at one side of the sinuous portion of the rail opposite the concave bends thereof to engage the hangers at a distance from the rotational center thereof for rotating the hangers.

3,717,241
TRANSPORTING APPARATUS

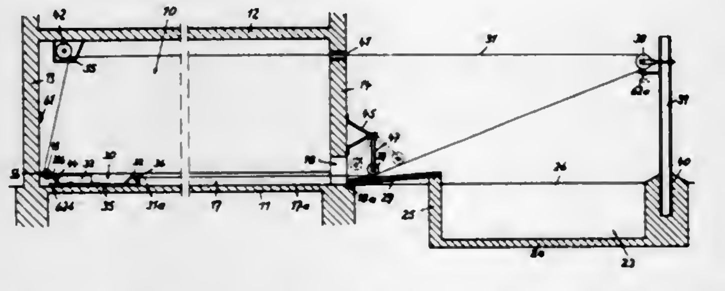
Shimon Arieh, Geneva, Switzerland (% Fort Dunlop, Erdington, Birmingham 24, England)
Filed May 25, 1971, Ser. No. 146,688
Claims priority, application Switzerland, May 27, 1970, 7,868/70
Int. Cl. B65g *15/00*
U.S. Cl. 198—184 **4 Claims**



A transporting apparatus in which a carrier belt is supported by gaseous pressure above a substantially flat support surface having a resilient upper surface coating.

3,717,242
MANURE REMOVAL SYSTEM

Johann Sohns, 77 Habscheider Weg, Brandscheid, near Prum, Germany
Filed Nov. 4, 1970, Ser. No. 86,847
Claims priority, application Germany, Nov. 11, 1969, P 19 56 624.6; May 22, 1970, G 70 19 117.2
Int. Cl. B65g *25/08*
U.S. Cl. 198—224 **17 Claims**

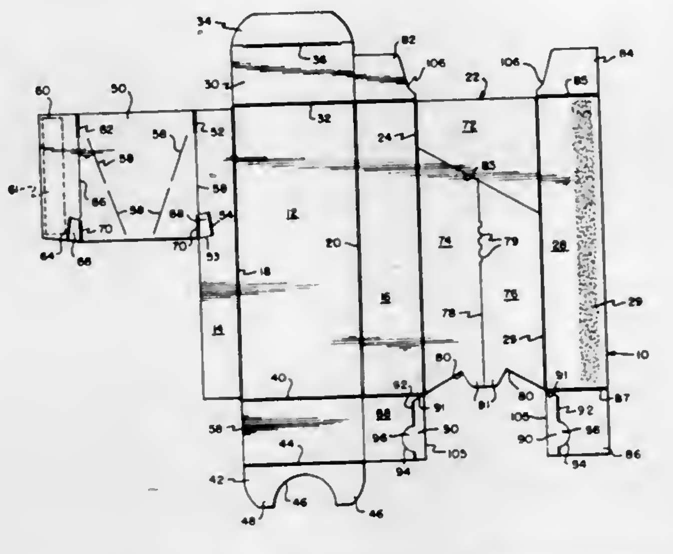


A manure removal plant or system for a shed, stable or the like for animals, with a manure gutter in the shed and a dung yard adjacent the shed. A dung removal carriage is movable along the gutter and thence out and obliquely over the dung yard. The carriage is also movable in the other or reverse direction over the dung yard and back along the gutter. The system further includes a haulage cable, connected to the carriage at oppositely spaced locations thereon and also include guiding pulleys for guiding the movement of the cable and carriage, and reversible drive means. The cable connections on the carriage at the spaced locations define between them a longitudinal carriage axis and each is disposed at such a height that the connecting line therebetween is slightly above the center of gravity on the carriage whereby the dung-laden carriage when suspended over the dung yard is capable of performing automatically complete self-discharging rotations about the longitudinal axis.

3,717,243
DISPLAY CARTON

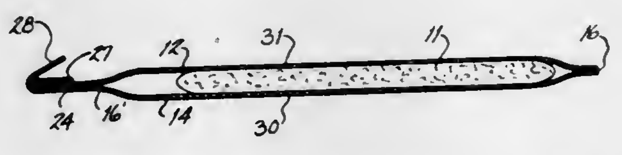
Raymond A. Cote, Charlotte, N.C., assignor to Rexham Corporation, New York, N.Y.
Filed Oct. 14, 1971, Ser. No. 189,187
Int. Cl. B65d *5/50, 5/08*
U.S. Cl. 206—45.14 **11 Claims**

A blank is provided for an article containing carton and the like with end closures having mirror image dust flaps of rectangular shape, with the dust flaps incorporating an integral pivot panel providing locking shoulders for a conventional tuck flap; and with the pivot panels having end panel engaging abutments arranged so that the act of insertion of the tuck flap effects pivoting of said pivot panels into locking engagement with the tuck flap. Also, the blank provides for erection of such a carton utilizing conventional tuck flap insertion machinery.



3,717,244
PACKAGE WITH EASY OPENING DUST FLAP AND METHOD OF MANUFACTURING THE SAME

Richard W. Smith, Racine, Wis., assignor to Pratt Manufacturing Corp., Milwaukee, Wis.
Filed Feb. 10, 1971, Ser. No. 114,309
Int. Cl. B65d *33/18, 75/20, 75/46, 83/00*
U.S. Cl. 206—56 AA **5 Claims**

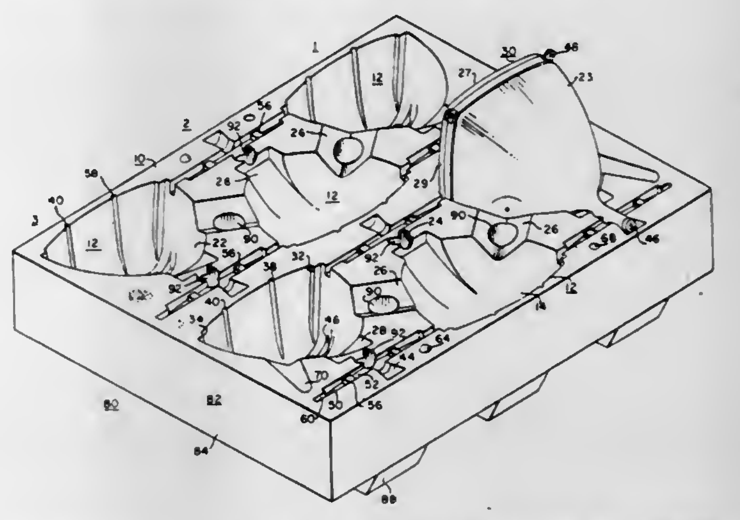


A flat package for items which are to be kept sterile has upper and lower panels secured together along a sealing band which surrounds the item. At the top of the package the panels project a substantial distance beyond the top sealing band, and the projecting portion of the top panel forms a first dust flap which is folded over on the top of the package and adhesively connected or heat sealed in folded-down position. The projecting portion of the bottom panel forms a second dust flap and is folded over the sealed-down portion of the first dust flap, the arrangement providing for easy separation of the dust flaps when it is desired to open the package. The invention also includes the method of manufacturing the package whereby the packages may be cut from continuous webs along transverse lines at the edges of the flaps.

3,717,245
NOVEL PALLET-PACKAGE STRUCTURE FOR CATHODE RAY TUBES

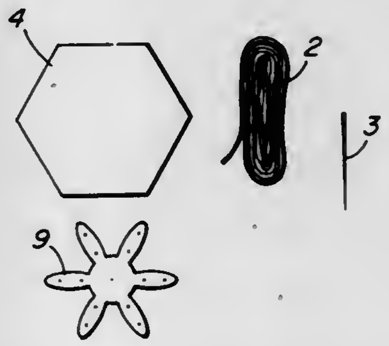
George T. Brander, Murrysville, Pa., and William M. Lander, Horseheads, N.Y., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.
Filed Feb. 11, 1971, Ser. No. 114,615
Int. Cl. B65d *81/12, 85/62*
U.S. Cl. 206—65 R **5 Claims**

The invention relates to an integral combination of a pallet and a package section which forms a one-piece pallet-package structure for cathode ray tubes. The pallet portion of the structure comprises a container having a bottom, sides extending substantially vertically therefrom to form an open top container, and feet elements outwardly protruding from the bottom to support the pallet in a raised position such that the pallet is capable of receiving the forks of a lift truck from all four sides. The package section forms an insert in the open top container and provides contoured cavities for accepting cathode ray tube elements and enclosing approximately 50 percent of these elements. A second package section identical to the package section used as a container insert is positioned in an oppositely disposed registering relationship with the container insert to completely enclose the cathode ray tube elements. The pallet-package structure forms a base upon which vertically mated package sections can be vertically stacked to a desired height for warehouse storage or for transporting to a truck for shipment.



3,717,246
METHOD AND APPARATUS FOR MANUFACTURING FABRICS

Ruth M. Cuddeback, 257 Shrewsbury St., Worcester, Mass. 01604
Filed Dec. 9, 1970, Ser. No. 96,351
Int. Cl. B65d *79/00;* **D05c** *17/02, 1/08*
U.S. Cl. 206—47 R **2 Claims**

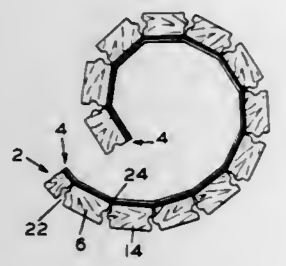


Apparatus for manufacturing by hand a fabric with a decorative tufted pile design on each face. A pattern device is affixed to a hexagonal fabric module and successive layers of yarn laced around the device and into the fabric, each layer enclosing the one before. The layers are cut lengthwise adjacent to each face of the fabric module, permitting the strands of yarn to stand upright, and the pattern device is removed. The module is then joined to other similarly prepared modules to form a finished product, such as a rug, blanket or pillow.

3,717,247
PREFABRICATED FLOORING

John H. Moore, Lancaster, Pa., assignor to Armstrong Cork Company, Lancaster, Pa.
Filed June 8, 1970, Ser. No. 44,402
Int. Cl. B65d *85/66*
U.S. Cl. 206—59 F **1 Claim**

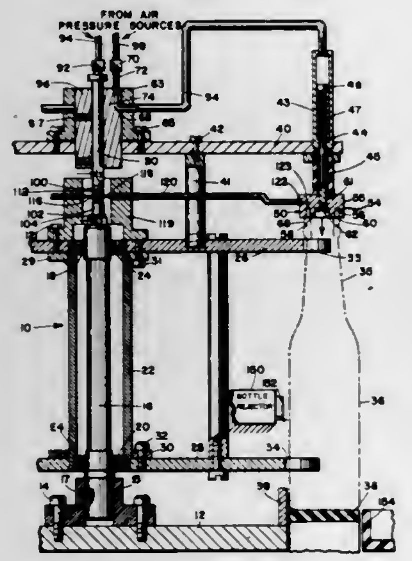
A resilient flooring or carpeting is mounted on a slat-like structure. The individual slats are not bonded together and are securely fastened to the underside of the flooring. The floor material is sufficiently resilient to permit the flooring with the slats attached thereto to be rolled in a large roll. When the roll of material is laid out on a flat support, the individual slats abut adjacent slats and form a subfloor for the flooring which is bonded to the slats.



3,717,248

DIFFERENTIAL PRESSURE BOTTLE CROWN INSPECTOR EMPLOYING FLUIDIC CONTROL SYSTEM

Harry E. Scribner, Brookfield, Wis.
(9036 N. 75th St., Milwaukee, Wis. 53224)
Filed Dec. 10, 1971, Ser. No. 206,681
Int. Cl. G01m *3/02*
U.S. Cl. 209—73 **10 Claims**



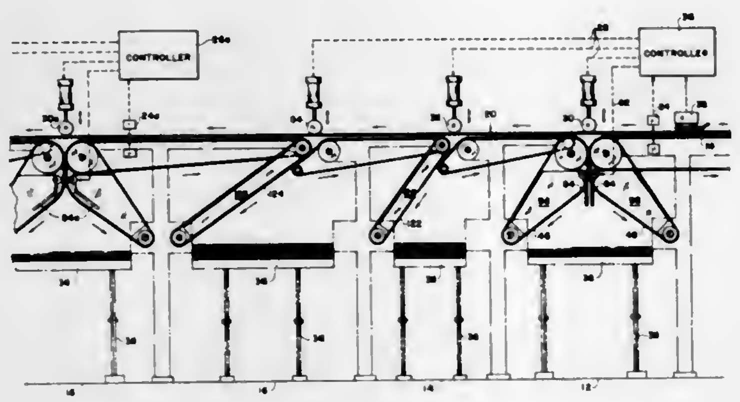
This apparatus inspects the tops of bottles as they move along on a conveyor past an inspection position. Resilient sensor heads carried by air driven cylinders on a rotating plate engage the top of each bottle in turn at the inspection position. The plate is carried by star wheels which engage the side of each bottle in turn at the inspection position. A pressurized source of air applies air under pressure to each sensor head in turn to test the bottle tops for air leakage. A fluidic control system is connected between the pressurized source of air and a bottle rejector to eject a bottle automatically after the bottle leaves the inspection position, if the bottle is defective and causes air leakage while in the inspection position.

3,717,249

SORTER AND STACKER FOR VENEER SHEET AND STRIP MATERIAL

Arnold F. Faley, Washougal, Wash., assignor to Moore Dry Kiln Company of Oregon, North Portland, Oreg.
Filed Feb. 22, 1971, Ser. No. 117,430
Int. Cl. B07c *1/14*
U.S. Cl. 209—75 **33 Claims**

A veneer sorting and stacking apparatus for segregating randomly sized veneer sheets, including both relatively wide sheets of selected predetermined dimensions as well as narrower width strips of variable dimension, into a plurality of stacks of respectively uniform characteristics. A main conveyor system delivers transversely arranged unsegregated veneer sheets of random and variable sheet widths horizontally at spaced intervals to the top of the proper respective sorting bin where a diverter roller triggered by width and moisture detecting devices along the path of the conveyor diverts each sheet downwardly into the sheet positioning apparatus of the bin. The sheet positioning apparatus comprises a vacuum conveyor system which retains each sheet by its upper surface and transports it downwardly on an inclined path towards the stack supporting surface of a lift table until a kicker arm separates the respective sheet from the vacuum conveyor, allowing the leading edge of the sheet to drop into abutment with a fixed transverse aligning stop and settle horizontally onto the top of the stack in formation. An aligning clamp immediately seizes the leading edge of the sheet to prevent it from bouncing off of the aligning stop, and thereafter is released prior to the placement of the next succeeding sheet. As the stack reaches a predetermined height with respect to the face of the aligning stop, the lift moves downward in measured increments until a completed stack of predetermined height or count is reached, whereupon the stack may then be removed from its bin by powered rolls or other transporting means. In those of the bins which are intended for stacking variable-sized and generally narrow width veneer strips the vacuum conveyor system for these bins comprises two separate vacuum conveyors, one inclined downwardly from the top center of the bin toward a front aligning stop adjacent the leading transverse edge of the stack and the other inclined in opposite relation toward a rear aligning stop adjacent the rear transverse edge of the stack. Means are provided for alternating the transfer of successive strips from the main conveyor to one or the other of the two vacuum conveyors so as to enable the formation of a uniform stack substantially wider than that of the largest width of veneer strip sorted into the bind. The vacuum conveyor systems handling strip material are also provided with actuable diverter arms at the top center of the bins to divert veneer strips of especially narrow width into the center of the stack.

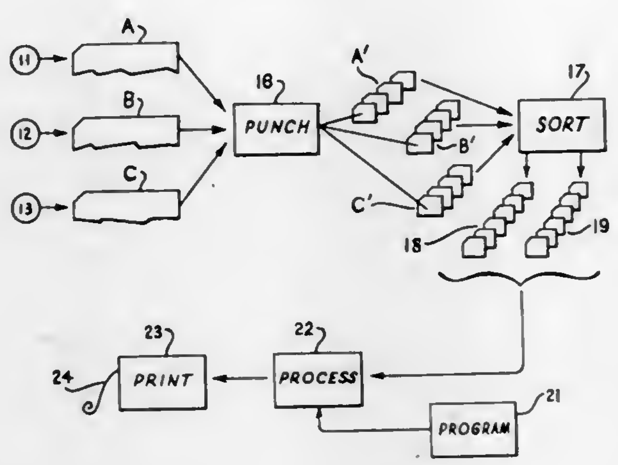


3,717,250

COLOR CODED COMPUTER SYSTEM

Douglas M. Emery, Bakersfield, Calif., assignor to Ambrite Computer Rents, Inc., Visalia, Calif.
Filed Aug. 2, 1971, Ser. No. 168,001
Int. Cl. B07c *5/342*
U.S. Cl. 209—111.6 **8 Claims**

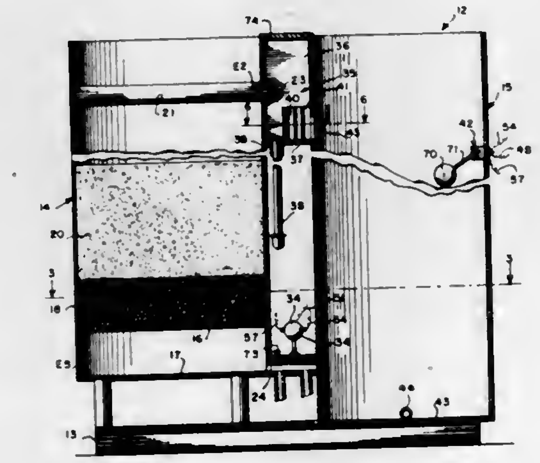
Color coded computer cards are employed for visual identification of different types of information as may be employed in computer operations for such as bookkeeping activities. The system provides for immediate visual identification of different types of information by an operator so that mechanical operations of sorting and card handling may be visually checked to correct errors at the time of commission.



3,717,251

METHOD AND APPARATUS FOR FILTERING SOLIDS

Quentin L. Hampton, 64 Kent Drive, Ormond Beach, Fla.
Continuation-in-part of Ser. No. 69,349, Sept. 3, 1970, abandoned. This application Aug. 19, 1971, Ser. No. 173,150
Int. Cl. B01d *23/24*
U.S. Cl. 210—80 **29 Claims**

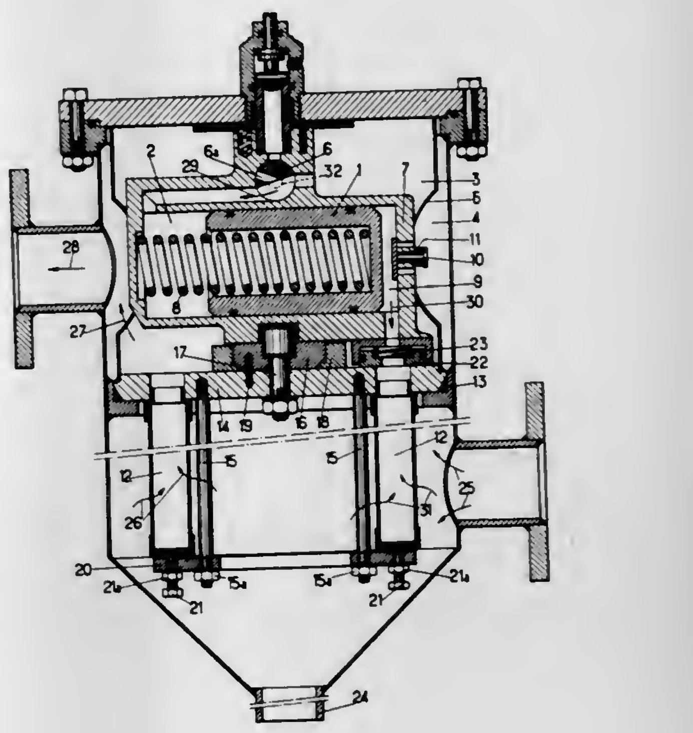


A method and apparatus for filtering suspended solids from a liquid suspension such as sewage, wherein the liquid to be filtered is forced upwardly through a filter media. Upon leaving the filter media, the filtered liquid flows over a weir and into an effluent trough, from where it is directed to an outlet conduit for suitable disposition. The solids entrapped in the filter media during the filtering process are removed therefrom by a cleaning or washing process, which simply involves increasing the rate at which the liquid is passed through the filter media. During washing, the liquid, such as water, is forced through the filter at a rate of flow equal to several times the rate of flow the water moves during filtering, which acts to fluidize the entrapped solids removed from the filter media, enters the effluent trough located above the filter media and because the rate of flow is higher than that during the filtering process, is directed into a compartment spaced away from where the filtered water has been directed. The washwater may then be redirected through the treatment plant, or to other suitable disposal. The washing operation of the filter can either be preset to take place at specified time intervals, or can be initiated upon the establishment of a predetermined back pressure in the filter inlet resulting from clogging of the filter by the solids removed from the water being filtered.

3,717,252

SELF-CLEANING FILTER

Marcel Picard, Rue Pasteur, Saint-Agulin, France
Filed June 28, 1971, Ser. No. 157,316
Claims priority, application France, July 9, 1970, 7025419
Int. Cl. B01d *29/38*
U.S. Cl. 210—108 **5 Claims**

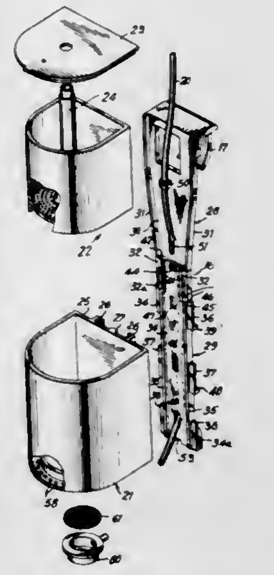


Self-cleaning filter comprises a horizontal pressure unit mounted to rotate about a vertical axis. Counter-current cleaning occurs when both faces of a piston inside the pressure unit are subjected to the pressure within the filter, the extra pressure required to cause a flow of cleaning fluid being supplied by a spring which acts on the piston and is compressed when one face of the piston is vented to atmosphere.

3,717,253

ADJUSTABLE BRACKET AND FILTER FOR VARIOUS SIZES OF HOME AQUARIUMS

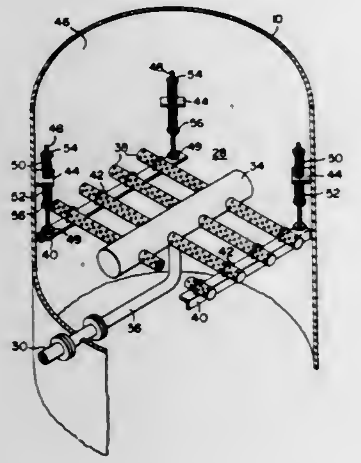
David D. Lovitz, Short Hills, N.J., assignor to Sternco Industries, Inc., Harrison, N.J.
Filed Dec. 22, 1971, Ser. No. 210,839
Int. Cl. E04h *3/20*
U.S. Cl. 210—169 **6 Claims**



A combination adjustable bracket and filter casing for suspension within aquarium tanks of different sizes. The bracket comprises upper and lower sections which are permanently connected when in assembled relation. The rear of the casing has a pair of channel elements and therebetween a wedge lock element, the bracket having a plurality of laterally opposite pairs of slide sections with bottom stops, said slide sections being slidably interengageable with said pair of channel elements, the casing being held by said stops in the selected operative position. The bracket has a plurality of vertically aligned apertured portions each being positioned for locking engagement with said wedge lock element when the corresponding pair of slide sections is in the said selected operative position, whereby the casing is held locked on said bracket. An air pipe is supported by said bracket and is adapted to extend through a selected one of the bracket's apertured portions for operative connection to the filter casing.

3,717,254
MID-BED DISTRIBUTOR

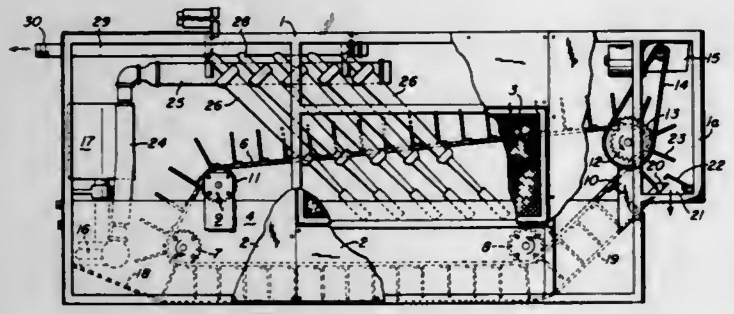
Norman L. Benecke, Garfield, N.J., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.
Filed Feb. 19, 1971, Ser. No. 116,876
Int. Cl. B01d *23/10*
U.S. Cl. 210—279 **4 Claims**



The mid-bed distributor of a mixed resin ion exchange demineralizer is supported on springs so that it can assume a first position during normal operations and a second predetermined position during ion bed regeneration.

3,717,255
LIQUID CLARIFICATION UNIT

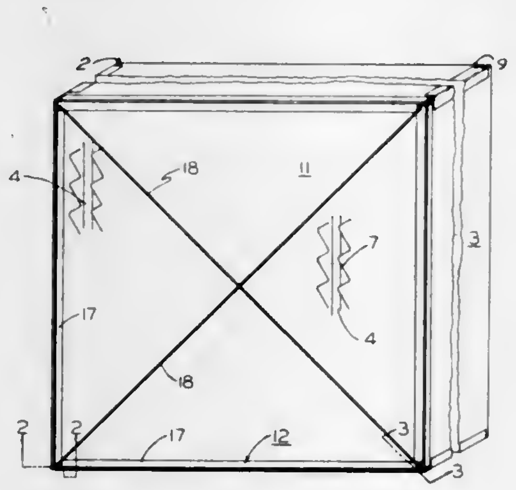
Ronald P. Rowland, Springfield, Ohio, and Donald P. Michel, Lake Oswego, Oreg., assignors to The Bauer Bros. Co., Springfield, Ohio
Continuation of Ser. Nos. 791,382, Jan. 15, 1969, abandoned, and Ser. No. 4,695, Jan. 21, 1970, abandoned. This application April 28, 1971, Ser. No. 138,093
Int. Cl. B01d *21/26*
U.S. Cl. 210—512 **13 Claims**



A liquid clarification unit comprising a single compartment receiving-settling type tank with means for a continuous discharge therefrom of settling solids combined with integrated means for the centrifugal separation of any remaining solids in the delivered liquid which do not settle, to provide thereby a substantially clarified liquid discharge which is distinct and separate from the discharge of the removed solids. The tank provides for a single common pool in the receptacle provided thereby, developed by a side feed of contaminated liquid in a relatively non-turbulent manner. This quickly spreads the inflow the length and width of the tank bottom and facilitates the quick and concurrent settling of contaminants which are continuously swept from the tank while suspended contaminants are cycled through integrated centrifugal cleaners to produce clarified liquids which discharge therefrom. The concentrated rejects issuing from the cleaners are returned directly to the same pool to quickly settle and discharge with the basic solids.

3,717,256
FILTER FRAME CONSTRUCTION

Orville C. Parrott and George W. Young, Fern Creek, Ky., assignors to American Air Filter Company, Inc., Louisville, Ky.
Filed Dec. 11, 1970, Ser. No. 97,258
Int. Cl. B01d *25/06*
U.S. Cl. 210—495 **3 Claims**



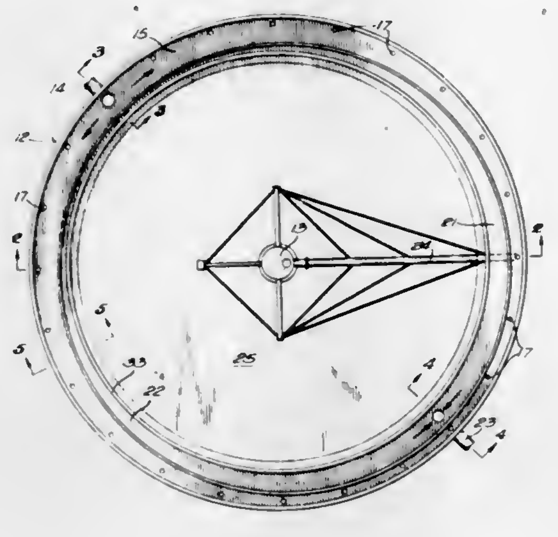
A filter assembly including a rectangular filter frame with filter medium disposed therein, a border flange arranged to engage the edge of the filter frame, the border flange having a terminal filter medium restraining portion extending therefrom to restrain the periphery of filter medium disposed in the frame, and rod means extending between diametrically opposed corners of the border flange size in length to retain the border flange on the frame with the extremities of the rod means connecting the restraining portions of the border flange.

3,717,257
PERIPHERAL FEED AND EFFLUENT SYSTEM FOR SEDIMENTATION TANKS

William H. Boyle, Milwaukee, Wis., assignor to Rex Chainbelt Inc., Milwaukee, Wis.
Filed Dec. 7, 1971, Ser. No. 205,607
Int. Cl. B01d *21/00*
U.S. Cl. 210—521 **11 Claims**

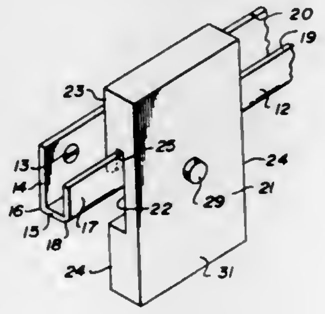
A sedimentation tank of simplified construction has a single horizontal shelf projecting inwardly from the outer wall of the tank. The shelf is of uniform width and an upright wall at its inner periphery forms the overflow weir of the tank. A dividing wall carried by the shelf between the inner wall and the upper portion of the tank wall defines therewith inner and

outer feed distribution and effluent channels of complementary cross-sections. An inner scum baffle is uniformly spaced inwardly of the weir and is concentric with respect to the vertical axis of the rotating sludge removal mechanism at the center of the tank.



3,717,258
ASSEMBLY FOR THE DISPLAY AND STORAGE OF SCIENCE DEMONSTRATION UNITS OR THE LIKE

James Willard McKinnon, 1427 29th St. SW., Calgary, Alberta, Canada
Filed Dec. 23, 1968, Ser. No. 786,114
Int. Cl. A47f *5/08*
U.S. Cl. 211—87 **1 Claim**

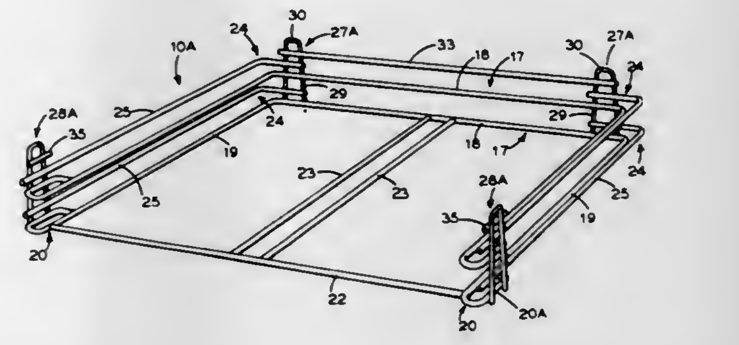


A plurality of elongated support brackets with a lower upwardly extending flange upon which is selectively engageable a plurality of substantially rectangular base members carrying science or similar demonstration exhibits.

3,717,259
TRAY RACK

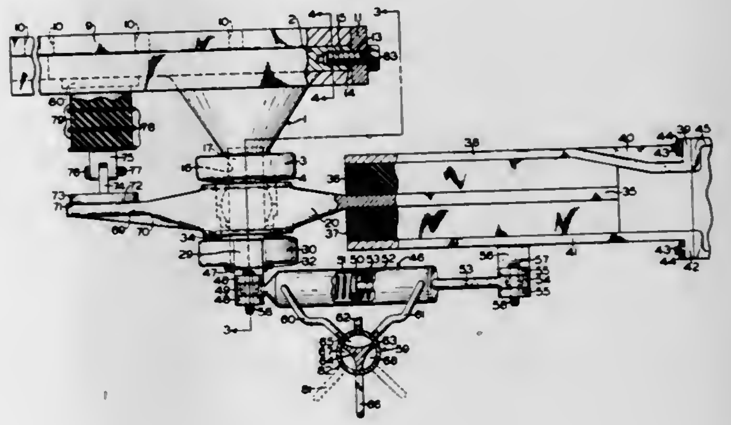
George Fried, Stamford, Conn., and Shalom Z. Hirschman, Forest Hills, N.Y., assignors to Greiner Scientific Corporation, New York, N.Y.
Filed June 11, 1971, Ser. No. 152,058
Int. Cl. A47f *3/14*
U.S. Cl. 211—126 **6 Claims**

A wire rack construction providing one or more support levels for carrying shallow trays at such support levels; the rack constructions being insertable into compartments of laboratory apparatus such as sterilizers, incubators, ovens or the like whereby to subdivide the compartments thereof when small or shallow containers, plates and the like are contained in the trays.



3,717,260
DRAFT GEAR AND COUPLER POSITIONING APPARATUS FOR A VEHICLE

William B. Jeffrey, Irwin, and Richard K. Frill, Pittsburgh, both of Pa., assignors to Westinghouse Air Brake Company, Urlmerding, Pa.
Filed March 16, 1971, Ser. No. 124,861
Int. Cl. B61g *5/00, 7/12*
U.S. Cl. 213—14 **8 Claims**

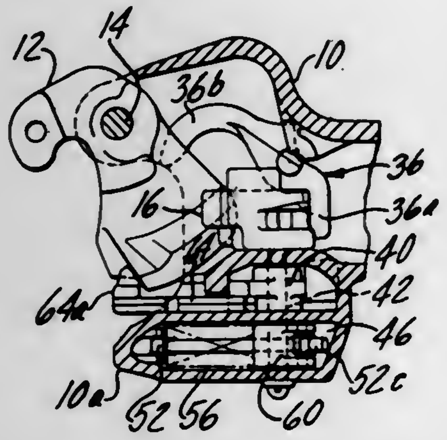


This invention relates to a draft gear device for rapid transit passenger cars in which the cushioning member constitutes a rubber or other elastomeric element subject to shear in response to the application of both draft and buff forces to a car coupler. The rubber or elastomeric element is bonded to a pair of parallel spaced-apart plates that constitute the shank of a car coupler and a third plate disposed therebetween and integral with one side of a hub of a drawbar. Extending from the opposite side of this hub, which has a pivotal connection with the car underframe, is a fan-shaped coupler-carrier element between which and the car underframe is a pair of spaced-apart resilient support elements that are normally effective to bias the car coupler to a horizontal position and provide for a limited vertical movement therefrom in either direction or for horizontal angular movement of the drawbar and coupler about their pivotal connection with the car underframe. Release means in the form of tension-breakable bolts are provided between the drawbar and the underframe which bolts break upon the application of excessive buff forces to provide for movement of the drawbar relative to the underframe until the anticlimbing plates on two adjacent cars are moved into engagement one with the other.

3,717,261

CAR COUPLER

Kenneth L. DePenti, Mayfield Heights, Ohio, assignor to Midland-Ross Corporation, Cleveland, Ohio
Filed Feb. 17, 1971, Ser. No. 116,148
Int. Cl. B61g *3/08*
U.S. Cl. 213—110 **7 Claims**

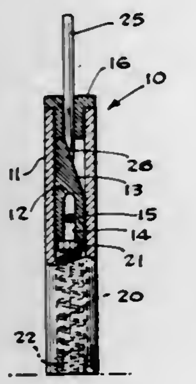


In a railway car coupler of the knuckle type which embodies means for automatic unlocking and opening of the knuckle during an uncoupling operation, a spring assembly is provided for actuating the knuckle unlocking and opening means. The spring assembly is applied to and removed from the coupler as a unit with the use of a simple tool such as a pry bar.

3,717,262

APPARATUS FOR ORIENTING A ROD OR TUBE HAVING A BEVELED END

Wilbert William Redmer, Boca Raton, Fla., assignor to Redmer Sons Co., Franklin Park, Ill.
Division of Ser. No. 49,482, June 24, 1970. This application Jan. 13, 1972, Ser. No. 217,453
Int. Cl. B65g *7/00*
U.S. Cl. 214—1 Q **5 Claims**

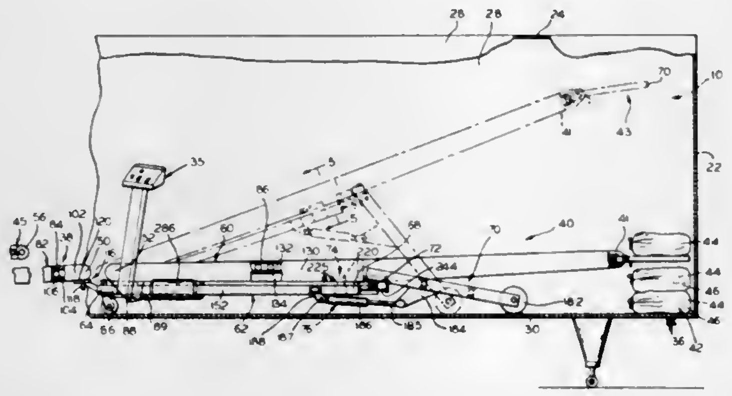


Disclosed is an apparatus for orienting a rod or tube having a beveled end. An example is the needle in an intravenous needle assembly which includes a grip for manipulation of the assembly during venipuncture. Basically, the apparatus comprises a tubular orienting cartridge including a beveled insert within the cartridge. A needle is inserted into the cartridge from a hopper and feeding device. After the needle is inserted in a horizontal position the tubular cartridge is rotated into an upright position and gently vibrated in order to align the beveled needle point on the corresponding beveled surface of the insert within the cartridge to thereby orient it. The orienting cartridge containing the properly oriented needle is thereupon rotated back to a horizontal position to deposit the needle within a mold with the beveled point thereof in proper alignment. The plastic hub, grip or wings are then molded in place about the needle. The beveled needle point of the resultant device is accordingly in proper alignment with the grip or wings for subsequent venipuncture.

3,717,263

APPARATUS FOR LOADING BAGGED MAIL FROM A LOADING DOCK INTO A HIGHWAY VEHICLE

Joseph E. McWilliams, 1345 Canterbury Lane, Glenview, Ill.
Filed Jan. 21, 1971, Ser. No. 108,500
Int. Cl. B65g *57/112*
U.S. Cl. 214—6 G **6 Claims**

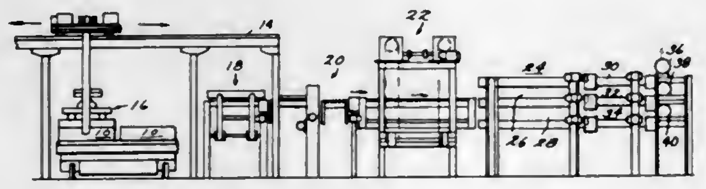


The invention relates to the loading of mail bags from a loading dock into an end loading highway vehicle to fully load the vehicle with mail bags, in which a mail bag handling conveyor is provided with a single bag width conveyor section carried by and extending longitudinally of a wheeled frame. The conveyor section projects cantilever fashion from the forward end of the frame, which is supported at its forward end by a swingably mounted leg that is movable between lowered and upright positions to vary the elevation of the discharging forward end of the conveyor section. The conveyor section is swingably connected to the frame at its rearward end, and its forward end rests on a slide bar arrangement for shifting from side to side to facilitate bag stacking or piling.

3,717,264

MACHINE FOR UNLOADING AND BLENDING LAYERED STACKS OF BRICKS OR SIMILAR ARTICLES

Hans Lingl, Jr., Paris, Tenn., assignor to Lingl-Bell Corporation, Gleason, Tenn.
Division of Ser. No. 39,707, May 22, 1970, Pat. No. 3,603,466. This application April 30, 1971, Ser. No. 139,285
Int. Cl. B65g *59/02*
U.S. Cl. 214—8.5 C **8 Claims**

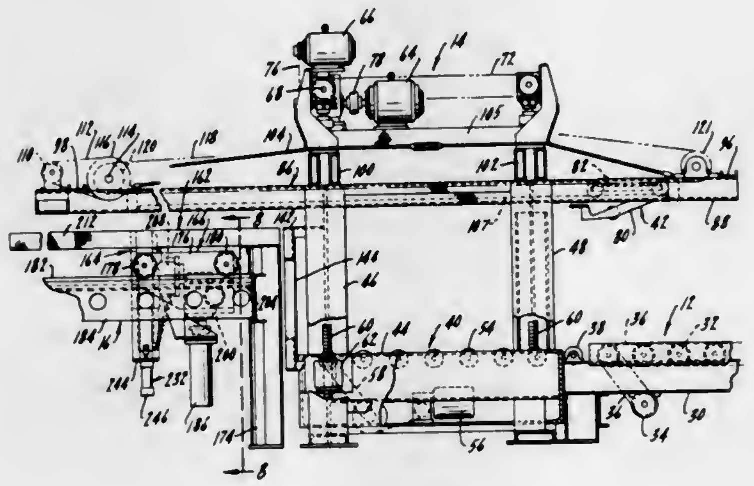


Apparatus and method for mechanically unloading a layer or double layers of layered stacks of rows of bricks or similar articles stacked, for example, on kiln cars or pallets and for selectively and variably blending bricks from different rows and/or from different layers of the stack to provide a blended balance between different brick firing qualities and/or to achieve special coloring effects in the final blended output. Bricks from one layer of the stack are stored on one of a plurality of storage levels and one or two rows of bricks from each level are separated and mixed with other separated rows of bricks from the same or other storage levels to achieve the desired blending pattern. Special handling also permits the mixing of bricks from less than a whole row of bricks from one layer with less than a whole row of bricks from another layer for increased flexibility in achieving any desired blend.

3,717,265

METHOD AND APPARATUS FOR CUTTING PANELS

James W. Campbell, Fort Worth, Tex., assignor to Halton City State Bank, Fort Worth, Tex.
Division of Ser. No. 805,943, Feb. 17, 1969. This application Sept. 10, 1970, Ser. No. 71,106
Int. Cl. B23q *5/22*
U.S. Cl. 214—1.6 **10 Claims**



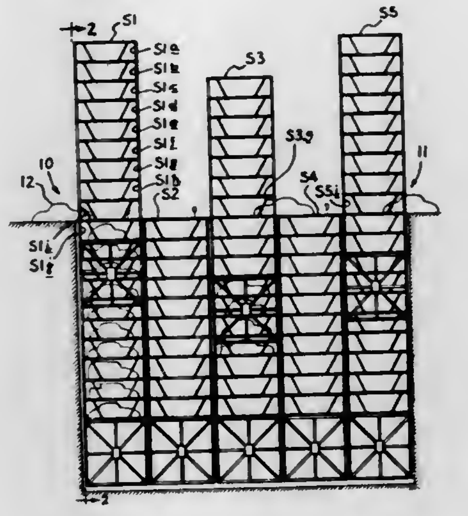
The method and apparatus for efficiently cutting accurately sized panels in an unlimited combination of sizes and shapes from larger sheets. The sheets are automatically counted and stacked on a gauge table, the stack is clamped by jaws which establish a reference line relative to a cutting station, and the stack is advanced along the table for accurately dimensioned rip cuts. One or more of these cut stacks are then moved on a rip run-out unit to a cut-off infeed and gauge table where they are automatically aligned, clamped to establish a second reference line, and accurately advanced to a cut-off station where cross-cut sawing produces finished panels. The stacks are moved and gauged by either digital or analog hydraulic servo motors which accurately position the reference lines relative to the saw stations by controlled deceleration of the load to stop the stacks. At each saw station hold-downs prevent sheet displacement as the saw traverses. Each saw automatically senses cutting load and returns to its initial position immediately upon finishing a cut. Linear saw speed is controlled as a function of saw load. Means are provided to automatically remove trim and scrap.

3,717,266

AUTOMOTIVE VEHICLE PARKING SYSTEM

Adrien P. Genest, 8518 Henri-Julien, Montreal 351, Quebec, and Jean C. Asselin, 5579 Woodbury, Montreal 250, Quebec both of Canada
Continuation of Ser. No. 810,674, March 29, 1969, abandoned. This application April 14, 1971, Ser. No. 134,021
Int. Cl. E04h *6/06*
U.S. Cl. 214—16.1 EC **1 Claim**

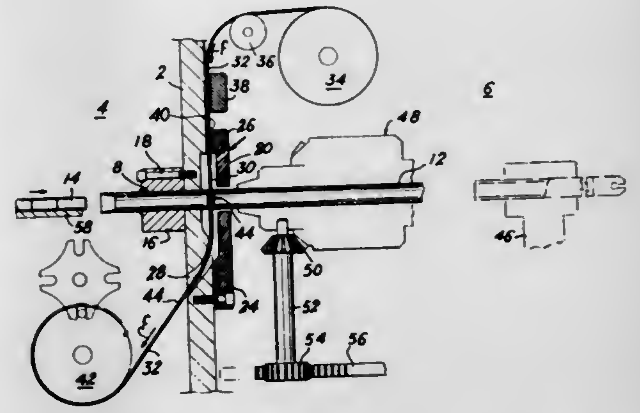
An automotive vehicle parking system wherein the vehicles are parked in a plurality of vertical stacks or columns between a fixed entrance station and a fixed exit station. The vehicles are stored in a plurality of vertical storage units arranged in one or more rows between the entrance and exit stations with each storage unit forming a plurality of vehicle cells arranged in a single vertical column. Each of the storage units is mounted for vertical movement independently of the other units so that any storage cell can be moved vertically to the level of the entrance or exit station, which may or may not be at the same level. A vehicle is driven from the entrance station into a cell in the first storage unit, or over the top of the first unit, and the vehicle may then be driven on through or over the succeeding units until it reaches a cell selected for the storage of that vehicle. When it is desired to retrieve the vehicle from the parking system, the storage cell in which it is parked is moved to the level of the exit station, and the vehicle is driven from the cell to the exit station, passing through or over intervening storage units if necessary.



3,717,267

DEVICE FOR LEAK-TIGHT TRANSFER OF OBJECTS

Michel Godart, Aix-en-Provence, France, assignor to Commissariat a l'Energie Atomique, Paris, France
Filed Mar. 4, 1970, Ser. No. 16,411
Claims priority, application France, Mar. 10, 1969, 6906778
Int. Cl. B65g *65/32*
U.S. Cl. 214—17 B **7 Claims**



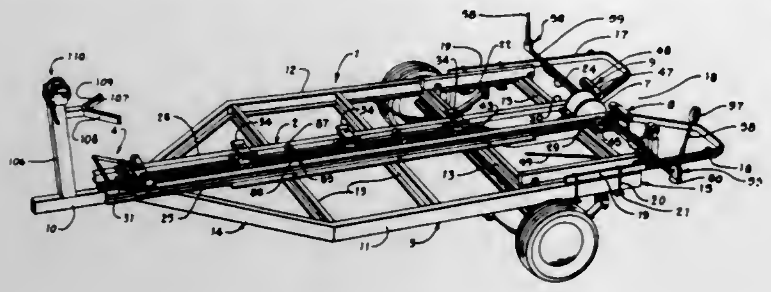
A device for leak-tight transfer of nuclear fuel pellets from a glove box to a fuel can. It comprises a tube which projects through the wall of the box, the internal diameter of the tube corresponding to the internal diameter of the can. A tape formed with holes having a diameter which corresponds to the internal diameter of the tube is circulated from the exterior to the interior of the box along a path which causes the holes to pass between the tube and the can.

3,717,268

BOAT TRAILER STRUCTURE

Harold F. Snodgrass, 1125 Topeka Street, Emporia, Kans.
Filed May 10, 1971, Ser. No. 141,866
Int. Cl. B60p *3/10*
U.S. Cl. 214—83.24 **10 Claims**

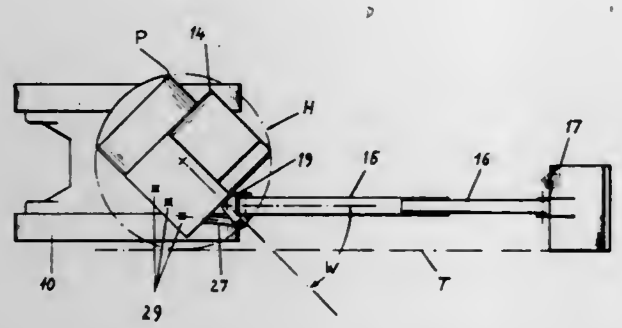
A boat trailer structure including an elongated track mounted on and extending longitudinally along a longitudinal central axis of a mobile frame and having a first portion for movement of a lead boat supporting dolly and a second portion for movement of a plurality of boat supporting carriages spaced from the lead dolly. An entrance guide roller is mounted on the frame and positioned to be engaged by a bow



of a boat to guide same onto spaced support rollers positioned adjacent the guide roller to engage and support bottom surfaces of a boat on the boat trailer structure.

3,717,269
MOBILE SHOVEL EXCAVATOR

Hans Schaeff, Wurttemberg, Germany, assignor to Karl Schaeff KG., Maschinenfabrik, Langenburg, Wurttemberg, Germany
Continuation of abandoned application Ser. No. 770,657, Oct. 25, 1968. This application Mar. 22, 1971, Ser. No. 126,974
Int. Cl. E02f *3/28*
U.S. Cl. 214—138 R **1 Claim**

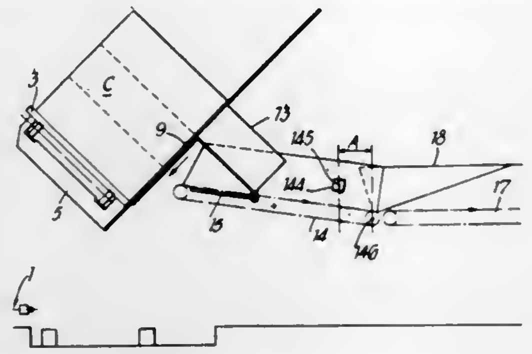


A mobile excavator, in which the digging tool, shovel arm and jib are mounted on a superstructure for pivoted movement and in a common vertical plane, and the superstructure, is rotatably mounted on a wheeled or tracked vehicle for movement through a 360° arc. The jib is attached to the superstructure by means of a bracket which permits pivoted movement of the jib about either vertical or horizontal axis so that narrow trenches extending parallel to the jib may be dug adjacent walls and other structures.

3,717,270
CONTAINER UNLOADING

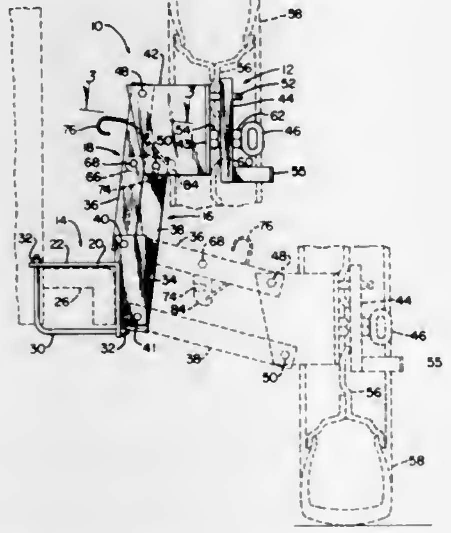
Sydney William Rooke, and Ronald Frances Coston, both of Kent, England, assignors to Sonex Ltd., Kent, England
Continuation-in-part of Ser. No. 11,956, Feb. 17, 1970, Pat. No. 3,651,967. This application Nov. 17, 1971, Ser. No. 199,568
Claims priority, application Great Britain, March 7, 1969,
Int. Cl. B65b *21/02*
U.S. Cl. 214—307 **11 Claims**

An apparatus for unloading the contents of containers, particularly but not exclusively baggage or cargo containers used in aircraft. The apparatus comprises a decanter apparatus for tilting each container toward an open side thereof at a discharge station and a fence arranged to hold back the contents of at least one region of said container until the contents of at least one other region have been discharged as a result of the tilting, the fence being arranged for relative vertical movement with respect to said open side to permit controlled discharge of the regions of said container in a predetermined order. The loaded containers are placed in turn on the decanter apparatus in the upright position and then tilted towards an open side of the container, the fence being arranged initially to close the open side except for the upper part thereof, and the fence is then moved with respect to the container side thus permitting progressive discharge of the container. Means are provided which are actuated by discharged articles to control the speed of the conveyor and so regulate the rate at which articles leave the conveyor and means may also be provided which control the relative movement of the fence with respect to the container side in synchronism with the speed of the conveyor.



3,717,271
VEHICLE TIRE CARRIER

Dale L. Bargman, Jr., Broomfield, Colo., assignor to Colorado Leisure Products, Inc., Broomfield, Colo.
Filed Mar. 30, 1971, Ser. No. 129,331
Int. Cl. B62d *43/00*
U.S. Cl. 214—451 **9 Claims**



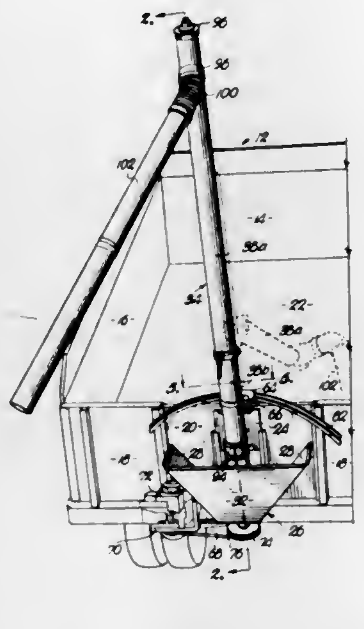
A tire carrier adapted to be secured to the rear bumper of a truck-type vehicle is characterized by a rugged, heavy-duty parallelogram linkage which supports the tire in a raised transport position against the rear of the vehicle and which may be selectively lowered to a removal position wherein the tire rests in an upright position on the ground. The carrier is provided with an automatic latch to secure the carrier in its raised position and a trigger release to allow the carrier to swing down to its lower removal position.

3,717,272
TAILGATE AUGER

Richard G. Chartier, Clyde, and Robert C. Chaffee, Green, both of Kans., assignors to Gilmore-Tatge Mfg. Co., Inc., Clay Center, Kan.
Filed Sept. 14, 1970, Ser. No. 71,962
Int. Cl. B60p *1/04*
U.S. Cl. 214—503 **14 Claims**

An auger for the box sides of a truck or wagon bed utilizes an open-top hopper positioned on the tailgate of the vehicle, an elevator assembly having one end thereof within the

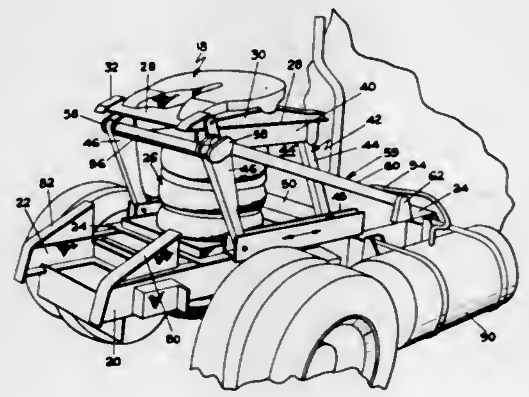
hopper, and structure mounting the assembly for swinging movement relative to the hopper. A prime mover is operably joined with the assembly in all positions of swinging movement. The assembly is comprised of first and second operably



interconnected sections, the uppermost of which is movable from its operating position to a collapsed position to reduce the effective vertical dimensions of the assembly during the transport of the vehicle.

3,717,273
VEHICULAR BAG HOIST

Howard P. Berends, Fruitport, Mich., assignor to Holland Hitch Company, Holland, Mich.
Filed Jan. 4, 1971, Ser. No. 103,689
Int. Cl. B60p *1/02*
U.S. Cl. 214—512 **4 Claims**

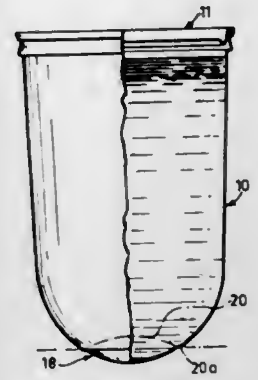


An elevatable vehicular hauling assembly employing expandable hoisting bellows, a pair of sliding parallelogram linkages, and vertical alignment retention and position control means interlinked therewith.

3,717,274
CONTAINER WITH LID FOR LIQUIDS

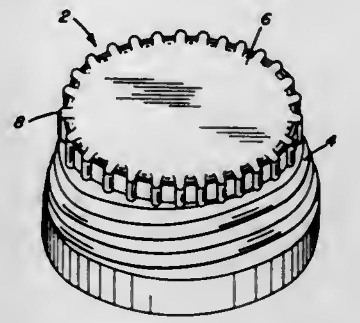
Uno Wingardh, Morarp, Sweden, assignor to Sprinter Pack AB, Halmstad, Sweden
Filed Sept. 18, 1970, Ser. No. 73,298
Claims priority, application Sweden, Sept. 30, 1969, 13453/69
Int. Cl. B65d *23/00*
U.S. Cl. 215—1 C **2 Claims**

A liquid container, particularly containing carbonized drinks, comprising a conical thin-walled plastic container with a bottom formed substantially as part of a sphere having its central portion selectively deformable, and a plane metal sheet lid secured by a folded edge or seal to the edge of the container and provided with a tear-away tongue to provide a pouring opening when tearing off the tongue.



3,717,275
KNURLED CLOSURE

Wilburn Coy Willis, Richmond, Ind., assignor to Aluminum Company of America, Pittsburgh, Pa.
Division of Ser. No. 807,189, March 14, 1969, Pat. No. 3,623,442. This application March 29, 1971, Ser. No. 128,974
Int. Cl. B65d *41/04*
U.S. Cl. 215—43 R **5 Claims**

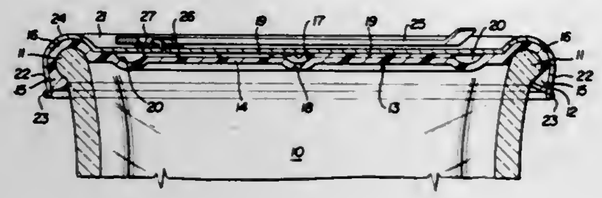


A method of forming an annular knurled band on two surfaces of a container closure by providing a generally cylindrical closure shell having a top panel and a depending annular skirt. Forming a plurality of outwardly directed knurled portions within a plurality of first circumferential arcs by outwardly reforming the arcs to establish in each knurled section a lower portion extending radially outwardly from the annular skirt and an upper portion formed as a continuous extension of the lower portion, extending upwardly and outwardly from the top panel. Forming a plurality of inwardly directed knurl portions in second circumferential arcs in alternating position with the outwardly directed knurl portions by restraining the second arcs against outward movement. The closure having both the outwardly directed and the inwardly directed knurled portions each of substantially uniform transverse width throughout their longitudinal extent. The knurling originates within the upper half of the skirt and terminates at its uppermost level in the upper panel.

3,717,276
VENTED CLOSURE

Terrence L. Luczak; Leonard K. Pudlicki and Carlton A. Richie, all of Toledo, Ohio, assignors to Owens-Illinois, Inc.
Filed Feb. 12, 1971, Ser. No. 114,830
Int. Cl. B65d *41/20, 51/16*
U.S. Cl. 215—40 **14 Claims**

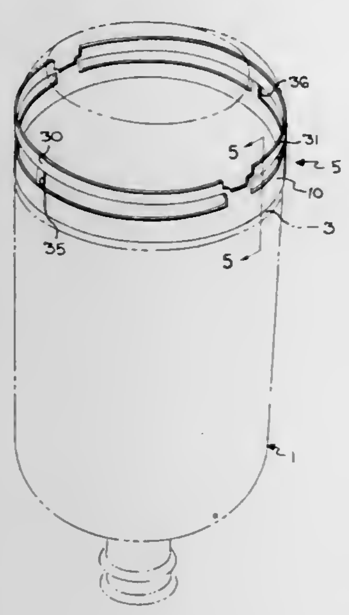
This invention relates to a venting plastic liner cap and a two-piece closure for pressurizable containers packaging products such as beer, carbonated beverages and the like. The liner serves to seal the mouth of the container under an outer metal cap provided with a pull tab and tear strip for removal. Pressure is vented through a central aperture of the liner top and into radial channels that extend as the spokes of a wheel. Effective release of internal pressure, upon opening the closure, is provided regardless of where the tear strip of the outer cap is initiated. This construction obviates registration or



index of the two parts in closure assembly on the container. Two channel embodiments comprise: (1) a series of depressed radial channels and an outer annular channel interconnected therewith, or (2) a series of radial ribs or projections on the cap that provide radial passageways from the center of the cap; either of these venting gas passing through the center aperture.

3,717,277
HANDLE FOR SUSPENDING INTRAVENOUS SOLUTION BOTTLES

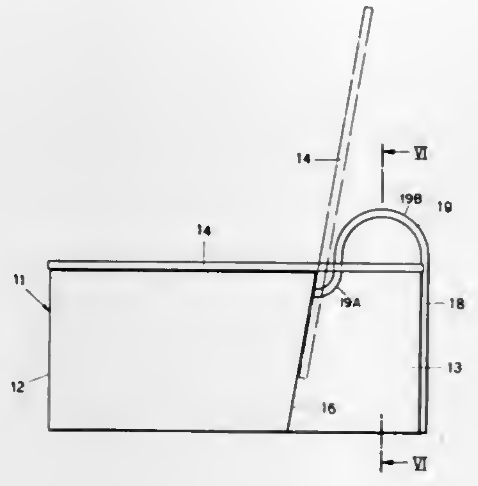
Edward J. Stengle, Jr., Toledo, Ohio, assignor to Owens-Illinois, Inc.
Filed Nov. 23, 1970, Ser. No. 91,955
Int. Cl. B65d *23/60, 25/32*
U.S. Cl. 215—100 A **8 Claims**



A plastic handle for bottles which allows the bottle to be suspended neck down from a suitable support device for administering the contents of the bottle. The handle has two bails attached to it, thereby providing an additional measure of safety while the bottle is thus suspended. In addition, severable lugs hold the bails in position until such time as they are required to support the bottle. The entire device, including a band which is attached to the bottle and the supporting bails, is formed as an integral unit by an injection molding process. The device is made of a thermoplastic material having high temperature resistance properties, which thus allows assembly of the handle device to the bottle immediately after manufacture and subsequent auto-claving of the completed package after filling with a suitable pharmaceutical material.

3,717,278
HINGED BOX

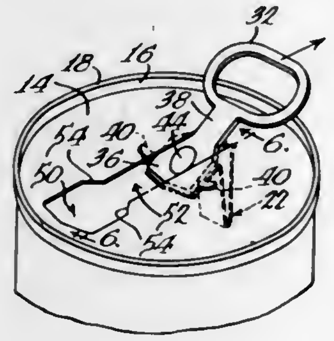
Enzo Mari, Piazzale Baracca 10, Milan, Italy
Filed Sept. 9, 1970, Ser. No. 70,723
Int. Cl. B65d *45/15, 51/10*
U.S. Cl. 220—31 R **5 Claims**



A hinged box is disclosed, which is characterized in that the body portion and the hinge are made as a single piece (such as of a plastic material, by moulding). The hinge integral with the body portion has two adjoining sections having oppositely directed radii of curvature.

3,717,279
NONDETACHABLE TEAR STRIP WITH WING TAB

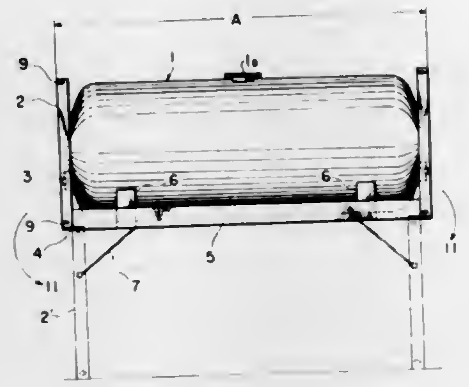
Leon M. Patarini and Arthur P. Zundel, Chicago, Ill., assignors to National Can Corporation, Chicago, Ill.
Filed Jan. 27, 1972, Ser. No. 221,205
Int. Cl. B65d *17/24*
U.S. Cl. 220—54 **15 Claims**



A container end panel is formed with a score line defining a tear strip permanently attached at one end to the panel. A tab has deflectable fingers extending laterally outwardly along opposite sides adjacent the connecting means to maintain the connecting end of the tab within the container after pivotal movement of the tab to institute severing of the score line. The opening in the panel created by the score line has a reduced portion adjacent the permanent connection between the panel and the tear strip while the tab has an enlarged portion on the connecting end and a reduced portion intermediate the ends that is received into the reduced portion of the opening so that the tab is guided along the opening to a stored position adjacent the permanent connection while the tear strip is bent intermediate its ends and is essentially folded upon itself to be located within the container when the panel has been fully opened.

3,717,280
TANK SUPPORT AND BRACING STRUCTURE

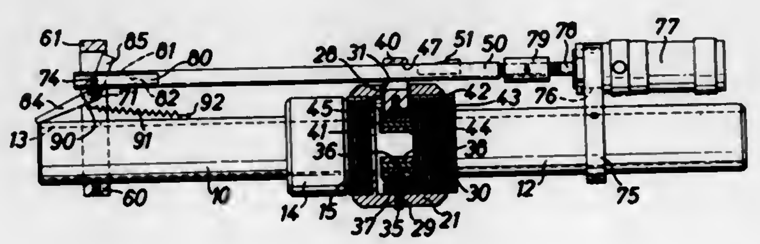
Natsuo Narumi, Kobe, Japan, assignor to Messrs. Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan
Filed Nov. 27, 1970, Ser. No. 93,166
Claims priority, application Japan, Dec. 5, 1969, 44/97,662
Int. Cl. B65d *7/42*
U.S. Cl. 220—69 **7 Claims**



A reinforcing structure for securing a cylindrical tank during shipment includes at least two longitudinal members which are interconnected by cross members providing cradles for the tank cylinder. The tank is secured at each end for shipment by an upright member at each side of each end of the tank which is secured to the adjacent end by a cross member and a clamp fitting. The upright members are positioned at each corner of the tank and they extend upwardly above the top thereof and they, together with the longitudinal and transverse members, provide a protective frame support for shipping the tank. The upright members may be disconnected from the tank by removing the clamp and they are pivotably connected at each end to the longitudinal members so that they may be swung downwardly to extend substantially vertically and downwardly in a position which they form supporting legs. Additional bracing elements are carried on the legs which may be opened up to extend diagonally from the leg to the longitudinal member.

3,717,281
TUBE DISPENSER

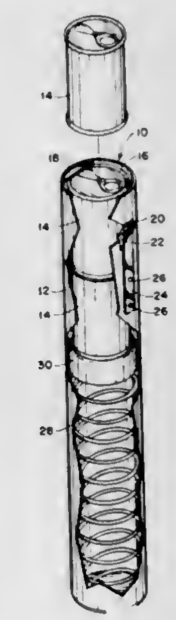
Thomas Duncan Brownbill, Uxbridge, England, assignor to John Dale Limited, London, England
Filed Feb. 11, 1971, Ser. No. 114,645
Claims priority, application Great Britain, Apr. 17, 1970, 18,542/70
Int. Cl. B65h *3/08*
U.S. Cl. 221—278 **10 Claims**



The present invention relates to the dispensing of nested collapsible tubes and includes a dispensing conduit, gate means disposed at the dispensing end of the conduit and clamp means spaced upstream of the gate means and arranged to engage an article adjacent thereto, control means interconnecting the gate means in the retaining means and pneumatic means disposed between said gate means and clamp means and arranged to debouche into the dispensing conduit to introduce a stream of air into the conduit at or towards the rear of a tube towards the gate means so that with the gate means in the open position and the clamp means in the clamping position the article or articles to be dispensed are ejected from the dispensing tube.

3,717,282
CONTAINER DISPENSER

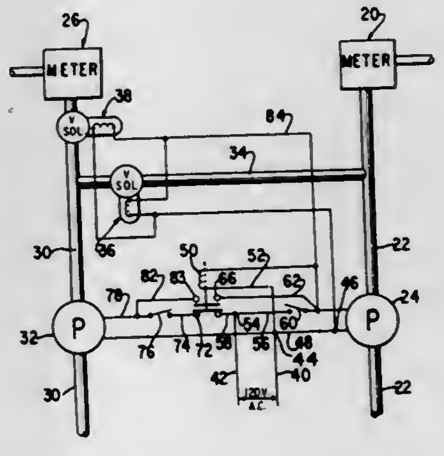
Robert A. Nordskog, Tarzana, Calif., assignor to Nordskog Company, Inc., Van Nuys, Calif.
Filed Oct. 5, 1970, Ser. No. 77,933
Int. Cl. A47f *1/06*
U.S. Cl. 221—279 **1 Claim**



Dispenser apparatus having a cylindrical housing to loose fittingly retain a plurality of stacked beverage containers, an axial biasing means to locate the uppermost container of a stack of containers adjacent a stop lip at the open end of the apparatus, a lateral bias to cause the uppermost container to be located under the lip thereby normally preventing removal thereof.

3,717,283
GASOLINE BLENDING APPARATUS

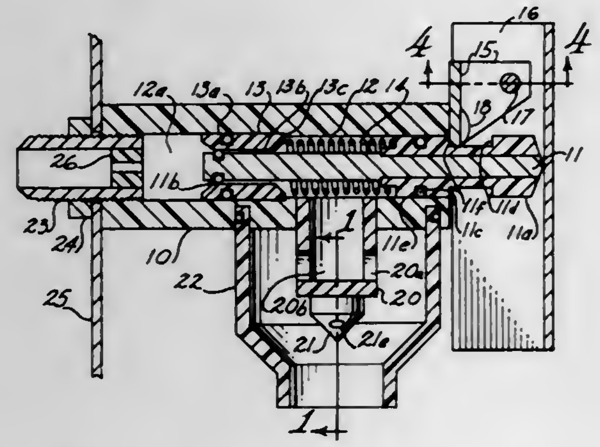
Arthur F. Gulbrandsen, South Plainfield, N.J., assignor to Cities Service Oil Company, Tulsa, Okla.
Filed Dec. 17, 1971, Ser. No. 209,135
Int. Cl. B67d *5/44*
U.S. Cl. 222—76 **3 Claims**



A three grade gasoline dispensing system is disclosed wherein two grades of gasoline are stored in subsurface tanks and blended to obtain an intermediate grade. The system comprises two separate storage tanks (for premium grade and regular grade gasoline) each connected to a separate pump, each pump being separately connected to metering and dispensing devices by two pipes, respectively a premium grade pipe and an intermediate grade pipe. A third pump, metering and dispensing device is separately connected to one of the tanks by a pipe. An interconnecting pipe is connected between each of the first (premium) and second (intermediate grade) pipes leading from their respective pumps. A normally closed solenoid valve is mounted in the interconnecting pipe, while a normally open solenoid valve is mounted in the pipe to the premium grade metering device whereby flow through the premium dispensing device pipe and the interconnecting pipe are controlled by an interlocking circuit to assure proper proportional mixing of the two grades of gasoline to obtain the intermediate grade.

3,717,284
BEVERAGE DISPENSING VALVE

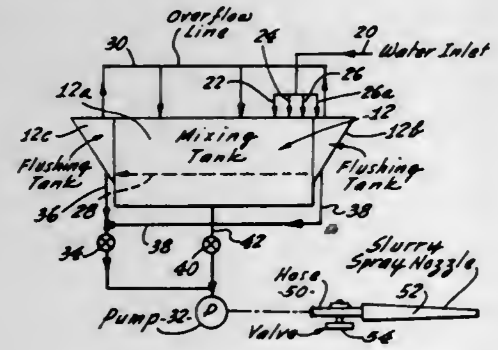
Bruce Garrard, 126 Montgomery Ferry Dr. N.E., Atlanta, Ga.
Filed Sept. 1, 1970, Ser. No. 68,615
Int. Cl. B67d *5/56*
U.S. Cl. 222—108 **6 Claims**



The specifications and drawings disclose a dual valve combination for dispensing a soft drink beverage, including a water valve and a syrup valve, each valve including a plunger which may be operated by a pivoted handle simultaneously with the other plunger or by separate manual operation when the handle is rotated out of the way. Each plunger has a small O-ring that shuts flow off when it seats in a small bore section of the valve body and allows flow when it is moved into a larger cavity. Each plunger has a small diameter O-ring portion and, because of a small movement of the plunger after stopping the flow, creates a suction that draws liquid back from its nozzle orifice. A water nozzle and syrup nozzle control flow into a mixing nozzle with the water being expelled in two circular, horizontal streams near the top of the mixing nozzle and syrup being directed in a jet at a downward angle into the center of the water stream leaving the mixing nozzle.

3,717,285
APPARATUS FOR SPRAYING A SLURRY

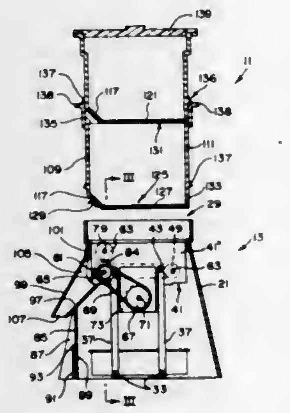
John H. Hatton, North Hollywood, Calif., assignor to Sta-Soil Corporation, North Hollywood, Calif.
Filed June 28, 1971, Ser. No. 157,277
Int. Cl. B67d *5/34*
U.S. Cl. 222—136 **4 Claims**



A spraying apparatus is provided which may, for example, be carried by a truck, and which is used for spraying mulch, fertilizer or seed, or any combination thereof, on planting sites. The spraying mechanism of the invention has auxiliary fresh water tanks mounted on either side of a main mixing tank, the auxiliary tanks being filled with fresh water when the main mixing tank is filled. The mechanism of the invention also includes coupling pipelines and valves which permit fresh water in the auxiliary tanks to be used, when needed, to flush out the hoses and nozzles of the mechanism when a particular job is terminated.

3,717,286
ICE DISPENSING MACHINE

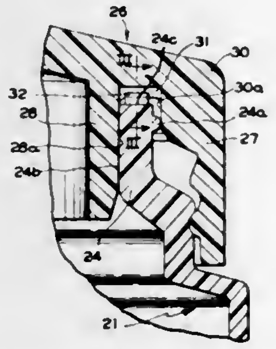
Ernest L. Crider, 3949 Hedgerow Cove, Memphis, Tenn.
Filed Dec. 23, 1970, Ser. No. 101,013
Int. Cl. B67d *5/60*
U.S. Cl. 222—143 **5 Claims**



A dispensing machine for dispensing crushed ice, cubed ice, or the like. The dispensing machine includes a base portion and a plurality of removable stacked hoppers supported on the base portion for containing the ice and supplying it to the base portion. The base portion contains an exit opening for the ice and a conveyor belt for receiving the ice from the hoppers and moving it into said exit opening for the dispensing thereof.

3,717,287
SELF-SEALING AND LOCKING COLLAR AND CONTAINER

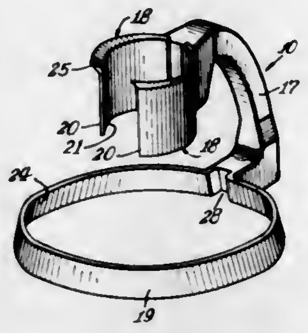
Jean Marand, Norwalk, Conn., assignor to Ciba-Geigy Corporation
Filed May 11, 1970, Ser. No. 36,010
Int. Cl. B65d *55/02*
U.S. Cl. 222—153 **2 Claims**



A container having an annular neck is sealed liquid tight to a cap having two annular flanges. The neck fits between the two flanges, the inner surface of the neck creating a seal with the outer surface of the inner flange, and the outer diameter of the neck having an annular bead which creates a seal with the inner surface of the outer flange. The thickness of the neck at the bead is greater than the space between the flanges. The outer diameter of the inner flange is greater than the inner diameter of the neck. The cap and container may be made of dissimilar plastic materials. The cap may snap or screw onto the container. Locking means may be provided to prevent removal of the cap from the container.

3,717,288
DECANTER HANDLE STRUCTURE

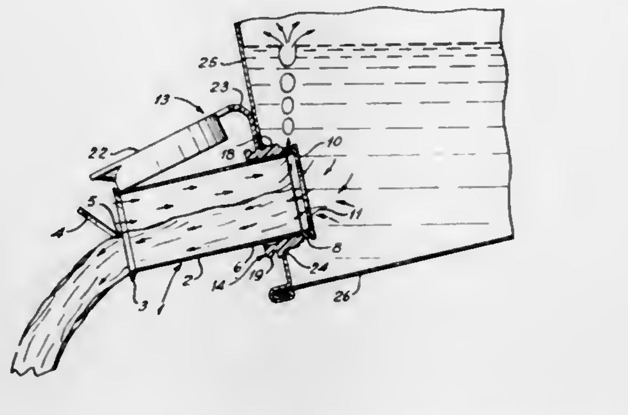
Norman H. Schlegel, Chicago, Ill., assignor to Cory Corporation
Filed March 22, 1971, Ser. No. 126,853
Int. Cl. A47b *95/02*
U.S. Cl. 222—465 **22 Claims**



A one-piece plastic handle structure for supporting a glass decanter such as for dispensing coffee and similar liquids. The handle structure is adapted to be removably engaged with the glass decanter and includes means for releasably embracing the decanter neck and means for protecting the bowl portion of the decanter bowl from injury.

3,717,289
VENTED POURING SPOUT

Jeremiah Laurizio, New Providence, N.J., assignor to American Flange & Manufacturing Co., Inc., New York, N.Y.
Filed Feb. 25, 1971, Ser. No. 118,690
Int. Cl. B67d *3/00*
U.S. Cl. 222—481 **13 Claims**

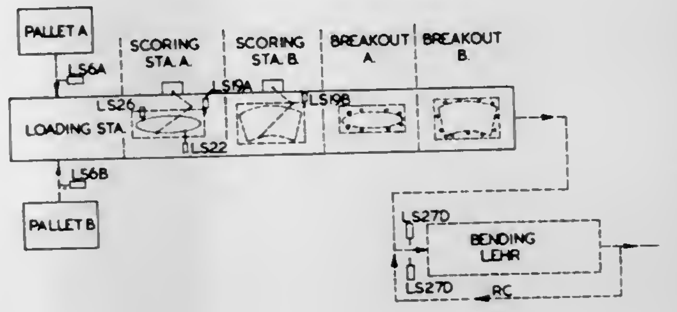


A vented pouring spout formed of synthetic plastics material adapted to be retracted in stored position within a container opening and pulled up to extended pouring position for dispensing of the container contents. The spout is formed at its inner end with venting means for permitting the entry of air within the container through the pouring spout simultaneously with the liquid dispensing.

3,717,290
MANUFACTURE OF GLASS SHEETS HAVING PREDETERMINED OUTLINE SHAPES

William Bentley, and John D. Kellar, both of Oshawa, Ontario, Canada, assignors to PPG Industries, Inc., Pittsburgh, Pa.
Filed Sept. 17, 1971, Ser. No. 181,450
Claims priority, application Canada, May 13, 1971, 112907
Int. Cl. B26d *3/08;* **B26f** *3/00*
U.S. Cl. 225—2 **9 Claims**

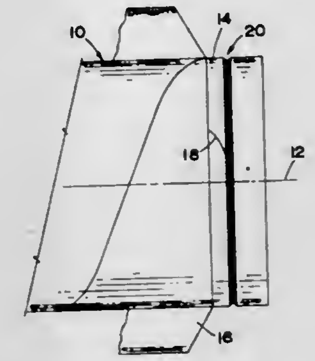
Glass sheets are scored and broken out in sequence on a conveyor line which includes a loading station for receiving rectangular sheets of glass of one predetermined outline size from a first storage means or pallet or from a second storage pallet containing glass of a different predetermined size. Just beyond the loading station are serially arranged first and second scoring stations and beyond these are located serially arranged first and second glass breakout stations. The first scoring and breakout stations are arranged to score to a first outline pattern and breakout, respectively, glass from the first



pallet while the second scoring and breakout stations are arranged to score to a second outline pattern and breakout, respectively, glass received from the second pallet. This arrangement permits very rapid changeover from one pattern to another; pattern changes and maintenance can be effected on one set of stations, e.g., the "first" scoring and breakout stations while the other set of stations remains in operation.

3,717,291
TEXTILE YARN CARRIER WITH CIRCUMFERENTIAL GROOVE

Hal M. Adams, Charles K. Dunlap, Jr., both of Hartsville, and William M. Harper, Darlington, all of S.C., assignors to Sonoco Products Company, Hartsville, S.C.
Filed Nov. 27, 1970, Ser. No. 93,037
Int. Cl. B26f *3/02;* **B65h** *75/28, 75/32*
U.S. Cl. 225—6 **5 Claims**

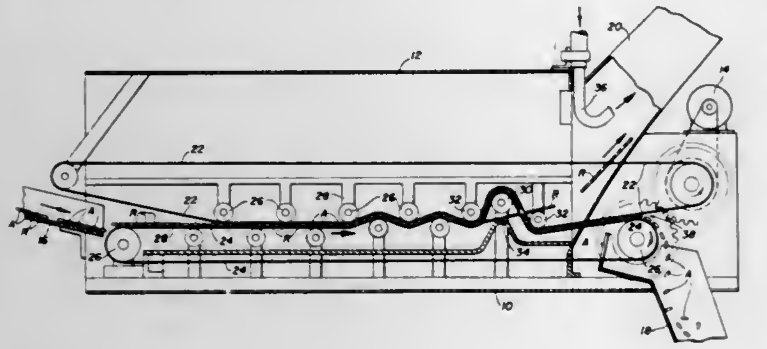


A core for winding yarn or thread having a circumferential groove of a desired width at any depth is provided by a double-sided, double-tapered blade or a single-sided, double-tapered blade.

3,717,292
DEGATING PLASTIC ARTICLES

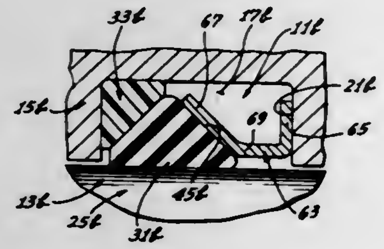
Marshall Honeycutt, Fitchburg, and William Pye, Leominster, both of Mass., assignors to Amarin Plastics Inc., Leominster, Mass.
Filed March 24, 1971, Ser. No. 127,589
Int. Cl. B26f *3/00*
U.S. Cl. 225—99 **10 Claims**

Degating plastic articles from the runner therefor by placing the articles and runner as received from the mold in a shot between a pair of traveling belts which are guided along a path flexing the articles relative to the runner so as to break the articles from the runner. The runners and articles are then conveyed to separate locations.



3,717,293
SEAL ASSEMBLY

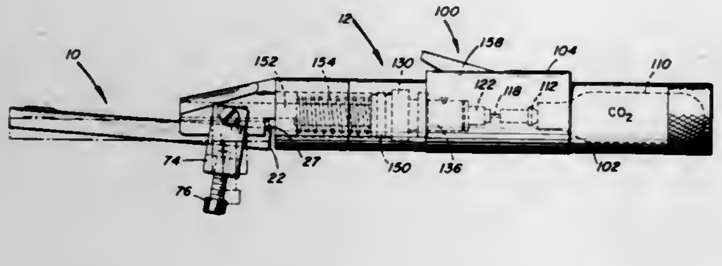
Henry A. Traub, Pacific Palisades, and Leslie A. Woodson, Long Beach, both of Calif., assignors to W. S. Shamban & Co., West Los Angeles, Calif.
Division of Ser. No. 842,178, July 16, 1969, Pat. No. 3,630,532. This application June 21, 1971, Ser. No. 154,808
Int. Cl. F16s *9/06*
U.S. Cl. 277—144 **7 Claims**



A seal assembly of the type for forming a seal between relatively movable inner and outer members. The seal assembly includes, nonelastomeric sealing ring means and a metallic spring for urging the nonelastomeric sealing ring means into fluid tight sealing engagement with the two members.

3,717,294
CARTRIDGE AND POWERING INSTRUMENT FOR STAPLING SKIN AND FASCIA

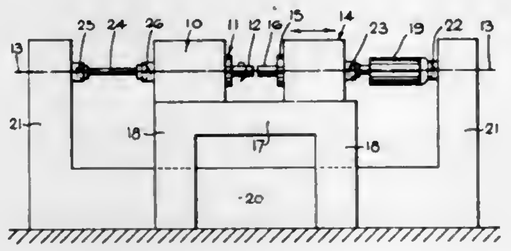
David T. Green, Norwalk, Conn., assignor to United States Surgical Corporation, Baltimore, Md.
Filed Dec. 14, 1970, Ser. No. 97,995
Int. Cl. B25c *5/00*
U.S. Cl. 227—19 **33 Claims**



A disposable staple cartridge housing a plurality of staples on a flexible belt and adapted to inject and form the staples, singly, into the disunited skin or fascia of a patient. Downwardly projecting flanges on a staple pusher act directly on the forwardmost staple positioned between a pair of adjacent teeth in the flexible belt and move the staple, the belt and its contents, with each stroke of the pusher. The forwardmost staple, when acted upon by the pusher, advances, rides out of the plane of the flexible belt and into the plane of the pusher and is ejected and bent around an anvil assembly. On the return stroke of the pusher, the downwardly projecting flanges flex out of the plane of the next successive staple, moving over that staple, and then take a position in readiness for the following stapling operation. The cartridge is provided with means for preventing the retraction of the staple housing belt during the rearward stroke of the pusher. In a second embodiment of the disposable cartridge, a plurality of staples are advanced as described above, but the number of disposable elements are reduced. With this embodiment, an inventive adaptor serves to associate the cartridge with a powering instrument. Also disclosed is a novel and simplified gas activated powering unit which develops a rectilinear thrust for advancing and forming staples.

3,717,295
FRICTION WELDING OR LIKE MACHINES

Alan Woodall, Wolverhampton, and Chesleigh Brian Honey, Walsall, both of England, assignors to Clarke Chapman-John Thompson Limited, Victoria Works, Gateshead on Tyne, County Durham, England
Filed March 17, 1971, Ser. No. 125,182
Int. Cl. B23k *27/00*
U.S. Cl. 228—2 **10 Claims**



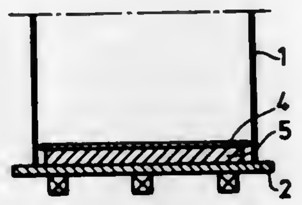
The disclosure relates to friction welding and other machines having holders for parts which are to be brought into contact and urged together by forces acting along an axis which extends through the contacting faces, the holders being supported by a bed which is off-set from the axis. The disclosure provides a machine having an end-loaded member distinct from the bed which bears the b ending load resulting from the contact pressure between the held parts and which is so arranged that it does not transmit to the bed any significant bending load such as would create mis-alignment of the holders and parts held thereby. The bed may be an open-ended box section member on an upper face of which the holders are mounted, the end-loaded member being a beam which extends through the interior of the bed, and the reaction to the force which urges the held parts together being transmitted to the beam by parts which extend from end portions of the beam upwardly to the axis.

3,717,296
CONTAINER FOR TRANSPORT, STORAGE AND HANDLING

Karl Alf Fellbrink, Sundsvall, Sweden, assignor to Hans Hjalmar Gustafson, Sundbyberg, Sweden
Filed Jan. 15, 1971, Ser. No. 106,873
Int. Cl. B65d *13/00*
U.S. Cl. 229—23 A **8 Claims**

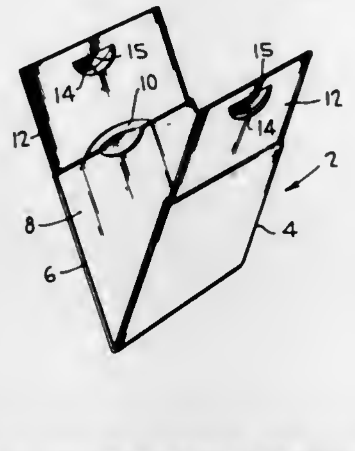
A container having a container wall with an open bottom which rests upon a transport lift element such as a pallet but

without any interconnection between the container wall and the transport lift element. The container bottom lies wholly within the container wall and comprises a rigid member whose periphery conforms generally to the inner periphery of the container wall without being secured thereto.



3,717,297
DISC RECORD CARRIER

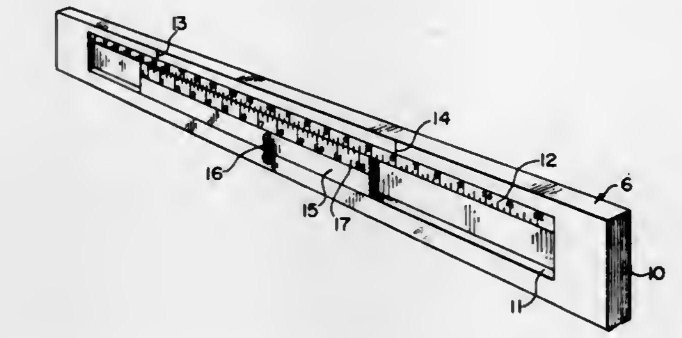
Charles Hamilton Perry, Washington, D.C., assignor to Creative Posters, Inc., Kensington, Md.
Filed Mar. 11, 1971, Ser. No. 123,306
Int. Cl. B65d *85/30*
U.S. Cl. 229—72 **5 Claims**



A paper blank includes a central section having a transversely positioned center fold line which allows the central section to be divided into two overlying parts hingedly connected by the center fold line. Flaps formed in the blank are turned inwardly toward the interior confronting surfaces of the divided central section parts to produce side by side envelopes. The outward end portions of the central section have handle means formed therein to facilitate carrying.

3,717,298
SLIDE RULE FOR PAYROLL USE

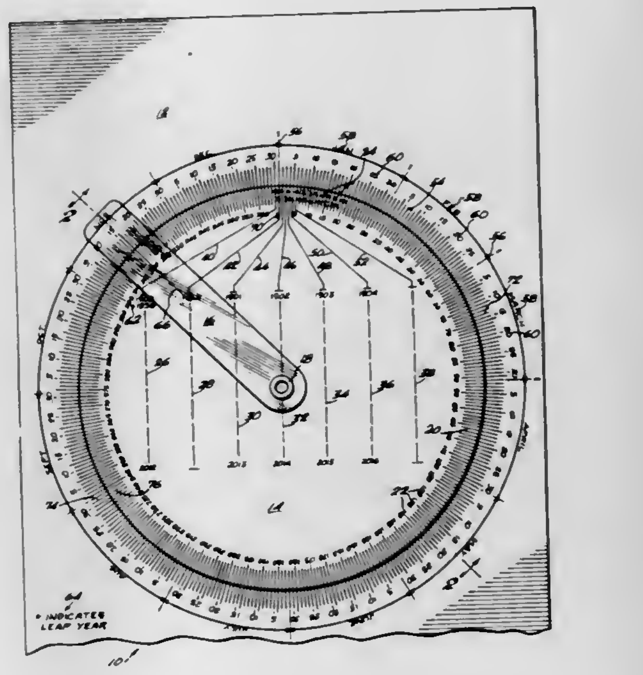
Emil Brugger, 5134 Illinois St., Loves Park, Ill.
Filed Oct. 7, 1971, Ser. No. 187,454
Int. Cl. G06g *1/02*
U.S. Cl. 235—70 R **4 Claims**



The longitudinally grooved calibrated stationary part has a slidable calibrated ruler disposed therein that is marked off at one end for a half-hour or a 1-hour lunch period depending on the working arrangement in a given place allotted for lunchtime and this marked-off end in computing any employees' time is set at the checkin point to avoid confusion in computing the number of hours worked when taking into consideration the employees checkout time, thus reducing the computation of all-over time to a simple single reading on the calibrated slidable ruler where the number of hours then becomes a matter of direct reading. A colored window piece slidably adjustable on the far end of the calibrated ruler is set according to the accepted 7 or 8 hours working period in the particular place of employment. By this simple means, the computation of regular time and overtime is a simple matter of separating one portion of the particular time that is being computed on the regular pay basis, the rest being overtime, which is paid on a time and one-half or double time basis depending on the rules for compensation in a given place.

3,717,299
CALENDAR AND DATE COMPUTER

William O. Penn, P.O. Box 1544, Eau Gallie, Fla.
Filed May 5, 1972, Ser. No. 250,602
Int. Cl. G06c *3/00*
U.S. Cl. 235—88 **10 Claims**

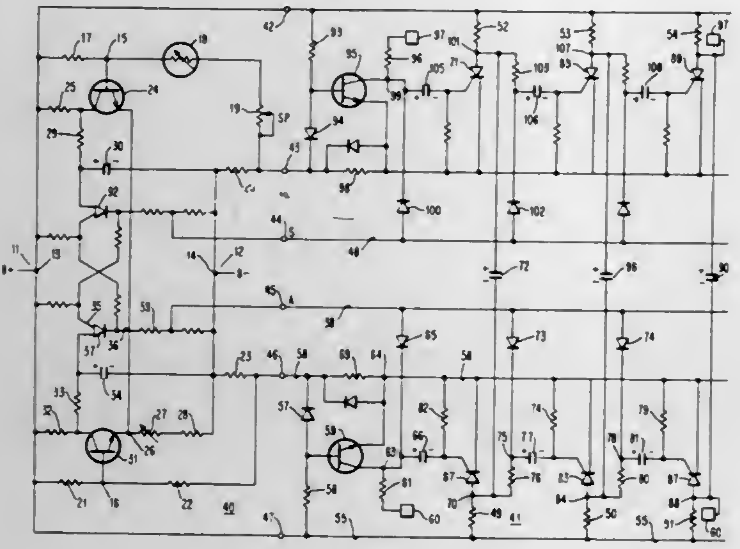


A calendar to record the correct date over a span of many years, for instance from the year 1950 to the year 2025, and to count calendar days from any point in the year, either into the future or back in time. Indicia are also provided to determine what day of the week is associated with any particular date.

3,717,300
TEMPERATURE CONTROL APPARATUS WITH A CYCLICAL DISTRIBUTOR

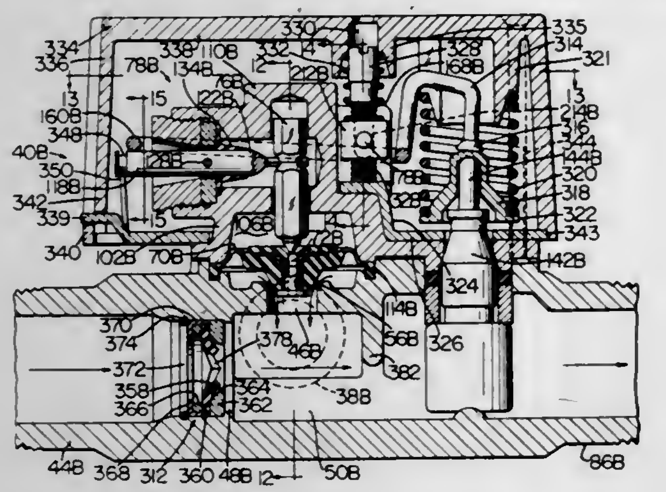
Egils Evalds, Ardmore, Pa., assignor to Athena Controls, Inc., West Conshohocken, Pa.
Filed Oct. 14, 1971, Ser. No. 189,186
Int. Cl. G05b *11/18;* **G05d** *23/24*
U.S. Cl. 236—1 E **11 Claims**

The present system provides a plurality of individual heater control circuits (or cooling circuits) which are connected together in such a way that the heater control circuits are serially activated to insure substantially equal use of all of the heating sources. The system follows a first on–first off procedure for increasing and decreasing the overall supply of heat.



3,717,301
VALVE CONSTRUCTION WITH MODULATING DIAPHRAGM CONSTRUCTION AND METHOD

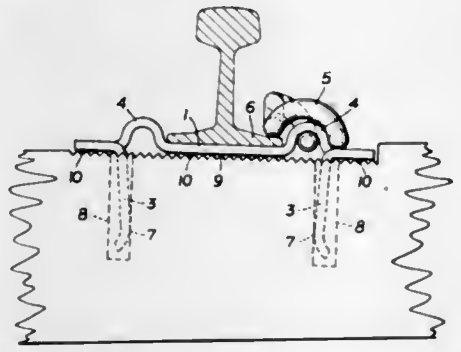
Harold A. McIntosh, South Pasadena, Calif., assignor to Robertshaw Controls Company, Richmond, Va.
Division of Ser. No. 716,556, March 27, 1968, Pat. No. 3,550,901. This application Aug. 26, 1970, Ser. No. 67,209
Int. Cl. G05d *23/13*
U.S. Cl. 236—12 A **8 Claims**



This application discloses a valve construction having a hot water inlet connected with a mixing chamber, a cold water inlet connected with the mixing chamber, and a water discharge outlet from said mixing chamber. One or more valve seats are provided in one or more of the inlets. One or more diaphragms are provided in modulating relationship with one or more of said valve seats. Each diaphragm construction includes a pilot passageway and bleed opening and an adjustable pilot in modulating relationship with the valve seat. A thermostat construction is responsive to the mixed water temperature of the mixing chamber and has adjusting means to adjust one or more pilots in modulating relationship to the water passageways in the one or more diaphragms. The thermostat construction may adjust the hot and/or cold water pilot to introduce a proper amount of hot and/or cold water into the mixing chamber. The pilot or pilots may be encased in a cavity wall construction which provides a cavity on one side of the diaphragm. One or more levers are provided with inner ends in the cavities and with sealing outward connections, so that their outer ends may be actuated by the thermostat construction to provide the modulating water control for the hot and/or cold water. This invention may also be used with other fluids than hot and cold water. Such fluids may be liquid or gaseous as desired.

3,717,302
RAILWAY SUPPORTING PLATES

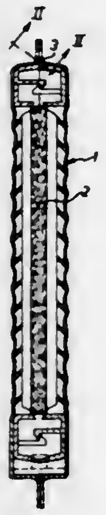
Gunter Neumann, Theresienfeld, Austria, assignor to Gunter Neumann Terrasan-Erzeugnisse, Theresienfeld, Austria
Filed Sept. 23, 1970, Ser. No. 74,615
Claims priority, application Austria, Sept. 24, 1969, A 9045/69
Int. Cl. E01b *9/40*
U.S. Cl. 238—287 **3 Claims**



A supporting plate for a railway rail is provided with downwardly extending pins integrally formed with said plate or welded thereto. These pins are inserted into holes formed in the sleeper and the interstices between the pins and the walls of the holes are filled with synthetic resin. The rail is secured to the supporting plate by clamps, so-called pandrols, engaging tunnel-shaped vaults formed in the supporting plate.

3,717,303
METHOD OF VACUUM-PACKING INSECTICIDAL MATERIALS

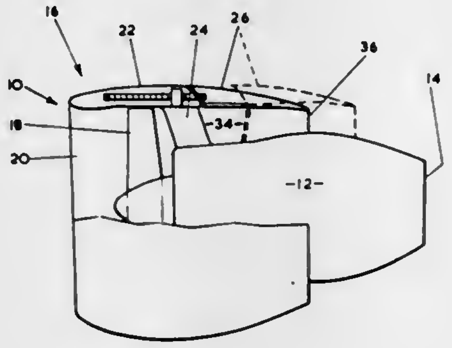
Jean Daeninckx, Saint Denis, and Rene Jules Bouvet, Boulogne sur Seine, both of France, assignors to L'Oreal, Paris, France
Filed Sept. 11, 1970, Ser. No. 71,433
Claims priority, application France, Sept. 26, 1969, 6932983
Int. Cl. A24f *25/00*; **A61l** *9/04*
U.S. Cl. 239—55 **4 Claims**



Method of packaging a sheet impregnated with an insecticidal product which evaporates slowly and which is contained in a perforated box which serves as a diffuser, by inserting the perforated box containing the impregnated sheet into a bag consisting of a flexible gas impervious material, placing the bag inside a chamber at a partial vacuum, introducing inert gas into said chamber to increase the pressure therewithin to a value still less than atmospheric pressure, sealing the bag, and increasing the pressure in said chamber to atmospheric pressure.

3,717,304
THRUST REVERSER FOR FLUID FLOW ENGINE

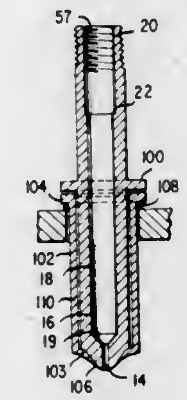
Julian MacDonald Davison Sutton, Linby, England, assignor to Rolls Royce Limited, Derby, England
Filed May 3, 1971, Ser. No. 139,693
Claims priority, application Great Britain, May 6, 1970, 21,810/70
Int. Cl. B63h *11/10*; **B64c** *15/00*
U.S. Cl. 239—265.19 **7 Claims**



Gas turbine ducted fan engines having short intakes suffer from re-ingestion problems when reverse fan thrust is selected. The present invention profiles the column of reversed fan air so that it presents a weaker front to the ambient airstream which is able to peel off the reversed fan air from the cowl before re-ingestion occurs.

3,717,305
FUEL INJECTION NOZZLE ASSEMBLY

Harry O. Hedges, P.O. Box 141, Marlton, N.J.
Filed Dec. 10, 1970, Ser. No. 96,961
Int. Cl. B05b *1/30*
U.S. Cl. 239—288.5 **5 Claims**



An improved fuel injection nozzle assembly is provided which may be easily removed from an engine block for replacement and maintenance purposes. A protective spray tip cap is formed to receive the nozzle portion of the overall assembly and may be formed with an external flange sized to be larger than any standard nozzle bore hole of an engine block. A body portion of the overall assembly is similarly provided with an external flange which, upon assembly of the overall apparatus, is clamped against an engine block so that the external flange of the body portion and the outer surface of the engine block cooperate to impinge upon the external flange of the spray tip cap to secure the cap in an operational posture.

In one independent feature of the invention, an adjustment nut is provided on the body portion of the assembly to vary the fuel pressure at which a valve portion of the assembly is actuated for the dispensing of fuel spray into a combustion chamber of the engine. The adjustment nut may be provided with a fluid passage fitting for removing any fuel passing through the assembly in a direction other than toward the combustion chamber. The nut may further be provided with a screwdriver receiving groove to facilitate the adjusting of the fuel pressure setting and the removal of the valve portion of the fuel injection nozzle assembly.

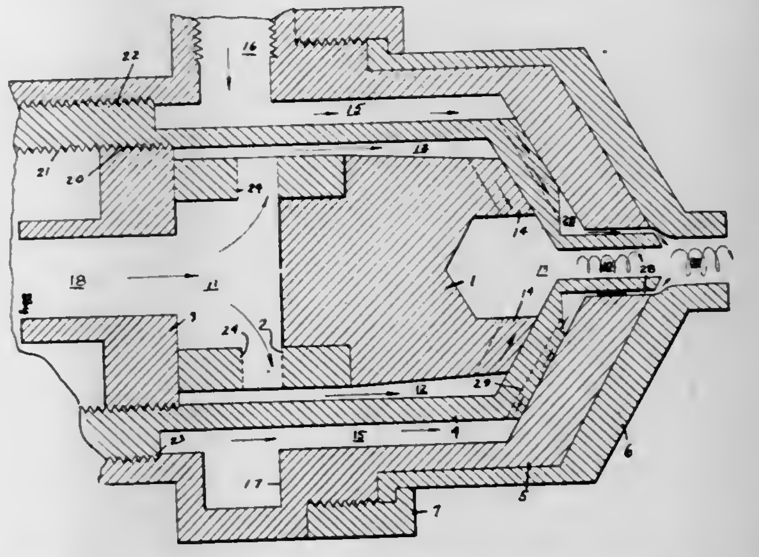
In another independent feature of the invention, a fuel inlet fitting may be threadedly mounted on the body portion of the assembly which fitting is provided with wedge shaped grooves adjacent the connection of the body with the fitting. Annular wedge shaped gaskets may be disposed within the grooves, and the fitting may cooperate with a clamping means to transfer an impinging force to the exterior flange on the nozzle spray cap in response to a tightening of the fastening means of the overall clamping means.

In another independent feature of the invention, the external flange portion of the spray cap may be formed with an annular groove for receiving an O-ring seal so that a more fluid-tight connection may be formed between the protective spray tip cap and the body portion of the overall assembly.

In still another independent feature of the invention, the body may be radially split adjacent a spray tip end thereof. Through this arrangement, the valve portion of the assembly may be removed from either axial end of the body after splitting the body into its two components.

3,717,306
NOZZLE FOR SPRAYING FOAMING MATERIALS

James R. Hushon, Bargain Road, McKean, Pa., and Sidney M. Price, Bel Air, Md., assignors to said R. Hushon, by said Price, McKean, Pa.
Filed March 10, 1971, Ser. No. 122,967
Int. Cl. B05b *7/06*
U.S. Cl. 239—404 **3 Claims**



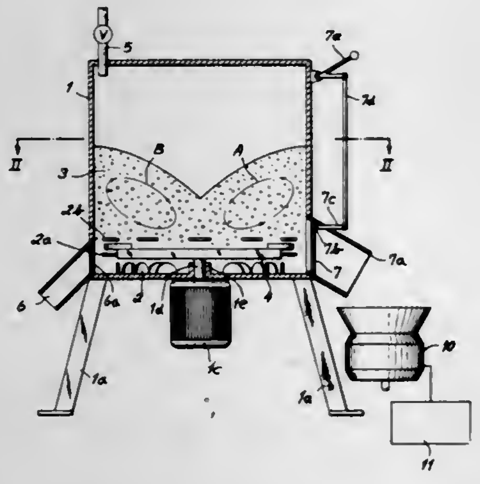
The specification discloses a spray nozzle assembly for simultaneously spraying two materials, such as the material and catalist of urethane foam. The nozzle assembly is made up of two concentric spray nozzle members defining a central path and a cylindrical path concentric to the central path. The nozzles are so arranged that the material is given a turbulent motion as it emerges from the nozzle thereby causing a mixing of the two materials. The assembly can be used without a pump connected to a source of pressure.

ERRATUM

For Class 239—654 see:
Patent No. 3,717,752

3,717,307
METHOD OF PREPARING REGRIND

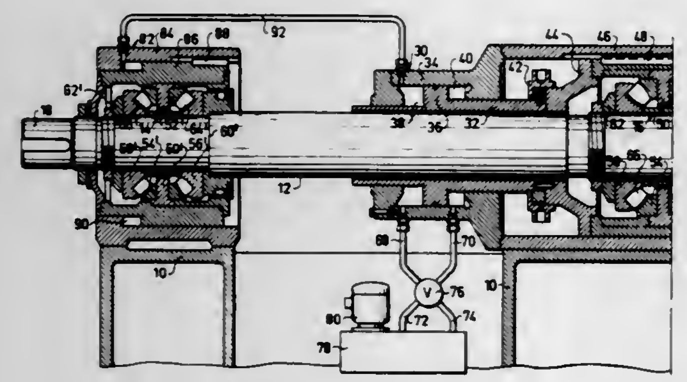
Erich Beck, Niedesheimer Pfad 25, Worms-Weinsheim, Germany
Filed Jan. 27, 1971, Ser. No. 110,122
Claims priority, application Germany, Feb. 6, 1970, P 20 05 360.5
Int. Cl. B02c *13/06*
U.S. Cl. 241—24 **5 Claims**



A method of preparing injection-molding, blow-molding and extrusion-molding residues, wastes and used thermoplastic materials for further forming which involves the comminution of the plastic simultaneously with the washing thereof, to remove soil, in a washing liquid.

3,717,308
GRINDING APPARATUS FOR FIBROUS MATERIAL

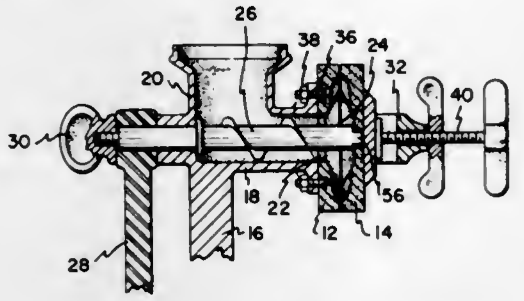
Rolf Bertil Reinhall, 16 Killingevagen, Lidingo, Sweden
Continuation of abandoned application Ser. No. 830,641, July 5, 1969. This application Mar. 6, 1972, Ser. No. 231,946
Int. Cl. B02c *7/06*, **F16c** *41/02*
U.S. Cl. 241—244 **2 Claims**



Grinding apparatus for fibrous material comprising a pair of grinding discs, at least one of which is carried by an axially displaceable shaft supported in two spaced combined radial and axial thrust bearings, each being associated with a servomotor for providing the axial displacement, one of the servomotors being operative to augment the grinding pressure exerted on the grinding discs by the other servomotor and to minimize bearing play in a radial direction.

3,717,309
GRINDING MILL

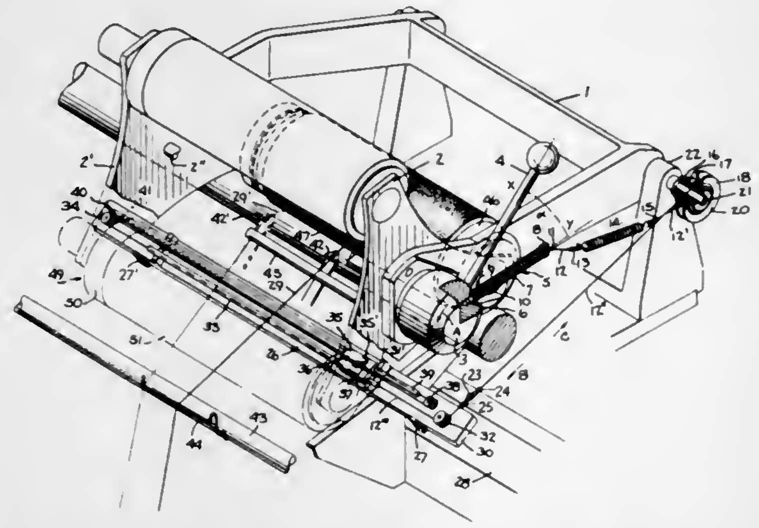
Harold E. Luker, Box 248, Tremonton, Utah, and Gary L. Skeem, Box 291, McCammon, Idaho
Filed Nov. 9, 1970, Ser. No. 87,723
Int. Cl. B02c *23/02*
U.S. Cl. 241—247 **1 Claim**



A grinding mill which includes first and second grinding wheels having substantially plane annular grinding faces mated substantially adjacent together, and at least one serration formed in the grinding face of each of the grinding wheels extending from an interior edge of the face to a mid-portion thereof, such that the material being ground by the wheels falls into the opening between the serrations and is cut by a grinding face of a grinding wheel when the serrations are moved out of mutual alignment.

3,717,310
TRANSFER TAIL TRACTION MECHANISM

Helmut Ritter, Wattwil, Switzerland, assignor to Heberlein Patent Corporation, New York, N.Y.
Filed April 20, 1970, Ser. No. 30,130
Claims priority, application Switzerland, Oct. 23, 1969, 15956/69
Int. Cl. B65h *54/02*
U.S. Cl. 242—18 A **8 Claims**

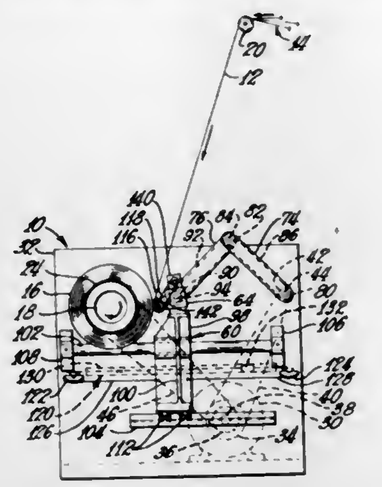


Apparatus for automatic formation of a transfer tail on a continuous delivery winding device including a bobbin changer wherein an oscillating thread guiding device traverses the normal winding zone of a winding spool and shifts the yarn during bobbin change to the transfer tail zone at one end of the new or empty spool.

3,717,311
APPARATUS FOR PACKAGING LINEAR MATERIAL

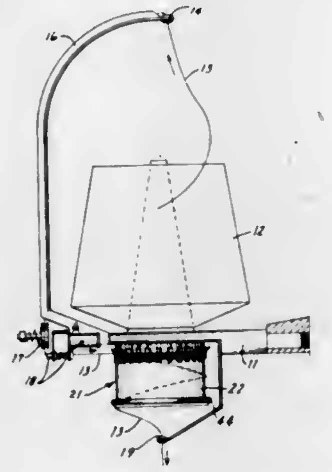
Roy E. Smith, Toledo, Ohio, assignor to Owens-Corning Fiberglass Corporation
Filed Sept. 30, 1970, Ser. No. 76,846
Int. Cl. B65h *54/02*
U.S. Cl. 242—18 R **3 Claims**

Apparatus for collecting linear material such as glass strand into a wound package on a rotating mandrel that uses a member exerting a constant pressure radially inwardly against the moving axial surface of the package during package build-up and that includes means responsive to the speed of the axial surface to control the rotating speed of the package.



3,717,312
THREAD STORAGE AND DELIVERY DEVICE

Karl Isac Joel Rosen, Villa Haga, Ulricehamn, Sweden
Continuation of Ser. No. 734,956, June 6, 1968. This application April 14, 1971, Ser. No. 133,961
Claims priority, application Sweden, Oct. 20, 1967, 14374/67
Int. Cl. B65h *51/20*
U.S. Cl. 242—47.12 **14 Claims**

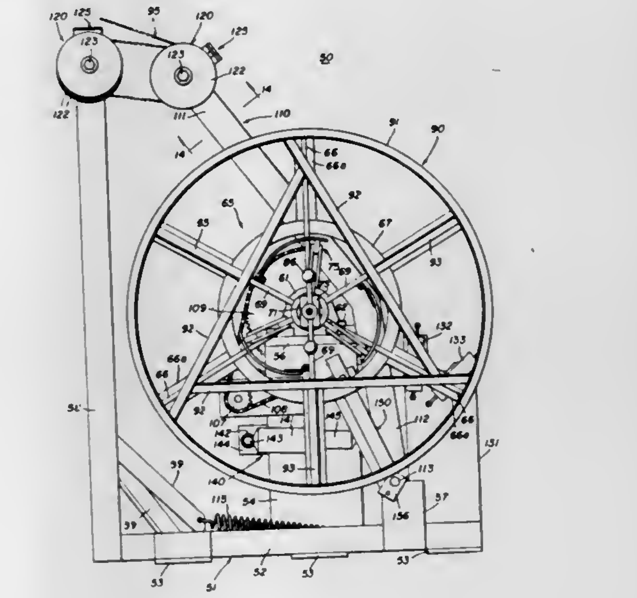


A thread storage and delivery device for conveying a thread from a spool to a working point on a textile machine. The device comprises a drum for receiving and storing a thread reserve. A disk is disposed substantially transverse to the axis of the shaft and is axially slideably mounted on the shaft. The disk has arm portions which extend radially through openings formed in the drum casing, said arms being axially supported on said thread reserve. The arm portions may be inclined upwardly relative to the external drum periphery for permitting the thread to be properly wound on the drum and for causing the thread on the drum to be wedged axially therealong. The disk is urged downwardly of the drum, the movement of the disk depending on the size of the thread reserve. The axial displacement of the disk controls the feed of thread to the drum to permit control over the size of the yarn reserve.

3,717,313
COIL UNREELER

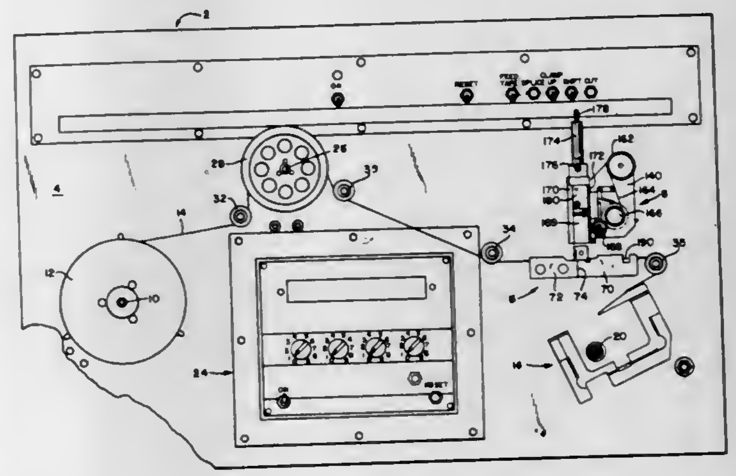
Walter Q. Williams, Glenwood, Ill., assignor to Interlake, Inc., Chicago, Ill.
Filed July 9, 1970, Ser. No. 53,580
Int. Cl. B65h *25/32, 25/04*
U.S. Cl. 292—54 R **15 Claims**

An unreeler for coils of a strapping material includes a coil support rotatably driven by a reversible air motor in either an unreeling or a reeling direction, two halves respectively controlling the operation of the air motor in two opposite directions, and a dancer arm having a home position and movable therefrom in opposite directions as the tension in the unreeled position of the strapping material varies above or below a reference range of tension, the dancer arm engaging and actuating the valves for actuating the motor in an unreeling or a reeling direction, respectively, as the arm moves from the home position thereof in response to increased or decreased strap tension; a coil support brake responsive to the movement of the dancer arm is also provided, the brake being applied when the dancer arm is in its home position and being released when the dancer arm moves from its home position.



3,717,314
AIR TURBINE DRIVE SYSTEM FOR TAPE WINDING AND SPLICING MACHINE

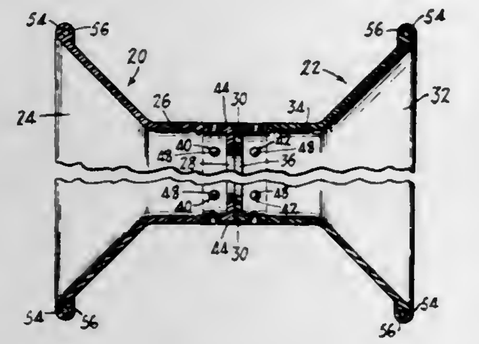
James L. King, Sudbury, Mass., assignor to King Instrument Corporation, Waltham, Mass.
Filed June 21, 1971, Ser. No. 154,857
Int. Cl. B65h *59/00*
U.S. Cl. 242—75.53 **15 Claims**



A drive system for transporting tape that is capable of rapidly accelerating to a high speed and of maintaining tension on the tape as it is being transported. The drive system utilizes two air turbines, one of relatively large inertia for driving a supply spool of tape and the other of relatively small inertia for driving a winding spindle, and includes valve means for adjustably and independently controlling the air input to each turbine.

3,717,315
TAKE-APART SPOOL FOR WIRE AND THE LIKE

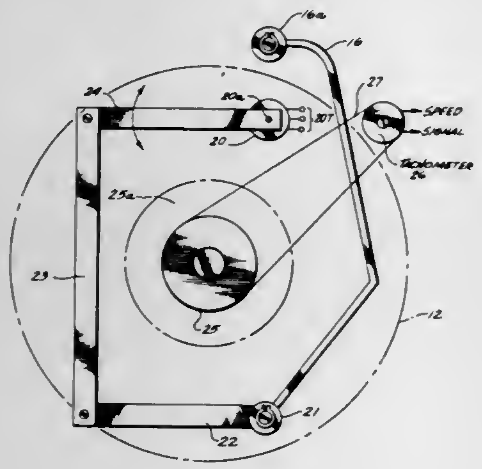
Joseph J. Kovaleski, Bridgeport, Conn., assignor to Wyrepak Industries, Inc., Bridgeport, Conn.
Filed Dec. 2, 1970, Ser. No. 94,449
Int. Cl. B65h *75/22, 75/28, 75/14*
U.S. Cl. 242—115 10 Claims



A spool for wire and like products, comprising a generally cylindrical body portion so arranged that the spool separates into two substantially identical halves along a transverse plane which is perpendicular to the spool axis and is located preferably substantially intermediate the ends of the body portion. The joining or engaging parts of the body portion are keyed to each other against turning and are prevented from separation by novel means arranged so that the securement or clamping action thereof is enhanced by the force exerted by the wire or similar material which is wound on the spool. In the main embodiment of the invention the body halves have quarter-segment splined portions and quarter-segment keyways receiving the spline portions, all said spline portions having circumferential clamping grooves which become aligned to constitute a single annular groove which is completely filled by the beginning turns of the wire which is wound on the body portion. The beginning turns thus lock the body portions to each other.

3,717,316
TAPE TRANSPORT CONTROL SYSTEM

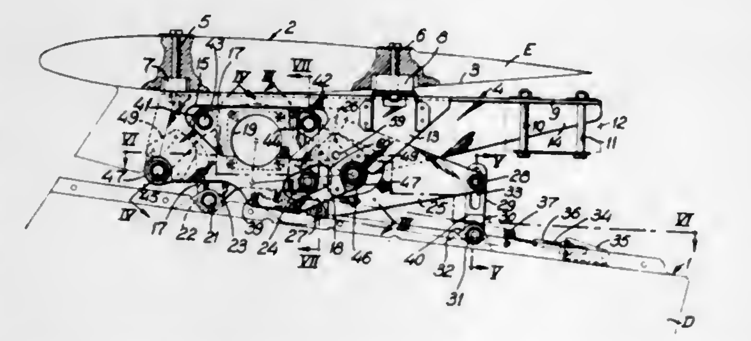
Paul A. Dennis, Hermosa Beach, Calif., assignor to Ex-Cell-O Corporation, Detroit, Mich.
Filed Oct. 28, 1970, Ser. No. 84,758
Int. Cl. B65h *25/32, 25/04*
U.S. Cl. 242—190 14 Claims



A control circuit for a reel-to-reel tape transport system for controlling the transfer of tape between the reels. The control circuit includes means for sensing the demand of tape during a tape transfer operation and providing an electrical signal corresponding thereto. The demand signal is compared with a feedback signal representative of the speed of the drive means for each of the storage reels and providing a comparison output signal of preselected magnitude and polarity. The comparison output signal is coupled to energize and individual reel drive through switchable power amplifiers. The power amplifiers are triggered from a "dead zone" trigger circuit coupled to be responsive to the comparison output signal for switching the power amplifiers from a fully conducting to a non-conducting condition. The "dead zone" trigger circuit is constructed and defined for providing a threshold comparison input signal level for defining the non-conductive state of the power amplifiers with changes in the comparison output signal level. The reel drives coast during the non-conductive states of the power amplifiers.

3,717,317
METHOD AND DEVICES FOR IMPROVING THE LONGITUDINAL STABILITY OF HELICOPTERS

Bernard Maurice Certain, Aix-en-Provence, France, assignor to Societe Nationale Industrielle Aerospatiale, Paris (Seine), France
Filed Nov. 25, 1970, Ser. No. 92,631
Claims priority, application France, Nov. 27, 1969, 6940879
Int. Cl. B64c *5/10*
U.S. Cl. 244—17.13 5 Claims



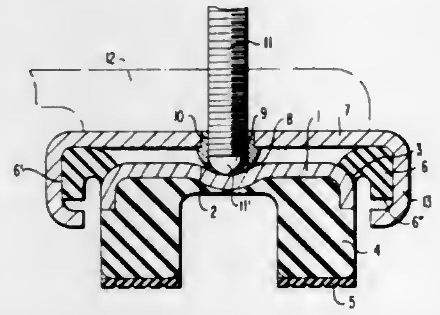
The technical province of this invention is that of aeronautical engineering.

The invention relates to a method and to devices for improving the longitudinal stability of helicopters, in which an incipient tendency for the nose of the helicopter to pull up is compensated by generating a diving moment responsively to a hinged stabilizer actuated as a result of the inertia of a weight attached thereto.

The principal industrial applications of the invention are to be found in the realm of rigid-rotor helicopters.

3,717,318
ANTI-VIBRATORY APPARATUS

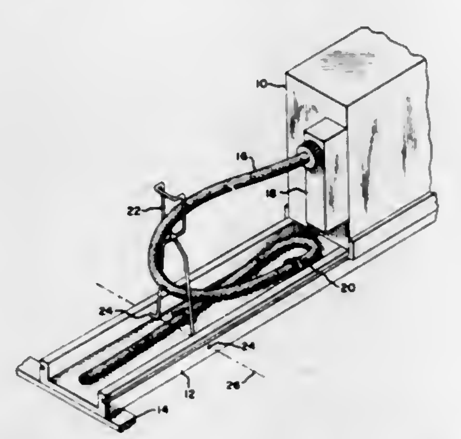
Kazuo Yamasita, Komaki, Japan, assignor to Tokai Rubber Industries, Ltd., Komaki-shi, Aichi-ken, Japan
Filed March 24, 1972, Ser. No. 237,853
Int. Cl. F16f *15/00*
U.S. Cl. 248—24 2 Claims



An anti-vibratory apparatus for a machine stand, comprises a cylindrical anti-vibratory rubber member edge lines with an oil-resistant rubber plate, a disc-like metal plate is bonded to the upper surface of said rubber member and includes a concave portion having a relatively large radius of curvature at its center and a shoulder portion at its periphery, a tongue-like rubber member is bonded to said shoulder portion, a disc-like metal cap is spaced from said metal plate and includes a flange portion which holds tight the peripheral surface of the tongue-like member and leaves a space between it and the end surface of the tongue-like member and carries a convex portion at the central part which has a radius of curvature smaller than said concave portion of said plate. A boss including an internal thread, carries a leveling bolt having a rounded end surface with a far smaller radius of curvature screwed in the internal thread, with the end in contact with said concave portion of said plate.

3,717,319
WIRE-FORM CABLE GUIDE FOR SHELF-MOUNTED ELECTRONIC EQUIPMENT MODULES

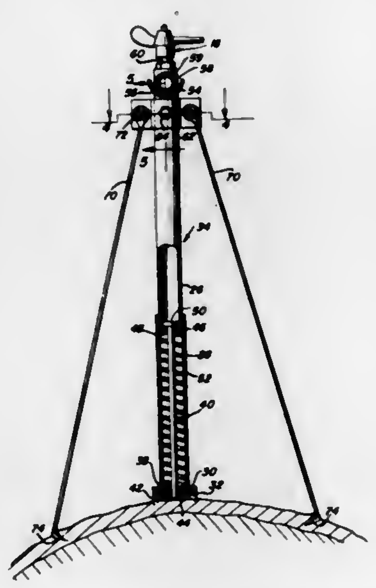
William James Schultz, Lynnfield, and Warren Norman Kernander, Boxford, both of Mass., assignors to General Electric Co.
Filed Nov. 27, 1970, Ser. No. 93,124
Int. Cl. H02g *11/00*
U.S. Cl. 248—49 4 Claims



A generally U-shaped wire-form cable guide having its legs pivotally connected to a module-supporting tray for rotation about an axis perpendicular to the direction in which the module may be moved. The guide includes an opening encircled by the bight portion and by inwardly crimped portions in each of the legs. A flexible electrical cable secured to the module and to the tray passes through this opening.

3,717,320
SPRINKLER STAND FOR COLD DECK LOG STORAGE

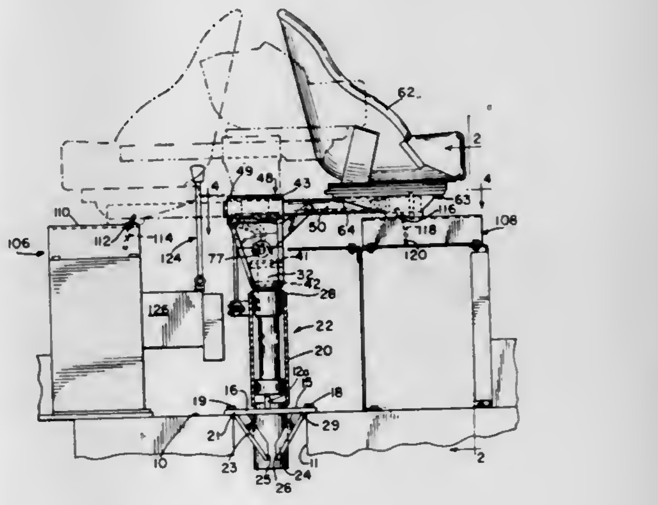
William W. Hill, 226 Isthmus Street, Coos Bay, Oreg.
Filed June 30, 1971, Ser. No. 158,220
Int. Cl. A47g *29/00*
U.S. Cl. 248—83 7 Claims



An upright stand including sprinkler head and supply hose supporting structure at its upper end. The stand includes a center main upright having a horizontally elongated foot supported from its lower end disposed in a first upstanding plane containing the center upright and the stand further includes opposite side legs pivotally supported at their upper ends for oscillation about horizontal axes disposed generally normal to the aforementioned plane and the lower ends of the legs are provided with inwardly directed angulated prongs for biting into and frictionally gripping the opposite sides of a log upon whose upper extremity the foot of the center upright is disposed with the foot extending longitudinally of the associated log. In order to maintain the angulated prongs at the lower ends of the legs in position penetrating the opposite sides of the associated log, the center upright is longitudinally extendable and yieldingly biased toward its extended position in a manner such that the sprinkler stand has its legs under tension, as opposed to compression, when the stand is operatively associated with a log.

3,717,321
HYDRAULICALLY ACTUATED SEAT ASSEMBLY

Lloyd A. Vander Burgh, Canton, Ill., assignor to International Harvester Company, Chicago, Ill.
Filed Aug. 30, 1971, Ser. No. 175,893
Int. Cl. B60n *1/02*
U.S. Cl. 248—404 9 Claims

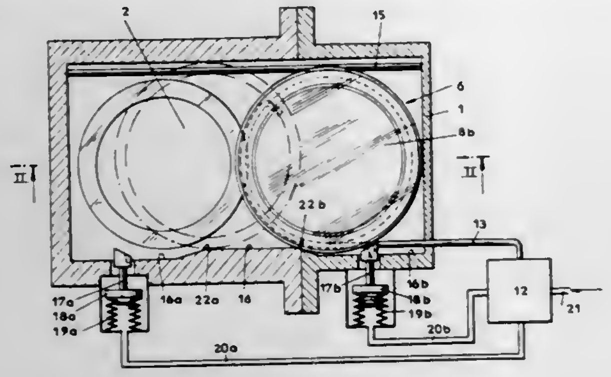


A seat assembly having a bearing mounted support column containing a hydraulic cylinder and an extension, slidably attached to the top thereof, which supports a seat at a distance away from the column. A hydraulic piston is provided in the upper part of the support column which allows vertical lifting only of that part, the lower part comprising the hydraulic cylinder. A dogleg-shaped member is pivotally fixed at one of its ends to the lower part of the column, the other end being pivotally fixed to the extension. The elbow portion of the dogleg is positioned on the upper part of the support column such that when the column is hydraulically actuated the dogleg pivots thereby retracting or extending the extension and seat.

3,717,322
SHUTTER VALVES FOR HIGH-VACUUM APPLICATIONS

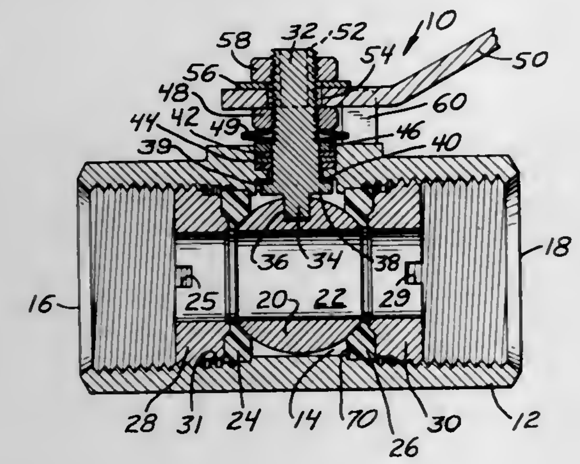
Rene George Bernard, Lyon, France, assignor to Societe D'Etudes Verrieres Appliquees, S/Seine, France
Filed Oct. 27, 1970, Ser. No. 84,426
Int. Cl. F16k *31/14, 3/10*
U.S. Cl. 251—61 10 Claims

A shutter valve primarily intended for high-vacuum use includes a housing and a valve disc which can be rolled by two actuators between two positions. In one position the valve is fully open and the other fully closed. In the closed position the valve disc is inflated through a flexible pipe which winds around the periphery of the disc. The inflation action ensures tight closure against the structure defining inlet and outlet openings of the valve body.



3,717,323
BALL VALVES

Ernest W. Geipel, Chicago, Ill., assignor to Crane Co., New York, N.Y.
Filed Sept. 24, 1971, Ser. No. 183,395
Int. Cl. F16k *5/06*
U.S. Cl. 251—315 **3 Claims**

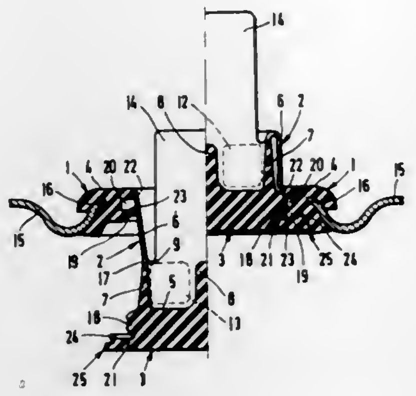


A ball valve having a novel seat arrangement whereby the seat rings, placed on opposite sides of the ball closure member, are each retained by a ferrule which is screwed into the valve body. The ferrule secures and positions the seat ring in a manner whereby the seat is advanced toward the ball to simultaneously form a seal between a counterbore in the valve body and the outer periphery of the seat, and, to preload the seat against the surface of the ball closure member, forming a seal therebetween. Such simultaneous forming of seals is assisted by a tapered conical surface of contact between seat rings and their respective ferrule. Thus, the advancement of the ferrule toward the seat results in a seal being established simultaneously between the seat and the body, and, the ball closure member and seat.

3,717,324
CLOSURE VALVE

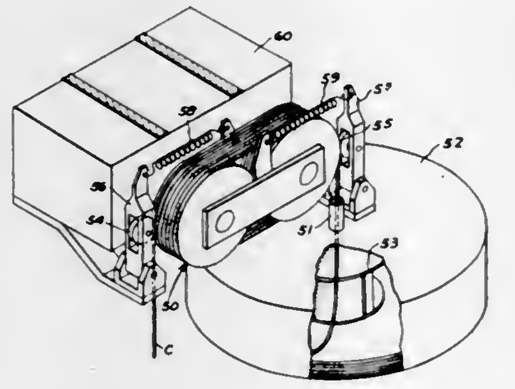
Wilhelm Milde, Wolfsburg, Germany, assignor to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Germany
Filed May 14, 1971, Ser. No. 143,517
Int. Cl. F16k *7/20*
U.S. Cl. 251—331 **11 Claims**

A locking arrangement made of flexible material which is insertable in an opening of a plate member, including a flanged portion with an axial bore therein, a cylindrical bellows secured at one end to the flanged portion along the periphery of its axial bore. The bellows has outlet openings to permit a flow axially through the arrangement, and a sealing plate is provided at the other end of the bellows which serves to limit the flow through the arrangement by being movable toward the flanged portion into sealing engagement therewith. The bellows is folded over on itself during such movement so as to permit a circumferential flange provided on the sealing plate to be sealed with said flanged portion.



3,717,325
CABLE SYSTEM

Vincent Carl J. Peterson, Huntingdon Valley, Pa., assignor to American Chain & Cable Company, Inc., New York, N.Y.
Continuation of Ser. No. 873,537, Nov. 3, 1969, abandoned. This application Aug. 2, 1971, Ser. No. 168,438
Int. Cl. B66d *1/76*
U.S. Cl. 254—175.7 **9 Claims**

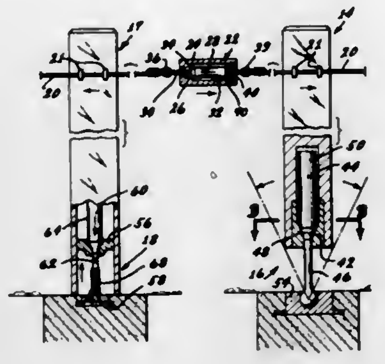


A cable system comprising a traction drive for a cable and a stationary container having axial guide means. One end of the cable is directed into the container and fixed to the container with the end portion extending generally circumferentially. The other end of the cable in one form of the system passes over a pulley and a load is attached thereto. In another form, the other end of the cable is trained over the traction drive and fixed thereto to provide a loop hoist. The entire assembly of container and traction drive is mounted on a carriage which is movable along a track.

3,717,326
ENERGY ABSORBING HIGHWAY BARRIER

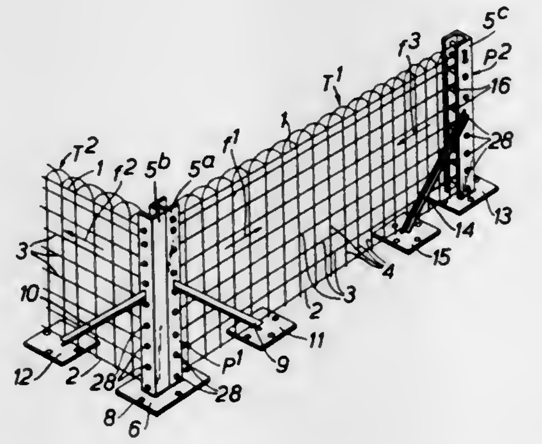
Austin F. Leach, Portland, Gary Karl Sandberg, Aloha, and William F. Pierson, Oregon City, Oreg., assignors to Omark Industries, Inc., Portland, Oreg.
Filed July 12, 1971, Ser. No. 161,573
Int. Cl. E01f *15/00*
U.S. Cl. 256—13.1 **4 Claims**

A series of aligned posts pivotally anchored by energy absorption devices along a roadway, a length of cable supported in slideways on the posts and energy absorption devices located at selected points along the cable whereby on receiving the impact of an automobile or the like, the energy imparted to the cable and posts is absorbed by the energy absorption devices.



3,717,327
FENCE POST WITH FENCE WIRE TENSIONING MECHANISM

Fernand Schmidt, Depinte, Belgium, and Cyrille Vanoverberghe, Bourbourg, France, assignors to N.V. Bekaert S.A., Zwevegem, Belgium
Filed March 4, 1970, Ser. No. 16,221
Int. Cl. E04h *17/02*
U.S. Cl. 256—41 **15 Claims**

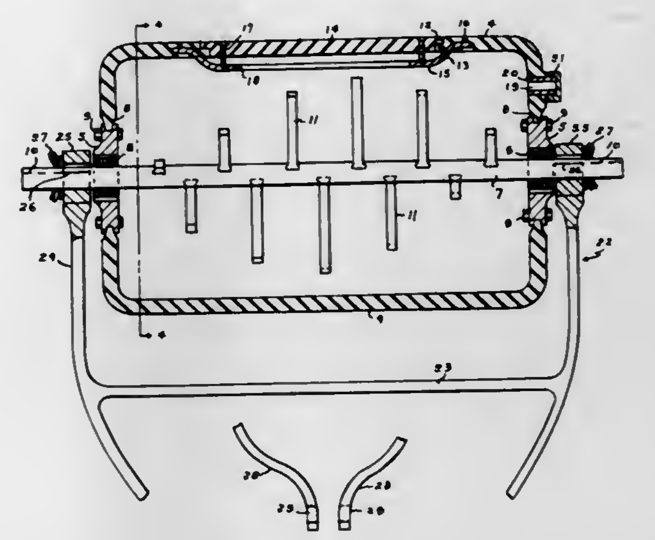


A tence post for a wire mesh fence consisting of a steel channel section in which a plurality of tensioning devices for tightening and holding of the horizontally extending wires of the mesh is located. Provision is made for inserting the channel section into a hollow tubular steel envelope for protecting the posts and their mechanisms from adverse weather.

3,717,328
METHOD FOR REPAIRING CRATERS IN THE SURFACE OF A CONCRETE RUNWAY

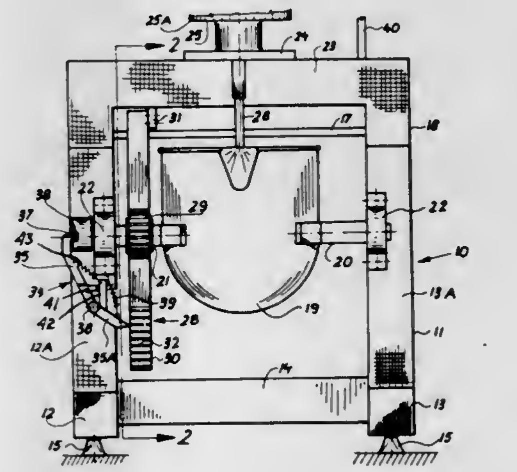
Karl F. Stevenson, 19 Oakdale Road N.W. Fort Walton Beach, Fla.
Division of Ser. No. 853,872, Aug. 28, 1969, Pat. No. 3,592,448. This application Feb. 12, 1971, Ser. No. 114,854
Int. Cl. B28c *5/06*
U.S. Cl. 259—148 **1 Claim**

A cylindrical rubber drum containing a "fast fix" cement and water in proper proportion and having metal ends for receiving ball bearings. A stationary shaft passes through the drum and a towing hitch is applied to the shaft. An inert gas is introduced into the drum either from a tank under pressure or by encapsulation to take up the ullage space caused by the shrinkage of the concrete mix. Paddles are mounted on the shaft so that as the drum is towed at a fast clip toward a damaged runway, the mixture is churned into a slurry of proper consistency and can be used immediately in leveling and hardening the fill which has previously been dumped into the crater.



3,717,329
STAND SUPPORTED VESSEL AND MIXER

Thomas Margittai, 778 Cornwall Drive, State College, Pa.
Filed Aug. 5, 1971, Ser. No. 169,344
Int. Cl. B01f *7/04*
U.S. Cl. 259—43 **12 Claims**

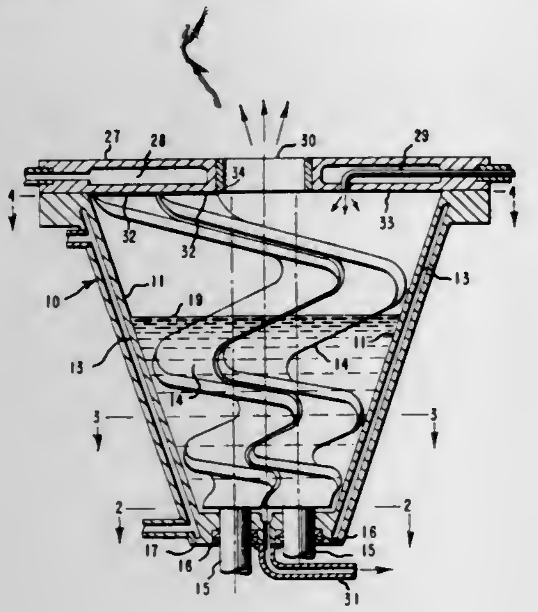


This disclosure is directed to a stand supported vessel and mixer constructed to permit the vessel and mixer to be pivoted between operative and inoperative positions in accordance with a predetermined synchronized motion wherein the mixer is first partially lifted out of the vessel a predetermined amount without effecting rotation of the vessel whereupon further pivoting of the mixer results in synchronous movement of the vessel toward a tilting or pouring position. A positive locking means is operatively associated between the mixer and vessel for securing the vessel against rotation until after the mixer has been partially rotated a predetermined amount.

3,717,330

HIGH VISCOSITY FINISHER

Baden McDowall Pinney, Kingston, Ontario, Canada, assignor to Du Pont of Canada, Limited, Montreal, Canada
Filed June 3, 1971, Ser. No. 149,580
Claims priority, application Canada, June 8, 1970, 084,936
Int. Cl. B01f *7/16*
U.S. Cl. 259—6 **6 Claims**

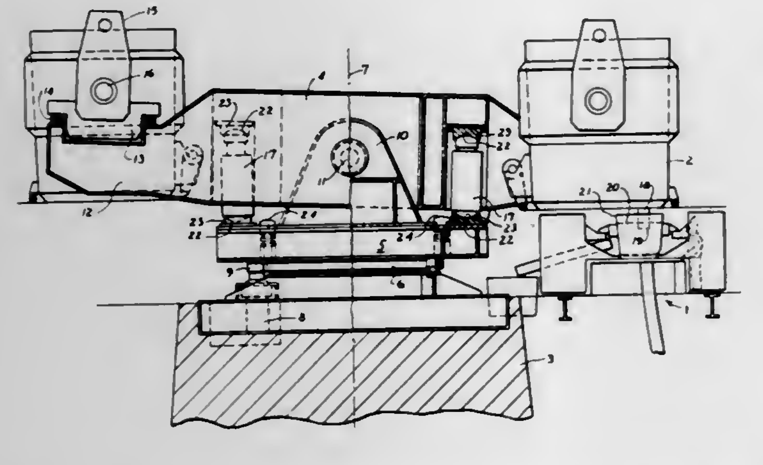


A self-wiping multiple screw element mixer of conical configuration useful as a polymerizer/finisher for the preparation of high viscosity polymers such as polyamides, polyesters, etc.

3,717,331

TURRET FOR CASTING LADLES

Willi Simons, Dusseldorf, Germany, assignor to Schloemann Aktiengesellschaft, Dusseldorf, Germany
Filed Sept. 7, 1971, Ser. No. 178,067
Claims priority, application Germany, Sept. 11, 1970, P 20 44 979.0
Int. Cl. C21c *7/00*
U.S. Cl. 266—13 **5 Claims**

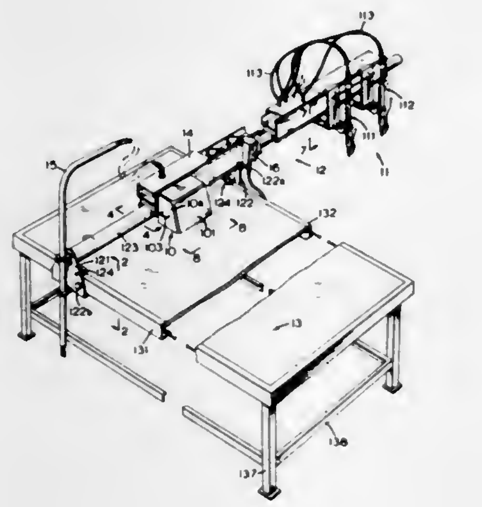


A casting ladle turret for continuous casting machines comprises a cantilever arm mounted for rotation on a vertical axis and mounted for deflection on a horizontal axis so that either one of two ladles mounted on each end of said arm may be adjusted both horizontally and vertically with respect to the tundish and casting mold. Power cylinders are provided for deflecting the arm in either direction, and means are provided to cushion the arm in the event of loss of pressure in the power cylinders.

3,717,332

CONTOUR CUTTING DEVICE

Ronald J. Luker, Hamilton, Ontario, and George S. Jewell, Ancaster, Ontario, both of Canada, assignors to Air Products and Chemicals, Inc.
Division of Ser. No. 881,528, Dec. 2, 1969. This application Aug. 2, 1971, Ser. No. 167,991
Int. Cl. B23k *7/00*
U.S. Cl. 266—23 B **12 Claims**

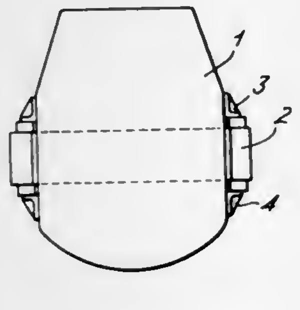


A contour cutting device where a torch or other cutting device is guided along a pattern followed by a photosensitive head wherein there is provided an improved means for maintaining parallel tracking of the main carriage in relation to the pattern support table. The machine is further characterized in that novel tool mounting devices, ready tool and tracing head access means, and tool spacing means are disclosed.

3,717,333

DEVICE FOR THE CONNECTION BETWEEN A CRUCIBLE AND A SUPPORTING RING

Luigi Giovanni Valdenazzi, Varazze, Savona, Italy, assignor to Costruzioni Meccaniche Industriali Genovesi C.M.I., S.p.A., Genoa-Fegino, Italy
Filed Sept. 25, 1970, Ser. No. 75,518
Claims priority, application Italy, Oct. 9, 1969, 7374 A/69
Int. Cl. F27b *14/02*
U.S. Cl. 266—36 P **5 Claims**

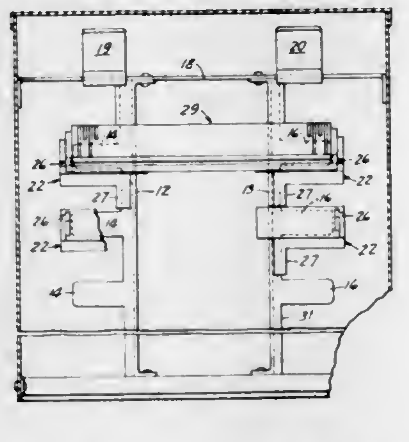


The present invention consists in that in a tilting crucible bearing by means of brackets on a supporting ring, the bearing planes are always kept in contact, through an arrangement of reversible wedges which are self-adjusting by means of springs and recover the plays caused by the different thermal conditions.

3,717,334

MOUNTING FOR WIRE SPLICE MODULES

Donald F. Miller; Leo E. Anthone, both of St. Paul, and Richard D. Kahabka, Burnsville, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed Nov. 23, 1970, Ser. No. 91,863
Int. Cl. B25b *1/24*
U.S. Cl. 269—37 **8 Claims**

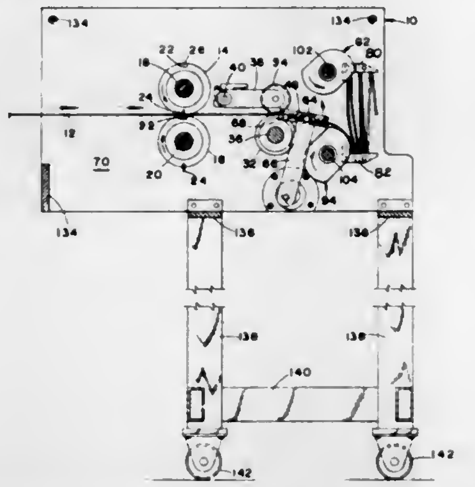


A frame assembly for supporting wire splice modules in position permitting cross-connect capability includes opposed parallel spaced vertical panels defining an inner wire run and having a plurality of oppositely extending upwardly slanted module support arms defining outer wire runs.

3,717,335

CROSS-WEB FOLDER FOR SHEET MATERIAL

Hans G. Faltin, York, Pa., assignor to Advance Enterprises, Inc., York, Pa.
Filed Dec. 23, 1970, Ser. No. 101,041
Int. Cl. B65h *45/00*
U.S. Cl. 270—79 **28 Claims**

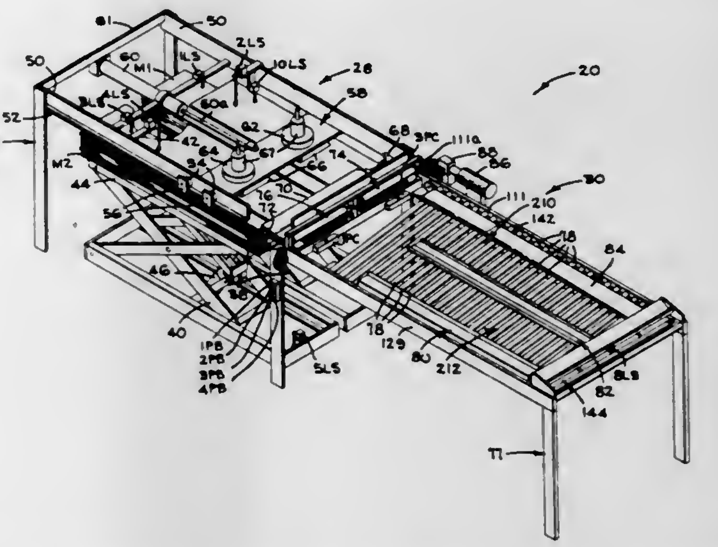


A cross-web folder for folding strips of sheet material such as a web of paper, either single or laminated, particularly of the type having rows of perforations extending transversely across the web at evenly spaced intervals upon which the web is to be folded into what is known as a fan-folded arrangement. The folder preferably is provided with cooperating creasing elements which successively crease the web alternately in reverse directions with respect to the plane of the web to a limited extent, the creases being coincident with perforations if the web contains the same. Folding and guiding means are provided to effect the folding of the web along said creases into a zigzag or fan-folded configuration and including means to receive the fan-folded arrangement and hold the folded, creased edges thereof against retraction into the folder while a conveyor progressively moves the compact product of fan-folded and connected sections of said web away from the folder for suitable packaging or other operations.

3,717,336

SHEET FEEDING AND ALIGNING APPARATUS

Charles R. Short, Cupertino, and Ronald J. Billett, Sunnyvale, both of Calif., assignors to FMC Corporation, San Jose, Calif.
Filed Nov. 8, 1971, Ser. No. 196,531
Int. Cl. B65h *9/10, 9/16*
U.S. Cl. 271—9 **14 Claims**

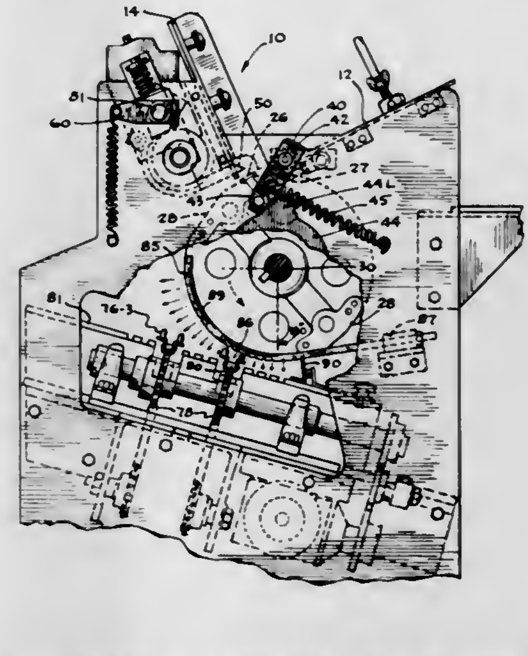


An apparatus for aligning two sheets of veneer in parallel relationship and feeding the veneer while in that relationship to a receiving station with such apparatus including a section for storing several stacks of veneer, conveying means for advancing individual sheets of veneer from the storage stacks to an alignment section of the apparatus, laterally shiftable fences in the alignment section for moving the veneer into adjacent side-by-side relationship, and controls for automatically controlling the operation of the apparatus.

3,717,337

SHEET OR SIGNATURE FEEDING MACHINES

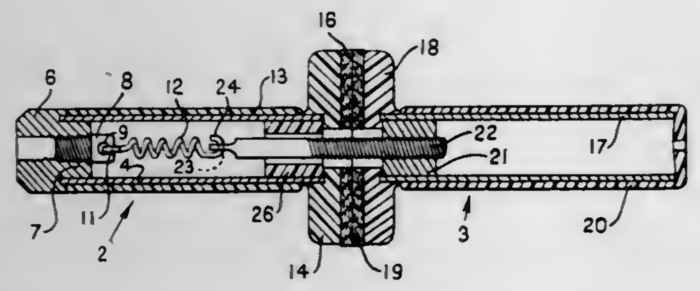
William B. McCain, Hinsdale, James F. Cosgrove, Western Springs, and Edward J. Zagorski, Chicago, Ill., assignors to McCain Manufacturing Corp., Chicago, Ill.
Filed Apr. 27, 1970, Ser. No. 32,257
Int. Cl. B65h *3/08, 5/12, 29/24*
U.S. Cl. 271—13 **3 Claims**



A feeder for sheets or signatures, feeding from a supply hopper to a conveyor, is constructed to have a single extracting cylinder operating between the supply and the hopper, effective to feed two sheets per cycle of revolution. A sheet released from the extracting cylinder is settled on the conveyor by means of an air blast. Further, the arrangement makes possible an improved system for demographic signature gathering.

3,717,338
WRIST EXERCISING DEVICE

Paul G. Hughes, 55 Halfmoon Road, Novato, Calif.
Filed April 17, 1972, Ser. No. 244,739
Int. Cl. A63b *21/22*
U.S. Cl. 272—67 **8 Claims**

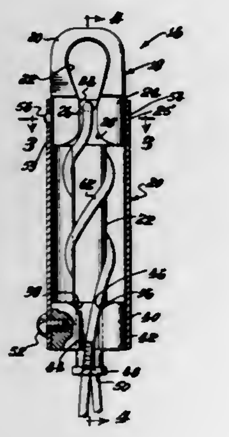


An exerciser for wrists or the like, of two hand grip units provided with adjacent friction surfaces compressed together by spring means, the pressure exerted thereby being adjustable by a threaded rod screwed in one of the units to which a spring is connected; the spring being also connected to an adjusting knob on the other unit whereby spring tension is adjusted by turning the knob to move the rod.

3,717,339
METHOD OF UNASSISTED FRICTION-RESISTIVE EXERCISING

Edgar E. Holkesvick, John Hudnall, and Robert W. Adams, Fullerton, Calif., assignors to Edgar E. Holkesvick, Fullerton, Calif.

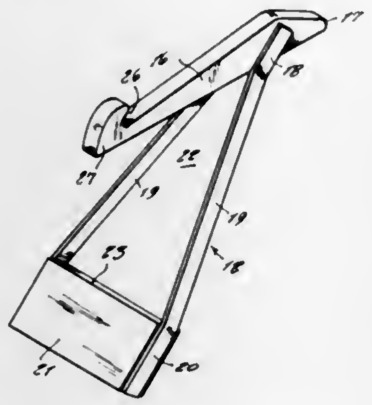
Division of applications Ser. No. 116,393, June 12, 1961, now Patent No. 3,197,204, and Ser. No. 482,646, June 9, 1965, now Patent No. 3,411,776, and a continuation of application Ser. No. 776,305, Oct. 21, 1968, now abandoned. This application Oct. 1, 1970, Ser. No. 77,313
Int. Cl. A63b *21/00*
U.S. Cl. 272—79 A **18 Claims**



A method of exercising body and arm muscles. The operator or user pulls on one end of a length of rope which has the center portion releasably restrained at a support to provide an adjustable resistance of substantially constant magnitude throughout the range of movement of the rope. The operator alternately pulls on one end of the rope with one arm to move the rope on and off the shaft. The rope is wrapped around a shaft and a support and offers frictional resistance to being pulled off the shaft and support, and he then pulls on the other end of the rope with the other arm to move it on and off the shaft.

3,717,340
BALANCE SKILL GAME

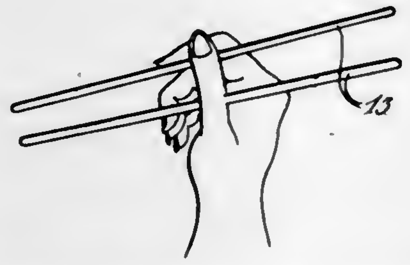
Jeffrey L. Bowers, 1023 North Broadway E., Columbus, Ohio 43224
Filed Feb. 10, 1971, Ser. No. 114,218
Int. Cl. A63f *9/00*
U.S. Cl. 273—1 R **1 Claim**



A game toy for promoting the skill of hand steadiness in a player which comprises an upstanding T-shaped supporting stand and a series of individual balancing units which can be successively suspended in chain-like array from the opposite ends of the stand, the object of the game being to erect the longest possible chain of balancing units without knocking or otherwise displacing the balancing units from the supporting stand. Each balancing unit comprises an upper horizontally disposed elongated arm with a bifurcated yoke connected at one end thereof in acute angular relation thereto, the yoke portion including a lower counterweighting cross-piece.

3,717,341
BOARD GAME APPARATUS

Colecta E. Blanton, Jr., 9713 S. Carpenter St., Chicago, Ill.
Filed May 6, 1971, Ser. No. 140,832
Int. Cl. A63f *3/00*
U.S. Cl. 273—1 R **2 Claims**

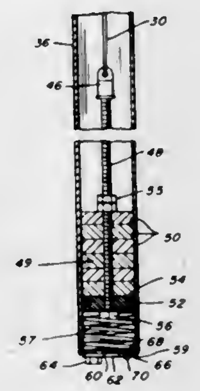


A game apparatus comprising a board with an array of upstanding pegs which have flat top surfaces. Sets of counters similar to checkers but with highly polished surfaces are provided, the counters designed to be deposited on selected pegs by means of a manual implement. The latter is a pair of sticks similar to Chinese chopsticks and having rounded, highly polished ends. Each counter is designed to be grasped between one of the ends of the sticks and carried for deposit as stated, this process imposing a hazard.

3,717,342
BASKETBALL TRAINING AID

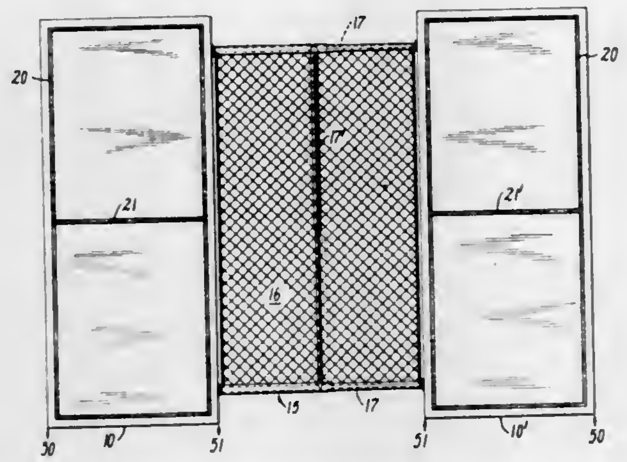
Jerome V. Haney, and John C. Hargis, both of Tulsa, Okla., assignors to Haney Recreational Equipment Company, Tulsa, Okla.
Filed Nov. 15, 1971, Ser. No. 198,637
Int. Cl. A63b *5/16, 21/06, 21/00*
U.S. Cl. 273—1.5 A **5 Claims**

This invention describes a basketball training aid in which a basketball is hung by a flexible cord from an arm which juts out from a supporting wall, the other end of the cord hangs vertically along the wall and carries a cylindrical weight which fits, as a piston, inside of a tubular cylinder and is sealed by means of an O-ring, rubber washer, or wiper to the cylinder. The bottom of the cylinder is closed and there is an opening which is covered by a sliding cover so that an aperture of variable size is available to limit the inflow of air as the weighted piston moves up or down. Check valve means may be installed in addition. The cylinder can be raised or lowered which sets the basketball at any desired height above the floor. In operation the basketball player jumps and grasps the ball in both hands and pulls down. Because of the weight, which can be adjusted to any desired value, and the suction created by the seal, the pull can be adjusted to any desired value which forces the player to maintain a strong pressure on the ball. When the ball is released it returns to its regular position as the weight drops to the bottom of the cylinder.



3,717,343
INDOOR-OUTDOOR TENNIS GAME

Huntington Hartford, 1 Beekman Place, New York, N.Y.
Filed Feb. 22, 1971, Ser. No. 117,287
Int. Cl. A63b *39/00*
U.S. Cl. 273—30 **7 Claims**

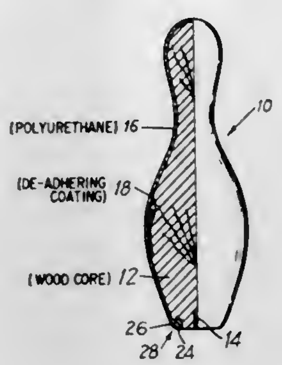


An indoor-outdoor game apparatus wherein two to four players provided with rackets engage in play with a lightweight ball on an elevated playing surface comprising two spaced-apart playing courts, the playing courts connected by means of a ball deflector. The playing courts comprise two tables with a plurality of legs and the ball deflector preferably comprises a net stretched between the tables and substantially parallel to and slightly below the surfaces of the tables.

3,717,344
BOWLING PIN WITH PLASTIC PROTECTIVE CLADDING

Joseph Rocco Infantino, Chappaqua, N.Y., assignor to AMF Incorporated
Filed Nov. 3, 1970, Ser. No. 86,394
Int. Cl. A63d *9/00*
U.S. Cl. 273—82 R **1 Claim**

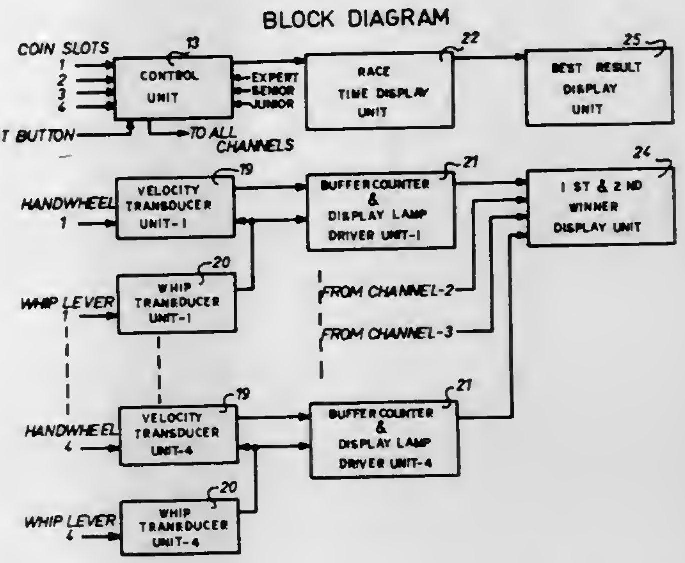
A bowling pin having a preformed wood body or core encased in a plastic cladding, the cladding being a polyurethane and the pin having a de-adhering coating on the core, the bond strength of the coating to the core or to the polyurethane



being less than the bond strength of the polyurethane to the core or the cohesion of the coating layer per se is less than the adhesion of the coating to the core or to the polyurethane.

3,717,345
COMPUTERIZED RACE GAME

Bertrand Banville, Dorval, Quebec, Canada, assignor to Prayfel Inc., Montreal, Ontario, Canada
Filed March 15, 1971, Ser. No. 124,225
Int. Cl. A63f *9/14*
U.S. Cl. 273—86 R **12 Claims**

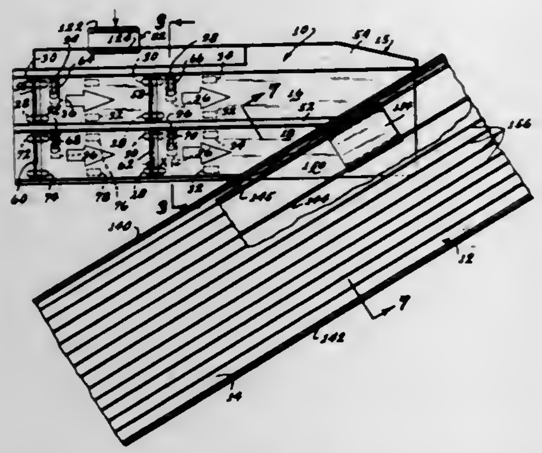


A coin-operated race game adapted to be used by one or more players, each operating a set of cooperating handwheel and whipping lever; the progress of each player in the game is indicated by a series of lamps which become successively illuminated by a computer. A first and a second winner, a race time and a best race time and a free game features and displays are also provided and controlled by computers. The whipping levers are arranged to be advantageously operated along in whipping zones of the series of lamps and are penalizing, if operated outside of the whipping zones. A coin slot is provided for each set of handwheel and whipping lever and switches are provided to impose a maximum effective angular velocity limit to the handwheels, to select the types of race and to adjust the time performance required to win a free game.

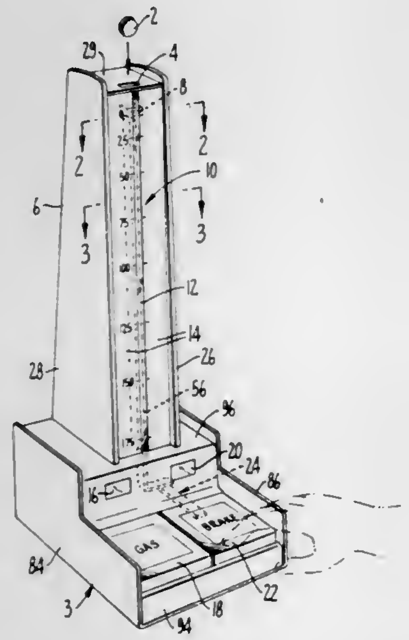
3,717,346
TOY VEHICLE STARTING MECHANISM

Dennis H. Merino, Harbor City, Denis V. Bosley, Palos Verdes Peninsula, Daniel R. Lucas, Jr., Orange, and Floyd E. Schlau, Palos Verdes Estates, Calif., assignors to Mattel, Inc., Hawthorne, Calif.
Filed Dec. 17, 1970, Ser. No. 99,200
Int. Cl. A63h *18/00*
U.S. Cl. 273—86 R **2 Claims**

A starting mechanism for self-powered miniature toy vehicles including two vehicle paths, recesses in the paths to align the toy vehicles and a sliding support frame having projecting switch abutments to engage activating switches of the toy vehicles. The starting mechanism is attached to a track at an angle so as not to interfere with the toy vehicles once on the track. Upon sliding the support frame, the toy vehicles are energized and an exciting race is begun. The starting mechanism is inexpensive to manufacture and exceedingly simple to use.



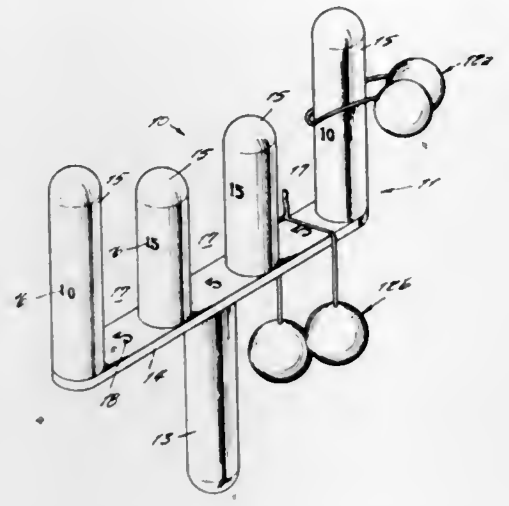
3,717,347
APPARATUS FOR TESTING THE REFLEXES OR REACTION TIME OF A PERSON
William J. Hottendorf, Sunnyvale, Calif., assignor to Hottendorf & Company
Filed Jan. 27, 1971, Ser. No. 110,173
Int. Cl. A61b *5/16*
U.S. Cl. 273—95 R **7 Claims**



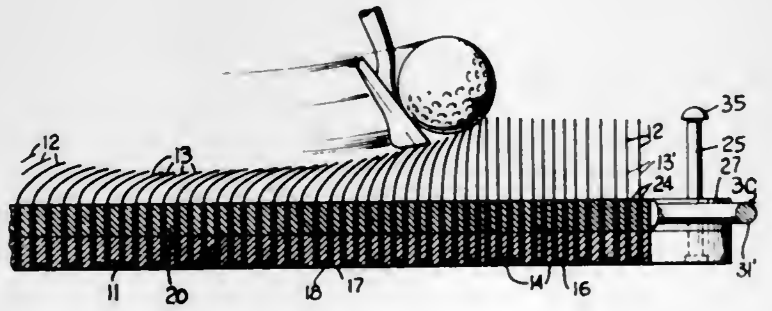
A coin inserted at the top of a column is initially held against falling down a channel. The coin actuates a circuit having a series of timing cycles; when a "gas" pedal is depressed, the end of the next cycle causes the coin to be released. A braking linkage is depressed by the operator to catch the coin fall as rapidly as possible.

3,717,348
CATCHING POST AND PROJECTILE
Jeffrey L. Bowers, 1023 North Broadway E., Columbus, Ohio 43224
Filed Feb. 10, 1971, Ser. No. 114,224
Int. Cl. A63b *71/02*
U.S. Cl. 273—96 R **1 Claim**

A competitive skill game which may be played by several players and wherein each player holds a projecting unit in his hand, the projecting unit being adaptable for throwing a ball unit to another player who likewise holds a projecting unit and upon which the player attempts to catch the ball unit in such position that it will attain a highest score, each of the projecting units having a series of upstanding fingers each one of which is individually scored and around which the ball unit is intended to be caught.



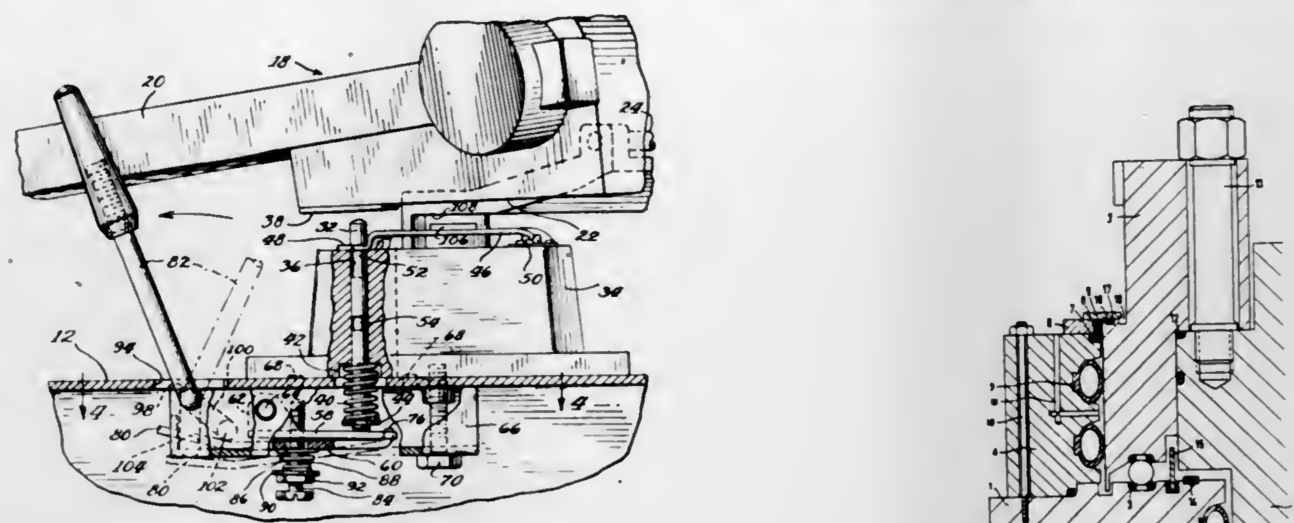
3,717,349
DIVOT INDICATING GOLF PRACTICE MAT
David J. Bohnen, 6112 Monteverdi Road, San Jose, Calif.
Filed July 30, 1971, Ser. No. 167,705
Int. Cl. A63b *69/36*
U.S. Cl. 273—186 R **5 Claims**



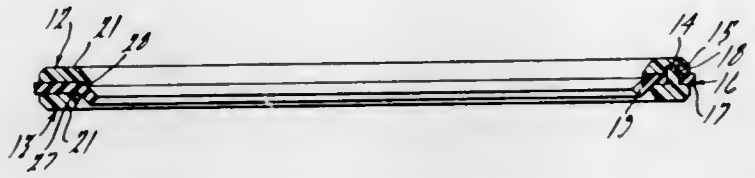
A golf practice mat formed of many separate strands of bendable members each individually extending upwardly from a base in spaced relation to one another to simulate blades of grass and a turfy surface of imitation grass, the individual strands being adapted to assume and stay in a bent condition impressed therethrough by the movement of a golf club head for collectively indicating the direction of such movement relative to a centerline aimed toward target until reset into upright condition preparatory to the next practice stroke of movement of a golf club head therethrough.

3,717,350
CUEING MEANS FOR RECORD PLAYER
Charles F. Oakley, and Larry D. Marks, both of St. Joseph, Mich., assignors to V-M Corporation, Benton Harbor, Mich.
Filed June 7, 1971, Ser. No. 150,400
Int. Cl. G11b *3/10*
U.S. Cl. 274—23 R **12 Claims**

A cueing mechanism for raising and lowering a record player tone arm relative to a rotatable turntable independent of manual or automatic record changer means. The cueing mechanism includes a tone arm lift pin and a pair of actuating plates movable through a cue lever to raise and lower the lift plate. Dampening means provide smooth controlled movement of the lift pin, and override means interconnect the actuating plates in a manner to allow movement therebetween to avoid injury to the mechanism if the lift pin is prevented from upward movement or is forced downwardly by the tone arm.



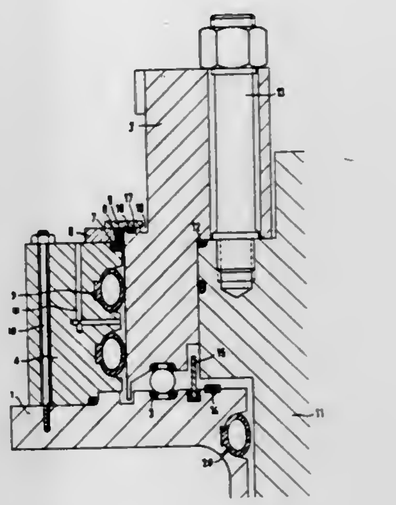
3,717,351
SEAL
Joseph M. Liebig, Wheaton, Ill., assignor to Microdt Inc.
Filed April 19, 1971, Ser. No. 135,298
Int. Cl. F16j *15/00*
U.S. Cl. 277—185 **5 Claims**



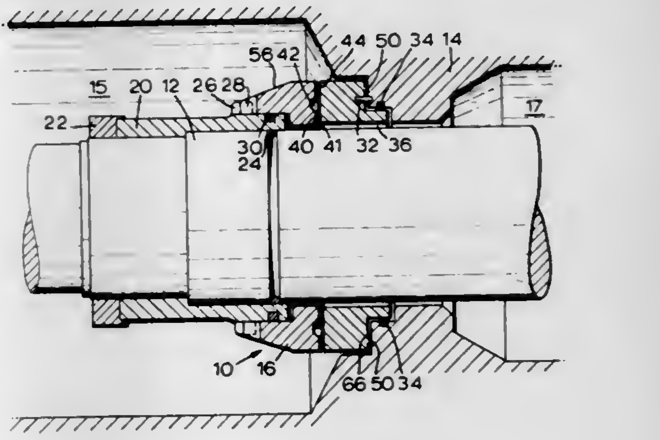
An annular seal for a shaft is built up in sandwich form comprising a central washer-like sealing element and a pair of rigid side wall elements on opposite sides thereof. The side wall elements on their radially inner edge have parallel sloping surfaces which deflect the inner edge portion of the sealing element to form a lip for sealing a shaft. The sealing element extends beyond the radially outer edge of the side wall elements to form a seal with the base of a groove in which the sealing unit is supported.

3,717,352
SEAL FOR ROTATABLE COVERS OF NUCLEAR REACTORS
Walter Jansing, Bensberg-Frankenforst; Hartwig Rohrs, Bensberg-Unterreschbach, and Helmut Rothfuss, Bensberg, all of Germany, assignors to Interatum Internationale Atomreaktorbau GmbH, Bensberg/Cologne, Germany
Filed April 21, 1970, Ser. No. 30,513
Claims priority, application Germany, April 26, 1969, P 19 21 377.5
Int. Cl. F16j *15/46*
U.S. Cl. 277—34.3 **5 Claims**

Seal for a large rotatable cover of a nuclear reactor containing protective gas and cooled with sodium wherein the cover is formed of a radially outer rotatable cover portion and a radially inner cover portion mutually connected by a plurality of peripherally distributed screws and the reactor has a flanged opening closable by the cover, comprising a removable outer ring surrounding the outer rotatable cover portion and threadedly secured to the flange of the reactor, a pair of spaced-apart inflatable hollow sealing rings surrounding the outer cover portion and received in the outer ring, a blocking gas connection located in the space between the sealing rings for supplying blocking gas to the space, a layer of tetrafluorethylene coated on the hollow sealing rings in situ in the outer ring, and an additional sealing member located below the inner cover portion, the screws connecting the inner and outer cover portions being adjustable for lowering the inner cover portion into sealing engagement with additional sealing member.



3,717,353
STATOR RING FOR FACE-TYPE FLUID SEALS
John Allen Rayfield, Toronto, Ontario, Canada, assignor to Champlain Power Products Limited, Dexdale, Ontario, Canada
Filed July 18, 1969, Ser. No. 843,041
Int. Cl. F16j *15/34*
U.S. Cl. 277—96 **4 Claims**

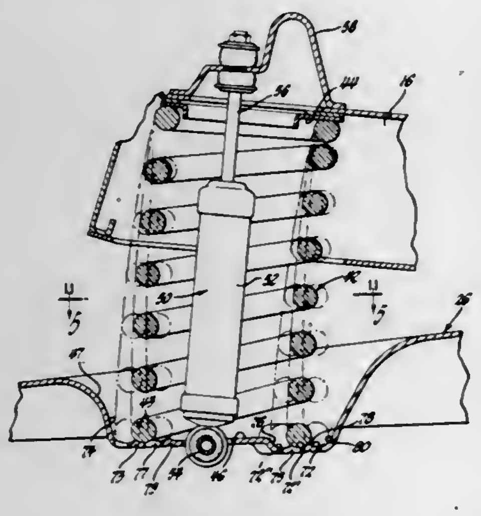


A state ring for face-type fluid seals on the back face of which there is formed a support annulus, which annulus serves to take up initial loading against the back face of the stator ring and to compensate for any unevenness in the face or its support, or unbalanced loading. The annulus also serves to overcome an overturning moment which develops in the stator ring of the face-type fluid seal in operation. The dimensions of the annulus are chosen with respect to its material so that initial force transmitted therethrough, when that initial force is not evenly distributed around the annulus, is above the yield point of the material but so that ultimate force transmission through the annulus after distribution of the same is below the yield point of the material.

3,717,354
VEHICLE SUSPENSION SYSTEM

Thomas E. Ritter, Utica, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 26, 1971, Ser. No. 175,284
Int. Cl. B60g *11/58*
U.S. Cl. 280—124 A **3 Claims**

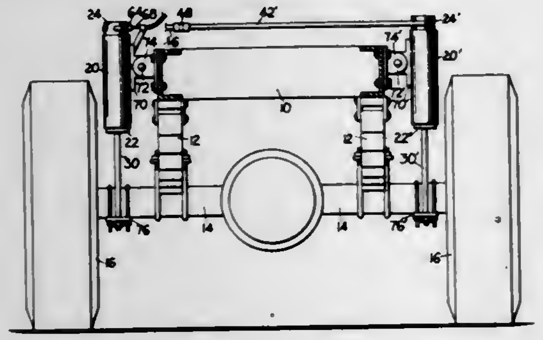


An adjustable suspension system for a vehicle having a sprung mass and an unsprung mass, the suspension system including a control arm connected to the unsprung mass and supported on the sprung mass for pivotal movement about a fixed axis of the latter, a coil spring disposed in compression between the sprung mass and the control arm, and three circular spring seats centered on the longitudinal centerline of the control arm and spaced at different distances from the fixed pivot axis. The spring is adapted to seatingly engage the control arm on any one of the spring seats, each of which seats has a different linkage ratio so that as the spring is shifted between the various seats the curb height of the vehicle is altered. Abutments on the control arm prevent sliding of the compressed spring between the various seats and perforations on the control arm below the seats are adapted to receive a prying tool which is operative to force the spring over the abutments while the latter is under full load compression.

3,717,355
HYDRAULIC VEHICLE STABILIZER

Alfred J. De Mars, 11226 N.E. Couch Court, Portland, Oreg.

Filed Sept. 8, 1970, Ser. No. 70,354
Int. Cl. B60g *11/26*
U.S. Cl. 280—124 F **12 Claims**

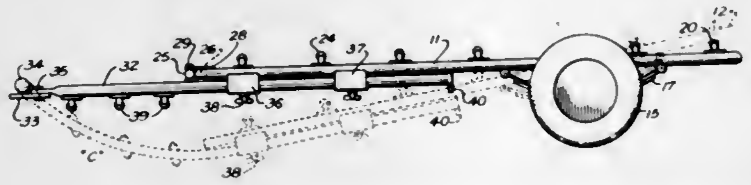


Each of a pair of extensible hydraulic piston-cylinder units interconnecting the body frame and axle housing of a vehicle includes concentric inner and outer chambers communicating with each other adjacent one end, with the inner chamber confining a reciprocative piston. Passageways communicate one side of one of the pistons with the opposite side of the other piston to effect simultaneous extension or retraction of both units. A control valve associated with at least one of the units is operable from the operator's compartment of the vehicle selectively to communicate with and seal from each other the opposite sides of each piston. The pair of units may be separate from each other, or integrated into a unitary, back-to-back dual cylinder unit.

3,717,356
BOAT TRAILERS

Wilbert L. Haberthier, 598 Main St., Limon, Colo.

Filed April 5, 1971, Ser. No. 130,955
Int. Cl. B60p *3/10*
U.S. Cl. 280—414 R **9 Claims**

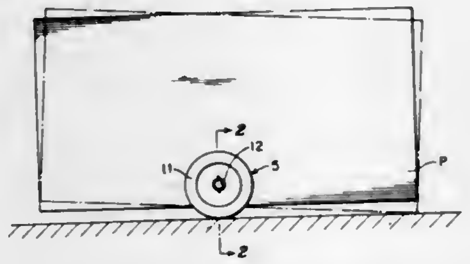


A relatively flat chassis frame having two elongated, parallel side elements supported on wheels at their rear extremities and separated from each other at their forward extremities to provide an open forward boat-launching channel between the side elements at the front of the chassis frame. Arcuate bow elements extend forwardly from the side elements and extend inwardly to detachably join each other forwardly of the launching channel to provide means for towing the chassis frame. The open launching channel being provided with removable means for supporting a boat therein for transportation purposes.

3,717,357
ADJUSTABLE DOLLY CONSTRUCTION

Theodore S. Schaefer, 3022 W. Scott Ave., McHenry, Ill. 60050

Filed July 27, 1970, Ser. No. 58,473
Int. Cl. B62b *1/14*
U.S. Cl. 280—35 **1 Claim**



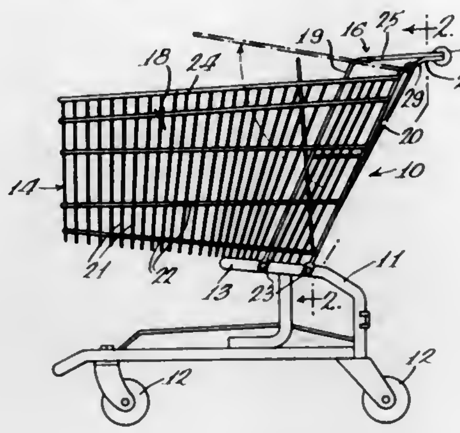
This dolly has the bottom inturned flanges of its two L-shaped stamped sheet metal frame members overlapped so that screws extending through parallel slots in one flange and threaded in holes in the other flange permit slidably adjusting these members for width adjustment of the frame. The U-frame formed by these members is springable under weight to close on opposite sides of the door or panel placed therein and the protective liners of sheet rubber or other cushioning material not only protect the article from damage but help to grip it more firmly. The U-frame being heavier on the bottom and mounted so its center of gravity is below the axle axis tends to gravitate to an upright position for easier loading.

3,717,358
SHOPPING CART CONSTRUCTION

Frank Jr. Mills, Olympia Fields, Ill., assignor to Tote-Cart Company

Filed Aug. 26, 1970, Ser. No. 67,075
Int. Cl. B62b *11/00*
U.S. Cl. 280—33.99 R **11 Claims**

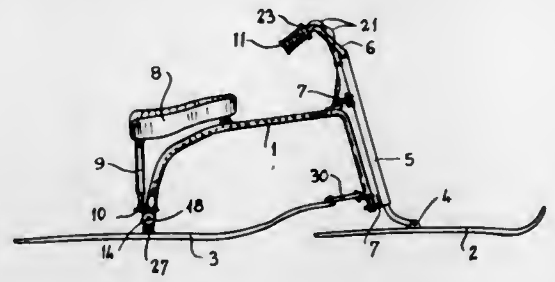
A shopping cart having an improved internal handle support avoiding catching of the support on another such basket as the result of a nesting operation. The cart is further provided with stop means for limiting the swing of the rear gate to avoid damage to the gate as by overswinging thereof into engagement with the handle. The stop means herein is provided on the handle support.



3,717,359
SKI-BOBS AND SIMILAR SLIDING APPARATUS OF THE SINGLE-TRACK TYPE

Christian Peronnon, Randens, par, Aiguebelle, and Claude Guillet, Le Chandinert, Correncon-en-Vercors, both of France

Filed Feb. 8, 1971, Ser. No. 113,320
Claims priority, application France, Feb. 9, 1970, 7004539
Int. Cl. B62b *13/04*
U.S. Cl. 280—16 **7 Claims**

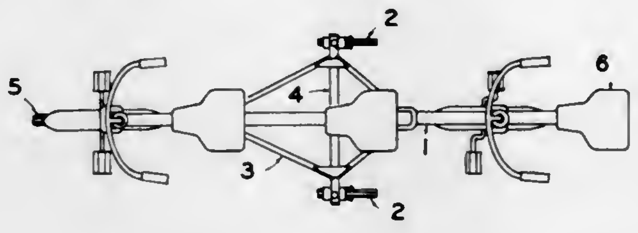


A ski bob comprising a frame and a pair of axially aligned runners in which the front runner is steerable by handlebars pivotally mounted on the frame and one of the runners, usually the rear runner, is provided with a rotating mechanism so that it may be rotated about a longitudinal axis for transverse movement relative to the frame so that the runner is caused to "edge" as the bob turns in snow. The rotating mechanism is controlled by a twist grip on the handlebars.

3,717,360
PLURAL OCCUPANT PROPELLED VELOCIPEDE

Damon M. Kennedy, 4410 W. Hiawatha Street, Tampa, Fla.

Filed Nov. 24, 1970, Ser. No. 92,423
Int. Cl. B62k *5/00*
U.S. Cl. 280—231 **4 Claims**

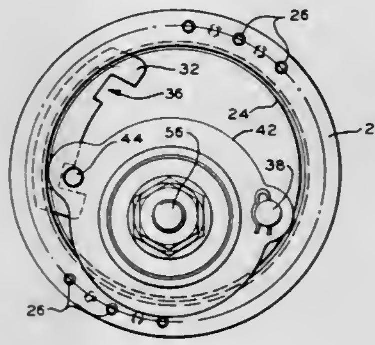


This invention is a sidewalk riding toy. It is operated by two riders and creates a unique action, while in operation, by pedalling and steering from both the front and the back.

3,717,361
SELECTIVELY OPERABLE ECCENTRIC WHEEL MOUNT

Charles C. Vanderpool, R. D. No. 1, Waverly, N.Y.

Filed Oct. 4, 1971, Ser. No. 186,204
Int. Cl. B60b *27/00*
U.S. Cl. 280—229 **10 Claims**

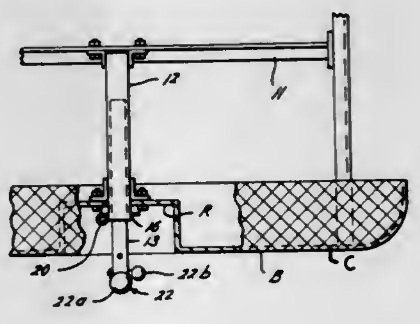


A hub assembly selectively operable to position an axle either concentrically or eccentrically with respect to a wheel during rotation of the wheel. In a preferred embodiment, the assembly is mounted on one or both wheels of a bicycle to provide a normal ride or a "galloping" action in accordance with actuation by the operator through movement of a lever, or the like. Particular advantages of the structure are that normal mounting and operation of conventional coaster brakes is possible, and that the actuating lever may be held in the actuating position after movement of the axle to the opposite position.

3,717,362
ADJUSTABLE AND RETRACTABLE TRAILER HITCH

Thomas C. Johnson, 1009 Henderson Street, Houston, Tex.

Filed May 18, 1971, Ser. No. 144,586
Int. Cl. B60d *1/06*
U.S. Cl. 280—415 A **2 Claims**



A trailer hitch for a vehicle comprises a housing and a shaft member which are telescopically positioned relative to each other. A single or multiple ball trailer hitch is provided on the side or sides of the shaft adjacent its end, and cooperating means on the shaft and housing are provided for positioning them at longitudinally predetermined, spaced relationships, as well as permitting the ball trailer hitch to be positioned in any one of several rotated planes or in retracted position when not in use. Where a multiple ball trailer hitch is provided, the balls may be of different diameter.

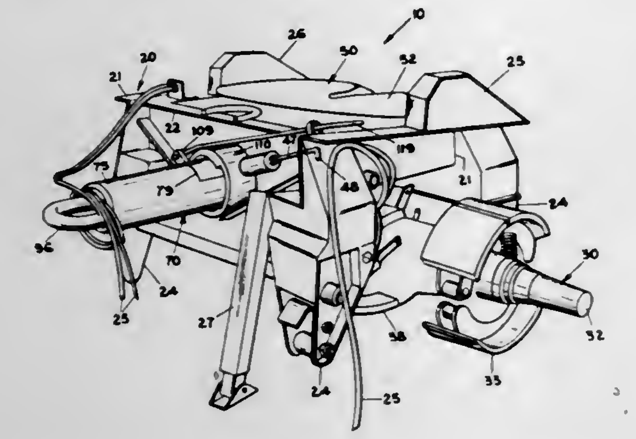
3,717,363
CONVERTIBLE DOLLY-TANDEM AXLE

Howard Berends, Fruitport, Mich., assignor to Holland Hitch Company, Holland, Mich.

Filed Sept. 28, 1971, Ser. No. 184,519

Int. Cl. B62d *53/02*

U.S. Cl. 280—476 **22 Claims**



A single axle two-wheeled dolly assembly including a fifth wheel which can be raised or lowered and a tongue telescopically mounted in a forward extending sleeve. The dolly can be employed as a tandem axle on a tractor by lowering the fifth wheel thereon, retracting the tongue into the sleeve; and fitting the tongue sleeve into a corresponding sleeve in the rear of a tractor. The dolly is securely locked to the tractor by means of a coupling and locking collar holding the tractor and dolly together thereby forming a tandem axle tractor. For use as a dolly to pull a second trailer, a lunette on the front of the tongue is rotated 90° thereby unlocking the telescopically retracted tongue, the lunette and tongue are pulled forward to extend the tongue, and the lunette is rotated 90° to lock the tongue in its extended position whereby the lunette can be coupled to the rear of a first trailer. The fifth wheel is then raised by means of a threaded shaft arrangement such that it can receive the the king pin of a second trailer.

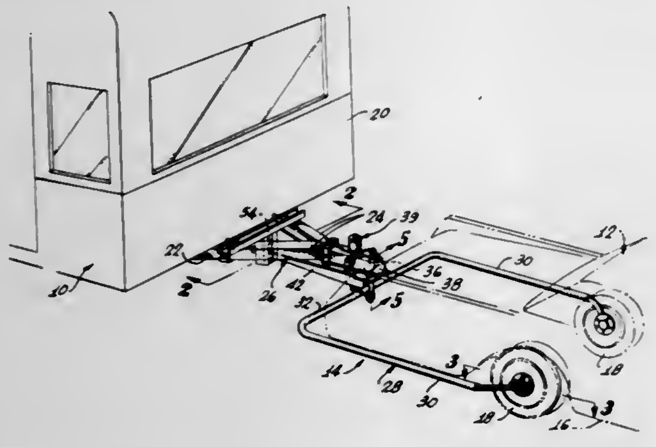
3,717,364
TRAILER HITCH

William J. McClive, 24019 Hartford Street, Canoga Park, Calif.

Filed Oct. 26, 1971, Ser. No. 191,997

Int. Cl. B60d *1/12;* **B62d** *53/00*

U.S. Cl. 280—489 **17 Claims**



A trailer hitch for coupling a trailer to a towing vehicle. The hitch has a U-shaped frame with arms which straddle and are attached by rotary couplings to the rear vehicle wheels, a stabilizer bracket attached to the trailer hitch tongue, and a stabilizer bar hinged to the rear cross member of the frame in line with a coupling ball on the frame and extending rearwardly through a guide opening in the stabilizer bracket. The stabilizer bar and bracket transfer the trailer tongue load through the hitch frame to the rear vehicle wheels and are movable fore and aft relative to one another in a manner which reduces substantially the loading on the coupling ball and socket when traveling over dips and humps and permits use of the hitch with a trailer having a surge brake. Other advantages of the hitch are its adaptability to trailers and vehicles of a wide range of types and sizes, reduced bounce and sway of the towing vehicle, and reduced pitching of the trailer when passing over dips and humps.

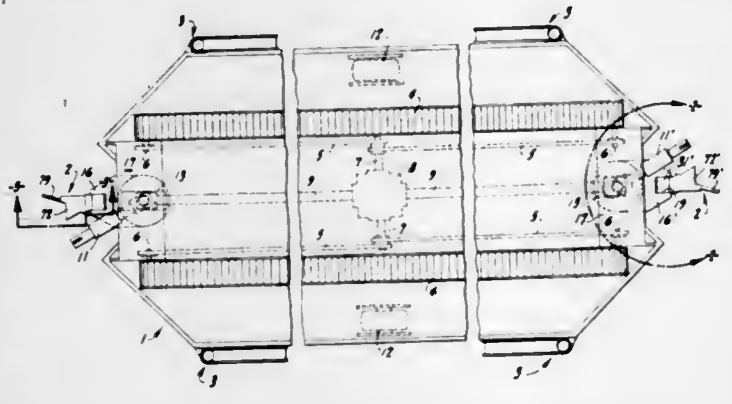
3,717,365
AUTOMATIC VEHICLE HITCH ASSEMBLY

John I. McCort, Monterey; Robert J. Notman, Salinas, and Victor H. Carder, Carmel, all of Calif., assignors to Cochran Western Corporation, Salinas, Calif.

Filed Oct. 19, 1970, Ser. No. 81,894

Int. Cl. B60d *1/00*

U.S. Cl. 280—508 **11 Claims**



A coupling device comprising a hitch assembly to be coupled with a like assembly in towing one or more trailer type vehicles. The hitch assembly includes latching structure which couples automatically upon interengagement of two assemblies with each other without requiring attendance of a person between the vehicles being coupled. Upon manually disengaging the latching structures of interengaged assemblies, the vehicles may be separated and each disengaged assembly thereafter is automatically prepared for subsequent automatic coupling with another hitch assembly. The hitch assembly also is usable with a conventional coupling and tow arrangement by manually rearranging its orientation against the urging of spring mechanism which normally hold the assembly in a position for automatic coupling.

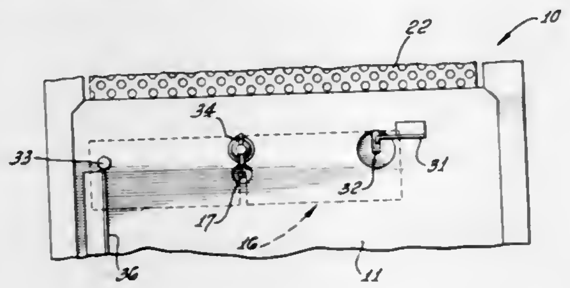
3,717,366
METHOD AND APPARATUS USED FOR BOOK BINDING

William R. Decker, 2316 Cameron, Covina, Calif.

Filed June 23, 1971, Ser. No. 155,771

Int. Cl. B42d *1/00;* **B42c** *19/00*

U.S. Cl. 281—21 R **4 Claims**



Fundamentally, the invention pertains to a method and apparatus to be used in binding books. The apparatus may be constructed relatively small and portable, and may be used in offices and print shops where binding machines of the prior art are not practical due to size, expense, and complexity of operation and their inadaptability to small lot binding activity. The relatively small size and portability of the apparatus is made possible by a method of inserting into the book cover, a hot melt adhesive in cool hard form and melting the adhesive material by applying heat externally to the book cover to be bound. The apparatus therefore, comprises a number of devices in combination including a heating rack to heat the binding edge of the book, a cooling rack to cool the edge of the book cover, a mechanism that folds the book cover, and a device that adjusts the folding mechanism so as to fold the book cover in such a way as to accommodate the thickness of the collated pages to be bound.

3,717,367
UNITARY HUB-SHAFT INTERCONNECTION ASSEMBLY

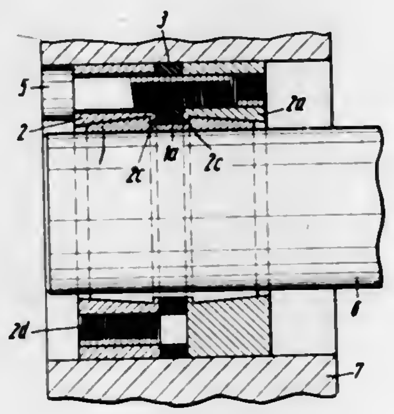
Oskar E. Peter, Schlosstrasse 9/1, 7129 Brackenheim, Germany, and Lothar Peter, Guglingen, Germany; said Lothar Peter assignor to said Oskar E. Peter

Filed Apr. 21, 1972, Ser. No. 246,198

Claims priority, application Germany, Dec. 2, 1971, P 21 59 813.0

Int. Cl. F16d *1/06*

U.S. Cl. 287—52.06 **7 Claims**



An inner ring has a cylindrical surface adapted to seat on a shaft and an outer double-conical surface with a notch or groove circumferentially extending in the middle thereof; a pair of outer rings with inner conical surfaces, adapted to seat against the outer conical surface are provided, the outer rings being formed with collars engaging the groove or notch of the inner ring, to provide a unitary assembly. The outer surfaces of the outer rings are cylindrical to seat within the hub, the outer rings being pierced axially to permit tightening screws to be passed therethrough to tighten the conical surfaces of the outer rings and the inner ring with respect to each other, and provide for wedging the parts together and transmission of torque.

3,717,368
CONNECTION THREAD SYSTEM FOR SETS OF EXTENSION DRILL RODS

Tadek Czarnecki, and Bengt Rolf Soderman, both of Fagersta, Sweden, assignors to Fagersta Bruks Aktiebolag, Fagersta, Sweden

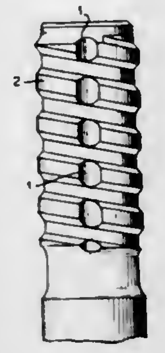
Filed Oct. 19, 1970, Ser. No. 81,769

Claims priority, application Sweden, Oct. 22, 1969, 14444/69

Int. Cl. F16b *7/00*

U.S. Cl. 287—117 **8 Claims**

Drill rod sets having rod diameters starting at about 3.75 cm. and increasing, have threads with flank angles between about 50° and 70°. The sets of the drill rods all have the same pitch angle, so that the pitch of the threads of the rods themselves will vary as the diameter of the rods increases. The pitch angle is selected to have a value of between 6° and 8°, preferably about 6.5°, with a flank angle of 60°. To improve resiliency, particularly during locking and unlocking, one or more essentially longitudinal grooves are formed in the lands of the threads.



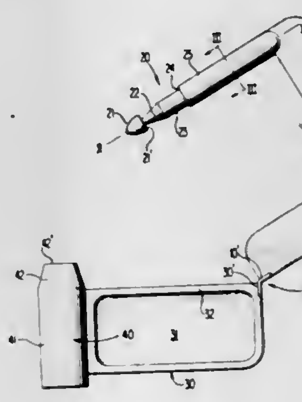
3,717,369
PLASTIC SEAL WITH HINGE

John F. Stoffel, Yonkers, and Charles Fuehrer, Scarsdale, both of N.Y., assignors to Stoffel Seals Corporation, New York, N.Y.

Filed Nov. 16, 1970, Ser. No. 89,543

Int. Cl. B65d *55/06*

U.S. Cl. 292—321 **19 Claims**



An all plastic seal in which a strap provided with a locking head is connected to the seal body by way of a hinge structure.

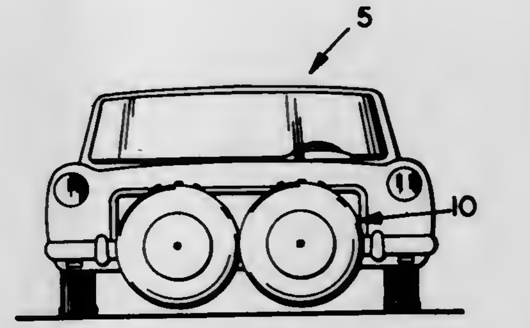
3,717,370
TIRE WATER BUMPER

Brooks Walker, 1280 Columbus Avenue, San Francisco, Calif.

Division of Ser. No. 888,421, Dec. 29, 1969, Pat. No. 3,664,653. This application July 30, 1971, Ser. No. 167,584

Int. Cl. B60r *19/10*

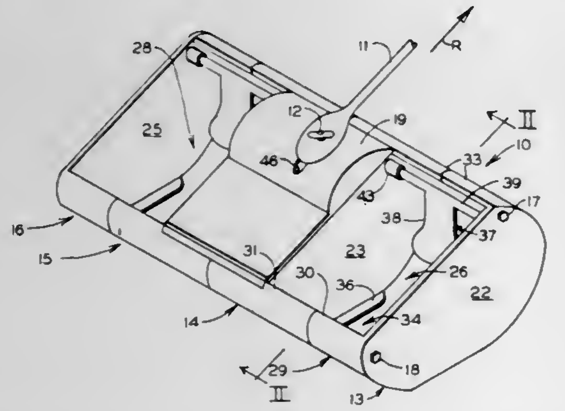
U.S. Cl. 293—1 **7 Claims**



This invention pertains to an energy absorber for use on abutments or on the front of vehicles to absorb energy when the vehicle abuts against another vehicle or a vehicle abuts against an abutment such as a divider between two roads, highways or freeways, a bridge support, a guard rail end, a bridge rail end, a sign support, a pole, etc.; the absorber to be composed of one or more tires, new or used, and filled with a liquid such as water (with salt, etc., to prevent freezing in cold climates) and with one or more blow out plugs to allow the liquid to escape when impacted, the ends or rim sides of the tires being closed and connected by flexible or collapsible means.

3,717,371
GOLF BALL RETRIEVER

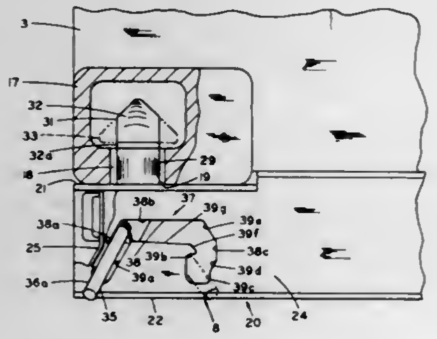
William Halone, 776 Sierra View Way, Chico, Calif.
Filed May 19, 1971, Ser. No. 144,799
Int. Cl. A47f *13/06*
U.S. Cl. 294—19 A **16 Claims**



A golf ball retriever comprises a box-like member defining a plurality of compartments therein for scooping a golf ball out of a water hazard or the like. A shutter is pivotally mounted on the member to normally close an opening to each compartment to permit a golf ball to move therepast and into the compartment. Stop means are formed on the member to limit outward movement of the shutter to prevent the golf ball from moving out of the compartment when it is retrieved.

3,717,372
CONTAINER HOLD-DOWN LOCKING MEANS

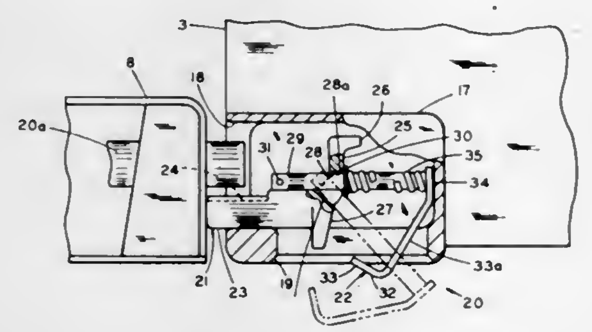
George W. Carr, Cincinnati, Ohio, assignor to Pullman Incorporated, Chicago, Ill.
Filed Dec. 15, 1970, Ser. No. 98,343
Int. Cl. B65j *1/22*
U.S. Cl. 296—35 A **10 Claims**



A chassis-to-container locking arrangement which includes a housing defined by the lateral end extension of the chassis cross member. The housing includes an inverted U-shaped cam slot in its rear end face and a vertically extending coupling pin protruding upwardly out of the housing and rotatable and vertically reciprocally movable by a handle attached thereto and extending outwardly of said slot. The slot is so contoured to assure confinement of the handle in the locked position and also provides for guiding of the handle in the locked and unlocked positions.

3,717,373
VARIANCE COMPENSATOR FOR CHASSIS-TO-CONTAINER LOCKING MECHANISM

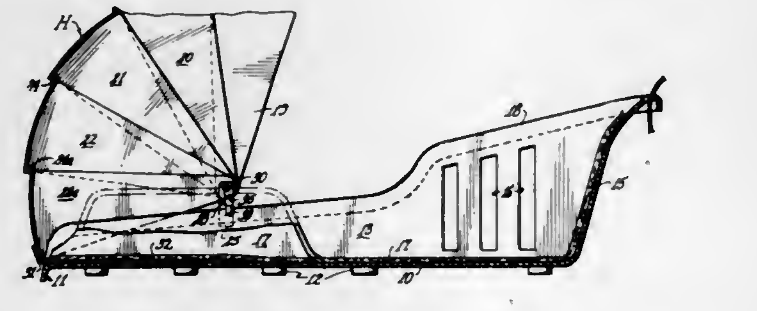
George W. Carr, Cincinnati, Ohio, assignor to Pullman Incorporated, Chicago, Ill.
Filed Dec. 15, 1970, Ser. No. 98,375
Int. Cl. B60p *7/08*
U.S. Cl. 296—35 A **13 Claims**



A variance compensator which is in the form of a two-part elongated structure insertable through the vertical opening in a corner casting which receives a horizontally extending locking pin from an associated trailer chassis, the compensator being in overlapping relation with the locking pin for adjusting for dimensional tolerances in the horizontal spacing between the interlocked chassis and container arrangement. The compensator includes a first member having a horizontal rod portion having a cradle supporting the overlapping chassis locking pin and extending into the corner casting and a second handle member spring biased with the first member for placing the compensator in the container corner casting and retrieving it from the container corner casting by retraction of the handle member against the spring and the first member.

3,717,374
HOOD COUPLING FOR BABY CARRIER

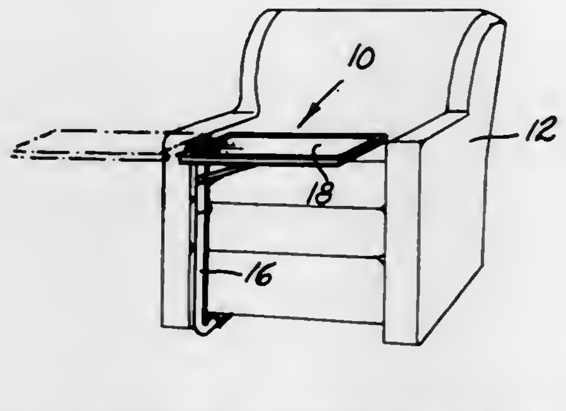
Hugh J. Pearce, P.O. Box 224, Bell, Calif.
Continuation-in-part of Ser. No. 113,128, Feb. 8, 1971, abandoned. This application March 18, 1971, Ser. No. 125,534
Int. Cl. B60j *7/10*
U.S. Cl. 296—111 **10 Claims**



Hood or sun shade composed of nestable segments, at each side brought together as a cluster and traversed by a shaft which dependently carries an offcenter swinging latch arm and an opposing hook arm for joint attachment to the convex side channel of a baby carrier. Axial tensioning means on the shaft enables positioning the hood at selected outspread position and simultaneously locks the assembly to the channel, at desired location along length. Each hood segment is a relatively rigid, inverted-U-shape cross strut with successive ones having mutual stop means to prevent their further separation when fully outspread. Rearmost segment is attached to flat, positioning panel which overlies inner face of floor of carrier and is slidable therealong as hood is moved lengthwise to carrier. Panel can also be uptilted and set at selected angle to elevate infant's head.

3,717,375
ADJUSTABLE STOW-AWAY TABLE

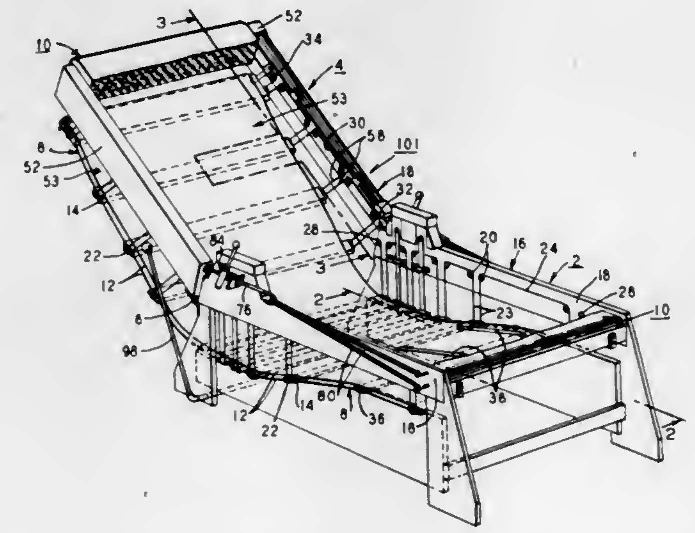
Ilich Slobodan, 3505 Linwood Place, Riverside, Calif.
Filed March 18, 1971, Ser. No. 125,599
Int. Cl. A47c *7/68*
U.S. Cl. 297—162 **3 Claims**



A stow-away table comprising a tabletop hinged for vertical swinging movement to the top end of a vertical supporting post. The bottom end of the post is bent horizontally and received within a tubular member mounted on a carriage that slides along tracks in a frame fixed to the under side of a chair or the like. The horizontal portion of the post is rotatable within the tubular member, and locks with respect thereto when the post is vertical. The top end of the supporting post is extendable upwardly to raise or lower the tabletop, and is swiveled to allow the tabletop to swing horizontally. A releasable lock in the post permits locking the tabletop in either of two horizontal positions, 180° apart. The vertical post is slidable on the carriage toward and away from the chair for a limited distance. The vertical post is pring-loaded toward the locked position, and is released by pulling the post forwardly against the pressure of a spring, to unseat a pin from its locking notches. The post is then laid down horizontally, and is pushed rearwardly to stow the tabletop under the chair.

3,717,376
FURNITURE WITH BODY CONTOUR ACCOMMODATING SUPPORT SYSTEM

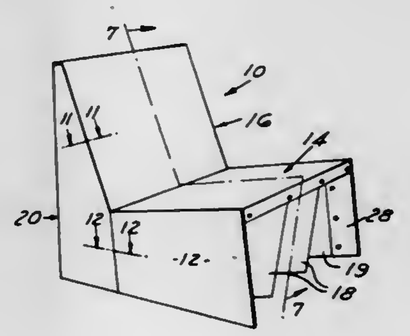
Milton Lutchansky, 29 Lake Shore Dr. R.D. No. 3, Dover, N.J.
Filed Aug. 31, 1970, Ser. No. 68,306
Int. Cl. A47c *3/00, 25/00, 4/00*
U.S. Cl. 297—284 **14 Claims**



An item of furniture such as a bed or chair provides increased comfort by supporting a body resting thereon with a distribution of support forces which match the body's weight distribution while simultaneously conforming to the contour of the supported body. This is accomplished by supporting the body with a plurality of spaced force means which are interconnected with a common force transmitting means. The spacings of the force means, the individual support forces provided by the force means, or both may be adjusted to achieve the desired support force distribution. Changes in body contour are accommodated by a movement of the force transmitting means without changing the magnitudes of the support forces.

3,717,377
PAPERBOARD CHAIR

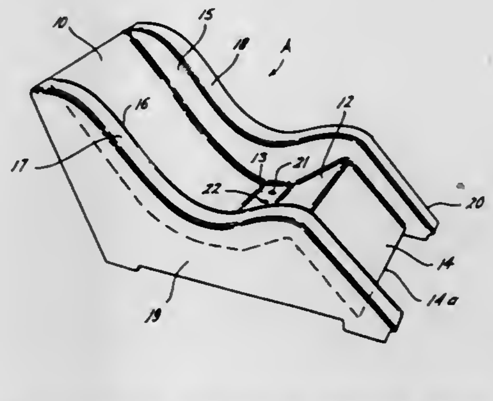
William J. Johnson, 8129 St. Paul, Detroit, Mich.
Filed April 21, 1971, Ser. No. 135,894
Int. Cl. A47c *4/00, 7/00, 7/62*
U.S. Cl. 297—440 **27 Claims**



A paperboard chair with a seat, seat supports, back, and back support panels of corrugated cardboard adapted to be packaged, shipped, and stored in flat unassembled relation and assembled by an unskilled ultimate purchaser.

3,717,378
RECLINING CHAIR

Clarence E. Jackson, P.O. Box 1109, Texas City, Tex.
Filed July 7, 1971, Ser. No. 160,404
Int. Cl. A47c *7/00, 7/14*
U.S. Cl. 297—446 **2 Claims**



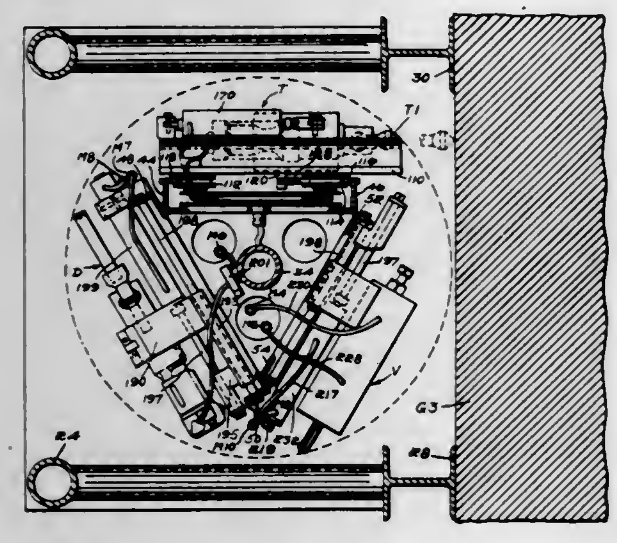
A chair includes first and second support areas disposed in such an angular relationship with respect to the floor and to each other than an individual incapable of supporting himself may be supported in a reclining position.

3,717,379
APPARATUS FOR CUTTING AND SPLITTING MINERAL BODIES AND OTHER MATERIALS

Ralph A. Fletcher, Bedford, N.H., and Joseph R. Oliver, Lowell, Mass., assignors to H. E. Fletcher Co., Westford, Mass.
Division of Ser. No. 2,489, Jan. 13, 1970, Pat. No. 3,655,243. This application April 19, 1971, Ser. No. 134,975
Int. Cl. E21c *37/02*
U.S. Cl. 299—22 **13 Claims**

Multiple tool means for working a material are mounted in a tool-supporting structure. The tool-supporting structure, at one side, is formed with an elongated tool opening to provide for movement of a gang of tools therethrough into and out of engagement with a surface and the body of the material. Each of the tools in the gang may thereafter be selectively actuated. Where desired, greater versatility is realized by mounting additional reciprocating tools in spaced relation around a frame which revolves through an extended arc of travel. Indexing movement of the revolving frame permits any of the tools to be located so as to be advanced and retracted through the said opening of the tool-supporting structure in various positions of angularity along the extended arc of travel.

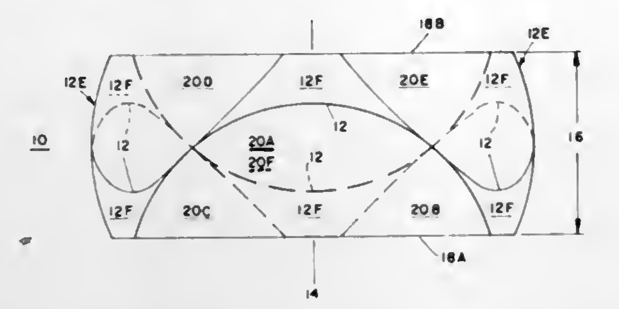
In one desirable form of tool means, multiple wedging forces are exerted to split minerals and other bodies along extended planes of splitting. Specifically the wedging forces may be applied to a mineral body such as granite as it occurs in a natural state, and from which pieces of dimensioned stone may be produced. Controlled splitting is accomplished by a gang of spaced, reciprocating wedge devices together with fluid power-actuated driver means for transmitting driving forces to each of the wedge devices. The wedge devices may be operated simultaneously or separately of one another and the driving forces may be exerted to reach a maximum intensity instantly or applied with gradually increasing intensity.



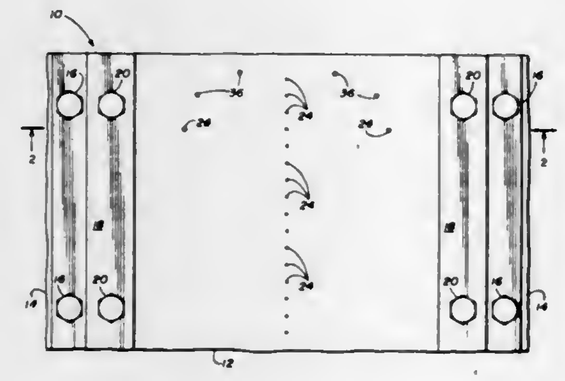
Application of wedging forces may also be preceded by tracing a line of splitting in a rock body and drilling spaced holes along the traced line, and the gang splitting apparatus may further include tracing and drilling means received therewithin. In the rock-splitting apparatus, a revolving frame with attached tools is supported in a frame-supporting structure which is particularly designed for locating the frame in close proximity to a work surface of stone or other material. The frameisupporting structure and revolving frame with tools comprise a mobile unit particularly suitable for location against a vertical surface of a mineral body but also applicable to a horizontally disposed work surface or any other disposition of work surface, and in any of these applications, the frame support and frame may be oriented in varying positions of angularity.

3,717,380
TRACTION DEVICE FOR VEHICLES
Ralph W. Eastwood, II, 125 Woodlane Dr., Toccoa, Ga.
Filed Feb. 12, 1971, Ser. No. 114,755
Int. Cl. B60b *15/00*
U.S. Cl. 301—41 R **8 Claims**

A wheel configuration is provided which is capable of effecting pure walking, pure rolling or pure paddling motions or a composite thereof depending upon the environmental of the surface upon which the configuration is operating. In one embodiment of the invention the wheel configuration is that generated by cutting on a line parallel to its rolling axis, a rotating cube having its rolling axis coincident with a diagonal of the cube. At selected depths of cut, a serpentine rolling periphery is generated which will provide a pure rolling motion on a hard flat surface while the wheel configuration maintains its other motion capabilities.

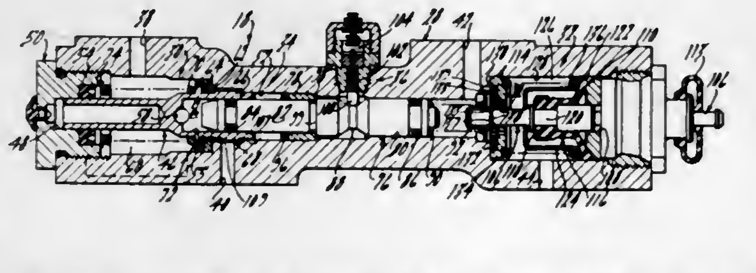


3,717,381
TRANSPORTING AND POSITIONING SYSTEM
Robert G. Hagler, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.
Filed July 25, 1969, Ser. No. 844,918
Int. Cl. B65g *51/02*
U.S. Cl. 302—31 **11 Claims**



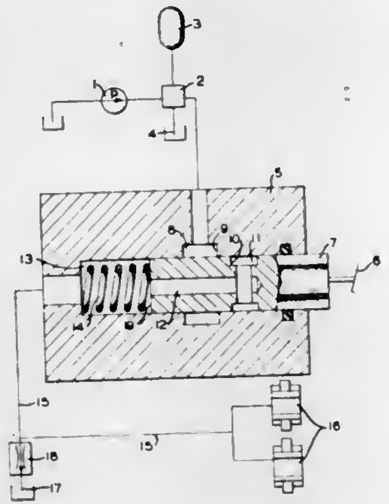
A transporting and positioning system for integrated circuit slices and the like includes a line of slice supporting and positioning holes, slice braking holes positioned adjacent the line and slice locating holes positioned adjacent the braking holes in the direction of slice motion. Slices are propelled through the system by directing compressed air through the supporting and transporting holes. Individual slices are stopped by generating a slice attracting vacuum in the braking holes. After a slice is stopped it is precisely located by releasing the vacuum in the braking holes and generating a vacuum in the locating holes.

3,717,382
DEVICE FOR DUAL BRAKE SYSTEMS
David T. Ayers, Jr., Birmingham, Mich., assignor to Kelsey-Hayes Company, Romulus, Mich.
Filed Nov. 13, 1970, Ser. No. 89,340
Int. Cl. B60t *8/26, 11/34, 17/22*
U.S. Cl. 303—6 C **10 Claims**



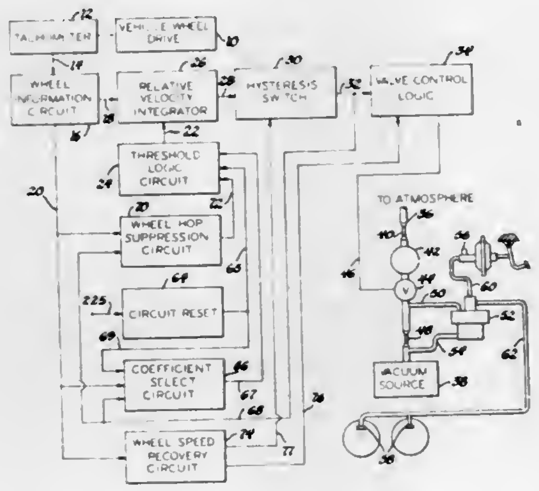
A valve device for a hydraulic brake system of the type incorporating a dual master cylinder for separately pressurizing the front and rear brakes of a vehicle including a pressure proportioning valve for proportioning the brake pressure delivered to the rear brakes, a metering valve for controlling the pressure delivered to the front brakes, a bypass valve for bypassing the proportioning valve in the event of a loss of fluid pressure in the front brake system, and a switch for indicating the loss of either the front or rear brake pressure.

3,717,383
BRAKE CONTROL APPARATUS
Johannes Altmeppen, Empelde, Germany, assignor to Westinghouse Bremsen-Und Apparatebau GmbH, Hanover, Germany
Filed Dec. 16, 1970, Ser. No. 98,601
Int. Cl. B25b *1/20*
U.S. Cl. 303—10 **4 Claims**



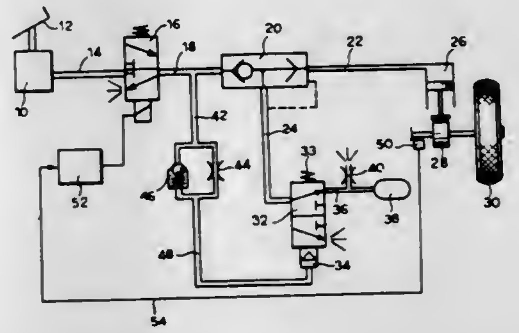
The invention relates to an activating system for a hydraulic servo brake installation for use with motor vehicles, particularly trucks, tractors, farm machinery, and the like, equipped with a brake valve located in the main brake line between a pressure source and the brake cylinders, and with a return pipe connected in series with the brake valve and branching off from the main brake line.

3,717,384
ANTI-LOCK BRAKE CONTROL SYSTEM
John L. Harned, Grosse Pointe Woods, Mich., assignor to General Motors Corporation, Detroit, Mich.
Filed March 15, 1971, Ser. No. 124,336
Int. Cl. B60t *8/12*
U.S. Cl. 303—21 BE **6 Claims**


TACHOMETER
VEHICLE WHEEL DRIVE
WHEEL INFORMATION CIRCUIT
RELATIVE VELOCITY INTEGRATOR
HYSTERESIS SWITCH
VALVE CONTROL LOGIC
THRESHOLD LOGIC CIRCUIT
WHEEL HOP SUPPRESSION CIRCUIT
CIRCUIT RESET
COEFFICIENT SELECT CIRCUIT
WHEEL SPEED RECOVERY CIRCUIT
TO ATMOSPHERE
VACUUM SOURCE

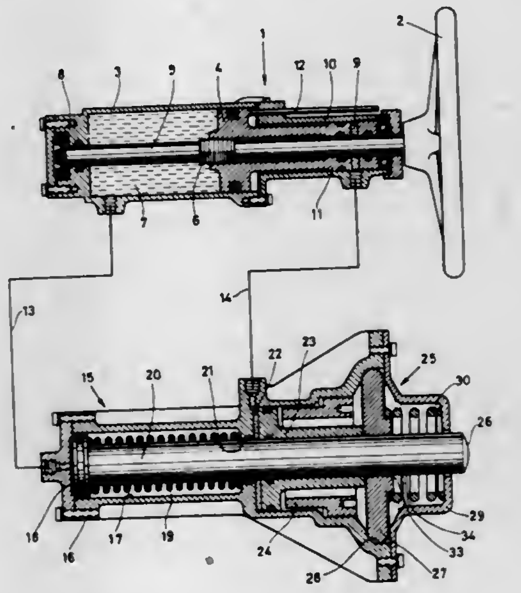
An electronic control for an anti-lock brake control system provides different deceleration threshold reference signal levels for high and low coefficient surfaces. A coefficient select circuit is responsive to wheel acceleration during the period of wheel speed recovery in an anti-lock cycle and selects for use during the subsequent cycle one of the threshold values in accordance with the degree of wheel acceleration. Another circuit senses wheel hop during braking to further increase the threshold during wheel hop to desensitize the control to undesirable transients.

3,717,385
ANTI-SKID BRAKING SYSTEMS
Giancarlo Michellone, and Mario Palazzetti, both of Turin, Italy, assignors to Fiat Societa per Azioni, Turin, Italy
Filed Jan. 12, 1971, Ser. No. 105,867
Claims priority, application Italy, Jan. 15, 1970, 67109-A/70
Int. Cl. B60t *8/10*
U.S. Cl. 303—21 F **6 Claims**



Anti-skid braking of a vehicle wheel is effected by periodical release of the braking pressure with a substantially instantaneous drop if the vehicle is moving on a ground with a low grip coefficient (ice, mud) while the release is effected with a substantially instantaneous drop by a fixed decrement followed by a gradual drop if the vehicle is moving on a ground with a high grip coefficient (firm dry surface).

3,717,386
BRAKE DEVICE PARTICULARLY FOR HYDRAULIC HAND BRAKES ON RAILROAD CARS
Kurt Axel Henry Edmansson, and Åke Gustav-Adolf Karlsson, Jonkoping, Sweden, assignors to Saab-Scania Aktiebolag, Linkoping, Sweden
Filed Nov. 3, 1970, Ser. No. 86,561
Claims priority, application Sweden, Nov. 3, 1969, 14,998/69
Int. Cl. B60t *17/16*
U.S. Cl. 303—89 **4 Claims**

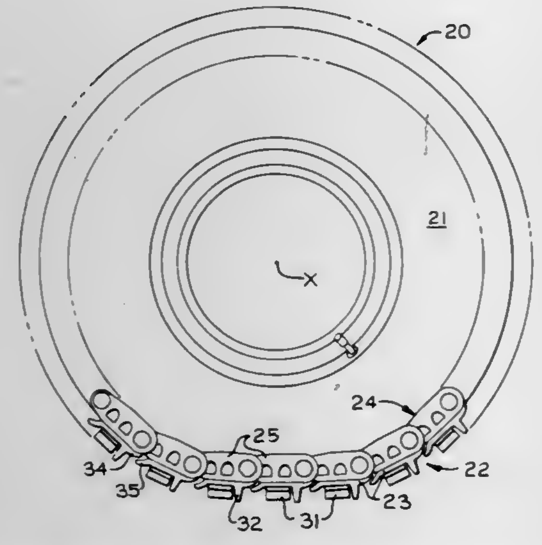


An endwise slidable rod, such as a brake rod, is releasably locked against sliding in one direction by a disc-like annular catch coaxially surrounding the rod and having its periphery engaging an annular seat that holds the catch against bodily axial displacement. The catch is frustoconical, converging in the opposite direction and has slits radial to its central aperture, defining spring segments that frictionally engage the rod. A sleeve around the rod, hydraulically actuatable in said opposite direction, disengages the spring segments from the rod to release the rod for movement in said one direction.

3,717,387
CUSHIONED TRACK WITH CROSS GROUSERS

George W. Cackley, Hanna City; Gary N. Heltzman, Washington; Roger L. Boggs, East Peoria, and Robert N. Stedman, Chillicothe, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Nov. 12, 1970, Ser. No. 88,808
Int. Cl. B60c *27/20*
U.S. Cl. 305—19 **13 Claims**

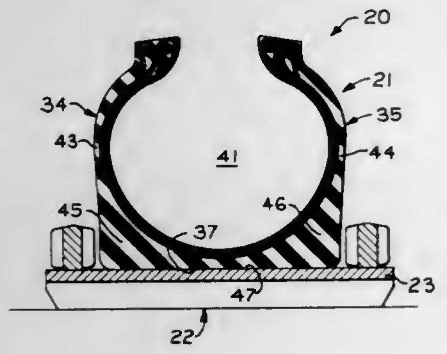


A resilient spacer means, such as a pneumatic rubber tire, has an endless track assembly mounted thereon. The track assembly comprises an annular and articulated link assembly positioned on each side of the spacer means to closely couple a plurality of ground engaging track shoes together. Each track shoe has a ground engaging grouser secured thereto to be disposed parallel relative to the rotational axis of the cushioned track. A cross grouser is attached to each shoe to extend substantially perpendicularly relative to the first-mentioned grouser to resist lateral sliding movement of the cushioned track during operation thereof.

3,717,388
SPACER MEANS FOR CUSHIONED TRACK

Roger L. Boggs, East Peoria, and Robert N. Stedman, Chillicothe, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Nov. 20, 1970, Ser. No. 91,481
Int. Cl. B60c *3/00, 13/00*
U.S. Cl. 305—19 **19 Claims**

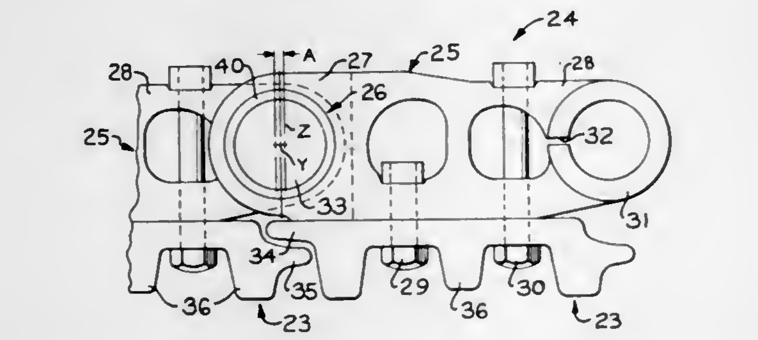


A resilient spacer means, such as a pneumatic rubber driver, is adapted to have an endless track assembly mounted thereon to form a cushioned track. The spacer means comprises a smooth and uninterrupted annular peripheral portion or tread which intersects with smooth sidewalls thereof to form circumferentially extending square shoulder portions. Each square shoulder portion extends radially inwardly towards the rotational axis of the spacer means to meet with the remaining and relatively thinner respective sidewall portions. The smooth and flat annular peripheral portion of the spacer means assures good sealing and driving contact with the shoes of the track assembly whereas the integrated sidewall and square shoulder construction permits the driver to flex above the articulated link assemblies thereof during operation.

3,717,389
PITCH ADJUSTMENT MEANS FOR TRACK ASSEMBLIES

Roger L. Boggs, East Peoria, and Robert N. Stedman, Chillicothe, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Dec. 23, 1970, Ser. No. 100,852
Int. Cl. B60c *27/20;* **B62d** *55/28*
U.S. Cl. 305—19 **15 Claims**

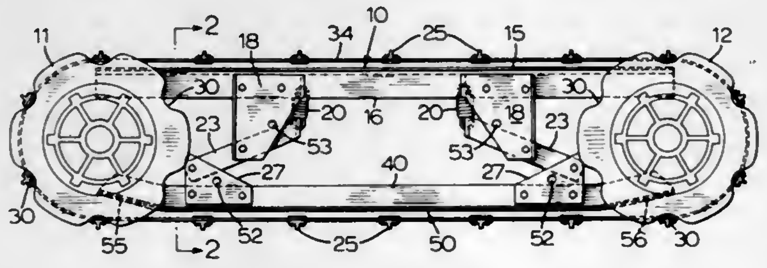


An adjustable track assembly comprises a plurality of shoes closely coupled together by at least one articulated link assembly. Each pair of adjacent links are pivoted together by a pivot pin to define a predetermined pitch length between each adjacent pair of pivot pins. At least one of the pivot pins has eccentric cam means formed thereon for selectively adjusting the pitch length between a respective pair of adjacent pivot pins.

3,717,390
SNOW-MOBILE TRACK ASSEMBLY

Antonio Parisotto, Coniston, Ontario, and James Nemis, Sudbury, Ontario, both of Canada, assignors to Original Equipment Manufacturing Limited, Sudbury, Ontario, Canada

Filed Jan. 7, 1971, Ser. No. 104,567
Int. Cl. B62d *55/10*
U.S. Cl. 305—25 **5 Claims**

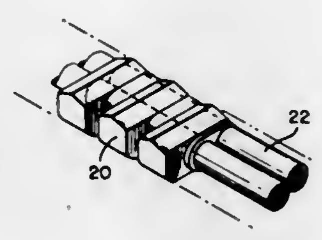


A snow-mobile track assembly having upper and lower track slides extending between a pair of spaced apart track wheels. The lower track slide is supported on a pair of pivotally mounted arms which are urged into a track-engaging attitude by a spring system so that the lower track guide will move through a vertical plane in response to variations in the terrain.

3,717,391
GLASS FIBER CABLE, METHOD OF MAKING, AND ITS USE IN THE MANUFACTURE OF TRACK VEHICLES

Donald L. Snellman, and Willard G. Hudson, both of Seattle, Wash., assignors to Norfin, Inc., Seattle, Wash.

Division of Ser. No. 718, Jan. 5, 1970, Pat. No. 3,662,533. This application March 31, 1972, Ser. No. 239,926
Int. Cl. B62d *55/24*
U.S. Cl. 305—40 **3 Claims**

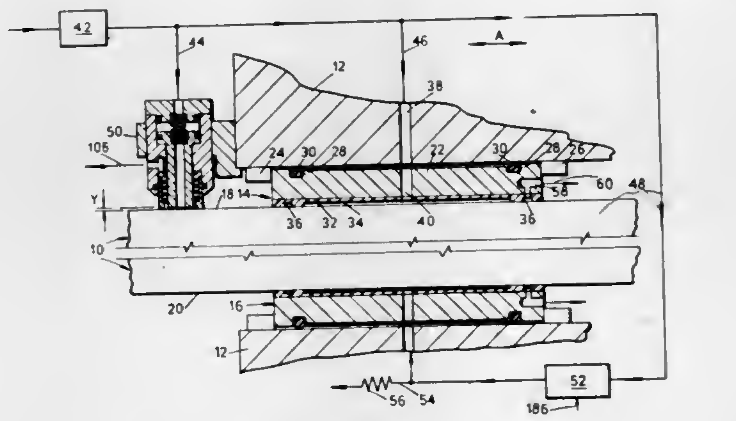


A coreless glass fiber cable is made of a plurality of individual substantially untwisted glass fiber rovings twisted together. Prior to twisting but during the twisting operation certain of the rovings are impregnated with one component of an elastomeric resin with the remainder of the rovings impregnated with the second component of the elastomeric resin. The impregnated rovings are spirally twisted together in the same direction at substantially the same helical angle, the two components of the elastomeric resin impregnating the rovings mixing with each other at the junction of the intertwining of the rovings to form a cured elastomer spacing the glass fiber rovings and filaments making up the rovings from each other. The layed up glass fiber cable is fed back on itself and subsequent layers of impregnated rovings plied together over the initial layers. The subsequently applied layers are applied at the same helical angle as the initial layer. The cable, although useful for other purposes, is particularly useful in the manufacture of endless track for track vehicles, the endless track comprising a plurality of individual track sections strung along a cable of the type mentioned.

3,717,392
RELATING TO HYDROSTATIC BEARINGS

Brian Ennis, Halifax, England, assignor to William Asquith Limited, Halifax, Yorkshire, England

Filed Feb. 16, 1971, Ser. No. 115,325
Claims priority, application Great Britain, July 10, 1970, 33,656/70
Int. Cl. F16c *17/00*
U.S. Cl. 308—5 R **12 Claims**

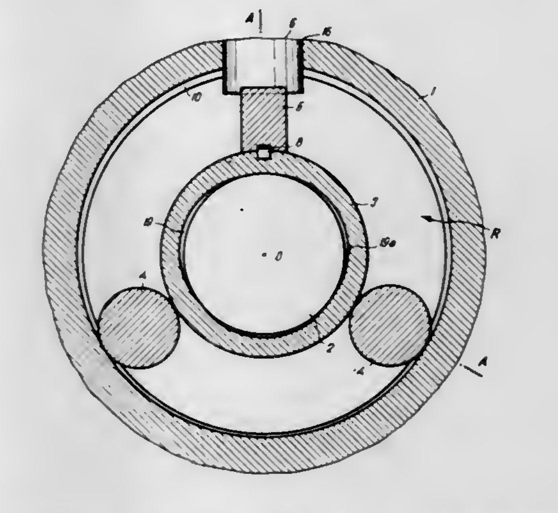


The invention provides a hydrostatic bearing arrangement for a machine tool. Two "floating pad" type hydrostatic bearings are active between first and second relatively movable parts of the machine, the bearings facing in opposite directions. A detector is fixed relatively to the first relatively movable part, and directs a fluid outlet towards a reference surface. The back pressure at the detector is measured and the pressure of fluid supplied to one of the bearings is controlled in proportion to that at the detector, the pressure at the other bearing being reduced as that at the first bearing increases and vice versa. A special resilient detector is also described.

3,717,393
RADIAL FLUID-FILM BEARING

Josef Linda; Bohuslav Belohoubek, and Jaroslav Marsalek, all of Prague, Czechoslovakia, assignors to TOS Hostivar, Narodni Podnik, Praha-Hostivar, Czechoslovakia

Filed March 15, 1971, Ser. No. 124,267
Claims priority, application Czechoslovakia, March 17, 1970, 1754-70
Int. Cl. F16c *17/02*
U.S. Cl. 308—122 **12 Claims**

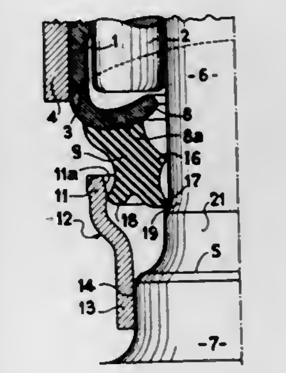


A hydrodynamic bearing for spindles and the like comprising a cylindrical shell surrounding the spindle. The shell is supported by three supports one of which is movable and is urged against the shell to deform it into triangular shape. The shell is housed in a sealed reservoir holding oil which provides a pressurized film between spindle and shaft tending to make the shell circular on rotation of the spindle.

3,717,394
SEALING DEVICE FOR A BEARING MOUNTED ON A SHAFT

Alfred Pitner, Paris, France, assignor to Nadella, Rueil Malmaison, France, a part interest

Filed Oct. 5, 1970, Ser. No. 77,910
Claims priority, application France, Oct. 28, 1970, 6936995
Int. Cl. F16c *33/78*
U.S. Cl. 308—187.1 **10 Claims**

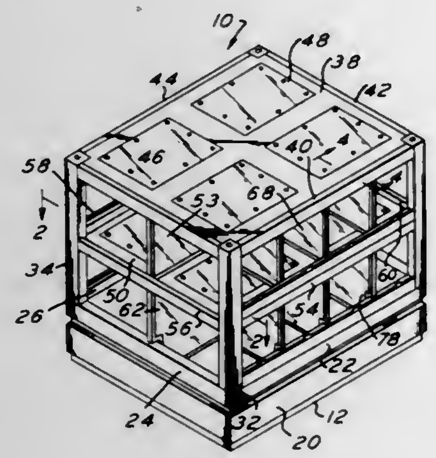


An elastomer sealing ring between a rolling bearing ring having a flange and a shaft having a shoulder. The sealing ring is fixed to the bearing ring and extends axially into an annular space defined by the shaft and a collar which is fixed to the shaft and has a larger diameter than the sealing ring. The sealing ring is capable of being slid and radially compressed in the annular space.

3,717,395
DISPLAY FIXTURE

Paul Spielvogel, Commack; William R. Sagal, Brooklyn Heights, both of N.Y., and Jay H. Miller, Long Branch, N.J., assignors to S. Klein Department Stores, Inc., New York, N.Y.

Filed Jan. 21, 1971, Ser. No. 108,470
Int. Cl. A47f *3/00*
U.S. Cl. 312—114 **11 Claims**

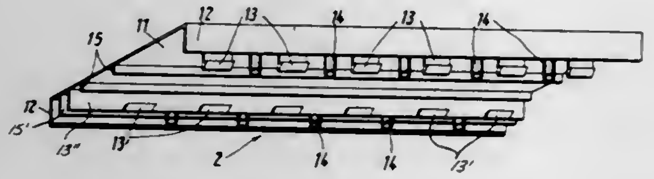


A display fixture having open display areas on all sides is disclosed. A top wall and an intermediate wall are provided with transparent inserts. The space above and below an intermediate horizontal wall is divided into open display compartments by means of a plurality of mutually perpendicular vertical transparent partitions, some of which may be movable.

3,717,396
MODULAR SHELL CABINET STRUCTURE

Hans-Werner Dupree, Osnabrucker Landstrasse 154, 4831 Gutersloh-Avenwedde, Germany

Filed Nov. 13, 1970, Ser. No. 97,428
Claims priority, application Germany, Nov. 18, 1969, P 19 57 878.0
Int. Cl. A47b *47/00*
U.S. Cl. 312—257 R **8 Claims**



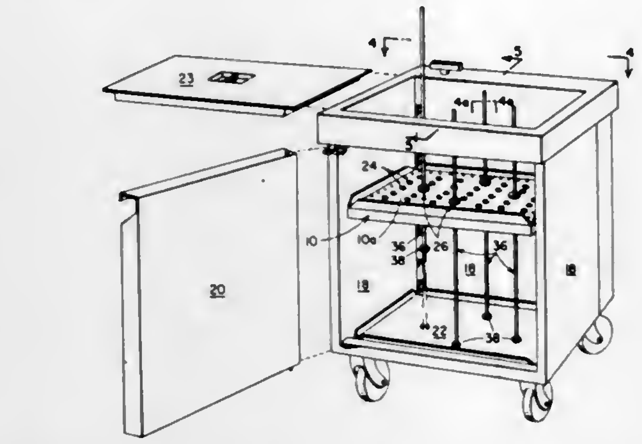
Matching pan elements of sheet plastic having complemental hooked interlocking members and projection and socket registering members are assembled into hollow panel components. Such hollow panel components have coplanar pegs projecting from an edge and/or tenons of channel-shaped cross section projecting laterally beyond a side to engage in complemental sockets in another panel for assembling such panels into cabinet walls, shelves or drawers.

3,717,397
UNIVERSAL SELF-LEVELING DISPENSER

Gilbert A. Cummings, Norwell, Mass., assignor to Peters & Co., Inc., Boston, Mass.

Filed April 26, 1971, Ser. No. 137,166
Int. Cl. A47f *1/00*
U.S. Cl. 312—71 **12 Claims**

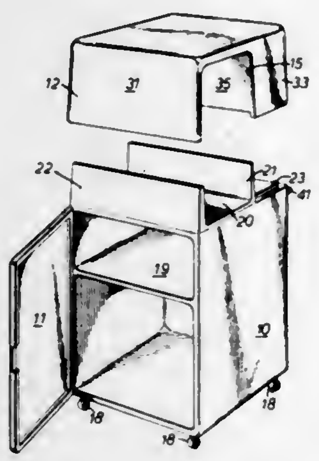
Universal self-leveling dispenser useful for food services. Apertures in the elevator platform mount tubular guides for divider rods and provide air circulation for heating and cooling articles on the platform. Heating and cooling units are installable to replace bottom and side walls. Unimpeded air paths below the elevator platform, together with apertures of the platform and particular placement of the temperature changing units provide self-adjusting air flow paths that depend upon where the articles are stacked.



3,717,398
HOSPITAL LOCKERS

William Harry Deane, London, and Geoffrey Crompton, Willington, England, assignors to Matburn (Holdings) Limited, London, England

Filed June 8, 1971, Ser. No. 151,110
Int. Cl. A47b *81/00*
U.S. Cl. 312—283 **6 Claims**



An article of furniture such as a cupboard, chest or hospital bedside cabinet, is formed in two separate parts of moulded foamed synthetic plastics material. These two parts are joined together after moulding. The upper part is open on its under side. The lower part closes the under side of the upper part when the article of furniture is assembled.

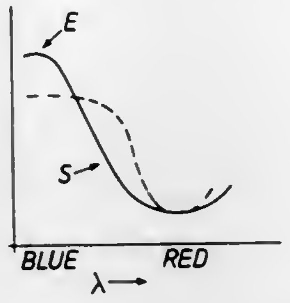
3,717,399
OPTICAL INTERFERENCE FILTER FOR SHIFTING COLOR TEMPERATURE

Hylton Taylor, Denbigh, and Michael John Tuck, Prestatyn, Wales, assignors to Pilkington Perkin-Elmer Limited, Liverpool, England

Filed Mar. 18, 1971, Ser. No. 125,693
Claims priority, application Great Britain, Mar. 20, 1970, 13,475/70
Int. Cl. G02b *1/10, 5/28*
U.S. Cl. 350—166 **7 Claims**

An optical filter comprises a glass carrier and four layers

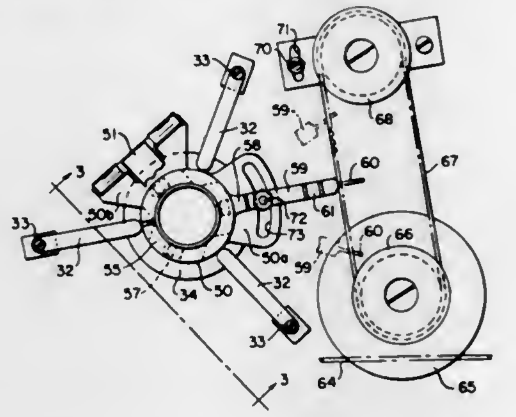
deposited in superimposed relationship on the carrier, the layers having low and high refractive indices in alternation, and the filter being particularly designed to produce a desired shift in color temperature.



3,717,400
MICROFORM VIEWER LENS FOCUSING MECHANISM

Walter L. Schutrum and Richard L. Funkhouser, Kettering, Ohio, assignors to The National Cash Register Company, Dayton, Ohio

Filed Feb. 25, 1971, Ser. No. 118,818
Int. Cl. G02b *7/02*
U.S. Cl. 350—255 **3 Claims**



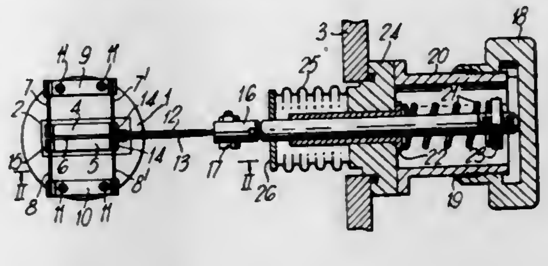
An operator-controlled lens focusing arrangement for a microform viewer wherein a belt is carried around two pulleys, one of the pulleys being integral with the operators control knob, a lens holder is supported by tracking mechanism which is in contact with the glass cover plate for the microform, and a camming ring is secured to the lens holder for the purpose of maintaining the lens in focus by vertical movement thereof. A camming yoke having a pin secured thereto extends toward the belt, the pin penetrating the belt and the yoke being swingable along a horizontal plane in response to travel of the belt which causes the camming ring to raise or lower the lens holder and to place the lens in proper focus. Different lenses may be interchanged under this arrangement with minimum adjustment for proper focus.

3,717,401
ADJUSTABLE WIDTH-SLIT MECHANISM

Royal Edward Powell, Newbury, England, assignor to United Kingdom Atomic Energy Authority, London, England

Filed Oct. 16, 1970, Ser. No. 81,405
Claims priority, application Great Britain, Oct. 23, 1969, 51,919/69
Int. Cl. G01j *3/04*
U.S. Cl. 350—271 **6 Claims**

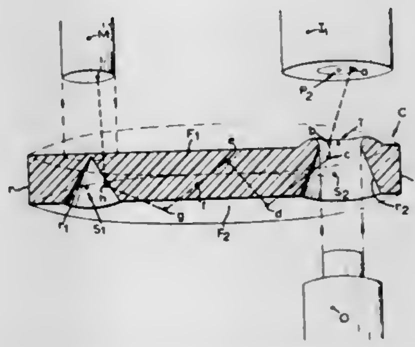
Two members having parallel edges defining a slit between them are each mounted on a pair of equal-length parallel flat springs extending away from the edges with their flat faces normal to the plane of the slit so that the edges move in that plane as the springs deflect. The slit width is adjusted by effecting such movement. For this purpose two flexible connections made of springy material are rigidly attached at one end to each member and have their other ends connected to a common adjustment member whose movement is colinear with the connections. The flexible connections may be flat strips rigidly connected to the adjustment member, or preferably wires having a common loop which loosely engages the adjustment member, the loop being spring-loaded against the latter by a spring connected between each slit-defining member and the fixed plate on which they are mounted.



3,717,402
LIGHT COLLECTOR FOR GAMMA RAY CAMERAS

Allen Brewer, and Michael Joy, both of Toronto, Ontario, Canada, assignors to Canadian Patents and Development Limited, Ottawa, Ontario, Canada

Filed Dec. 8, 1969, Ser. No. 883,095
Claims priority, application Great Britain, Dec. 16, 1968, 59,685/68
Int. Cl. G02b *5/04*
U.S. Cl. 350—286 **8 Claims**



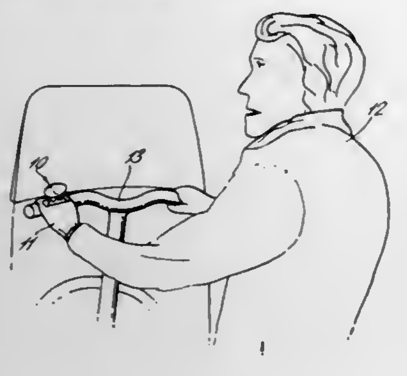
A light collector for use in an optical system for collecting light falling outside a predetermined area, the collector comprising an elliptical plate of transparent material having an opening therethrough from one face to the other centered on one of its foci to allow unimpeded passage therethrough of light falling within the desired predetermined area, the plate being adapted to intercept and collect light falling outside the area around such one focus, the plate having a refracting surface arrangement providing for total internal reflection when the light strikes the plate faces or employing a reflective coating on such plate faces except in the vicinity of the foci to effect entrapment of such collected light between the plate faces, the plate having a reflective coating on the periphery thereof to direct such entrapped light from the one focus to the other focus whereby the intercepted light is collected at such other focus and means are provided at such other focus to reflect such collected light out through one of the plate faces.

3,717,403
MITT MIRROR

Fernand A. Messier, P.O. Box 372, Spanish, Ontario, Canada

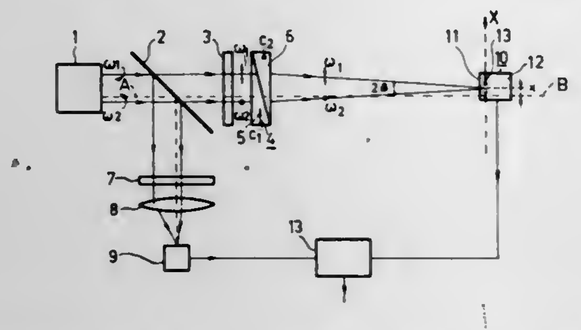
Filed March 10, 1971, Ser. No. 122,685
Claims priority, application Canada, Aug. 7, 1970, 090270
Int. Cl. G02b *7/18*
U.S. Cl. 350—298 **5 Claims**

A rear-viewing mirror is provided which is adapted to be worn by the viewer. The mirror includes a base; a frame mounted on the base; and a mirror mounted in the frame. Apparel means, for example, a glove, or a mitt, or a band, or an elastic band, is secured to the base and is adapted to be worn by the user. This wearing is carried out in such a manner that the mirror is visible to the wearer.



3,717,404
APPARATUS FOR DETERMINING THE POSITION OF AN OBJECT IN AN ARBITRARY CROSS-SECTION OF A BEAM OF RADIATION

Rene Dandliker, Zug, Switzerland, assignor to U.S. Philips Corporation, New York, N.Y.
Filed July 6, 1971, Ser. No. 159,716
Claims priority, application Netherlands, July 9, 1970, 7010130
Int. Cl. G01b *9/02;* **G01j** *3/46*
U.S. Cl. 356—106 **9 Claims**



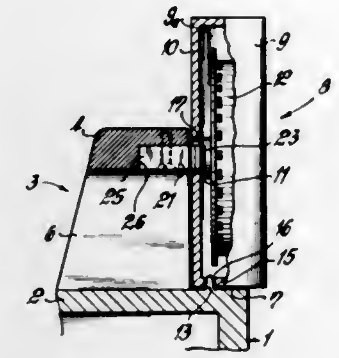
An apparatus for determining the position of an object in an arbitrary cross-section of a beam of electromagnetic radiation is described.

It is set forth that for this purpose the radiation beam is produced by two monochromatic coherent orthogonally polarized radiation sources having different frequencies, the frequency difference being small compared with each of the frequencies, whilst the radiation beam is divided in a polarization-sensitive system into at least two subbeams which each have one of the said different frequencies and are applied to the detection system rigidly secured to the object.

3,717,405
CINEMATOGRAPHIC APPARATUS WITH COUPLING MEANS FOR DETACHABLE FILM-CONTAINING CASSETTES

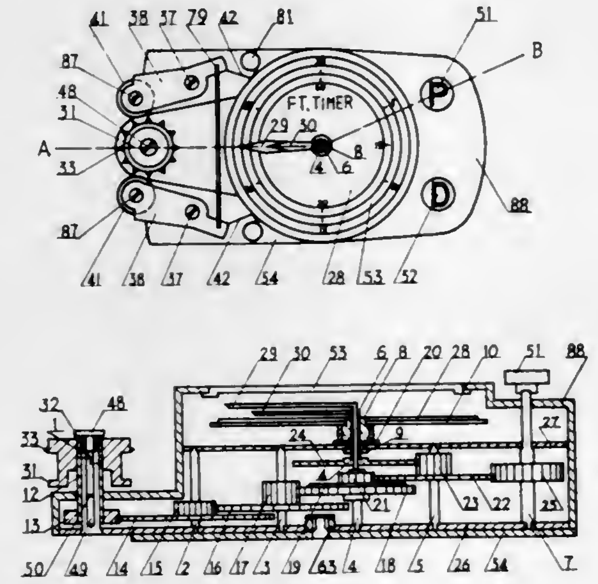
Wolfgang Riedel, Winnenden, Germany, assignor to Robert Bosch Photokine GmbH, Stuttgart-Unterturkheim, Germany
Filed Feb. 24, 1971, Ser. No. 118,302
Claims priority, application Germany, Feb. 26, 1970, P 20 08 974.1
Int. Cl. G03b *23/02*
U.S. Cl. 352—72 **10 Claims**

The housing of a motion picture projector for use with film-containing cassettes has a top wall which supports an upwardly extending inverted U-shaped handle. The handgrip portion of the handle is connected with a plate which is provided with elastic tongues receivable in openings provided in the rear panel of the casing of a cassette when the casing rests on the top wall of the housing adjacent to the handle. The tongues then engage suitably inclined surfaces in the openings of the rear panel to separably hold the cassette in a desired position. The top wall of the housing has upwardly extending projections which extend into sockets provided therefor in the bottom panel of the casing and the plate has platforms which abut against the exposed surface of the rear panel when the tongues are received in the respective openings and the projections of the top wall extend into the adjacent sockets.



3,717,406
MEASURING APPARATUS FOR EIGHT MILLIMETER FILM EDITING MACHINE

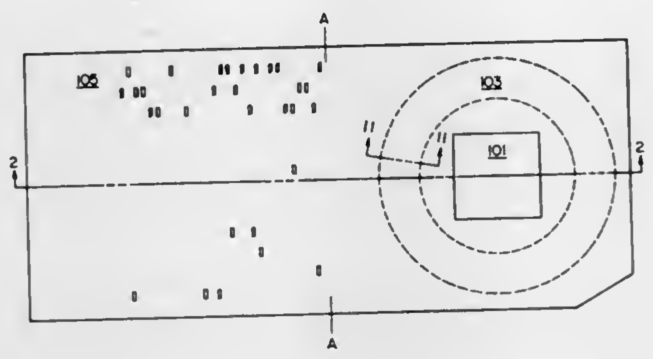
Itsuo Handa, 47 Higashigoto-cho, Kamigamo, Kyoto, Japan
Filed Mar. 13, 1969, Ser. No. 806,867
Int. Cl. G03b *1/60*
U.S. Cl. 352—172 **3 Claims**



A device which measures length of film or recorder tape calibrated in terms of time necessary for the tape or film to move past the measuring point. Included is a shaft to which various size sprockets having different sizes and numbers of teeth to correspond to different film speed may be journaled. Rollers of different diameters for different tape speeds may also be journaled to the shaft. Reduction gears make a minute and second hand rotate in proportion to the time necessary for the winding or reeling to proceed for a given length of film or tape at a given film or tape speed. A knob and gearing is provided to rotate the dial of the minute and second hand to a convenient orientation.

3,717,407
AUDIOVISUAL SLIDES AND DATA-RECORD CARDS

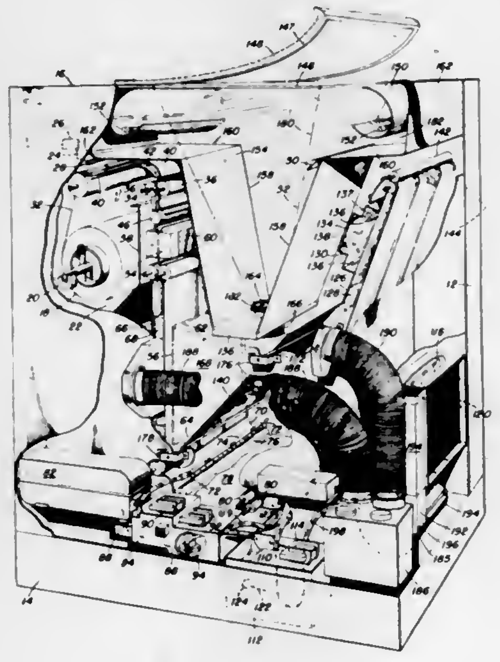
Panayotis C. Dimitracopoulos, P.O. Box 458 Outremont, Montreal, 154 Quebec, Canada
Filed March 2, 1970, Ser. No. 15,738
Int. Cl. G03b *21/00, 31/06;* **G11b** *17/06*
U.S. Cl. 353—120 **3 Claims**



Audiovisual Slides and Audiovisual Data-Record Cards carrying on their surface a stationary spiral sound track surrounding a window receiving a projectable transparency, the spiral sound track being recorded on one surface of the slides or cards, while a spiral groove, formed on the same or the opposite surface of these slides or cards, is used in the special recording and reproduction apparatus for the guidance of the recording and reproduction transducer. An alternative transducer-guidance means, on the slides and cards, is one or more auxilliary tracks coaxial to the sound track.

3,717,408
FLASH FLAT-BED WET COPIER

Edward J. Radin, and Delbert W. Sames, both of Johnson City, N.Y., assignors to GAF Corporation, New York, N.Y.
Filed Aug. 19, 1970, Ser. No. 65,181
Int. Cl. G03g *15/00*
U.S. Cl. 355—3 **4 Claims**

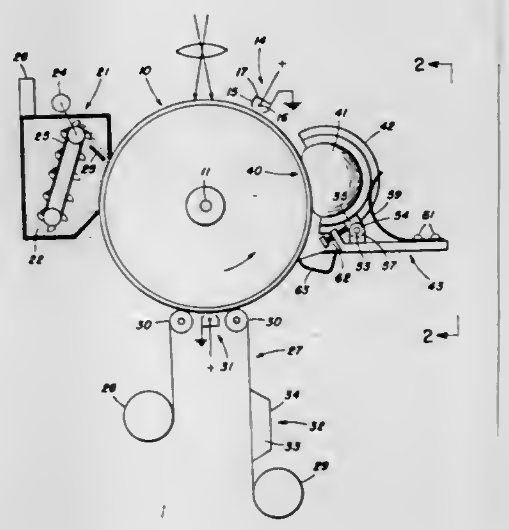


An electrostatic flat-bed wet copier in which copy moves in the exposure station while a 1:1 image of the stationary original is flashed thereon through a shutterless optical system upon the automatic energization of Xenon flash-tubes that flash-illuminates the underside of such original. The copy paper web is automatically fed from a supply roll, charged, cut into sheets of selected length corresponding to that of the original, one-shot flash exposed without interruption, wet-processed, and dried at a rate of up to 40 copies per minute. The copies moving through the machine are electronically monitored at each station by the electrical system so that any trouble is automatically indicated, to show the station involved, and further operation stopped until the trouble is corrected. The pre-wet developing device not only supplies and recirculates the liquid toning solution for flow with the copy, but maintains the pre-wet solution at a selected level in the liquid solution reservoir by gravity feed, and adds concentrated toner to an inlet to the liquid recirculating pump. The system is such that only concentrate need be added to the dip-developer system because a greater amount of pre-wet solution (same solution as liquid carrier for toner) is added on per copy basis than is squeegeed off after image development (in effect toner is manufactured with this system; never have to add to dip tray).

A sump receives any overflow from the toner reservoir, and feeds the liquid therein when the latter raises to a certain level, to a forced air evaporator. Any residual liquid is returned to the sump. The base of the copier cabinet consists of a liquid-proof tray for receiving any other spilled or overflow liquid. The copy fixing or drying station contains a box-like hood containing radiant-heating rods over which air is drawn from openings in the hood by an inclined vacuum-belt as well as by forced air means which carried the squeegeed copies thereon. The electrical system automatically handles any selected one of a plurality of copy lengths, corresponding to those of any original within the length range of the original platen, by virtue of individual sets of exposure platen switches corresponding to such lengths.

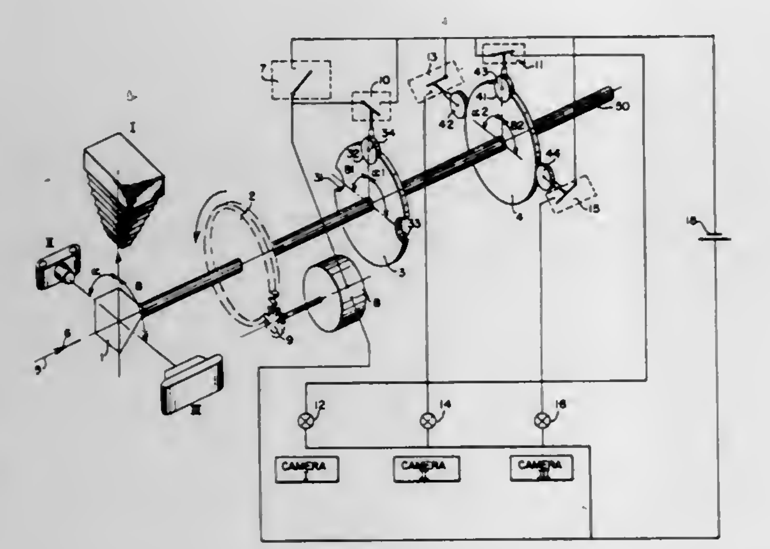
3,717,409
CLEANING OF ELECTROSTATOGRAPHIC SURFACES

Wilbur G. Hespenheide, West Lake Village, Calif., assignor to Xerox Corporation, Stamford, Conn.
Filed April 12, 1971, Ser. No. 133,022
Int. Cl. G03g *15/22*
U.S. Cl. 355—15 **21 Claims**



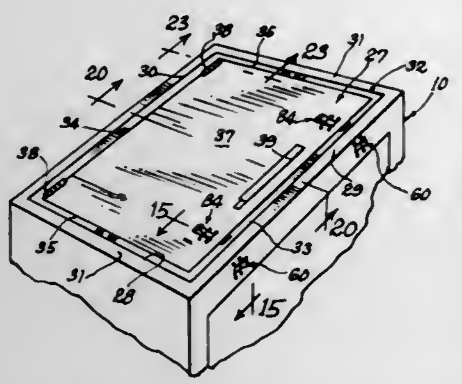
An inflated elastic tube is maintained in pressure contact with a moving electrostatographic recording surface having residual toner thereon whereby a ridge of toner is accumulated on the recording surface. The contact between the inflated tube and the recording surface is periodically interrupted; e.g., by deflating the tube or moving the tube away from the surface, and the accumulated toner is carried by the recording surface into the development apparatus.

3,717,410
PHOTOMICROGRAPHIC APPARATUS
Karl Kropp, Vienna, Austria, assignor to C. Reichert Optische Werke A.G., Vienna, Austria
Filed Jan. 26, 1972, Ser. No. 220,918
Int. Cl. G03b *27/44*
U.S. Cl. 355—46 **3 Claims**



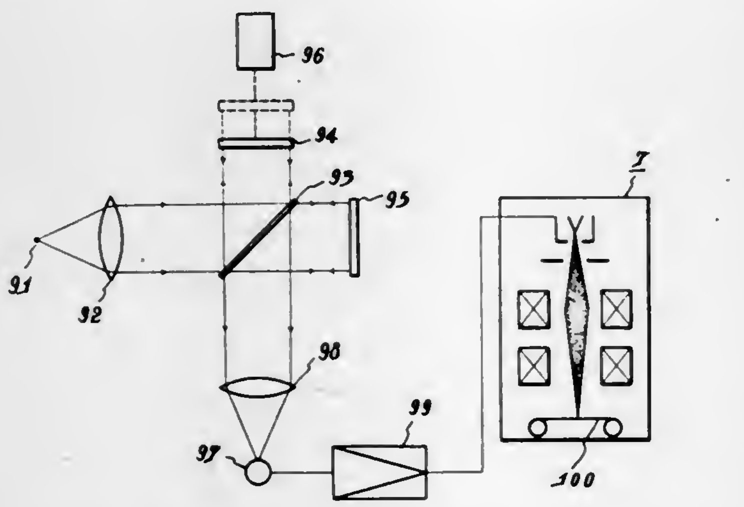
A number of camera backs are accommodated on a single photomicrographic apparatus. A mirror which deflects the microscope optical path selectively into each camera is rotatable by a control drive to an operative position relative to each camera.

3,717,411
REVERSIBLE COPYBOARD FOR ELECTROSTATIC COPYING MACHINE
George P. Niesen, Niles; Wolodymyr Dutko, and William L. Garbarino, both of Chicago, all of Ill., assignors to A. B. Dick Company, Niles, Ill.
Filed April 15, 1971, Ser. No. 134,362
Int. Cl. G03b *27/62*
U.S. Cl. 355—75 **6 Claims**



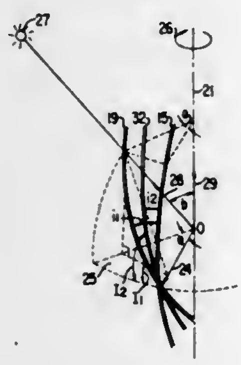
The housing of an electrostatic copying machine has an opening in the top thereof located over the means in the housing defining an exposure station. An open frame is disposed in such opening. A glass platen and a cover are each hingedly secured to this frame for individual swinging movement to and away from their normal positions wherein such members are coplanar with the frame. The frame is mounted for pivotal movement through 180° back and forth between a copying position wherein the cover may be swung away from the frame thereby permitting the material to be copied to be placed face down on the glass platen and a loading position wherein the glass platen may be swung away from the frame thereby permitting the material to be copied to be placed face up on the cover.

3,717,412
METHOD FOR ANALYZING SPECTRAL DATA USING HALOGRAMS
Hiroshi Takuma; Hajime Mori; Koji Masutani, all of Tokyo, and Kazuko Umezu, Yokohama, all of Japan, assignors to Nihon Denski Kabushiki Kaisha, Tokyo, Japan
Filed Nov. 27, 1970, Ser. No. 92,979
Claims priority, application Japan, Nov. 28, 1969, 44/95946; Nov. 28, 1969, 44/95947
Int. Cl. G01j *3/40;* **G01b** *9/02;* **G01k** *9/08*
U.S. Cl. 356—77 **1 Claim**



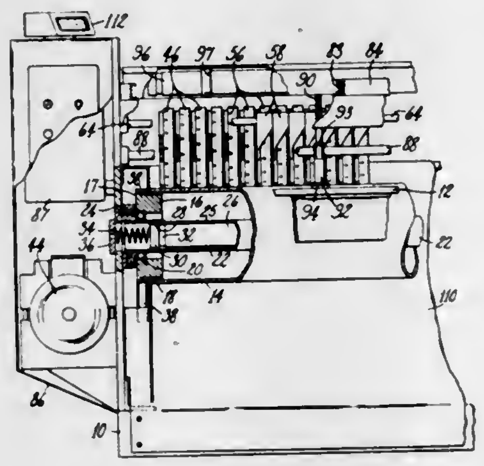
A signal obtained by an analytical instrument is converted into a light and shade spectrum by an electron exposure unit, the said light and shade spectrum then being formed into a hologram. Unknown samples are qualitatively and quantitatively analyzed by correlating the hologram formed by a given unknown sample with the hologram of a known sample. Further, if the output signal from an interference spectrometer is fed into the exposure unit, a light and shade spectrum in the form of a hologram is produced. By applying Fraunhofer diffraction, Fourier transformed spectrum in reverse corresponding to a wave number is derived from the said hologram.

3,717,413
SUN SENSING SYSTEM FOR A FLYING BODY
Moritada Kubo, Tokyo; Kuniji Asano, Kawasaki, and Hiromichi Ohashi, Yokohama, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan
Filed Nov. 20, 1970, Ser. No. 91,273
Claims priority, application Japan, Nov. 20, 1969, 44/92639; Nov. 20, 1969, 44/92641
Int. Cl. G01b *11/26*
U.S. Cl. 356—152 **5 Claims**



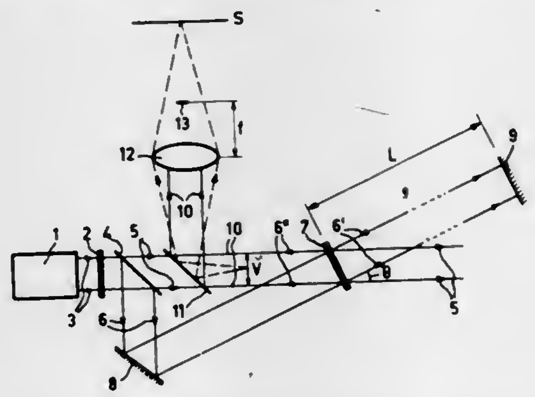
A flying body, such as a satellite, is provided with three sun sensors mounted thereon, each of which includes a slit for allowing the sun rays to fall on a photoelectric converter mounted within the satellite. The first sensor is positioned with its slit in a plane which includes the spin axis of the flying body, the second sensor is positioned with its slit in a plane inclined at a first angle to the spin axis, and the third sensor is located with its slit in a plane inclined at a second angle to the spin axis. Logic is provided for selecting the outputs of different sensors, depending on the attitude of the satellite.

3,717,414
AREA MEASURING MACHINES
Clifford Hall, Wakefield, and John E. Holdsworth, Dacre, both of England, assignors to USM Corporation, Boston, Mass.
Filed May 12, 1971, Ser. No. 142,591
Int. Cl. G01b *7/32, 11/28;* **G01n** *21/30*
U.S. Cl. 356—158 **7 Claims**



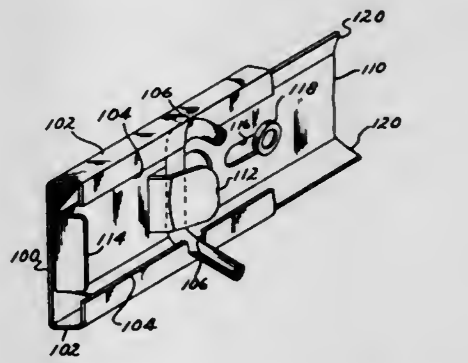
Apparatus for measuring the superficial area of a workpiece such as a hide wherein the hide to be measured is supported by a glass roll within which is an elongated light source and cooperating therewith are a plurality of measuring wheels each disposed on an axis parallel to said roll and having regular holes around the periphery thereof, each wheel having a photoelectric cell therein aligned with said light source to activate a summing circuit upon the presence of a hide between said light source and said cell and wherein said summing circuit includes a second light source and a plurality of photoelectric cells with said wheels so aligned as to provide a signal to s said summing circuit upon each occurrence of a measuring wheel rotating a unit amount.

3,717,415
SHORT INTERVAL HOLOGRAPHIC COMPARISON
Johannes Petrus Woerdman, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Filed July 12, 1971, Ser. No. 161,564
Claims priority, application Netherlands, July 14, 1970, 7010378
Int. Cl. G01b *11/24;* **G02b** *27/00*
U.S. Cl. 356—168 **5 Claims**



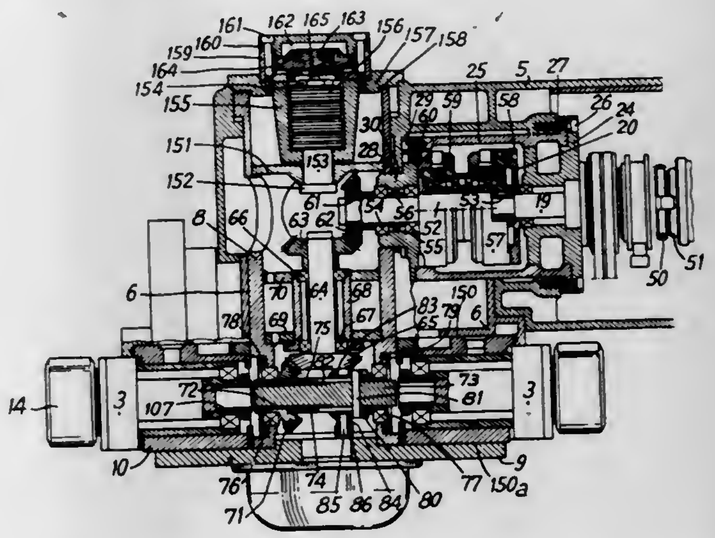
A method of, and an apparatus for, holographic comparison are described in which at a first instant a hologram of an object is made, this hologram is so reconstructed at a second instant that an image of the object is formed at the original position of the object and the image is compared with the object itself at the second instant. It is shown that by the direct production of the hologram by means of optical changes in a non-linear optical medium and by reconstructing this hologram a very short time afterwards the object may be compared with itself at two closely proximate instants.

3,717,416
ARCHED RING-WIRE POST BINDER
Frank Stanley Schade, Holyoke, Mass., assignor to National Bank Book Company, Inc., Holyoke, Mass.
Division of Ser. No. 784,533, Dec. 3, 1968, Pat. No. 3,606,557. This application May 21, 1971, Ser. No. 145,789
Int. Cl. B42f *3/02*
U.S. Cl. 402—31 **2 Claims**



An arch-type ring binder with cover members and hinged thereto an assembly of hingedly connected back panel sections comprising opposed side panel sections and a connecting panel section, an arched split ring loose leaf toggle mechanism fixed on one side panel and means on one of said other back panel sections, preferably the other side panel section, for releasably locking the arched rings thereto, said binder with the rings in locked condition providing a post binder type assembly with a loose leaf ring mechanism, and with the rings in unlocked condition having the operational advantages and usefulness of a ring binder type of loose leaf unit.

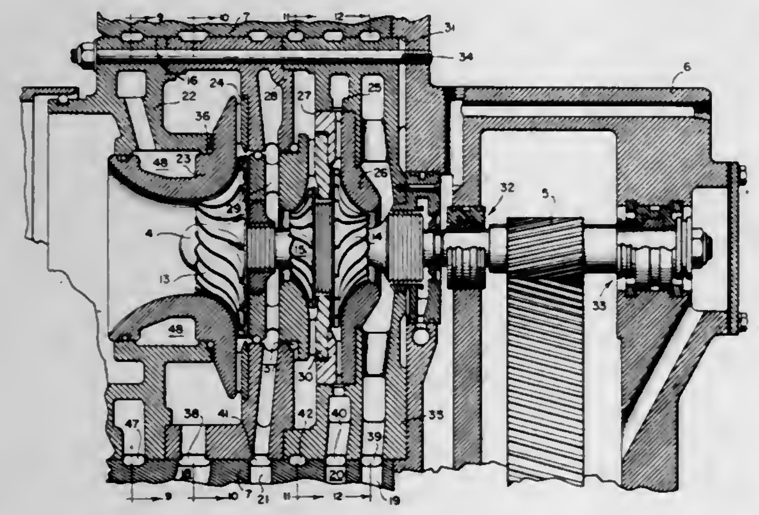
3,717,417
ROTARY TOOL-CARRYING HEADS FOR MACHINE TOOLS
Paul Jacques Aubrier, Le Havre, France, assignor to Societe Anonyme dite: CNMP-Berthiez, Paris, France
Filed July 27, 1970, Ser. No. 58,575
Claims priority, application France, Aug. 8, 1969, 6927430
Int. Cl. B23b *39/20*
U.S. Cl. 408—35 **7 Claims**



A rotary head for use in a machine tool, for example, a milling and boring machine, includes a turret having a plurality, for example eight, tool-carrying spindles. The turret is rotatably mounted on a body of the head through the intermediary of a cylindrical casing which houses drive means for the turret. The turret is indexed angularly and as each spindle is stopped in its working position, a locking device comes into action and a slidable drive shaft engages the selected spindle and drive can be commenced. The turret motion is controlled by hydraulic actuators.

3,717,418
COMPRESSOR BARREL ASSEMBLY

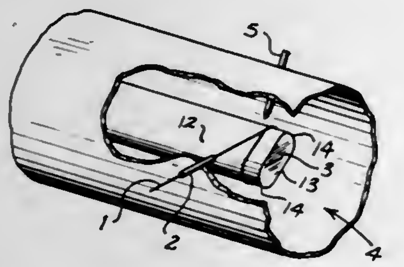
Karol Pilarczyk, Loudonville, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.
Filed June 8, 1970, Ser. No. 44,446
Int. Cl. F04d *29/66, 1/06, 29/58*
U.S. Cl. 415—104 **23 Claims**



The three stage centrifugal compressor of the present invention employs a one-piece cast casing having a cylindrical bore containing therein a removable barrel assembly, which assembly comprises three directly engaging diaphragms, three diffusors, three shrouds and a rotor having three impellers, all in axially stacked relationship. Only the three diaphragms are axially clamped directly to each other by means of tension bolts. The diffusers and shrouds are held by the diaphragms for axial free play and biased in one axial direction by axially compressed sealing O-rings and effective piston surfaces under the influence of the fluid being pumped. The end closure containing the bearings and drive for the overhung rotor has a cylindrical surface flush with the cylindrical bore of the casing, which surface is overlapped by the outer cylindrical surface of one of the diaphragms to provide for axial alignment. Four engaging cylindrical surfaces on the diaphragms further assure axial alignment. Fluid passages are provided integrally cast in the diaphragms and casing for conducting the fluid through intercoolers, between stages.

3,717,419
TURBINE BLADE

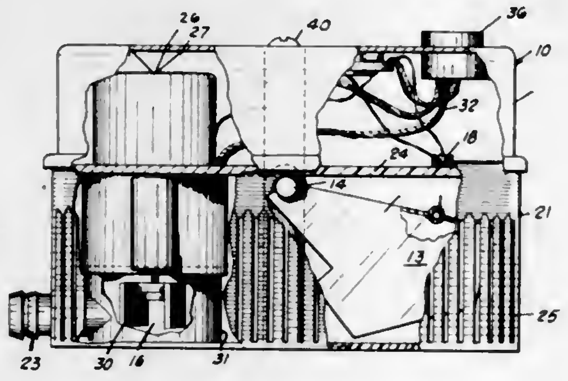
Eugene L. Olcott, Falls Church, Va., assignor to The Susquehanna Corporation, Alexandria, Va.
Filed July 9, 1971, Ser. No. 161,007
Int. Cl. F01d *5/14*
U.S. Cl. 416—230 **19 Claims**



A turbine blade or vane shaped from an article comprising a pyrolytic graphite matrix containing embedded therein at least one reinforcing refractory strand layer, the refractory being carbon or a refractory metal, carbide, boride, nitride, or oxide. The refractory strand layer comprises a plurality of unidirectional and substantially parallel, laterally spaced, individual, continuous refractory strands. The matrix comprises crystallite layers of pyrolytic graphite nucleated from each of the individual refractory strands and interconnected to form a continuous phase surrounding and interconnecting the individual strands comprising the embedded strand layer. The finished blade or vane has the strength and durability to withstand gas turbine temperatures of 2,000° to 5,000°F.

3,717,420
BILGE PUMP

Eugene Rachocki, Erie, Pa., assignor to Zurn Industries, Inc., Erie, Pa.
Filed Dec. 3, 1970, Ser. No. 94,644
Int. Cl. F04b *49/04*
U.S. Cl. 417—12 **8 Claims**

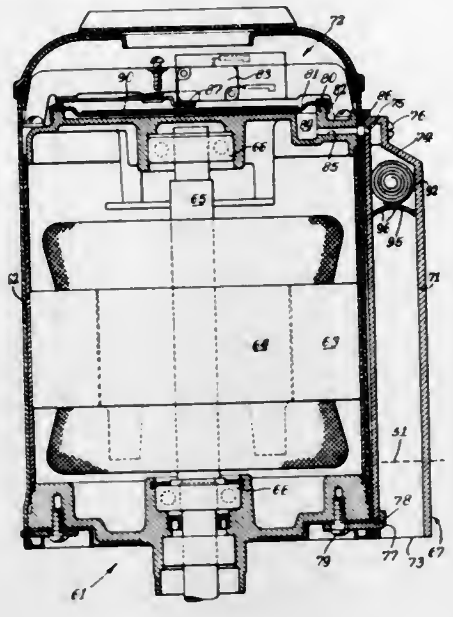


The specification discloses a bilge pump for boats or the like, made up of a motor, a motor housing, with an impeller connected to the motor, a float compartment on said housing, a float in the housing in the float compartment, and a reed switch supported in a separate compartment. A permanent magnet is supported on the float in such a way that when the float rises, the magnet moves into proximity with the reed switch. The current through the reed switch energizes a thermostat. When the float is held up for a period of time or closed and opened intermittently by waves, the thermostat is heated and the thermostat switch closed for intervals of time sufficient to drive the motor to empty the bilge.

3,717,421
APPARATUS AND METHOD FOR A LIQUID LEVEL SENSOR

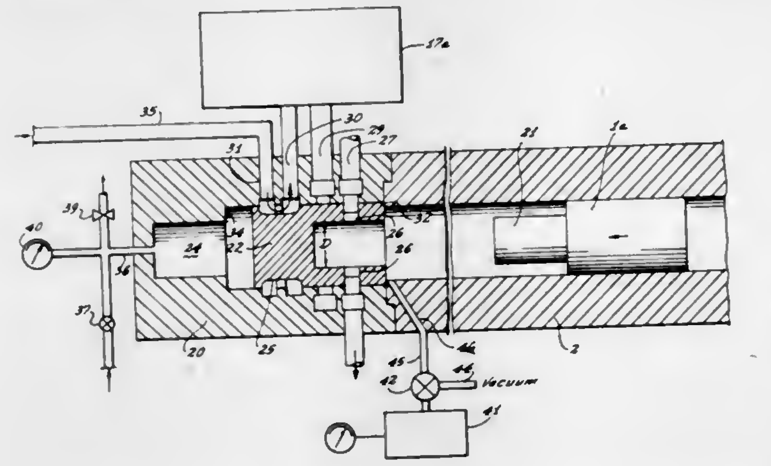
Edward J. Schaefer, Bluffton, Ind., assignor to Franklin Electric Co., Inc., Bluffton, Ind.
Filed Oct. 9, 1970, Ser. No. 79,472
Int. Cl. F04b *49/02*
U.S. Cl. 417—38 **20 Claims**

In a liquid level sensor comprising a gas, such as air, filled column having the bottom end thereof exposed to a liquid, and a gas pressure sensing means which is activated by the liquid rising in the column and compressing the gas in the column, a method and apparatus for refilling or introducing gas into the column to compensate for any gas absorbed by the liquid, Thus, the reliability of the liquid level sensor is maintained and is not affected by the absorption of part of the gas by the liquid. The apparatus, in one form, comprises gas generating means for generating gas in the column, and in another form, comprises gas pumping means for pumping gas from the environment into the column. The apparatus, in still a third form, comprises liquid level control means for insuring lowering the level of the liquid to a point where gas or air from the environment may enter through the bottom of the column. The method and apparatus of the present invention, for example, may be incorporated in a control for an electric motor driving a sump pump for controlling the water level in the sump reliably for a period of years, the control being unaffected by absorption of part of the gas in the column by the water.



3,717,422
FREE-PISTON GAS HEATER SYSTEM

Stellan P. Knoos, Pacific Palisades, Calif., assignor to Northrop Corporation, Beverly Hills, Calif.
Filed June 10, 1970, Ser. No. 45,131
Int. Cl. F04b *17/00, 35/00, 21/00, 39/00*
U.S. Cl. 417—392 **5 Claims**

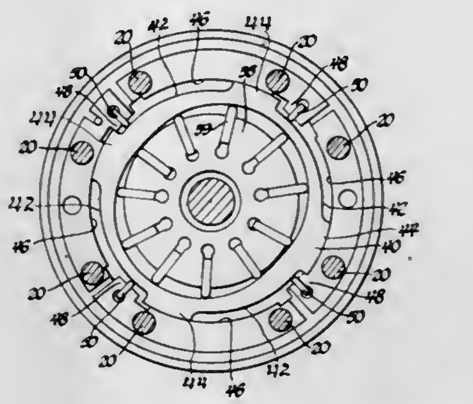


A reciprocating, free-piston gas heater having flow-restricting orifices is driven by a gas through a valving arrangement with proper timing.

3,717,423
POWER TRANSMISSION

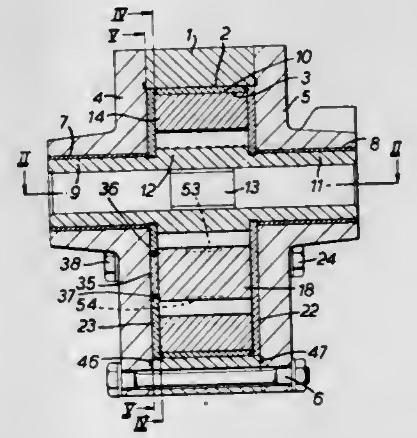
Nicholas F. Pedersen, Farmington; Howard V. Fromm, Madison Heights; Melvin L. Kent, Rochester, and Don G. Olmstead, Troy, all of Mich., assignors to Sperry Rand Corporation, Troy, Mich.
Filed Nov. 25, 1970, Ser. No. 92,741
Int. Cl. F01c *21/16;* **F03c** *3/00;* **F04c** *15/04*
U.S. Cl. 418—16 **6 Claims**

A variable displacement rotary van pump has a cam ring which is angularly displaceable relative to the stationary commutating ports of the pump body. Power losses due to trapping of fluid at intermediate adjustments of the cam ring are minimized by a particular cam contour. Both the rise and the fall of the cam in the intake and discharge areas respectively occur in two steps and these steps are unsymmetrical both as to arcuate extent and as to rate of rise and total rise. This permits the commutating ports to be arranged for higher efficiency at all settings of the adjustable cam ring.



3,717,424
HYDRAULIC APPARATUS

Dennis Ernest Lambeth, Benhall, Cheltenham, England, assignor to Dowty Technical Developments Limited, Brockhampton, Cheltenham, England
Filed March 22, 1971, Ser. No. 126,554
Claims priority, application Great Britain, March 24, 1970, 14060/70
Int. Cl. F04c *1/06, 27/00*
U.S. Cl. 418—126 **10 Claims**

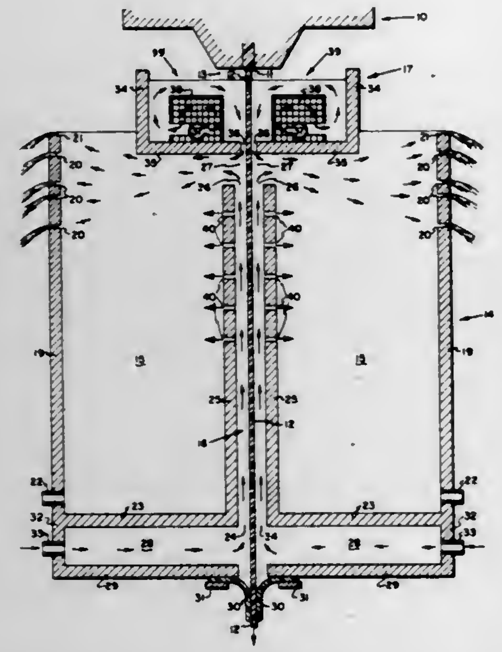


This invention concerns a hydraulic displacement device, such as an internal gear pump, having an internally toothed gear in mesh with an externally toothed gear, a crescent-shaped land engaging at least some of the tips of unmeshed gear teeth and defining a high pressure zone and a low pressure zone with the position of teeth which are in mesh within the internally toothed gear, and at least one end bearing member engaging the end surfaces of the gears and loaded by liquid from the high pressure zone to engage the adjacent end surfaces of the gears. The present invention provides a means to provide a good fit between the end bearing member and the crescent-shaped land to take up wear at the end surfaces of the gears by providing a spacer member extending from the land parallel to the rotation axes and leaving a shoulder around the land and a hole within the end bearing member to enable it to fit over the spacer member and to engage the end surfaces of the gears, the shoulder of the land being so located that when the bearing member engages the end surfaces of the gears it is very closely spaced from the shoulder whereby as wear takes place the bearing member can move towards the shoulder.

3,717,425
APPARATUS FOR PRODUCTION OF THERMOPLASTIC SHEET

Howard C. North, Baytown, Tex.; Harry W. Sherman, Palatine, Ill., and Edward B. Kaplan, Springfield, N.J., assignors to Esso Research and Engineering Company, Linden, N.J.

Filed April 16, 1971, Ser. No. 134,598
Int. Cl. B29d *7/20*
U.S. Cl. 425—71 **1 Claim**

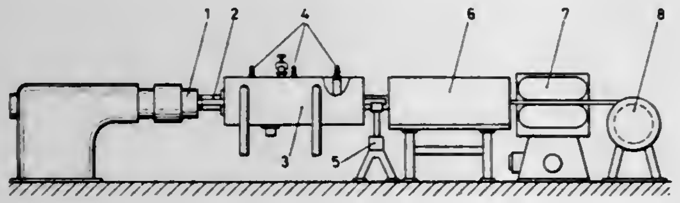


Plastic polyolefin sheets may be formed by passing extruded resin through a primary cooling zone having a moving, smooth free surface on the cooling liquid, cooling being effected by laminar flow cooling liquid and thence by turbulent flow cooling liquid.

3,717,426
OVERPRESSURE EXTERNAL SIZING TOOL

Werner Tucking, and Gerhard Roder, both of Frankfurt/Main, Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt/Main, Germany

Filed Dec. 3, 1970, Ser. No. 94,645
Claims priority, application Germany, Dec. 5, 1969, P 19 61 060.7
Int. Cl. B29c *25/00*
U.S. Cl. 425—71 **5 Claims**

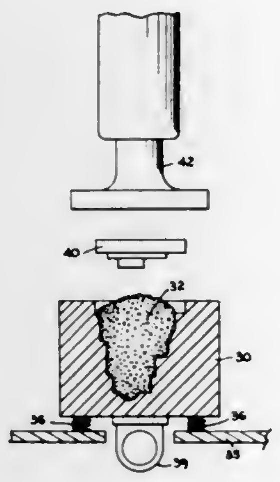


An overpressure external sizing tool for extruded hollow profiles of thermoplastic material is described which consists of a sizing bushing which is cooled by a liquid and firmly mounted on the front side, facing the extruder, of a cooling trough, and of draw plates arranged on guiding means within the cooling trough so that they can be longitudinally shifted. The draw plates are provided with individual connections for a cooling liquid and with bores opening into enlarged cross-sections of the draw plate apertures for allowing the cooling liquid to immediately contact the hollow profile as it proceeds through the sizing arrangement. The arrangement permits to fully use the throughput capacity of modern extruders while enabling easy access to the individual stations while starting up the extrusion.

3,717,427
SONIC APPARATUS FOR WORKING PLASTIC MATERIAL

Albert G. Bodine, 7877 Woodley Avenue, Van Nuys, Calif.

Continuation-in-part of Ser. Nos. 845,865, July 29, 1969, abandoned, and Ser. No. 454,335, May 10, 1965, abandoned, each is a continuation-in-part of Ser. No. 538,062, March 28, 1966, Pat. No. 3,639,152. This application Dec. 3, 1970, Ser. No. 94,663
Int. Cl. B29c *3/00*
U.S. Cl. 425—174 **6 Claims**

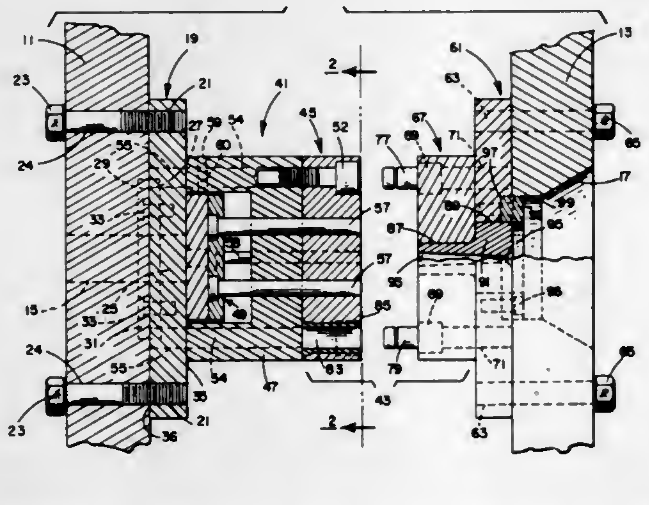


A plastic charge which may be in granular form, in the form of pellets, or in the form of a "fluff" material, is placed into a mold, which is closed off by means of a cover, mandrel or the like, for forming, and a bias force pressure applied thereto. High level sonic energy is generated by means of an orbiting mass oscillator which drives a resonant vibration system, the sonic energy being applied to the plastic charge to cause it to liquefy and flow uniformly throughout the mold to form a high strength plastic end product.

3,717,428
MOLD BASE ADAPTER

John Andras, Detroit, Mich., assignor to USI Corporation, Pasadena, Calif.

Filed March 8, 1971, Ser. No. 122,042
Int. Cl. B29c *1/00*
U.S. Cl. 425—191 **5 Claims**

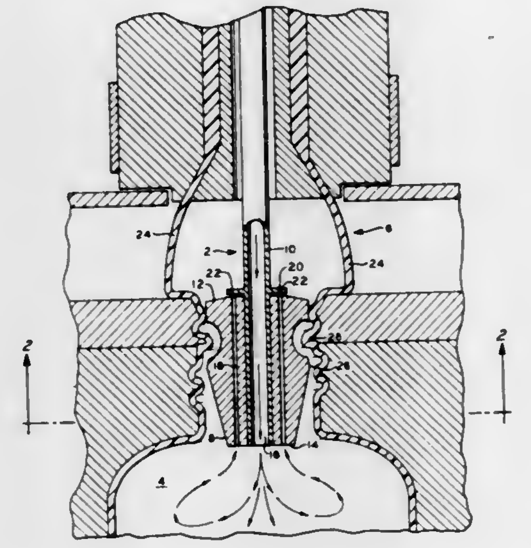


An adapter plate system and corresponding mold bases for use with injection molding assemblies to secure the mold bases to varying press platens which comprises two adapter plates having a plurality of apertures therein so that they can be secured to various standard press platens, the plates further having means for aligning one half of a mold base therewith and means for fixedly securing each half to each plate.

3,717,429
APPARATUS FOR COOLING THE BLOW PIN AND PLASTIC MOLDING MATERIAL DURING BLOW MOLDING OPERATION

Donald L. Peters, and Newton R. Wilson, both of Bartlesville, Okla., assignors to Phillips Petroleum Company

Filed Jan. 4, 1971, Ser. No. 103,377
Int. Cl. B29d *23/03*
U.S. Cl. 425—387 **5 Claims**

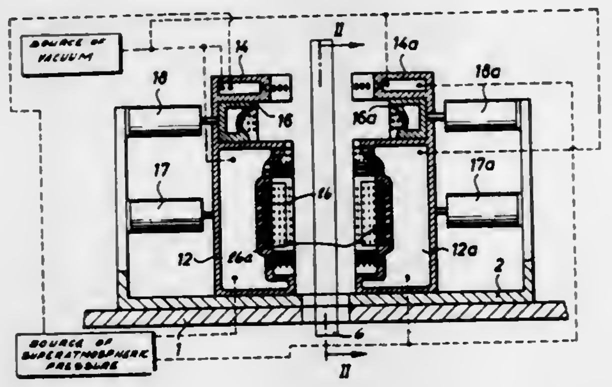


A blow pin of a blow molding apparatus is provided with a central opening and return air passages with a diverter plate adjacent the discharge ends of the return air passages for passing air through the blow pin for blow molding plastic articles and cooling the blow pin and diverting air outwardly for cooling portions of the plastic molding material.

3,717,430
APPARATUS FOR TEMPORARILY REDUCING THE VOLUME OF A SYNTHETIC MATERIAL CONTAINER

Gerhard Hansen, D 7013 Oeffingen, Kreis Waiblingen, Hofener Str. 47, Germany

Filed July 14, 1970, Ser. No. 54,796
Claims priority, application Germany, July 18, 1969, P 19 36 648.4
Int. Cl. B29d *23/00*
U.S. Cl. 425—392 **5 Claims**

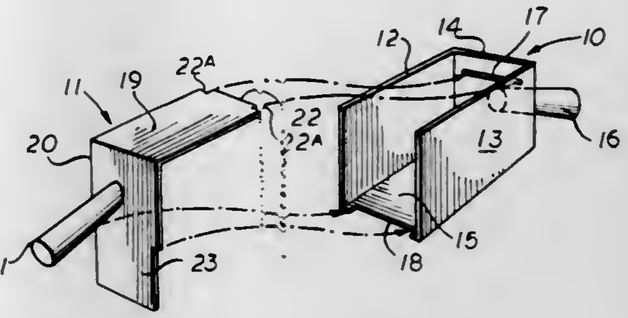


After filling and before closing of a container of synthetic material, the volume of the container is reduced, by an amount corresponding to the reduction in volume on cooling of the container to reduce or prevent undue pressure in the closed container. Pressure can be applied pneumatically or mechanically to produce the reduction in volume.

3,717,431
SNOW BRICKER

Hari Matsuda, 744 Hinman Ave.,
Evanston, Ill. 60202

Filed Aug. 23, 1971, Ser. No. 174,064
Int. Cl. B28b *7/10;* **B29b** *3/00*
U.S. Cl. 425—318 **5 Claims**

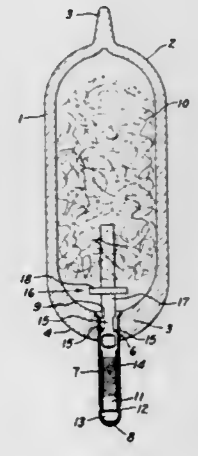


A two-piece mold for forming snow bricks includes a scoop and a shovel formed in complementary relation to provide the mold. Each mold piece is provided with a handle. The shovel may be hingedly connected to the scoop for compressing snow into brick shape, or it may be used to level the sides of snow held in the scoop, depending on the degree of wetness of the snow. In either case, the shovel may be used to remove a molded snow brick from the scoop.

3,717,432
PHOTOFLASH LAMP

Louis A. Demchock, Jr., Lyndhurst, Ohio, and Gerald F. Greaney, Mattoon, Ill., assignors to General Electric Company

Filed Sept. 20, 1971, Ser. No. 181,721
Int. Cl. F21k *5/02*
U.S. Cl. 431—93 **4 Claims**



The deflector shield of a percussion ignitable type flash lamp, for deflecting toward the side of the lamp envelope the hot particles of the lamp igniting fulminating material on ignition thereof, is constituted by an integral upset collar portion of the wire anvil which extends into the metal ignition tube of the lamp and which is coated with the fulminating material.

CHEMICAL

3,717,433
CORROSION INHIBITION METHOD

Gerhard W. Scherf, Ancaster, Ontario, and Gary C. Pfaff, Dundas, Ontario, both of Canada, assignors to Diamond Shamrock Corporation, Cleveland, Ohio

Division of Ser. No. 67,570, Aug. 27, 1970. This application Feb. 15, 1972, Ser. No. 226,560

Int. Cl. 252 *392;* **C23f** *11/02, 11/16*

U.S. Cl. 21—2.7 **6 Claims**

A composition and method for inhibiting steam-corrosion, comprising adding to the water a stable, cationic, fatty amine emulsion which breaks down upon heating, thereby allowing the fatty amine to enter the vapor phase and coat the interior surfaces exposed to the steam. Optionally, an ethoxyiated straight chain aliphatic acid may be added where the boiler water contains inorganic salt impurities, or is at a high temperature in order to maintain stability of the emulsion.

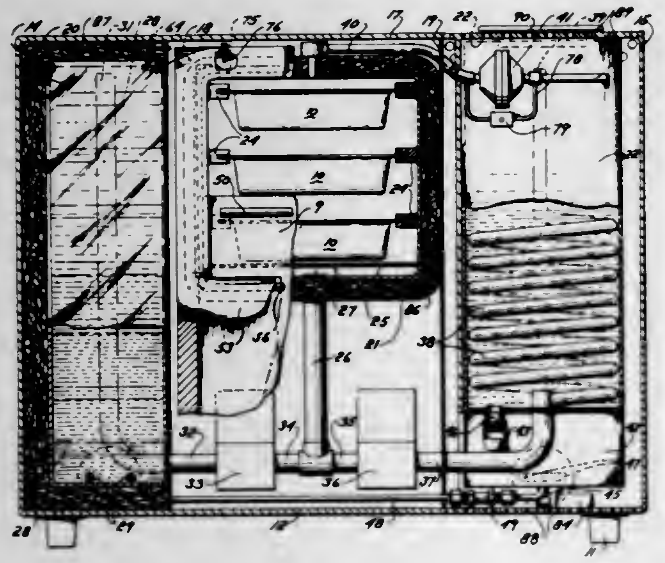
3,717,434
AUTOCLAVE

Robert B. Black, 2925 Denver St., Corpus Christi, Tex.

Continuation of Ser. No. 813,537, April 4, 1969, abandoned. This application Aug. 19, 1971, Ser. No. 173,237

Int. Cl. A61l *3/00*

U.S. Cl. 21—94 **5 Claims**



An autoclave, particularly adapted for use as a sterilizer, and in which the functions of steam generation and sterilization are performed in separate steam generating and autoclaving chambers, with provision for controlled delivery of steam from the generating chamber to the autoclaving chamber. A feed water system is also provided incorporating a receptacle for receiving sequential batches of feed water and for heating such batches to a temperature providing a pressure adequate to deliver the batch into the steam generating chamber.

The equipment further includes a closure for the autoclaving chamber and means interlocking the operation of the closure with the function of transfer of steam from the generating chamber to the autoclaving chamber. The closure for the autoclaving chamber is in the form of a sliding door mounted adjacent to the access opening into the autoclaving chamber in a manner providing for sealing of the door under the influence of the pressure of the steam introduced into the autoclaving chamber from the steam generating chamber.

3,717,435
PROCESS AND APPARATUS FOR MEASURING AND CONTROLLING THE CONCENTRATION OF CHEMICAL COMPOUNDS IN SOLUTIONS

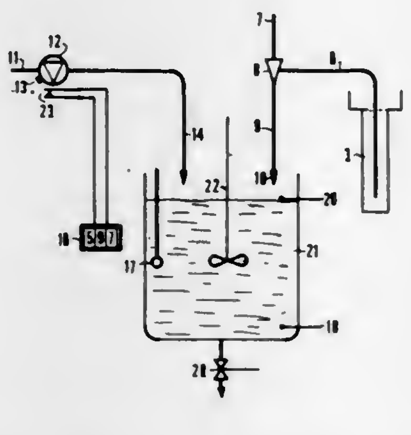
Stefan Ertl, Wallisellen, and Friedrich Oehme, Bassersdorf, Switzerland, assignors to Zellweger, Ltd., Uster, Switzerland

Filed Mar. 19, 1970, Ser. No. 21,029

Claims priority, application Switzerland, Sept. 30, 1969, 14,704/69

Int. Cl. G01f *1/06;* **G01n** *31/16*

U.S. Cl. 23—230 R **17 Claims**



The present disclosure is directed to a process and apparatus for measuring and regulating the concentration of chemical compounds in solution which comprises transferring a quantity of the solution to be analyzed to a titration vessel, controlling the amount of said solution introduced into the titration vessel, simultaneously transferring a predetermined quantity of an inert liquid diluent with said solution into said titration vessel, introducing at least one titrating agent into the solution in the titration vessel, with at least one metering pump having a specific pump volume per revolution until at least one end point is reached, said end point being monitored by at least one detector element and preselected by means of at least one limit-value contact on an indicating instrument and determining the consumption of the titrating agent by measuring the number of revolutions completed by the metering pump, expressed digitally.

3,717,436
PROCESS FOR THE SEQUENTIAL DEGRADATION OF PEPTIDE CHAINS

Harry A. Penhasi, and Henry Meier, both of Cupertino, Calif., assignors to Beckman Industries, Inc.

Filed Jan. 25, 1971, Ser. No. 109,157

Int. Cl. G01n *31/00, 31/06*

U.S. Cl. 23—230 R **5 Claims**

An improvement in the process of sequentially degrading peptide chains in a reaction vessel by successive coupling and cleavage reaction steps, wherein the vessel is subjected to a vacuum purging operation between the reaction steps to remove undesired materials. The improvement involves flushing the vessel with a stream of nitrogen gas while it is under vacuum whereby the undesired materials are more rapidly and more completely removed from the vessel and the cumulative yield of the process is increased.

3,717,437
CRYSTALLIZATION OF BERYLLIUM SULFATE

James K. Grunig, Rodney J. Anderson, and Bess L. Vance, Tucson, Ariz., assignors to The Anaconda Company

Filed Dec. 14, 1970, Ser. No. 97,841

Int. Cl. C22b *59/00*

U.S. Cl. 23—24 B **16 Claims**

A process for the recovery of substantially pure beryllium oxide from an impure aqueous sulfuric acid solution containing dissolved beryllium sulfate by crystallizing beryllium sulfate from the solution after concentrating it to about 50% to 55% by weight of sulfuric acid and then calcining the crystallized beryllium sulfate.

3,717,438
HYDROCARBON CRACKING APPARATUS

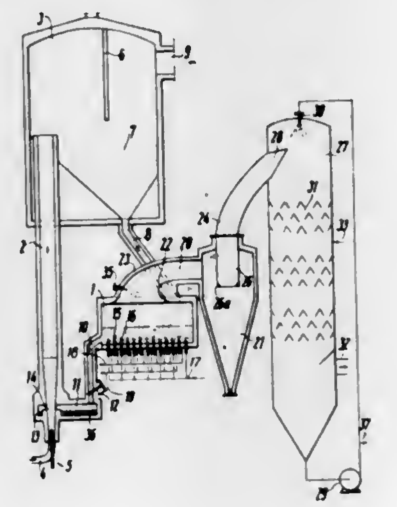
Paul Schmalfeld, Bad Homburg, Erich Mosberger, Frankfurt am Main, and Georg Gauch, Gotzenhain, Germany, assignors to Metallgesellschaft AG, Frankfurt, Germany

Filed Oct. 6, 1970, Ser. No. 78,424

Claims priority, application Germany, Oct. 17, 1969, P 19 52 347.8

Int. Cl. C10g *9/32*

U.S. Cl. 23—262 **23 Claims**



Apparatus for cracking high-boiling hydrocarbons to form olefins, with circulating, highly heated, fine-grained heat carriers in a fluidized bed. In the apparatus, the heat carriers are elevated and heated in a vertical pneumatic line, separated from the conveying and heating gases and sorted in a greatly enlarged separator chamber, and supplied through a conduit to the reactor. The reactor has a plurality of individual nozzles provided with individual inlet conduits and extending through the bottom of the reactor to supply the hydrocarbons to be cracked. A lateral outlet is connected to the lower portion of the fluidized bed and serves to return the heat carriers to the conveying and heating line. The connections between the reactor and a cyclone for separating entrained fine-grained heat carriers, and between the cyclone and a quencher, ensure that the flow paths of the cracked gas will be kept free of deposits. The connections comprise a transfer duct between the reactor and the separating cyclone, and a discharge duct between the separating cyclone and the quencher.

3,717,439
VAPOUR PHASE REACTION APPARATUS

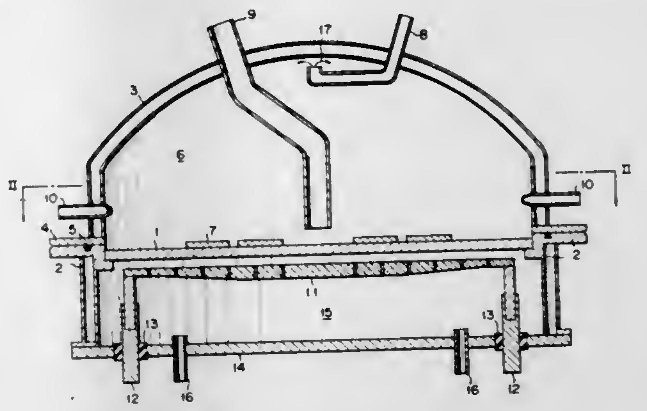
Ryoichi Sakai, Yokohama, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan

Filed Nov. 18, 1970, Ser. No. 90,642

Int. Cl. C23c *13/08;* **B01j** *6/00*

U.S. Cl. 23—277 R **4 Claims**

A reaction chamber having a bottom which is a wafer mount and dome member; a plurality of gas inlet pipes positioned at the lower part of the reaction chamber for introducing gas into the reaction chamber so as to cause streams of gas therein to whirl along the inner wall of said chamber; an exhaust for expelling waste gas from the lower part of the vortex center of whirling gas in the reaction chamber; and heating means provided outside of the reaction chamber for its heating. The reaction chamber preferably contains a reaction gas inlet pipe having its opening positioned upwardly facing the upper central part of the inner wall of said done member.



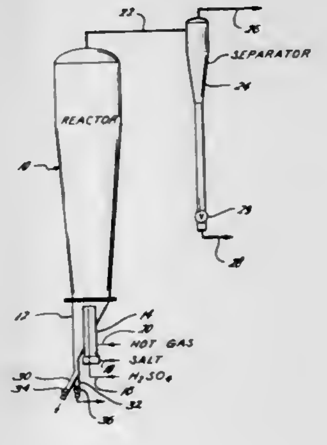
3,717,440
SOLID-LIQUID CONTACTING APPARATUS

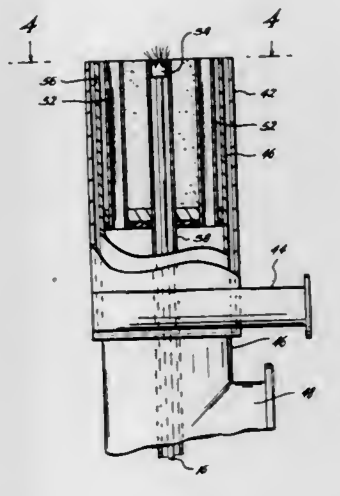
Curtis W. Cannon, Boulder, Colo., assignor to Climax Chemical Company, Monument, N. Mex.

Division of Ser. No. 619,434, Feb. 28, 1967, Pat. No. 3,563,701. This application Aug. 20, 1970, Ser. No. 65,544

Int. Cl. C01d *5/02;* **C01g** *1/10*

U.S. Cl. 23—284 **8 Claims**





An apparatus for providing contact between a liquid and solid particles having an upright vessel with an upper outlet and a pair of lower outlets, a plurality of concentric upwardly directed inlets into said vessel with one of the outer inlets including a means for swirling its discharge around the inner inlet, means for axially adjusting the discharge position of the central inlet and means for directing oversized particles to one of said lower outlets and smaller particles to the other of said lower outlets. Such apparatus is particularly useful in providing intimate contact between solid salts and an acid, such as salt such as sodium chloride, to produce a volatile acid and sulfate granules.

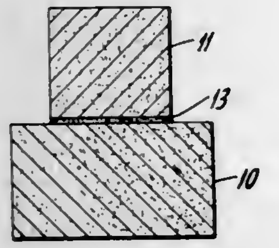
3,717,441
LOW EXPANSION ALUMINOSILICATE GLASS COMPOSITIONS COMPRISING A PENTAVALENT METAL OXIDE

Charles F. Rapp, Toledo, Ohio, assignor to Owens-Illinois, Inc.
No Drawing. Filed Mar. 30, 1971, Ser. No. 129,571
Int. Cl. B01j *3/00;* **C03c** *3/04*
U.S. Cl. 23—292 **20 Claims**

Low thermal expansion glass compositions based on a ternary glass system comprising SiO_2-Al_2O_3-R_2O_5, where R is a pentavalent metal, such as vanadium, niobium and tantalum, having an atomic radius of about 1.34 to 1.46 A. and an ionic radius of about 0.59 to 0.73 A., or mixtures thereof. Equimolar substitution of SiO_2 in the above ternary system with a stabilizer compound, such as B_2O_3 or $AlPO_4$, has been found to enhance the resistance of the glasses of this invention to phase separation. The low termal expansion glasses of this invention can be readily formed at temperatures below 1700° C. using conventional techniques, and are useful in the preparation of thermal shock-resistant glassware and low expansion reflective mirror blanks.

3,717,442
BRAZING ALLOY COMPOSITION

Walter V. Knopp, Wyckoff, N.J., assignor to A. Johnson & Co. Inc., New York, N.Y.
Filed May 17, 1971, Ser. No. 143,759
Int. Cl. B22f *3/00;* **C22c** *33/00*
U.S. Cl. 29—182.2 **18 Claims**



A powder brazing composition is provided comprising a blend of at least two alloy powders (A) and (B) as essential ingredients, the ratio of powder alloy (A) to powder alloy (B) ranging in parts by weight from about 50(A)/50(B) to 75(A)/25(B); the composition of alloy (A) consisting essentially by weight of about 35 to 70 percent copper, about 3 to 20 percent nickel and the balance essentially manganese in the range of about 15 to 50 percent; the composition of alloy (B) consisting essentially of about 2.5 to 5.5 percent silicon, about 0.75 to 5.25 percent boron and the balance essentially nickel; the mixture being such that the average composition thereof with respect to the silicon and boron contents being about 0.05 to 3 percent silicon and about 0.15 to 1.5 percent boron by weight. A brazed joint will generally have substantially the average composition of the brazing alloy mixture.

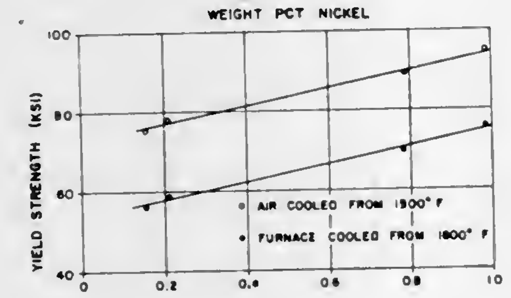
3,717,443
ZIRCONIUM DIFFUSION BARRIER IN TITANIUM-SILICON CARBIDE COMPOSITE MATERIALS

Nolan D. McMurray, Franklin, and Morris J. Tumey, Indianapolis, both of Ind., assignors to General Motors Corporation, Detroit, Mich.
Filed June 24, 1971, Ser. No. 156,365
Int. Cl. B32b *15/04*
U.S. Cl. 29—191.4 **5 Claims**

A composite article, comprising silicon carbide-containing reinforcing filaments in a titanium or titanium alloy matrix, is found to have increased strength when the filaments are initially provided with a thin coating of zirconium. The zirconium acts as a barrier to interdiffusion of titanium and silicon carbide and prevents weakening of the composite structure which would otherwise result from such interdiffusion.

3,717,444
CHROMIZED STEEL PRODUCT

William E. Heitmann, Dolton, Ill., assignor to Inland Steel Company, Chicago, Ill.
Continuation of Ser. No. 653,161, July 13, 1967, abandoned. This application Dec. 14, 1970, Ser. No. 98,125
Int. Cl. B32b *15/00*
U.S. Cl. 29—196.6 **10 Claims**



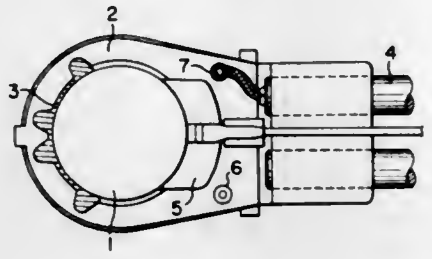
Chromized steel product having carbon content as low as possible, carbon stabilizer in atomic excess of carbon and 2.0–6.0 wt. % nickel or 0.6–6.0 wt. % manganese to improve strength, decrease grain size and give transformation-induced dislocation substructure upon cooling. Nickel improves toughness. Up to 1.0 wt. % titanium, as carbon stabilizer, improves strength.

Chromizing process includes heating steel base in sealed retort with ferrochrome alloy and halide at 1,800°–1,850°° F. for 6–8 hours and providing composition and cooling rate giving a transformation-induced dislocation substructure, while avoiding oxidation of chromium surface.

3,717,445
ELECTRODE HOLDER FOR ELECTRIC ARC FURNACE AND MAKE THE SAME

Tsuneo Yoshimura; Kunio Suzuki, Tokyo, and Gohei Shikano, Chigasaki, all of Japan, assignors to Mitsubishi Seiko Kabushiki Kaisha and Toyo Carbon Kabushiki Kaisha, Tokyo
Filed Nov. 5, 1970, Ser. No. 87,086
Claims priority, application Japan, Nov. 12, 1969, 44/90676; Oct. 13, 1970, 45/89329; Oct. 13, 1970, 45/89330
Int. Cl. H05b *7/12*
U.S. Cl. 29—182.3 **6 Claims**

An electrode holder having a powder metallurgical liner suitable for an application of an electric arc furnace using a high electric power as well as an ultra high electric power. The liner is fabricated from a porous powder metallurgical plate itself or the plates sintered on one side or both sides of a metal plate comprising at least one of metal powder selected from the group consisting of copper, iron and aluminum powders with or without graphite powder, an additional metal powder and if necessary, together with carbon fiber or graphite fiber.



3,717,446
GASOLINE ANTI-ICING ADDITIVES (A)

Ward W. Howland, Anaheim, and William R. Mallett, Placentia, both of Calif., assignors to Union Oil Company of California, Los Angeles, Calif.
Filed Dec. 31, 1970, Ser. No. 103,162
Int. Cl. C10l *1/18, 1/22*
U.S. Cl. 44—58 **10 Claims**

A combination of two known types of surfactant gasoline additives with a non-surfactant lubricating oil additive is found to provide, in addition to good overall carburetor detergency, a synergistic anti-icing effect, as compared to any one or two of the additives alone. One of the surfactant additives is a succinimide condensation product of an alkylene polyamine with an alkenyl succinic anhydride, while the other is a long-chain primary alkyl- or alkenyl amine.

3,717,447
FUEL COMPOSITIONS CONTAINING NITROGEN-HETEROCYCLIC SUBSTITUTED CARBAMATES

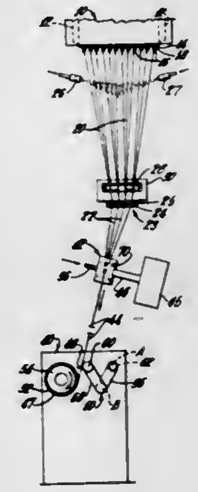
Elmer J. Badin, Hightstown, N.J., assignor to Cities Service Oil Company, Tulsa, Okla.
Filed Feb. 11, 1971, Ser. No. 114,729
Int. Cl. C10l *1/18, 1/22*
U.S. Cl. 44—63 **8 Claims**

Compounds useful as additives in hydrocarbon fuels are prepared by reacting urea with a nitrogen-heterocyclic substituted alcohol, for example an organylimidazolinyl substituted alcohol, in the presence of an organic solvent. The reaction products are carbamates containing, for example, organylimidazolinyl substituents. Hydrocarbon fuel compositions containing these additives exhibit enhanced carburetor detergency and have other beneficial multifunctional properties of value to combustion improvement.

3,717,448
APPARATUS FOR AND METHOD OF PROCESSING WET STRAND-LIKE MATERIAL

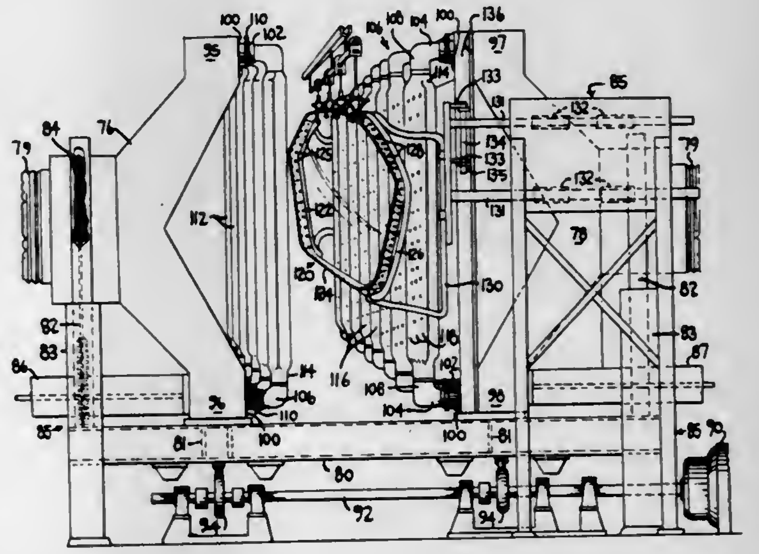
Roy E. Smith, Columbus, Ohio, assignor to Owens-Corning Fiberglas Corporation
Continuation-in-part of Ser. No. 40,024, May 25, 1970, abandoned. This application March 27, 1972, Ser. No. 238,252
Int. Cl. C03c *25/02*
U.S. Cl. 65—3 **12 Claims**

Apparatus for and method of processing wet strand having a tendency to effect a coherence of the strands upon contact with each other including subjecting the advancing separated side-by-side wet strands to conditions promoting a drying of the strands to a non-coherent state on their way to a collection zone and accumulating the strands at the collection zone.



3,717,449
TREATING GLASS SHEETS DURING SHAPING AND COOLING

Samuel L. Seymour, Oakmont, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.
Filed Oct. 1, 1970, Ser. No. 77,284
Int. Cl. C03b *23/02*
U.S. Cl. 65—104 **11 Claims**



Press bending heated glass sheets between a solid type-press bending mold and a frame-type press bending mold introduces a temperature gradient through the thickness of the glass. This gradient induces thermal warpage when the glass cools below its strain point. The present invention compensates for this warpage by cooling the surface engaged by the frame-type mold more rapidly than the surface engaged by the solid-type pressing mold and supporting the glass sheet with a shaping surface that engages at least a portion of the surface cooled more slowly during the cooling operation.

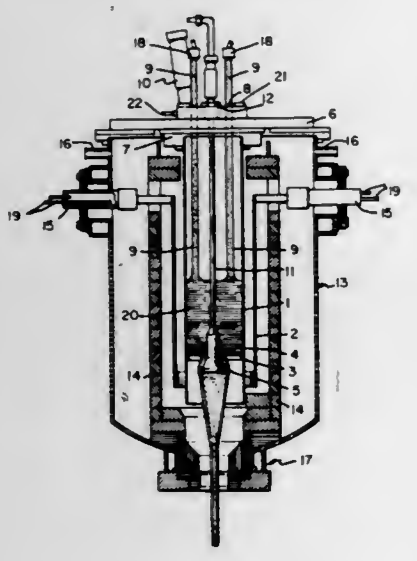
3,717,450
FURNACE FOR MANUFACTURE OF STRIATION-FREE QUARTZ TUBING

Frederick A. Loughridge, Manchester, and William A. Finch, Marblehead, Mass., assignors to Sylvania Electric Products Inc.

Filed Dec. 1, 1970, Ser. No. 94,109

Int. Cl. C03b *5/32, 3/00*

U.S. Cl. 65—145 **9 Claims**



A furnace includes a refractory metal container for melted quartz surrounded by an electric heater. The bottom of the container has an orifice which includes a mandrel for the purpose of forming quartz tubing. In the cover of the furnace are a plurality of feed holes through which sand-filled quartz tubes can be introduced into the furnace.

The furnace also has gas passages surrounding the holes, the purpose of which is to introduce and maintain a non-oxidizing gas atmosphere in the container and to form a gas lock around the quartz tubes to prevent air from entering the furnace. Included also are movable vacuum supports for supporting the quartz tubes and advancing them into the furnace.

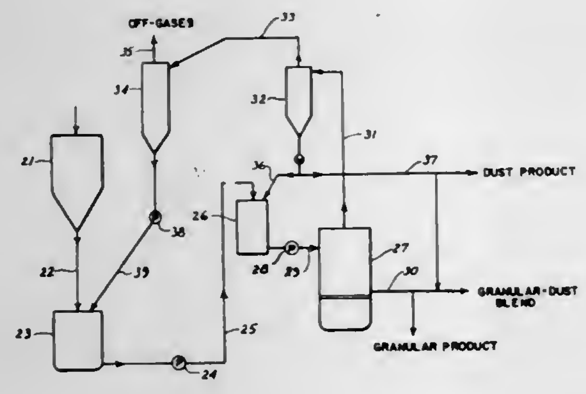
3,717,451
FLUIDIZED BED TREATMENT OF PHOSPHORUS-CONTAINING PRECIPITATOR DUST

Richard Ray Severns; James Kirk Sullivan, and Lynn Coulson Simmons, all of Pocatello, Idaho, assignors to IMC Corporation, New York, N.Y.

Filed Oct. 6, 1970, Ser. No. 78,449

Int. Cl. C05b *17/02*

U.S. Cl. 71—33 **6 Claims**



A process for drying, granulating and oxidizing phosphorus-containing precipitator dust which comprises charging an aqueous slurry of said dust onto a fluidized bed of granular precipitator dust particles thereby coating said particles with the slurry; utilizing the heat from the fluidizing gases to evaporate the slurry liquid and, simultaneously, to oxidize the phosphorus present in the slurry; and recovering the dry, particulate granules.

3,717,452
APPLYING AGRICULTURAL CHEMICALS WITH XANTHOMONES HYDROPHILLIC COLLOIDS

Kenneth F. Gibsen, and Arthur W. Saddington, both of San Diego, Calif., assignors to Kelco Company, San Diego, Calif.

Continuation of Ser. No. 759,203, Sept. 11, 1968, abandoned, which is a continuation-in-part of Ser. No. 392,300, Aug. 26, 1964, abandoned. This application Jan. 16, 1970, Ser. No. 4,469

Int. Cl. A01n *17/10*

U.S. Cl. 71—117 **7 Claims**

Method of applying agricultural chemicals by forming an admixture of an agricultural chemical, an aqueous carrier therefor, and a Xanthomonas colloid in an amount in the range of 0.02 percent to 2.0 percent by weight of the aqueous component, and applying the agricultural chemical. As a new composition, an agricultural chemical, an aqueous carrier therefor, and from 0.2 percent to 2.0 percent by weight of the aqueous component of a Xanthomonas hydrophilic colloid.

3,717,453
POWDERS OF METAL SILVER AND GOLD AND PROCESSES FOR MAKING SAME

Valdis R. Dalga, Toledo, Ohio, assignor to Owens-Illinois, Inc.

No Drawing. Filed May 6, 1971, Ser. No. 141,006

Int. Cl. B22f *9/00;* **C22b** *11/04*

U.S. Cl. 75—.5 A **18 Claims**

Homogeneously mixed, finely divided powders of metal, silver, and gold are formulated by initially forming a soluble salt solution of the metal and silver. In one alternative technique a finely powdered gold and an antiagglomerating agent are then added to the solution. The admixture is thoroughly stirred to slurry the gold powder and a reducing agent is added to precipitate the metal and silver from solution so as to form an intimate mixture with the finely powdered gold. In another alternative technique, the solution of silver and metal salt is initially contacted by a reducing agent after addition of the anti-agglomerating agent thereto. The reduction reaction, coupled with agitation, causes a slurry of silver and metal to form. To this slurry is then added a soluble gold chloride solution which is reduced to form an intimate admixture of gold particles with the already precipitated silver and metal. By drying the above-described mixtures, intimately homogeneous, finely divided powders of metal, silver and gold are formed.

3,717,454
URANIUM-BASE ALLOYS

Brian Sidney Wyatt, deceased, late of Ottawa, Ontario, Canada, and by Margaret I. Wyatt, administratrix, Kanata, Ontario, Canada, assignors to Atomic Energy of Canada Limited, Ottawa, Ontario, Canada

Filed June 8, 1970, Ser. No. 44,611

Claims priority, application Canada, June 16, 1969, 054,506

Int. Cl. C22c *31/99*

U.S. Cl. 75—122.7 **4 Claims**

Nuclear fuel uranium-base alloys are provided containing 3.5 to 3.7 wt. percent silicon and 0.1 to 1.5 wt. percent aluminum. On heat treatment, the structure consists mainly of a matrix of delta phase U_3Si with a minor amount of UAl_2. Improved processing properties are obtained over the binary delta U_3Si alloy, and better corrosion resistance compared to a similar ternary alloy with less Si and a free uranium phase.

3,717,455
STAINLESS FERRITE-AUSTENITIC STEEL

Nils Erik Allan Hede, Lars Ivar Hellner, and Hans Elof Johansson, Karlskoga, Sweden, assignors to Aktiebolaget Bofors, Bofors, Sweden

No Drawing. Filed Feb. 16, 1970, Ser. No. 11,777

Claims priority, application Sweden, Feb. 18, 1969, 2,228/69

Int. Cl. C22c *39/20*

U.S. Cl. 75—128 N **1 Claim**

A process of producing a stainless ferritic-austenitic steel having high resistance to intercrystalline corrosion is disclosed. The process comprises adding to the steel titanium in such an amount that the quotient Ti_{rest}/C is at least 4. Ti_{rest} is the total titanium present minus the quantities consumed to form titanium nitride, titanium oxide or other titanium compounds. C is the total carbon content of the steel.

3,717,456
ALLOY AND METHOD FOR TREATMENT TO PRODUCE SPHEROIDAL-GRAPHITE CAST IRONS

Jean-Claude Percheron and Louis Septier, Chedde, France, assignors to Compagnie Pechiney, Paris, France

No Drawing. Filed Mar. 4, 1971, Ser. No. 121,178

Claims priority, application France, Apr. 16, 1970, 7013757

Int. Cl. C22c *37/04*

U.S. Cl. 75—130 B **14 Claims**

The treatment of cast irons for the production of spheroidal-graphite cast irons by the addition of an alloy containing silicon, magnesium, barium and nitrogen with the remainder being iron plus impurities.

3,717,457
COMPOSITE MEANS FOR TREATING CAST IRON

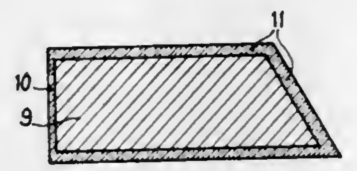
Henri Jarysta, Pont-a-Mousson, France, assignor to Pont-a-Mousson S.A., Pont-a-Mousson, France

Division of Ser. No. 724,960, April 29, 1968, Pat. No. 3,598,575. This application April 15, 1971, Ser. No. 134,195

Claims priority, application France, May 9, 1967, 67105658; March 4, 1968, 68142187

Int. Cl. C22c *33/00*

U.S. Cl. 75—130 A **6 Claims**



Compact composite means for treating molten iron.

The composite means is in the form of a solid piece of an inoculating product having a coating of a non-metallic refractory material totally covering the inoculating product. The piece has a plurality of faces and the coating covering one of these faces is thinner than the coating on the other faces so that when the composite means is placed in the molten iron, the piece melts progressively along a front roughly parallel to said one face.

Alternatively, the composite means is in the form of a plurality of solid compact pieces of inoculation product. The pieces are wholly coated with non-metallic refractory coatings of different thicknesses so that the piece melt successively in the molten-iron in the order to increasing thicknesses of the coatings.

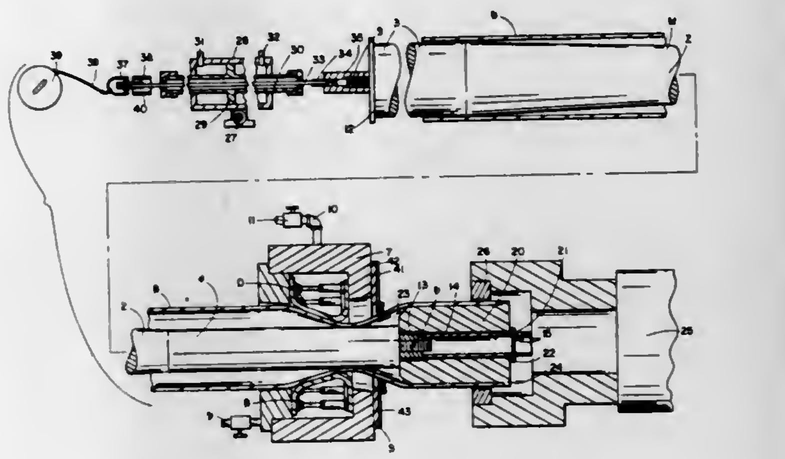
3,717,458
METHOD OF AND APPARATUS FOR FORMING A TUBULAR METAL BLANK INTO A TAPERED TUBE ON A TAPERED MANDREL AND STRIPPING THE TUBE FROM THE MANDREL

Frank J. Lesko, Phoenix, Ariz., assignor to Reynolds Metals Company, Richmond, Va.

Filed Jan. 14, 1971, Ser. No. 106,366

Int. Cl. B21c *3/06*

U.S. Cl. 72—276 **2 Claims**



A method of forming a tubular metal blank into a tapered tube on a tapered mandrel and stripping the tube from the mandrel comprising collapsing a tubular metal blank onto a tapered mandrel to closely embrace and assume the tapered shape of the mandrel and thereafter applying longitudinal force to the mandrel in the direction from the smaller toward the larger end of the mandrel and applying longitudinal force to the tapered tube in the opposite direction whereby to strip the tube from the mandrel. The longitudinal force is preferably applied to the end surface of the tapered tube, and desirably to substantially the entire end surface thereof, at the larger end. The tubular metal blank may be disposed about the tapered mandrel and the mandrel and blank may be moved through a die whereafter the tapered mandrel may be moved longitudinally in the direction from the smaller toward the larger end thereof while blocking movement of the tapered tube in that direction and thereby stripping the tube from the mandrel. Also apparatus for forming a tubular metal blank into a tapered tube on a tapered mandrel and stripping the tube from the mandrel comprising a tapered mandrel about which the tubular metal blank is adapted to be disposed, means for collapsing the tubular metal blank onto the tapered mandrel to closely embrace and assume the tapered shape of the mandrel, which means may comprise a die through which the tapered mandrel with the tubular metal blank thereabout passes, means for applying longitudinal force to the mandrel in the direction from the smaller toward the larger end of the mandrel and means for applying longitudinal force to the tapered tube in the opposite direction whereby to strip the tube from the mandrel. A stripper may be employed which is constructed and arranged to engage the end surface of the tapered tube at the larger end whereby to strip the tapered tube from the mandrel when the mandrel is moved in the direction from the smaller toward the larger end thereof. The stripper may be resiliently pressed against the outside of the tubular metal blank during collapsing of the tubular metal blank onto the tapered mandrel so that the stripper moves in behind the larger end of the tapered tube at the conclusion of the forming operation when the tapered mandrel with the tubular metal blank thereabout passes through the die with the smaller end of the tapered mandrel leading. The die may be mounted in a housing with the stripper mounted on the outside of the housing. The stripper is preferably in two opposed sections mounted on opposite sides of the mandrel and blank and preferably resiliently pressed to be movable toward each other into position to engage the end surface of the tapered tube at the larger end at the conclusion of the forming operation. The stripper sections are preferably shaped so that the stripper engages substantially the entire end surface of the tapered tube. The stripper sections may be mounted in guide means on the outside of the housing with spring means resiliently urging the stripper sections toward each other.

3,717,459

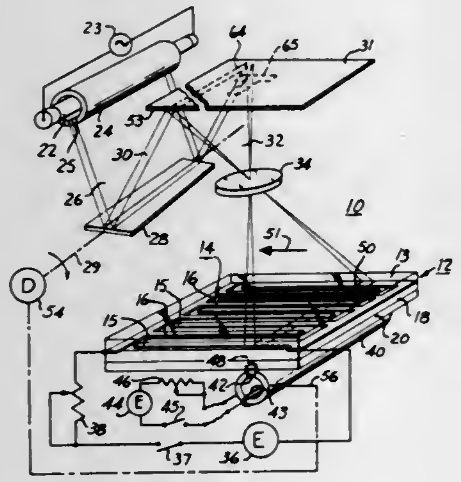
METHOD OF IMAGING INVOLVING PRE-HEATING USING INTERDIGITATED ELECTRODES, A PHOTOCONDUCTIVE LAYER AND A MAGNETIC IMAGING LAYER

Richard J. McClure, Altadena, Calif., assignor to Bell & Howell Company, Chicago, Ill.

Filed April 17, 1970, Ser. No. 29,583

Int. Cl. G03g *13/14, 13/22*

U.S. Cl. 96—1 R **11 Claims**



A composite recording medium comprises a photoconductive layer, a plurality of interdigitated first and second electrodes in electrical contact with and contiguous to the photoconductive layer, and an electrically conductive magnetic recording layer in electrical contact with and contiguous to the photoconductive layer. Methods and apparatus for magnetically recording an image with the assistance of this composite recording medium are also disclosed.

3,717,460

METHOD OF IMAGING USING INTERDIGITATED ELECTRODES, A PHOTOCONDUCTIVE LAYER AND A MAGNETIC IMAGING LAYER

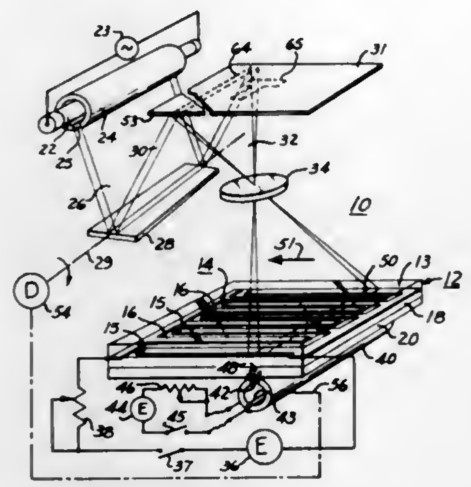
Sherman W. Duck, Alhambra; Frederick J. Jeffers, Altadena, and James U. Lemke, Del Mar, all of Calif., assignors to Bell & Howell Company, Chicago, Ill.

Filed April 17, 1970, Ser. No. 29,584

Int. Cl. G03g *13/14, 13/22*

U.S. Cl. 96—1 R **15 Claims**

A composite recording medium comprises a photoconductive layer, a plurality of interdigitated first and second electrodes in electrical contact with and contiguous to the photoconductive layer, and a magnetic recording layer in heat-transfer relationship with and contiguous to the photoconductive layer. Methods and apparatus for magnetically recording an image with the assistance of this composite recording medium are also disclosed.



3,717,461

REMOVAL OF PROTECTIVE RESIN LAYER BY LIQUID DEVELOPER IN ELECTROPHOTOGRAPHIC IMAGING

Satoru Honjo, Asaki-shi, Saitama, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Feb. 12, 1971, Ser. No. 115,141

Claims priority, application Japan, Feb. 12, 1970, 45/12192

Int. Cl. G03g *13/22*

U.S. Cl. 96—1 LY **6 Claims**

Such susceptibility is reduced REMOVAL OF PROTECTIVE RESIN LAYER BY LIQUID DEVELOPER IN ELECTROPHOTOGRAPHIC IMAGING forming overlying the photoconductive coating a protective top coating which can be removed by dissolving away into an insulating liquid prior to or during liquid development. An electrophotographic process wherein an electrostatic latent image is formed on an electrophotographic member, the member comprising a flexible support bearing thereon a photoconductive insulative layer insoluble or only sparingly soluble in a non-polar, electrically insulating liquid. Disposed on the photoconductive insulative layer is an insulative protective layer consisting mainly of a non-polar resin. The protective layer may be dissolved with the non-polar electrically insulating liquid either prior to or during the development of the latent image with the non-polar electrically insulating liquid. If the protective layer is dissolved during the development step, the carrier liquid of the liquid developer is the non-polar, electrically insulating liquid.

An electrophotographic coating is generally susceptible to mechanical damage in the course of manufacture storage and processing.

Such susceptibility is reduced by forming overlying the photoconductive coating a protective top coating which can be removed by dissolving away into an insulating liquid prior to or during liquid development.

3,717,462

HEAT TREATMENT OF AN ELECTROPHOTOGRAPHIC PHOTOSENSITIVE MEMBER

Hirokazu Negishi, Kanagawa-ku, Yokohama-shi, Kanagawa-ken; Ichiro Endo, Nakano-ku, Tokyo; Kikuo Kinjo, Meguro-ku, Tokyo, and Teruo Yamanouchi, Fujisawa-shi, Kanagawa-ken, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

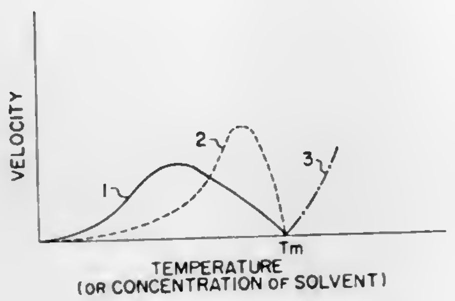
Filed July 22, 1970, Ser. No. 57,094

Claims priority, application Japan, July 28, 1969, 44/59491

Int. Cl. G03g *5/04*

U.S. Cl. 96—1.5 **17 Claims**

An electrophotographic photosensitive material comprising mainly an organic photoconductive material of low molecular weight and a high polymer resin which is subjected to heat treatment or atmosphere treatment, and if desired, stimulus treatment to improve the electrophotographic properties.



3,717,463

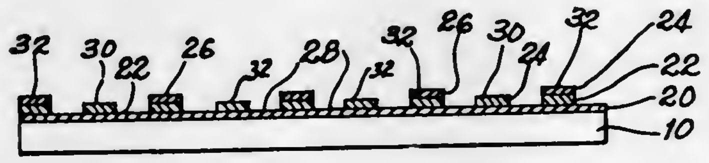
ELECTROPHOTOGRAPHIC MULTICOLOR COPY DEVELOPED RECEPTOR EMPLOYING SOLUBILIZABLE DYES

Frederick O. Bach, Villa Park, Leo N. Chapin, Des Plaines, Robert Freed, Lincolnwood, and Thomas J. Cernoch, Chicago, Ill., assignors to A. B. Dick Company, Niles, Ill.

Original application June 25, 1969, Ser. No. 836,415. Divided and this application June 25, 1971, Ser. No. 157,024

Int. Cl. G03g *5/00, 9/00*

U.S. Cl. 96—1.5 **11 Claims**



An electrophotographic process and materials for the production of multi-color copies of a multi-color original in which an electrostatic charge is applied to a receptor sheet having a face portion subdivided into photoconductive segments containing sensitizing components in interspersed segments which cover different portions of the visible light spectrum and in which each such segment contains a solubilizable dye color corresponding to the color of the spectrum other than that to which the segment is sensitized and in which the exposed receptor is developed with a toner in which the dye component is soluble in response to toner activation for transfer of dye color from the developed receptor to copy sheets brought into surface contact therewith.

3,717,464

PHOTOSENSITIZATION OF PRINTING MASTERS

William H. Tandy, Mentor, Ohio, assignor to Addressograph Multigraph Corporation, Cleveland, Ohio

Filed April 7, 1971, Ser. No. 132,222

Int. Cl. G03f *7/02*; **G03c** *1/00, 1/52*

U.S. Cl. 96—33 **3 Claims**

Printing masters are formed by a photosensitization and selective conversion process. A surface material, preferably a ZnO resin binder system is provided which is normally hydrophobic/oleophilic in nature but which can be converted to hydrophilic/oleophobic in nature by chemical reaction. The surface material also is selected such that the rate of its conversion can be altered by exposure to radiation energy. Selected areas only are exposed to the radiation (heat may also be applied), to form a more reactive surface area where exposure has taken place. The entire surface is then contacted with a conversion reagent for a sufficient time to convert the exposed areas to a far greater extent than the non-exposed areas. The selectively convertible master then is used to perform the printing function.

3,717,465

LIGHT-SENSITIVE SILVER HALIDE COLOR PHOTOGRAPHIC MATERIAL HAVING IMPROVED GRAININESS UPON COLOR DEVELOPMENT

Kenro Sakamoto, Isamu Fushiki, and Fumio Shimizu, Tokyo, and Sadao Sugita, Hanno, Japan, assignors to Konishiroku Photo Industry Co., Ltd.

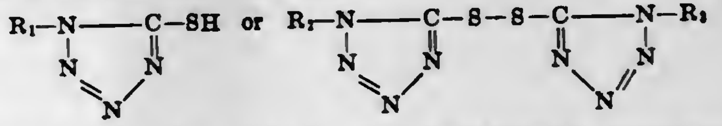
No Drawing. Filed Apr. 12, 1971, Ser. No. 133,405

Claims priority, application Japan, Apr. 17, 1970, 45/32,371

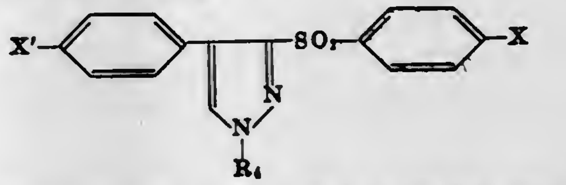
Int. Cl. G03c *1/40*

U.S. Cl. 96—100 **4 Claims**

A color photographic material contains a silver halide light-sensitive, coupler-containing emulsion layer, a mercaptotetrazole type compound of the formula



wherein R_1, R_2 and R_3 are individually hydrogen, lower alkyl, alkenyl, aryl or aralkyl, and a pyrazole type compound of the formula



wherein R_4 is hydrogen, lower alkyl or aralkyl and X and X′ are individually hydrogen, alkyl, alkoxy or halogen. Upon development a color image having excellent graininess is obtained.

3,717,466

FOGGED DIRECT POSITIVE SILVER HALIDE ELEMENT CONTAINING A SELENIUM COMPOUND SENSITIZER

Raymond Leopold Florens, Edegem, and Robert Joseph Pollet, Vremde, both of Belgium, assignors to Gevaert-Agfa N.V., Mortsel, Belgium

Filed Feb. 18, 1971, Ser. No. 116,661

Claims priority, application Great Britain, April 1, 1970, 15,472/70

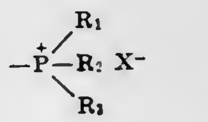
Int. Cl. G03c *1/28*

U.S. Cl. 96—107 **17 Claims**

Direct-positive photographic elements are described which comprise uniformly fogged radiation-sensitive silver halide and a selenium compound of the formula:

$$R-Se-Q$$

wherein R is alkyl, aralkyl, alkaryl, aryl or a heterocyclic ring system and Q represents —Se—R′ or —S—R′ wherein R′ has one of the significances given for R, halogen, cyano, or



$$-\overset{+}{P}(R_1)(R_2)(R_3)\;X^-$$

wherein each of R_1, R_2 and R_3 is alkyl, aralkyl or aryl and X^- is an anion but does not exist when R itself contains an anionic group. The selenium compounds increase the speed of the direct-positive silver halide elements.

3,717,467

HARDENING GELATINO SILVER HALIDE EMULSIONS WITH REACTION PRODUCTS OF HALOGENATED TRIAZINES AND HYDROPHILIC ORGANIC COLLOIDS

Yasushi Ohyama and Sadayuki Miyazawa, Kyoto, Japan, assignors to Mitsubishi Seishi Kabushiki Kaisha, Tokyo, Japan

No Drawing. Filed Nov. 3, 1970, Ser. No. 86,617

Claims priority, application Japan, Nov. 7, 1969, 44/88,724

Int. Cl. G03c *1/30*

U.S. Cl. 96—111 **3 Claims**

A method of hardening photographic layers using a new macromolecular type hardener, to provide a good water resistance and yet a sufficient water absorption and swelling thereto, which is prepared by dissolving a halogenated triazine compound in a least quantity of a good solvent for both said compound and a hydrophilic organic macromolecular colloid binder to make them react in an aqueous medium, then precipitating and separating the reaction product with a large quantity of a poor solvent for both.

3,717,468

LIGHT-SENSITIVE SUPERSENSITIZED SILVER HALIDE EMULSIONS

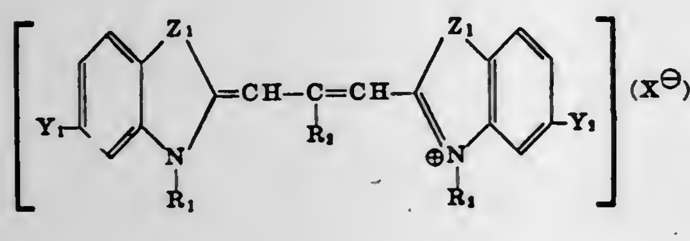
Kaiichiro Sakazume and Shui Sato, Tokyo, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

No Drawing. Continuation of abandoned application Ser. No. 778,301, Nov. 22, 1968. This application May 21, 1971, Ser. No. 145,918

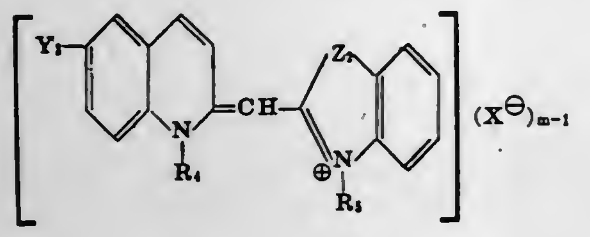
Int. Cl. G03c *1/14*

U.S. Cl. 96—124 **9 Claims**

A new supersensitizing combination particularly useful for a green-light-sensitive gelatinous silver halide photographic emulsion comprising at least one carbocyanine dye of the general Formula 1 and at least one monomethine cyanine dye of the general Formula 2, said combination being so selected that at least one substituent on a nitrogen atom in a heterocyclic ring of the said two dyes has a carboxyalkyl or sulfoalkyl moiety. The general Formulas 1 and 2 are:



(1)



(2)

wherein R_1, R_3, R_4 and R_5 are each lower alkyl, substituted alkyl, hydroxyalkyl, substituted hydroxyalkyl or carboxyalkyl group or its derivative, or a sulfoalkyl group or its derivative; R_2 is lower alkyl group; Z_1 and Z_2 are each S or Se; Y_1 and Y_2 are each hydrogen, halogen, or lower alkyl group; Y_3 is hydrogen, lower alkyl or lower alkoxy group; X is an anion; and *n* and *m* are each 1 or 2.

3,717,469

GRANULAR PROTEIN CONTAINING FOOD PRODUCT RESEMBLING THE NATURAL CAVIAR OF STURGEON, SALMON AND OTHER FISH, AND A METHOD OF PREPARING SAME

Grigory Lvovich Slonimsky; Vladimir Borisovich Tolstoguzov; Vera Alexandrovna Ershova, and Dmitry Borisovich Izjumov, all of Moscow, U.S.S.R., assignors to Ordena Lenina Institut Elementoorganischeskikt Soedineny, Moscow, U.S.S.R.

Filed Jan. 12, 1970, Ser. No. 2,355

Int. Cl. A23j *3/00*

U.S. Cl. 99—14 **13 Claims**

The present invention relates to granular food products resembling the natural caviar of sturgeon, salmon and other fish, and to a method of preparing same.

According to the present invention the product contains an aqueous colloidal solution of proteins, gelatin, ions of alkaline earth metals, polysaccharides capable of forming ionotropic gels when interreacting with the above-said ions, and vegetable tannins, preferably tannides, the products resulting from the interreaction of polysaccharides with ions of metals, and of vegetable tannins with proteins being contained in the membrane or pellicle of the granules.

3,717,470

HYDROLYSIS OF GLUTAMINE WITHIN FOODS AND BEVERAGES TO GLUTAMIC ACID

Tamotsu Yokotsuka, Nagareyama; Takashi Iwaasa, and Mitsuharu Fujii, both of Noda-shi, all of Japan, assignors to Kikkoman Shoyu Co., Ltd., Noda, Noda-shi, Japan

Filed April 15, 1971, Ser. No. 134,492

Claims priority, application Japan, Nov. 26, 1970, 45/103677

Int. Cl. A23l *1/26;* **C12d** *13/06*

U.S. Cl. 99—16 **6 Claims**

Glutaminase is added to various foods or beverages containing glutamine. The food or beverage is kept at 10° C to 70° C for at least 0.5 hours so as to hydrolyze the glutamine to glutamic acid and prevent the formation of pyroglutamic acid.

3,717,471

PREPARATION OF A LOW CARBOHYDRATE BEER

Michael R. Sfat and Bruce J. Morton, Manitowoc, Wis., assignors to Bio-Technical Resources, Inc., Manitowoc, Wis.

No Drawing. Continuation of abandoned application Ser. No. 873,089, Oct. 31, 1969. This application Feb. 1, 1972, Ser. No. 222,685

Int. Cl. C12c *11/04*

U.S. Cl. 99—31 **13 Claims**

A low carbohydrate alcoholic beer is produced by subjecting barley malt to aqueous extraction under conditions favorable to the extraction of protein while unfavorable to the extraction of carbohydrate, adding a highly fermentable sugar to the resulting extract to produce a brewers wort low in unfermentable carbohydrates, and fermenting the resulting wort.

3,717,472

SEPARATING AROMA- AND FLAVOR-BEARING SUBSTRATES INTO AROMA AND FLAVOR CONCENTRATES

Rudolf G. K. Strobel, Colerain Township, Hamilton County, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

No Drawing. Filed June 30, 1971, Ser. No. 158,590

Int. Cl. A23f *1/04*

U.S. Cl. 99—65 **26 Claims**

Aroma- and flavor-bearing substrates are separated into an aroma concentrate and a flavor concentrate by pulsing or applying in a continuous fashion wet steam to a zone containing the substrate. The substrate-containing

zone is held under vacuum pressure and the flavor concentrate is collected in a first trap, while an aroma concentrate is collected in a second trap. In a preferred embodiment, the substrate comprises either coffee or tea.

3,717,473

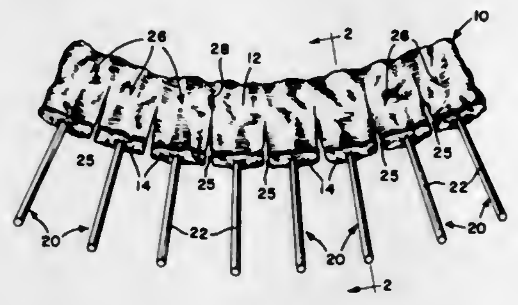
MEAT PRODUCT

Joseph L. Bissett, 1410 N. Main Street, Dayton, Ohio

Division of Ser. No. 825,150, May 16, 1969, Pat. No. 3,635,732. This application Nov. 22, 1971, Ser. No. 200,851The portion of the term of this patent subsequent to Jan. 18, 1989, has been disclaimed.

Int. Cl. A22c *18/00*

U.S. Cl. 99—107 **4 Claims**



A strip of lean meat is cut from a loin so that the width of the strip is substantially greater than its thickness, and a plurality of generally parallel skewers are inserted into the strip at longitudinally spaced intervals and provide handle portions projecting from one of the edge surfaces of the strip. Transverse slits are formed within the strip between the skewers and extend from one edge surface toward the other edge surface to provide connected strip sections on the skewers.

3,717,474

LOW CHOLESTEROL EGG PROCESS

Joseph A. Fioriti, Hastings-on-Hudson; Howard D. Stahl, Tarrytown; Rex J. Sims, Pleasantville, all of N.Y., and Clifford H. Spotholz, Montvale, N.J., assignors to General Foods Corporation, White Plains, N.Y.

Filed Dec. 29, 1969, Ser. No. 888,608

Int. Cl. A23l *1/32*

U.S. Cl. 99—113 **6 Claims**

Wet egg yolk is combined with edible oil by high energy, high shear mixing. During mixing cholesterol is extracted from the yolk by the oil. Simultaneously the ratio of polyunsaturated fat to saturated fat in the yolk is increased. The wet yolk is separated from the oil and can be made a constituent of various egg products.

3,717,475

STARCH PRODUCTS HAVING UNIQUE GELLING PROPERTIES AND PROCESS FOR PREPARING SAME

Felix J. Germino, Palos Park, and Joseph R. Caraccia, Chicago, Ill., assignors to CPC International Inc., Chicago, Ill.

No Drawing. Original application June 12, 1967, Ser. No. 645,527, now Patent No. 3,586,536. Divided and this application May 6, 1970, Ser. No. 35,241

The portion of the term of the patent subsequent to June 22, 1988, has been disclaimed

Int. Cl. A23g *3/00*

U.S. Cl. 99—134 **13 Claims**

The bound fat content of granular starch is reduced to not more than 0.15% by weight by heating a mixture of the starch, a suitable solvent, and not more than 15% water, in a confined zone, at from about 225° F. to about 300° F. for not more than 30 minutes, the conditions being selected so as to avoid incipient gelatinization of the starch. Starch treated in accordance with the process which is further characterized by a fluidity of from about 30 to about 80 is an exceptionally fine congealing agent in the manufacture of gum confections.

3,717,476

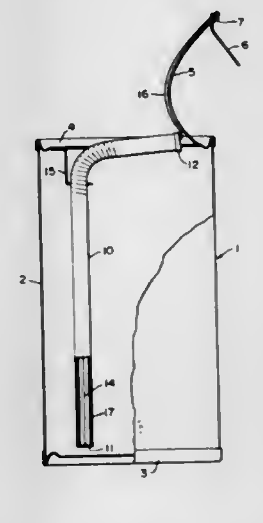
CAN-STRAW CONSTRUCTION

Robert J. Harvey, Sudbury, Mass., assignor to Mirlin Corporation, Wayland, Mass.

Filed Sept. 9, 1970, Ser. No. 70,757

Int. Cl. A23l *1/26;* **B65d** *17/04, 47/06*

U.S. Cl. 99—138 R **9 Claims**



A container construction comprising a container having a straw sealed at both ends and means for breaking the seals without removing the straw from the container. The construction is particularly useful in conjunction with a straw coated on the interior surface with a flavoring or taste-modifying material, such as miraculin, the taste-modifying protein obtained from the berry of Synsepalum dulcificum.

3,717,477

SWEETENING AGENT CONTAINING TRYPTOPHANE AND SACCHARIN

Tsunehiko Nonomiya, Totsaka-ku, Yokohama-shi, Kanagawa-ken; Takashi Ojima, Kawasaki-shi, Kanagawa-ken; Shizuko Yamaguchi, Taito-ku, Tokyo, and Mieko Ito, Kamakura-shi, Kanagawa-ken, all of Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

Filed Jan. 4, 1971, Ser. No. 103,828

Claims priority, application Japan, Jan. 16, 1970, 45/4286

Int. Cl. A23l *1/26*

U.S. Cl. 99—141 A **2 Claims**

The sweetening potency and taste of saccharin sodium are improved by the addition of even small amounts of D-tryptophan in the form of the optically active compound or as a component of DL-tryptophan.

3,717,478

DISPOSABLE COOK-IN PACKAGE FOR FROZEN FOOD PRODUCTS

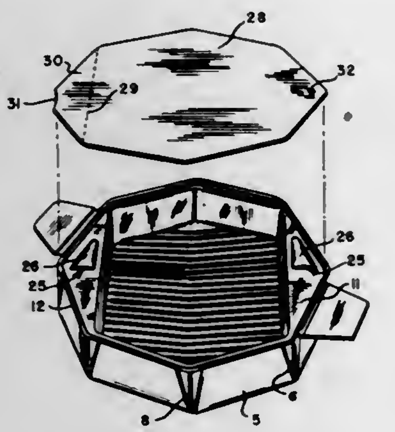
Donald E. Lipfert, Woolwich, Maine, assignor to General Foods Corporation, White Plains, N.Y.

Filed Sept. 22, 1967, Ser. No. 669,749

Int. Cl. B65b

U.S. Cl. 99—192 R **16 Claims**

A frozen food package acts as a cooking container as well as a serving dish for the contained product and has special application to food products a constituent portion of which is packaged in a dehydrated or concentrated form. The package comprises an inner food receptacle nesting within an outer ice-containing receptacle, the edges of both receptacles being joined in a common seam and covered by a single lid having a snap-fit engagement with said seam. The inner food-containing receptacle is vented at a location above the level of the food product to allow escape of steam generated by heating of the ice and resulting boiling of the water contained in the outer receptacle. The steam, by being directed into the inner food receptacle, hastens the heating of the food product to the desired temperature, and the resultant steam condensate serves to rehydrate or liquefy the hydratable constituent of the product to the desired viscosity. The amount of ice provided in the outer receptacle is predetermined so that upon complete evaporation thereof the food product will be hydrated or reconstituted to the desired temperature and viscosity conditions. Removal of the snap-fit snap-fit lid permits the package to be used as a serving dish.

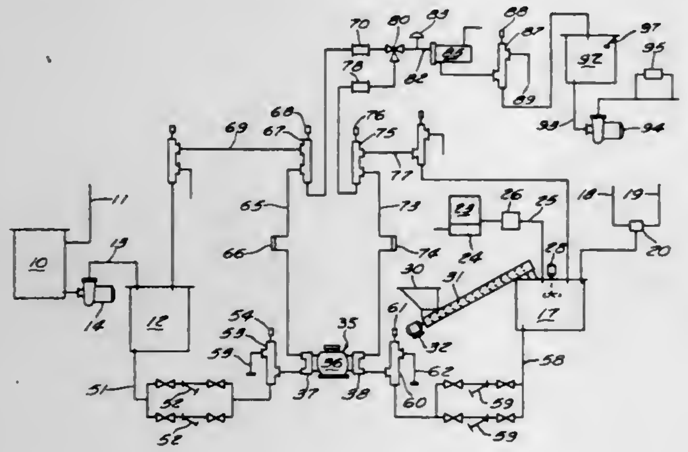


3,717,479
PICKLE MANUFACTURING
Francis Glenn Connick, Downers Grove, Ill., assignor to Swift & Company, Chicago, Ill.

Filed Dec. 1, 1970, Ser. No. 94,064

Int. Cl. A23b *1/02*

U.S. Cl. 99—222 **4 Claims**



Separate streams of saturated brine and a dose mix of liquid sugar or dextrose, water and additional ingredients useful in curing, are strained, metered and combined whereafter the combined stream is cooled and stored against need in curing operations.

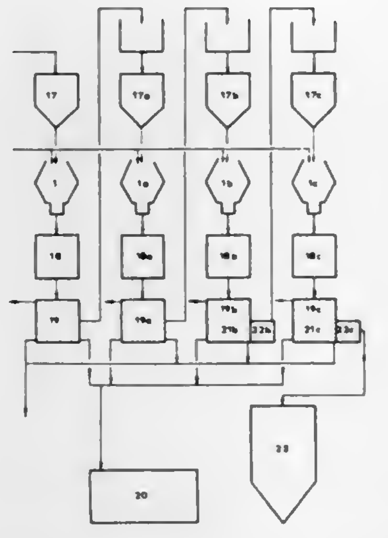
3,717,480
TREATMENT OF GRAIN
Geoffroy Guichard, Saint-Cloud, and Rene Le Bolloch, Argenteuil, France, assignors to Societe Milliat Freres, Saint-Cloud, France

Filed Dec. 24, 1970, Ser. No. 101,255

Int. Cl. B02b *3/00*

U.S. Cl. 99—233.3 **14 Claims**

A process for treating grain having a multi-layer husk, particularly hard wheat, prior to grinding, comprising abrading the humidified grain batchwise by repeated projection of the grain against an abrasive surface until the desired husk layer has been removed and then separating the removed layer from the grain. The process is preferably carried out in a plurality of stages, the charge of grain being humidified at each stage and the abraded portion separated after each stage. The amount of water added preferably decreases from the first stage to the last while the projection speed of the grains is increased from one stage to the next.



3,717,481
GOLD METALLIZING COMPOSITIONS
Oliver A. Short, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 820,636, April 30, 1969. This application May 13, 1971, Ser. No. 143,249

Int. Cl. C09d *5/24*

U.S. Cl. 106—1 **6 Claims**

A metallizing composition comprising a gold powder having spherical particles with a particle diameter within the range of 1–10 microns wherein the powder has a bulk density within the range of 5–9 gms./cc. and prepared by precipitating the gold from solution with selected reducing agents under controlled conditions.

3,717,482
STABILIZED ELECTROLESS PLATING SOLUTIONS
Michael Gulla, Newton, and Oleh Borys Dutkewych, Medfield, both of Mass., assignors to Shipley Company Inc., Newton, Mass.

Continuation-in-part of Ser. No. 65,301, Aug. 19, 1970, which is a division of Ser. No. 785,350, Dec. 19, 1968, abandoned. This application Nov. 16, 1971, Ser. No. 199,307

Int. Cl. C23c *3/02*

U.S. Cl. 106—1 **17 Claims**

An electroless nickel or cobalt plating solution is characterized by the addition of a small but effective amount of a source of mercury ions for increased bath stability. It is known in the art that solutions for electroless plating are unstable and tend to decompose with use. It is also known that decomposition can be retarded and the useful life of a plating solution increased by the addition of various additives, frequently catalytic poisons, in very small concentrations. In accordance with the present invention, it has been found that the stability of an electroless nickel or cobalt plating solution can be substantially increased by the addition of a source of mercury ions alone as a primary stabilizer, or preferably, by the addition of the mercury ions as a secondary stabilizer in combination with a prior art stabilizer as primary stabilizer. The combination of stabilizers provides a synergism with stability substantially improved over that obtainable with either component of the combination alone. One characteristic of the present invention is the co-deposition of mercury in minute amounts with the plating metal.

3,717,483
METALLIZING COMPOSITION
Lewis F. Miller, La Grangeville, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 542,726, Apr. 15, 1966. This application Apr. 22, 1969, Ser. No. 818,410

Int. Cl. C09d *5/24*

U.S. Cl. 106—1 **12 Claims**

A metallizing composition adapted to be deposited on an insulating substrate and fired to form a conductive element thereon comprises: a metal powder component of, by weight 40–70% gold, 5–25% silver and 15–35% of platinum and/or palladium; finely divided vitreous frit for bonding the particles together and to the substrate; and, vehicle in which the metal and frit particles are dispersed. The metal powder component comprises, by weight, 60–72% of the total formula, the vitreous frit 6–10% and the vehicle 22–30%.

3,717,484
REDUCING CORROSIVITY OF SOLVENT CASTING COMPOSITIONS
James R. Waring, Binghamton, N.Y., assignor to GAF Corporation, New York, N.Y.

Continuation of Ser. No. 790,431, Jan. 10, 1969, abandoned. This application June 8, 1971, Ser. No. 151,142

Int. Cl. C09d *5/08*

U.S. Cl. 106—14 16 Claims

This invention provides a non-corrosive solvent casting composition comprising at least one anti-corrosive selected from the group consisting of (a) non-volatile epoxides; (b) oxides of compounds from the group consisting of styrene, higher homologs of styrene, and simple nuclear substitution products of styrene; (c) 2,2-dimethoxy propane; and (d) 1,4-dioxane.

3,717,485
PATTERN WAX COMPOSITIONS
Allen E. Larson, St. Louis, Mo., assignor to Atlantic Richfield Company, New York, N.Y.

Filed March 25, 1971, Ser. No. 128,142

Int. Cl. C08h *9/06*

U.S. Cl. 106—38.8 **15 Claims**

Novel pattern wax compositions for use in investment casting by the Lost Wax Process are disclosed. The pattern wax composition materials contain base waxes such as petroleum waxes, natural vegetable or mineral waxes, synthetic waxes and various resinous materials derived from the refining of petroleum and wood rosin, and mixtures of the above and solid filler particles. The base wax generally has a melting point of between about 120° to 180° F. The solid filler particles are imides of aromatic polycarboxylic acids.

3,717,486
FOAMED PRODUCTS OF SILICA AND MANUFACTURING THE SAME FROM SILICA GEL
Kenichi Fukumoto; Tokunori Nakamura, and Kenji Kadota, all of Ibaragi-shi, Osaka, Japan, assignors to Shikoku Kaken Kogyo Kabushshiki Kaisha, Ibaragi-shi, Osaka-fu, Japan

Filed Nov. 23, 1970, Ser. No. 92,150

Claims priority, application Japan, Nov. 24, 1969, 44/94560

Int. Cl. B01j *11/56*

U.S. Cl. 106—40 V **14 Claims**

A method for manufacturing foamed product of silica from silica gel comprises prefiring silica gel at a temperature ranging from 500 to 900°C so as to obtain a prefired product which can be ignited with a loss of not more than 5 percent by weight, the silica gel having a specific surface area of at least 500 m^2/g and being of a size not passing through an 80-mesh sieve and substantially free of adsorption water, and thereafter firing the prefired product at a temperature ranging from 1000 to 1450°C to effect foaming.

3,717,487
CERAMIC SLIP COMPOSITION
Thomas P. Hurley, Pownal, Vt., and Arthur C. McAdams, Jr., Wichita Falls, Tex., assignors to Sprague Electric Company, North Adams, Mass.

Continuation-in-part of Ser. No. 613,954, Feb. 3, 1967, abandoned. This application June 17, 1970, Ser. No. 47,103

Int. Cl. C03c *5/02*

U.S. Cl. 106—48 **7 Claims**

A new ceramic slip and an improved method for forming ceramic films and ceramic capacitors by passing a flat substrate through a falling sheet of the novel ceramic slip so as to receive a thin, uniform film of the ceramic slip. The substrate is either re-passed through said falling sheet one or more times to build up the desired thickness, dried and fired to maturity or the film is dried and alternate electrode-ceramic layers built-up in well-known capacitor fashion.

3,717,488
HYDRATION OF SILICATES
Regis Marie Albert Magnan, Montelimar, France, assignor to Societe Anonyme Ciments la Farge, Paris, France

No Drawing. Filed Oct. 14, 1970, Ser. No. 80,782

Claims priority, application France, Dec. 15, 1969, 6943404

Int. Cl. C04b *7/02*

U.S. Cl. 106—97 **11 Claims**

The invention relates to a process for hydration of silicates with a low calcium content—one mixes with 2 to 15% of portlant cement and 85 to 98% of synthetic monocalcium silicate having an analysis of 35 to 45% of SiO_2, 35 to 50% of CaO, 5 to 15% of Al_2O_3, and up to 6% in all of alkali and alkaline earth metal oxide, Fe_2O_3, and other oxides, whilst maintaining a water/solids ratio of 0.10 to 0.4 and autoclaving the mixture at a temperature of 100 to 250° C. under a steam pressure of 1 to 40 bars.

3,717,489
PROCESS FOR INCREASING THE STRENGTH OF CEMENT OBTAINED FROM CALCIUM SULFATE
Gunther Herzog, Bad Kostritz, Gunter Kahle, Wolfgang Kolling, and Christian Lamm, Coswig, Ursula Munch, Wolfen, Horst Schumann and Walter Wolfrom, Coswig, Werner Riesel, Bad Kostritz, and Roland Wagner, Gera, Germany, assignors to Dungemittelkombinat Veb Stickstoffwerk Piesteritz, Wittenberg-Piesteritz, Germany

No Drawing. Continuation-in-part of application Ser. No. 691,950, Dec. 20, 1967. This application Jan. 4, 1971, Ser. No. 103,800

Int. Cl. C04b *7/24*

U.S. Cl. 106—103 **1 Claim**

In a process for producing cement clinker from calcium sulfate by reduction of the calcium sulfate with coke at 900 to 1200° C. to produce SO_2 as a by-product and CaO and sintering the CaO with addition of Al_2O_3-, Fe_2O_3- and SiO_2-containing materials, the improvement which comprises subjecting to the reduction a mixture of at least one of anhydrite and native gypsum with phosphorous gypsum having a P_2O_5 content of about 0.5 to about 2.5% by weight and an F content of about 0.5 to about 1% by weight, the weight proportion of phosphorus gypsum relative to the total of phosphorus gypsum, anhydrite and native gypsum being 20 to 90%, and subjecting to the sintering the resultant CaO.

3,717,490

METHOD OF TREATING SLAG

Karl V. Hauser, Ann Arbor, Mich., assignor to Edward Levy Company, Detroit, Mich.

Filed Feb. 1, 1971, Ser. No. 111,380

Int. Cl. C04b *7/14*

U.S. Cl. 106—117 **10 Claims**

A method of treating steel furnace slag in order to convert unreacted calcium oxide and calcium hydroxide into a form which will not cause either volumetric expansion or leaching. Wet crushed slag is brought into contact with carbonate ions. The water hydrates the calcium oxide to form calcium hydroxide, and the calcium and carbonate ions combine to form calcium carbonate.

3,717,491

DYE COMPOSITIONS

Melville W. Uffner, Media, Pa., assignor to Air Products and Chemicals, Inc., Philadelphia, Pa.

Filed Aug. 19, 1970, Ser. No. 65,312

Int. Cl. C08b *25/00*

U.S. Cl. 106—209 **13 Claims**

A fluorinated organic acid compound of the formula

$$C_nF_{2n+1}CONRCHRCOOH,$$

wherein each R is independently selected from H or an alkyl radical of one to eight carbon atoms and *n* is an integer of six to 18, is added to a dispersion containing a pigment, a bonding agent and a dispersing agent such as sodium alginate to obtain improved dye compositions.

3,717,492

WATER-PERMEABLE BITUMINOUS COMPOSITIONS FOR HYDRAULIC ENGINEERING

Gerardus Rinkel, 's-Hertogenbosch, and Gijsbert van Doorn, Utrecht, The Netherlands, assignors to Bitumarin N.V., Zaltbommel, Netherlands

No Drawing. Filed Dec. 2, 1969, Ser. No. 881,608

Claims priority, application Netherlands, Dec. 16, 1968, 6818023

Int. Cl. C08h *13/00, 17/32;* **C08j** *1/46*

U.S. Cl. 106—280 R **7 Claims**

A water-permeable bituminous composition for hydraulic engineering purposes consists of a mixture of bituminous mortar and a stone fraction. The quantity of mortar in the mixture is less than the volume of voids between the stones of the stone fraction in the mixture. Further, the smallest size D15 of the stone in the stone fraction is from four (4) to sixteen (16) times the largest size D85 of the mineral matter contained in the mortar.

3,717,493

PRODUCTION OF PHTHALOCYANINE PIGMENT

Paul H. Griswold, Jr., Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Feb. 1, 1971, Ser. No. 111,618

Int. Cl. C08h *17/14*

U.S. Cl. 106—288 Q **2 Claims**

A metal phthalocyanine pigment composed almost exclusively of the α I polymorph is prepared by a process in which crude metal phthalocyanine is converted to the corresponding tetrahydrosulfate followed by controlled crystal growth and hydrolysis.

3,717,494

PROCESS FOR THE PRODUCTION OF COLOR BLACK BY THE FURNACE PROCESS

Gerhard Jager, and Gerhard Kuhner, both of Grossauheim, Germany, assignors to Deutsche Gold - und Silber - Scheideanstalt vormals Roessler, Frankfurt (Main), Germany

Filed April 28, 1970, Ser. No. 32,712

Int. Cl. C09c *1/50*

U.S. Cl. 106—307 **6 Claims**

Color blacks of low pH are prepared from furnace blacks by treating the black before separation from the gas phase but after cooling at a temperature between 600° and 150°C., preferably between 500° and 250°C, with an aqueous solution of hydrogen peroxide. Preferably potassium is present in the feedstock in an amount sufficient that the finished carbon black has at least 150 ppm of potassium.

3,717,495

GLASS CONTAINERS FOR AEROSOLS AND METHOD AND APPARATUS FOR MAKING SAME

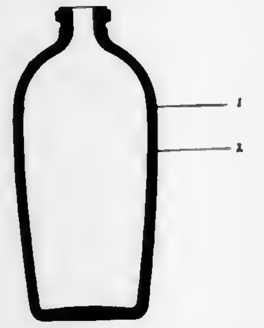
Charles Paoletti, Aulnay-sous-Bois, and Gilles Terrasse, Deuil-la-Barre, France, assignors to L'Oreal, Paris, France

Continuation-in-part of applications Ser. No. 665,798, Sept. 16, 1967, now abandoned, and Ser. No. 843,617, July 22, 1969, now Patent No. 3,611,990. This application June 30, 1970, Ser. No. 51,229

Claims priority, application France, Sept. 9, 1966, 75,913

Int. Cl. B44d *1/94*

U.S. Cl. 117—18 **10 Claims**



A fluid containing a polymerizable film forming substance is introduced into a container so as to adhere to the inner walls thereof. The non-adhering portion of the liquid is then withdrawn and the remainder polymerized in situ on the inner surface of the container. Alternatively, the container is a mold coated with a parting compound and the film formed therein is separated from said mold after polymerization.

3,717,496

MACHINE PARTS HAVING A WEAR- AND ABRASION-RESISTANT SURFACE

Richard Kieffer, Wien-Osterreich, and Hans Mariacher and Hansotto Schoof, Krefeld, Germany, assignors to Deutsche Edelslahlwerke Aktiengesellschaft, Krefeld, Germany

No Drawing. Filed Nov. 30, 1970, Ser. No. 93,920

Claims priority, application Germany, Nov. 28, 1969, P 19 59 690.8

Int. Cl. C23g *5/00*

U.S. Cl. 117—49 **8 Claims**

Machine parts made of hard metal comprising at least one metal carbide and a metal binder may be provided with an improved wear- and abrasion-resistance by forming a nitride or carbonitride surface layer thereon of one or more metals of Groups IV*a* to VI*a* of the Periodic

Table. In particular embodiments of the invention a surface layer of titanium nitride or carbonitride is formed. The invention also provides a method of producing such surface layers which includes the step of heating the machine parts in the presence of a thermally-decomposable metal halide and a purified gas mixture of nitrogen, hydrogen and possibly methane.

3,717,497

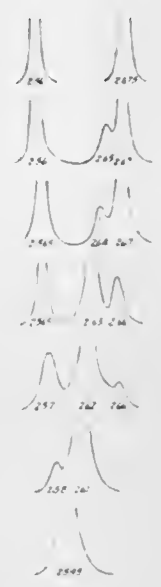
REFRACTORY ARTICLES AND METHOD OF MANUFACTURE

Norman H. Stradley, Signal Mountain, and Harry C. Dunegan, Chattanooga, both of Tenn., assignors to American Lava Corporation, Chattanooga, Tenn.

Filed March 25, 1971, Ser. No. 127,995

Int. Cl. C04b *35/10*

U.S. Cl. 117—169 R **4 Claims**



A method for hardening dressed and dimensioned ceramics which does not require further dimensioning after hardening requires repeated impregnation with hardening agent and are at temperatures below 1,000° C. followed by a cure above 1,000° C. and preferably from about 1,100° C. to about 1,400° C. for Al_2O_3—Cr_2O_3 systems in which chromic acid, which reduces to Cr_2O_3 on firing, is employed with Al_2O_3 to form a hard solid solution of Al_2O_3 and Cr_2O_3 on firing which acts as a bond cement in the alumina-chromia system.

3,717,498

METHOD FOR TREATING THE SURFACE OF A CONTAINER AND A CONTAINER PRODUCED BY THE METHOD

Ilse Franz and Werner Langheinrich, Ulm (Danube), Germany, assignors to Telefunken Patentverwertungsgesellschaft m.b.H., Ulm (Danube), Germany

No Drawing. Continuation of abandoned application Ser. No. 721,075, Apr. 12, 1968. This application Feb. 12, 1971, Ser. No. 115,096

Claims priority, application Germany, Apr. 13, 1967, T 33,647

Int. Cl. F27b *14/00*

U.S. Cl. 117—70 A **3 Claims**

A method for treating the surface of a container and a container which has been treated according to the method. The method involves coating at least the inside surface of a container with a layer of a diffusion-preventative substance. The container, which can be made of quartz, glass or a ceramic material, can then be used to hold products to be annealed in a heat-treating furnace without diffusions out of or into the container walls.

3,717,499

ARTICLE WITH FILLED CAVITY

George R. McClure, Claymont, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed Oct. 1, 1970, Ser. No. 77,311

Int. Cl. B32b *35/00*

U.S. Cl. 117—72 **14 Claims**

An article comprising a substrate material having a cavity therein and two layers of resin occupying or filling the cavity is provided. One layer is an underlayer of a foamed resin and the second layer is a top layer of a specified resin. The two layers in the cavity provide a resistance to cracking the filling out of the cavity when the article is subjected to shocks.

3,717,500

FABRIC FINISHING METHOD AND FABRIC

Vincenzo Mastrianni, Cranston, R.I., assignor to Owens-Corning Fiberglas Corporation

Continuation of Ser. No. 789,061, Jan. 2, 1969, abandoned. This application May 3, 1971, Ser. No. 139,810

Int. Cl. B44f *1/08*

U.S. Cl. 117—76 **16 Claims**

A fabric finishing process comprising passing fabric composed of textured and untextured yarns, through multiple colorant-finish solutions, each having at least a different color or tone, wherein the amount of adsorption of each finish by the yarns is a function of the surface area of the yarns and a function of a finish solution applied between the multiple colorant-finish solutions to induce a subsequently applied colorant-finish solution to adhere to substantially only the textured yarns, to produce a novel, decorative fabric having varying colors and tones.

3,717,501

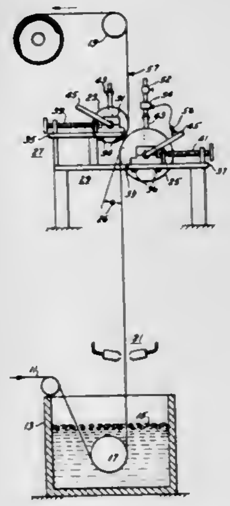
METHOD OF FORMING MINIMIZED SPANGLE COATED STRIP

Laurence B. Caldwell and Robert W. Helman, Bethlehem, Pa., assignors to Bethlehem Steel Corporation

Original application Sept. 12, 1969, Ser. No. 857,515. Divided and this application June 24, 1971, Ser. No. 156,264

Int. Cl. C23c *1/02*

U.S. Cl. 117—102 M **5 Claims**



Molten zinc coated material is wrap contacted with unequal sized internally cooled chromium plated rolls prior to solidification to inhibit the formation of undesirable spangling of the zinc coated surface.

3,717,502

METHOD FOR PROVIDING ANTICOAGULANT SURFACES ONTO ARTICLES

Eiichi Masuhara, Tokyo, and Imai Yohji, Chiba, both of Japan, assignors to President of Tokyo Medical and Dental University, Tokyo, Japan

Filed June 15, 1970, Ser. No. 46,470

Claims priority, application Japan, June 13, 1969, 44/46132

Int. Cl. A61k *17/18*

U.S. Cl. 117—124 D **6 Claims**

This invention relates to a method for providing anticoagulant surfaces onto articles by treating said articles with an organic solvent solution of a co-precipitated material produced by mixing an aqueous solution of heparin and an aqueous solution of a certain cation surface active agent. Said solution may include an organic solvent-soluble plastic material.

3,717,503

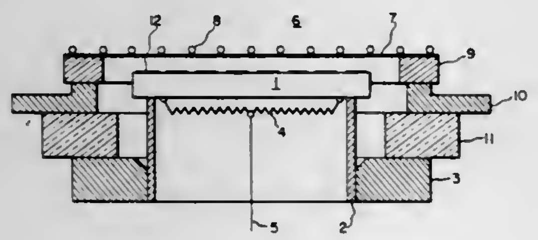
METHOD OF CONSTRUCTING A VAPOR DEPOSITED BI-POTENTIAL CATHODE

James E. Beggs, Schenectady, N.Y., assignor to General Electric Company

Division of Ser. No. 762,797, Sept. 26, 1968. This application Dec. 15, 1970, Ser. No. 98,269

Int. Cl. B44d *1/18;* **H01j** *1/00*

U.S. Cl. 117—212 **5 Claims**



To increase selectively the electron emission from a cathode, a control grid is placed above the cathode and osmium or iridium is evaporated through the openings of the grid onto the cathode. On the resulting cathode the coated regions provide a value of work function which is lower than that of the uncoated regions.

3,717,504

MAGNETIC RECORDING MEDIUM

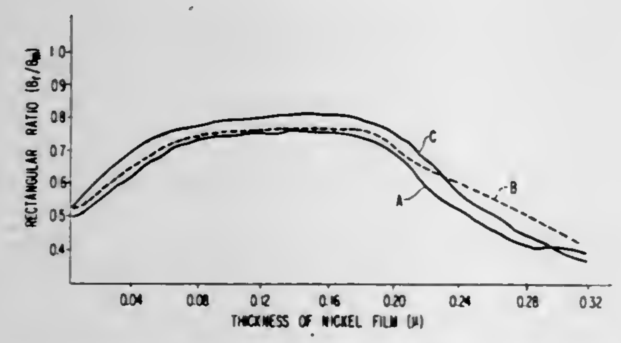
Mashashi Aonuma; Masaaki Fujiyama, and Goro Akashi, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Aug. 6, 1970, Ser. No. 61,561

Claims priority, application Japan, Aug. 6, 1969, 44/61679

Int. Cl. H01f *10/06*

U.S. Cl. 117—239 **10 Claims**



A magnetic recording medium prepared by applying a magnetizable layer onto one surface of a non-magnetizable substrate by either electrolytic or non-electrode plating, applying a nickel layer onto the exposed surface of said magnetizable layer having a thickness less than 0.2μ and applying a rhodium layer onto the exposed surface of said nickel layer having a thickness greater than 0.2μ, the magnetic recording medium having a smooth surface and excellent magnetic properties such as improved rectangular ratio, as well as exhibiting extended service life, the magnetizable layer being protected by said nickel and rhodium layers.

3,717,505

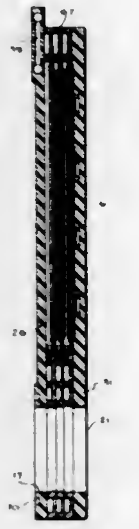
ELECTROCHEMICAL CELL STACK

Truman F. Unkle, Jr., Poway, and John F. Loos, San Diego, both of Calif., assignors to Gulf Oil Corporation

Filed June 25, 1970, Ser. No. 49,696

Int. Cl. H01m *27/02, 29/04*

U.S. Cl. 136—86 A **3 Claims**



A cell stack for use in a battery or fuel cell using a liquid electrolyte. A plurality of individual frames made from electrically insulating material, each having a cavity extending transversely therethrough and separate elongated supply and return electrolyte passageways leading to and from the cavity. An electrode assembly is disposed in a recess provided in one surface of one of the frames and sandwiched between it and another frame. Each frame is bonded to the next adjacent frame to provide a complete seal surrounding the periphery of the cavity, each group of two adjacent electrode assemblies and three frames providing an electrochemical cell. The frames may be injection-molded from polysulfone and solvent-bonded by a chlorinated hydrocarbon.

3,717,506

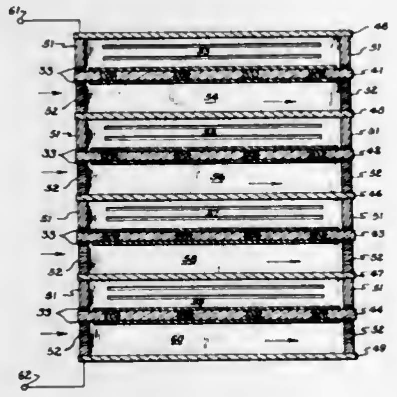
HIGH VOLTAGE DEPOSITED FUEL CELL

Ralph E. Hopkins, Fairfax, Va., assignor to The United States of America as represented by the Secretary of the Army

Filed Jan. 28, 1971, Ser. No. 110,499

Int. Cl. H01m *27/16*

U.S. Cl. 136—86 F **1 Claim**



This invention pertains to an improved fuel cell of the solid electrolyte variety and a method of manufacturing same. The improved fuel cell is especially adaptable to high voltage, high power applications in that a large number of planar cell assemblies may be stacked in a compact manner to afford a relatively high power density.

3,717,507

METHOD OF MANUFACTURING SEMICONDUCTOR DEVICES UTILIZING ION-IMPLANTATION AND ARSENIC DIFFUSION

Toshio Abe, Yokohama, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan

Filed June 17, 1970, Ser. No. 46,898

Claims priority, application Japan, June 19, 1969, 44/47,950

Int. Cl. H01l *7/00*

U.S. Cl. 148—1.5 **6 Claims**

In a method of manufacturing a transistor, the N-type emitter region is formed by diffusing arsenic and the P-type base region is formed by at least injecting ions of an acceptor impurity.

3,717,508

METHOD OF IMPROVING STABILITY OF BORON HARDENABILITY EFFECT IN ALLOY STEELS

George F. Melloy, Bethlehem, Pa., and John C. Russ, Woburn, Mass., assignors to Bethlehem Steel Corporation

Continuation-in-part of Ser. No. 824,749, May 8, 1969, abandoned, which is a continuation of Ser. No. 541,210, April 8, 1966, abandoned. This application Nov. 4, 1970, Ser. No. 86,962

Int. Cl. C21d *7/14*

U.S. Cl. 148—2 **1 Claim**

The method of stabilizing the hardenability effect in quench hardenable hypoeutectoid steel containing nitrogen as influenced by time and temperature is decreased by aluminum, columbium and vanadium and increased by titanium and zirconium.

3,717,509

COATED METAL AND METHOD

Bert E. Palm, Mentor, and Earnest W. Harwell, Mansfield, both of Ohio, assignors to Diamond Shamrock Corporation, Cleveland, Ohio

Continuation-in-part of Ser. No. 717,359, March 29, 1968, and a continuation-in-part of Ser. No. 642,133, May 29, 1967, abandoned. This application Nov. 6, 1970, Ser. No. 87,626

Int. Cl. C23f *7/26*

U.S. Cl. 148—6.2 **1 Claim**

A composite coating provides enhanced corrosion protection for metal substrates, can maintain weldability where otherewise desirable and provide a surface for receiving electrocoat paint. The undercoating on the surface of the substrate is the residue obtained from heating an applied corrosion-resistant, hexavalent-chromium-containing coating composition. The coating over such residue results from curing an applied topcoat composition comprising an electrically conductive pigment in a vehicle.

3,717,510

METHOD FOR THE BLACKENING OF ALUMINIUM

Cesar Adrianus Boose and Maarten Johan Reidt, The Hague, Netherlands, assignors to Reactor Centrum Nederland, The Hague, Netherlands

No Drawing. Filed Mar. 10, 1971, Ser. No. 123,071

Int. Cl. C23f *7/24*

U.S. Cl. 148—6.24 **9 Claims**

An even, tenacious black coating of nickel sulfide is applied to the surface of aluminium alloys by immersion of the alloy into an aqueous bath containing from 35–200 g./l. of $NiCl_2$.6 aq and from 0.03–0.25 molar of thiocyanate ions for a period up to 5 minutes according to the process disclosed. Preferably the aqueous bath also contains from 10–20 g./l. of NH_4Cl, from 8–12 g./l. of KCNS and is maintained at a pH in the range of 3–4.

3,717,511

PROCESS FOR MAKING HARDENABLE COPPER ALLOY PRODUCTS

Hans-Joachim Wallbaum, Osnabruck, Germany, assignor to Kabel- und Metallwerke Gutehoffnungnutte Aktiengesellschaft, Hannover, Germany

No Drawing. Filed Aug. 14, 1968, Ser. No. 752,499

Claims priority, application Germany, Aug. 16, 1967, P 15 58 790.3

Int. Cl. C22f *1/08*

U.S. Cl. 148—11.5 R **1 Claim**

A method of improving the properties of heat hardenable copper alloys by heating the alloy in its original cast form to its solution annealing temperature, working the heated alloy to a selected semi-finished cross section and immediately thereafter quenching the alloy in its worked form to thereby obtain a fine grain structure giving rise to improved mechanical and electrical properties.

3,717,512

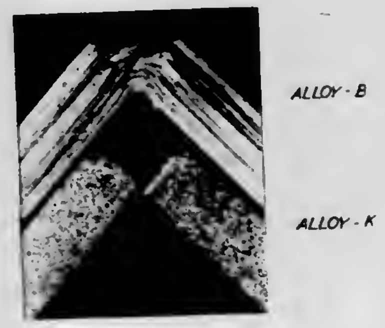
ALUMINUM BASE ALLOYS

Philip R. Sperry, North Haven, and Damian V. Gullotti, Madison, both of Conn., assignors to Olin Corporation

Continuation-in-part of Ser. No. 14,189, Feb. 25, 1970, Pat. No. 3,642,542. This application Oct. 28, 1971, Ser. No. 193,458

Int. Cl. C22c *21/02*

U.S. Cl. 148—32.5 **10 Claims**



BROKEN CHARPY IMPACT TEST SPECIMENS AT MAGNIFICATION OF 2.5 X MACRO-ETCHED AFTER IMPACT TESTING TO SHOW GRAIN STRUCTURES

The disclosure teaches improved aluminum base alloys containing silicon, magnesium, chromium and zirconium. The alloys have a combination of high strength and high impact properties.

3,717,513

PROCESS FOR THE PRODUCTION OF COMPOSITE SHEETS

Daniel J. Adenis, Lancaster, Pa., assignor to Compagnie Pechiney, Paris, France

No Drawing. Filed Dec. 3, 1971, Ser. No. 204,734

Claims priority, application France, Dec. 23, 1970, 7046434

Int. Cl. B23p *3/02, 3/06*

U.S. Cl. 148—11.5 A **7 Claims**

The invention relates to the plating of sheets of ferrous metal with aluminum having a thickness less than 0.5 mm. by co-rolling, wherein the cold worked sheets are subjected to a residence time of at least 1 hour in a temperature zone of from 275 to 460 C. to avoid the appearance of intermetallic compounds of the Al_3Fe type.

3,717,514

SINGLE CRYSTAL SILICON CONTACT FOR INTEGRATED CIRCUITS AND METHOD FOR MAKING SAME

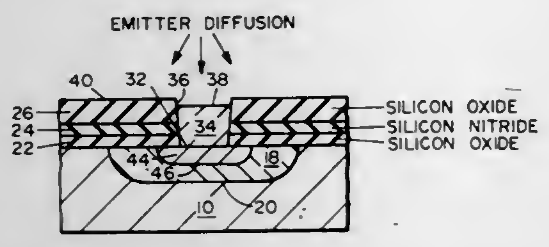
Ronald R. Burgess, Phoenix, Ariz., assignor to Motorola, Inc., Franklin Park, Ill.

Filed Oct. 6, 1970, Ser. No. 78,468

Int. Cl. H01l *7/36*

U.S. Cl. 148—175 **15 Claims**

The method for making a single crystal silicon contact for integrated circuits is described. The epitaxial contact is self-patterning and is formed by coherent growth on a surface of



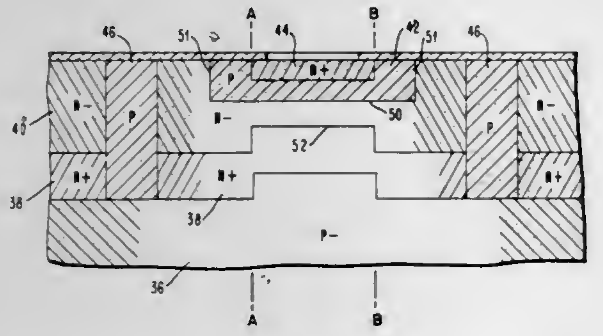
monocrystalline silicon for protecting and contacting said surface.

3,717,515
PROCESS FOR FABRICATING A PEDESTAL TRANSISTOR

Kanu G. Ashar, Wappingers Falls, N.Y., and Leo W. Maheux, Underhill, Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 10, 1969, Ser. No. 875,016
Int. Cl. H01l ***7/36, 19/00***

U.S. Cl. 148—175 **2 Claims**



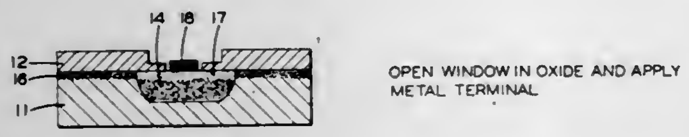
This invention relates to a process for fabricating monolithic integrated circuits including at least one pedestal transistor device and comprises the steps of selectively forming and removing oxide layers to produce a substrate having a raised pedestal structure, diffusing a high conductivity impurity into the substrate so as to form a subcollector region having a pedestal portion, growing and then forming a flat epitaxial collector region over said subcollector region, using oxide conversion to remove the raised region, and successively diffusing a base and emitter region over the pedestal region.

3,717,516
METHOD OF CONTROLLING THE REVERSE BREAKDOWN CHARACTERISTICS OF SEMICONDUCTORS

Arthur L. Hatcher, Jr., Sinking Spring, and Ronald D. Stonefelt, Reading, both of Pa., assignors to Western Electric Company, Incorporated, New York, N.Y.

Continuation of Ser. No. 730,743, May 21, 1968, abandoned. This application Oct. 23, 1970, Ser. No. 83,612
Int. Cl. H01l ***7/44***

U.S. Cl. 148—187 **11 Claims**



The impurity density profile of p-n junctions in semiconductive devices is modified at localized regions of the junctions. This is achieved by a controlled oxidation process that causes a selective redistribution of impurities at such regions of the junctions. The process is particularly useful in the manufacture of reverse bias regulator diodes since it enables a controlled adjustment of the breakdown voltage with considerable precision. When the process is used in the manufacture of low voltage regulators, sharp reverse voltage breakdowns and other desirable electrical properties are obtained.

3,717,517
COMPOSITION FOR COLORED SMOKE DISSEMINATION

Erwin M. Jankowiak, Sanford, and Earl Thomas Niles, Midland, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Nov. 12, 1970, Ser. No. 89,132
Int. Cl. C06b ***3/00, 5/06***

U.S. Cl. 149—19 **10 Claims**

Disclosed is a composition for the pyrotechnic dissemination of colored smoke. The composition contains an oxidizer, a material which produces a colored smoke cloud when heated and a binder fuel. The binder fuel is the copolymerization product of a polyaziridinyl compound and a polyfunctional amine or mercaptan terminated curing agent.

3,717,518
ROCKET PROPELLANT AND METHOD

Robert D. Fox, Midland, Mich., William A. Rains, Trenton, N.J., and Gerald G. Lambert, Milwaukee, Wis., assignors to the United States of America as represented by the Secretary of the Air Force

No Drawing. Filed June 25, 1970, Ser. No. 48,784
Int. Cl. C06d ***5/06, 5/10;*** **C10l** ***7/04***

U.S. Cl. 149—36 **3 Claims**

A composition suitable for use in rocket propellants is prepared by dissolving an oxidizer material in an excess of anhydrous liquid hydrazine and gelling the resulting mixture. Critical weight percentage ranges for hydrazine, gelling agent, oxidizer, and metallic fuel particles are given.

3,717,519
POLYACRYLAMIDE THICKENED SLURRY EXPLOSIVE WITH PARTICULAR CROSS-LINKING COMBINATION

Harold W. Sheeran and Marcel H. Oriard, both of Box 33, Marshall, Wash. 99020

No Drawing. Filed June 30, 1970, Ser. No. 51,331
Int. Cl. C06b ***1/04***

U.S. Cl. 149—60 **15 Claims**

Water resistant gels produced by cross linking water soluble polyacrylamide resins in an aqueous nitrate solution.

3,717,520
COMPOSITION AND METHOD FOR SELECTIVELY STRIPPING NICKEL AND/OR COPPER

Frank A. Brindisi, Jr., Madison, Conn., assignor to Enthone, Incorporated, New Haven County, Conn.

No Drawing. Filed Feb. 9, 1971, Ser. No. 114,066
Int. Cl. C23f ***1/20***

U.S. Cl. 156—18 **12 Claims**

Stripping solutions for selectively dissolving nickel and/or copper from metal and plastic substrates and which are alkaline solutions comprising:

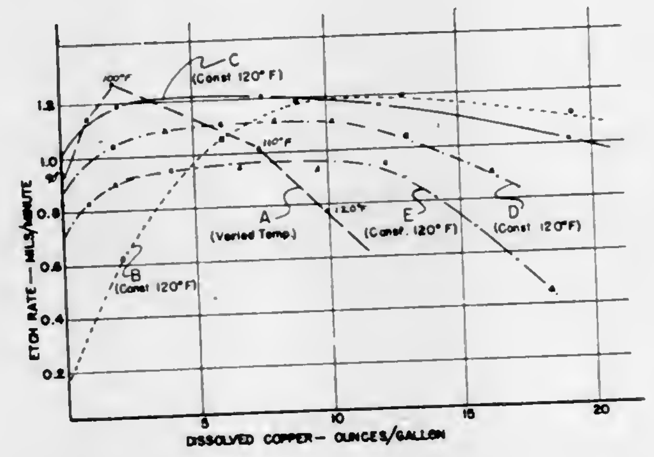
(a) a nitro-substituted aromatic compound having at least one —NO_2 group attached to the aromatic ring and a water-solubilizing substituent also attached to the aromatic ring;
(b) elemental sulfur;
(c) an alkali phosphate;
(d) an alkali chloride;
(e) an alkylene polyamine; and
(f) a corrosion attack inhibitor.

3,717,521
SOLUTION AND METHOD FOR DISSOLVING COPPER

Leo J. Slominski, Bristol, Adela Landau, Watertown, and Arthur J. Siegmund, Hamden, Conn., assignors to MacDermid Incorporated, Waterbury, Conn.

Continuation of abandoned application Ser. No. 75,106, Sept. 24, 1970. This application Feb. 22, 1972, Ser. No. 228,348
Int. Cl. C23g ***1/18, 1/22, 1/36***

U.S. Cl. 156—19 **14 Claims**



An etchant solution is disclosed for use in dissolving copper from copper-surfaced articles, the solution being of the aqueous alkaline ammoniacal chlorite type but modified by the inclusion of a halogen-substituted acetic acid to provide improvement in the capacity for dissolving copper and unusually uniform rate of etching throughout the useful life of the etchant bath. The method of using the etchant solution, and a process for rejuvenating and recycling it, are also disclosed.

3,717,522
METHOD FOR FORMING A CROSS-LINKED POLYETHYLENE INSULATOR

Akira Shirato, Kohoku-ku, Yokohama; Hidezo Furuyama, Totsuka-ku, Yokohama, and Masaru Aoki, Kawasaki-shi, all of Japan, assignors to Showa Electric Wire and Cable Co., Ltd., Kawasaki-shi, Japan

Filed July 25, 1969, Ser. No. 845,036
Claims priority, application Japan, July 29, 1968, 43/53463; Nov. 4, 1968, 43/80495
Int. Cl. H01b ***13/06***

U.S. Cl. 156—53 **7 Claims**

A cross-linked polyethylene insulation having good electrical characteristics can be obtained by laminatedly wrapping of solid phase polyethylene film containing a small amount of substantially involatile hydrocarbon insulating oil and di-α-cumyl peroxide round a solid article and then heating the wrapped article. The present method is suitable as a method for forming a thick cross-linked polyethylene insulation on large size conductor or forming a joint section of cross-linked polyethylene cable.

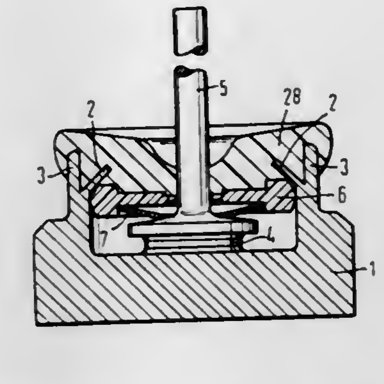
3,717,523
METHOD OF GAS-TIGHT SEALING OF SEMICONDUCTOR COMPONENTS

Horst Georg Dunsche, Singapore 12, Singapore, assignor to Siemens Aktiengesellschaft, Berlin, Germany

Filed Aug. 23, 1971, Ser. No. 173,834
Claims priority, application Germany, Aug. 26, 1970, P 20 42 333.0
Int. Cl. B29c ***27/02***

U.S. Cl. 156—69 **6 Claims**

For a gas-tight sealing of a semiconductor in a metal housing, the housing is preheated. An annular tablet of epoxide resin is then placed on the housing. While the housing slowly



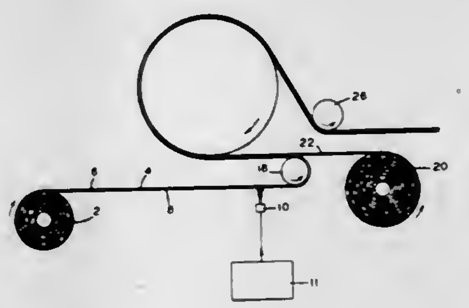
cools off, the tablet melts and seals the component by fusion.

3,717,524
METHOD OF ADHERING FIBERS IN A TUFTED CARPET

Charles Richard Culp, and Walter John Lewicki, Jr., both of Lancaster, Pa., assignors to Armstrong Cork Company, Lancaster, Pa.

Filed Oct. 16, 1969, Ser. No. 866,831
Int. Cl. B32b ***5/02***

U.S. Cl. 156—72 **1 Claim**



A primary backing is needle punched with fiber strands to form a tufted carpet. The short loops of the strands which the tufting needle formed on the primary backing are treated with a solvent which softens the outer surface of the fibers. A secondary backing is then applied over the primary backing, and a sandwich-like structure is formed with the primary backing and secondary backing having therebetween the short fiber loops which have been softened by the solvent. After the solvent has been vaporized, the two backings are adhered to each other and the fiber loops. Adherence is due primarily to the fact that the fiber loops had been softened by the solvent and turned into an adhesive which, upon drying, serves to bond the elements together.

3,717,525
METHOD FOR PRODUCTION OF A DIFFUSION MEMBRANE ARRANGEMENT

Hans-Joachim Bültemann, Bremen, Germany, assignor to Varian Mat GmbH, Bremen, Germany

Filed May 23, 1968, Ser. No. 731,386
Claims priority, application Germany, June 5, 1967, B 92,867
Int. Cl. B32b ***5/18, 31/12***

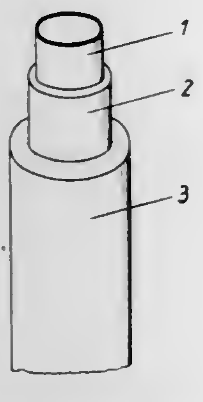
U.S. Cl. 156—77 **6 Claims**

The invention is concerned with a method of making gas diffusion membranes. The pores adjacent the surface of a porous permeable carrier member are filled with a material, later to be removed, a diffusion member is applied to that surface, and the filler material is then removed. In another embodiment a diffusion member is applied to a glass carrier member which is pore-free, and the glass is then made porous by heat treatment and selective dissolution.

3,717,526
PRODUCTION OF TEXTILE ARTICLES
Lubomir Visnovsky, Waterloo, and Pierre Stordeur, Melle, both of Belgium, assignors to Monsanto-Europe S.A., Brussels, Belgium
Filed May 18, 1970, Ser. No. 38,505
Claims priority, application Great Britain
May 19, 1969, 25368/69
Int. Cl. B32b *5/18*
U.S. Cl. 156—78 **21 Claims**

A process for adhering a foam backing to textile articles by applying a foamable composition of a vinyl chloride polymer, a plasticizer and a nitrogen-evolving blowing system which is active at a temperature below 150° C. to textile articles and thereafter applying heat to the treated article.

3,717,527
METHOD OF MAKING AN INSULATED TUBE
Helmut Benteler, Bielefeld, Germany, assignor to Benteler-Werke AG, Paderborn, Germany
Division of Ser. No. 763,311, Sept. 27, 1968, Pat. No. 3,570,545. This application Dec. 23, 1970, Ser. No. 101,024
Claims priority, application Germany, Sept. 29, 1967, P 16 25 936.2
Int. Cl. B32b *5/18*
U.S. Cl. 156—79 **8 Claims**



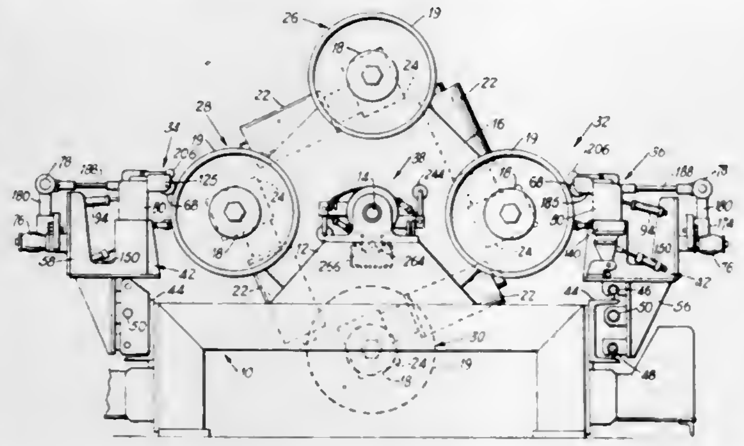
A method of making an insulated tube. A steel tube is internally clad with corrosion-resistant material and externally jacketed with foamed plastic material having a volumetric weight which at most approaches 0.7 p/cm³. The resulting product is corrosion-resistant as well as thermally insulated and sound insulated.

3,717,528
FABRIC BONDING WITH THERMOPLASTIC FIBROUS MATS
Dwight E. Peerman, Minnetonka, and Hulbert van Demmeltraadt, Coon Rapids, both of Minn., assignors to General Mills, Inc.
Filed Feb. 5, 1970, Ser. No. 9,036
Int. Cl. B32b *31/04*; **C09j** *7/04*
U.S. Cl. 156—179 **6 Claims**

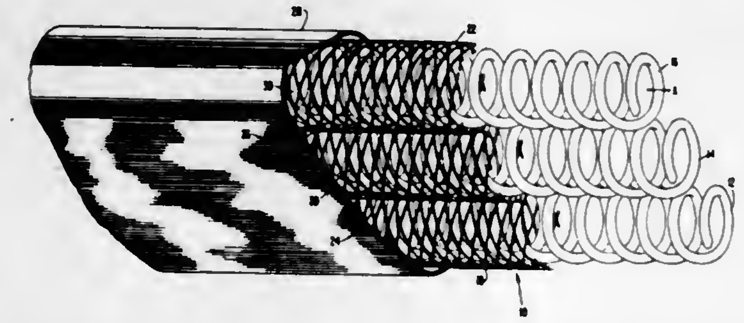
A method of bonding fabrics wherein a fibrous, thermoplastic adhesive is sprayed on the fabric and the bond is formed by heating the fabric and adhesive. The resulting seam or sprayed area is porous, flexible and has good hand.

3,717,529
APPLICATION ASSEMBLY FOR TREAD BUILDING APPARATUS
William L. Rattray, Garden Grove, and Bruce G. Brown, Corona, both of Calif., assignors to AMF Incorporated
Filed March 1, 1971, Ser. No. 122,580
Int. Cl. B29h *17/02, 17/20*
U.S. Cl. 156—130 **8 Claims**

Apparatus for applying tread rubber to bases of circular cross section, which comprises a central shaft, means for mounting a plurality of bases on the central shaft, means for rotating said shaft to advance the bases through a succession of stations, means mounted adjacent one of said stations for applying rubber to a base advanced to said stations, means mounted adjacent another of said stations for applying rubber to the base having the rubber thereon applied thereto at said one of said stations, the rubber applied at the two stations taken together forming the tread and sidewall rubber portions of a tire, and means mounted on said central shaft for stitching the rubber applied to the base at said one of said stations firmly to the base. Further means for applying extruded rubber to the base by advance of a roller, individually braked for severing the rubber, and means responsive to the movement of the roller to the base for actuating base rotation and extruder feed.



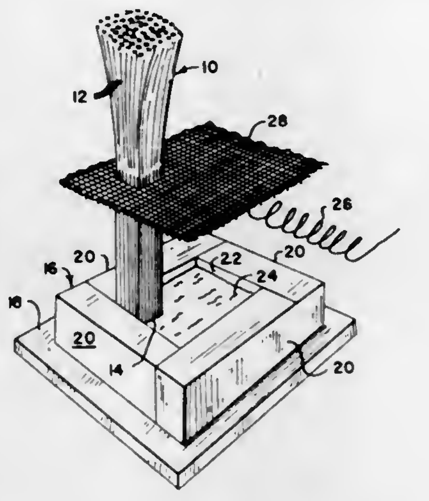
3,717,530
METHOD FOR FORMING CRUSH RESISTANT CONDUIT
Melvin C. Case, and George P. Durney, both of Dover, Del., assignors to ILC Industries, Inc., Dover, Del.
Division of Ser. No. 782,283, Dec. 9, 1968, Pat. No. 3,616,818. This application May 1, 1970, Ser. No. 33,889
Int. Cl. F16l *11/10*
U.S. Cl. 156—144 **3 Claims**



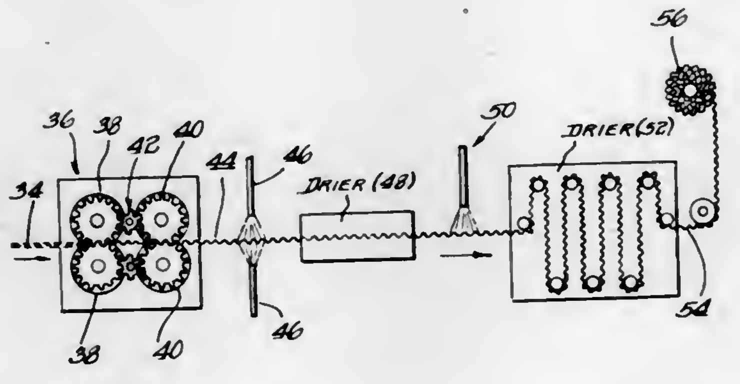
Disclosed is a method for forming conduits or ducts for feeding life support gas, such as oxygen, to or from portions of a spacesuit. The conduit formed comprises a plurality of side-by-side helical coils, each surrounded by a flexible open mesh sleeve. The sleeves are joined longitudinally and are secured to the coils by means of an adhesive. The coils and sleeves are surrounded by a flexible gas impermeable cover. The conduit or duct, while quite flexible, is extremely resistant to being crushed.

3,717,531
METHOD AND APPARATUS FOR MAKING FUSED BUNDLES OF ENERGY-CONDUCTING FIBERS
Luther W. Smith, Brimfield, Mass., assignor to American Optical Corporation, Southbridge, Mass.
Filed Mar. 31, 1971, Ser. No. 129,839
Int. Cl. B32b *31/00*
U.S. Cl. 156—180 **3 Claims**

A bundle of fibers is inserted endwise into a pool of fiber non-wetting, preferably heavy, liquified metal in an open container adjacent a corner thereof wherewith the displaced metal effects tight bundling and fluid clamping of the fibers against the container walls for fusion thereof with applied heat.



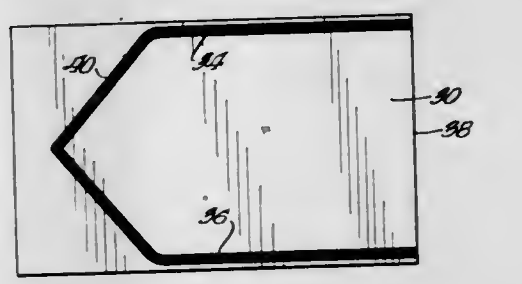
3,717,532
METHOD AND APPARATUS FOR PRODUCING CONTROLLABLY ORIENTED FIBROUS PRODUCT
Ewald A. Kamp, 4940 South East End Ave., Chicago, Ill.
Continuation-in-part of Ser. No. 777,698, Nov. 21, 1968, Pat. No. 3,616,159. This application Dec. 24, 1970, Ser. No. 101,370
Int. Cl. B31f *1/00*
U.S. Cl. 156—199 **18 Claims**



The method of making a non-woven fibrous pad comprising a three-dimensional network of individual fibers interconnected by bonding means where they cross and contact each other and having a surface textured with a pattern of undulating elevations separated by a respective pattern of undulating depressions wherein each of the elevations comprises a structural dome in which the ratio of cap wall unit weight to average web unit weight is less than 1.0. The method includes the step of subjecting an unbonded web of mechanically engaged fibers to successive forming operations between partly meshing, multiple cogged work members relocating fibers from the regions forming the peaks of the elevations to the regions forming the sidewalls thereof.

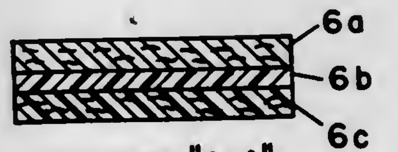
Apparatus for producing such a fibrous pad comprises a pair of fiber orienting arrangements, one of which includes means forming a traveling cog surface and the other of which includes a plurality of synchronized cog members meshing successively with the cog surface. One of the fiber orienting arrangements includes a plurality of closely laterally spaced cog elements having channels therebetween aligned generally with the direction of travel of the cog surface, and a conveyor belt arrangement is disposed partly in the channels and diverges from a meshed region of the fiber orienting arrangements for feeding a fibrous web into the orienting arrangements or stripping a processed web therefrom.

3,717,533
METHOD FOR PRODUCING PLASTIC FLEXIBLE CONTAINERS HAVING PEELABLE SEALS
Daniel E. Mayworm, Deerfield, and William A. Rohde, Arlington Heights, Ill., assignors to Tower Products, Inc., Mundelein, Ill.
Continuation-in-part of abandoned application Ser. No. 755,271, Aug. 26, 1968. This application May 27, 1971, Ser. No. 147,341
Int. Cl. B29f *3/01;* **B32b** *31/30*
U.S. Cl. 156—244 **4 Claims**



In a process for forming a cold peelable bond between plastic films, polyisobutylene-modified polyethylene resins provide cold peelable seals after being blow extruded at temperatures higher than normal extrusion temperatures in the presence of oxygen. Various forms of aseptic packages are disclosed in which a peelable seal may be beneficially employed.

3,717,534
METHOD FOR PREPARING LAMINATED ARTICLE OF CELLULOSIC AND POLYMERIC LAYERS
Irl N. Duling, West Chester, and John C. Merges, Jr., Glen Mills, both of Pa., assignors to Sun Oil Company, Philadelphia, Pa.
Filed Aug. 6, 1970, Ser. No. 61,719
Int. Cl. C05j *7/04*
U.S. Cl. 156—309 **5 Claims**

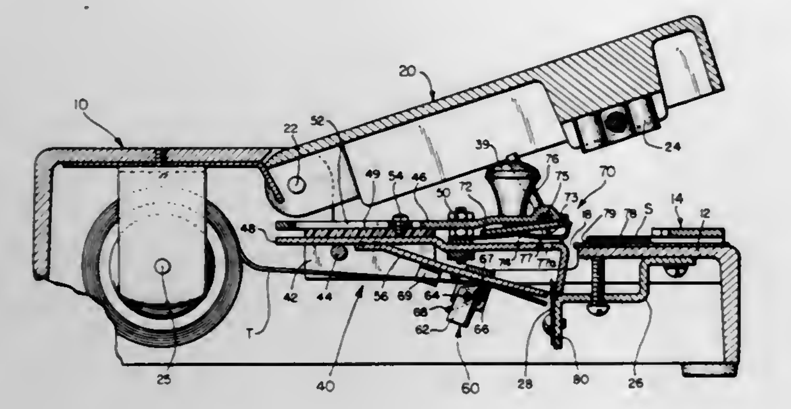


SECTION "A-A"

A tri-layer laminated article, having utility as a packaging material, is prepared by forming an inner layer of a dispersion of solid polymer particles in molten wax adjacent to and between two outer cellulosic layers. The subsequent application of heat and pressure to the resulting composite causes the wax to impregnate the cellulosic material while the polymer particles form a molten middle layer. Upon cooling the polymer solidifies resulting in an article having two outer cellulosic layers of which at least one is wax impregnated and a middle polymeric layer. Said polymer is insoluble in molten wax at a temperature below the polymer's melting point and has a melting point between the melting point of the wax and 300°C.

3,717,535
SPLICING DEVICE
Leif G. Jorgensen, 211 S. Main St., Lombard, Ill. 60148
Filed Nov. 20, 1970, Ser. No. 91,417
Int. Cl. B31f *5/06;* **G03d** *15/04*
U.S. Cl. 156—443 **4 Claims**

In a device for splicing a pair of motion picture film



strips, or the like, by wrapping them with a band of adhesive tape from a roll, a mechanism for dispensing a predetermined length of tape.

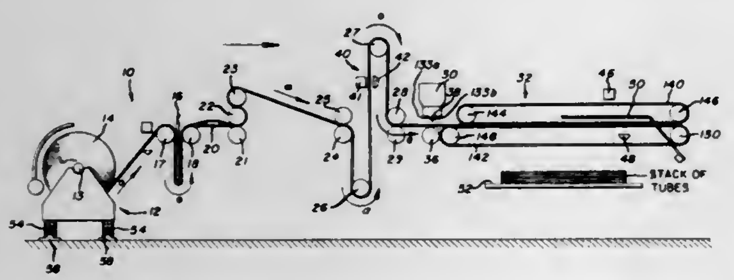
3,717,536
TUBE-MAKING APPARATUS

David Robert McVay, Hazlehurst; Henry Louis Eickhoff, Dunwoody, and Harry William Thatcher, Hazlehurst, all of Ga., assignors to Standard Oil Company, Chicago, Ill.

Filed Dec. 7, 1970, Ser. No. 95,816

Int. Cl. B29d *23/00*

U.S. Cl. 156—463 **10 Claims**



Disclosed is a method and apparatus for forming tubes from woven fabric, especially fabric made of polymeric ribbon yarns. The apparatus includes a movable carriage including a spindle on which a roll of the woven fabric is rotatably mounted. The fabric is unwound and passed over folding means which bring outer edges of the fabric into an overlapping position. An extruder applies a hot melt adhesive to the overlapping edges and then a series of chilled pressure rollers squeeze the overlapping edges together, cooling the adhesive and forming a seam. This fabricates a tube which is periodically severed into shorter lengths.

3,717,537
CONTINUOUS WEBS

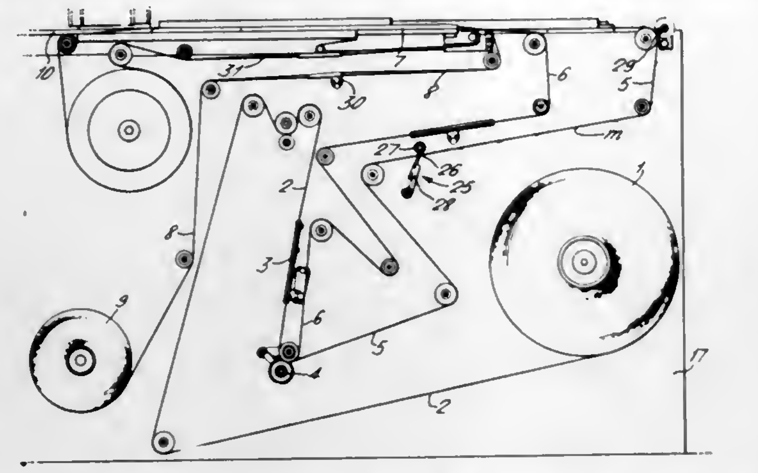
Desmond Walter Molins and Tom Rowlands, Deptford, England, assignors to Molins Machine Company Limited, London, England

Continuation of abandoned application Ser. No. 705,161, Feb. 13, 1968. This application Nov. 30, 1970, Ser. No. 93,873

Claims priority, application Great Britain, Feb. 21, 1967, 8,229/67

Int. Cl. B29d *23/10*

U.S. Cl. 156—466 **10 Claims**



A continuous composite tube of resilient material, for production of cigar or cigarette mouthpieces, is made by continuously slitting one web into two strips, and folding the strips to form an inner and an outer tube respectively, the edges of the outer tube abutting while those of the inner tube may overlap. The width of the strip for the outer tube is controlled and variable to ensure accurate abutment while any resulting width variations in the other strip can be accommodated since the inner tube edges do not abut.

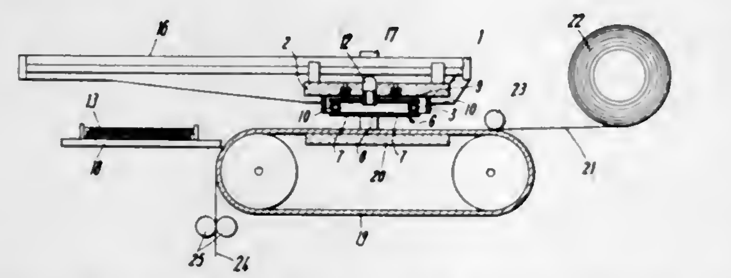
3,717,538
APPARATUS FOR FORMING ARTICLES OF THERMOPLASTIC FILM MATERIAL

Gerhard Hartung, Biesfeld, Germany, assignor to Joisten & Kettenbaum Elektro-Maschinenfabrik

Filed Dec. 31, 1970, Ser. No. 103,206

Int. Cl. B32b *31/08*

U.S. Cl. 156—497 **10 Claims**



There is disclosed an apparatus for forming articles of a thermoplastic film material, in particular of tubular film material, including an endless circulating conveying belt carrying and conveying said film material drawn from a storage roll, a welding die vertically movable above the belt and including an electrically heated welding band having a projecting edge producing a severed and welded seam upon being moved upon the film material, and a counter engaging platen arranged in the vicinity of said die below the conveying belt for supporting same. The apparatus is characterized by a depressor arranged within the projecting edge of the welding die, the depressor having an engaging plate provided with bores and a cavity disposed thereover and selectively capable of being connected to a vacuum or compressed air line.

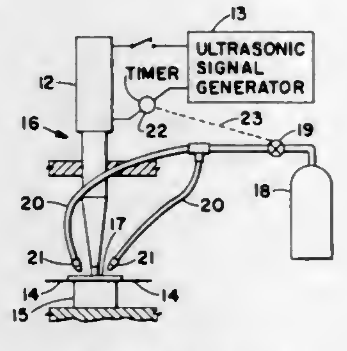
3,717,539
ULTRASONIC WELDING APPARATUS

Harold D. Roberts, Dallas, Tex., assignor to E-System, Inc., Dallas, Tex.

Division of Ser. No. 732,216, May 27, 1968, Pat. No. 3,488,240. This application Aug. 28, 1969, Ser. No. 871,211

Int. Cl. B32b *31/20*

U.S. Cl. 156—498 **2 Claims**



An ultrasonic welding apparatus and method appropriate for welding sheets of plastic including oriented polyesters such as polyethylene terephthalate film, including means for chilling the workpieces while they are being compressed by the ultrasonic tool.

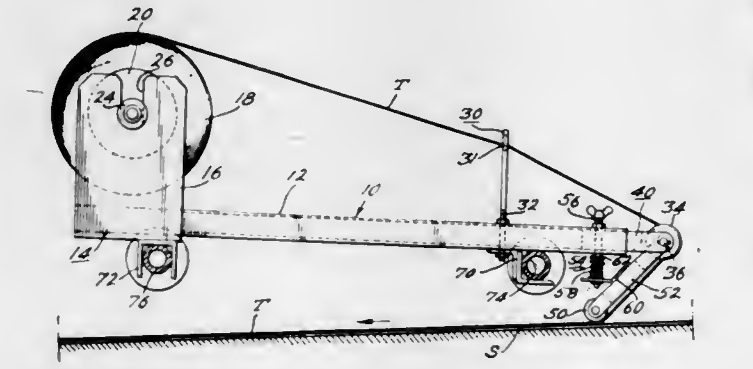
3,717,540
TEAR TAPE APPLICATOR

Edward V. Henc, Promise Dale Farm, Boot Road, Malvern, R.D. 2, Pa.

Filed April 16, 1970, Ser. No. 29,074

Int. Cl. B32b *31/08, 31/20*

U.S. Cl. 156—577 **4 Claims**



A tear tape applicator adapted to be mounted on apparatus for making sheet material comprising an elongated body member, a roll of tear tape rotatably mounted at one end of the body member, a guide member mounted on said body member adjacent the other end thereof, a guide roll pivotally mounted adjacent said other end, a roller pivotally mounted on an arm depending from said other end and spring biasing means normally pivoting said arm in a direction to press said roller and said tape against the sheet material.

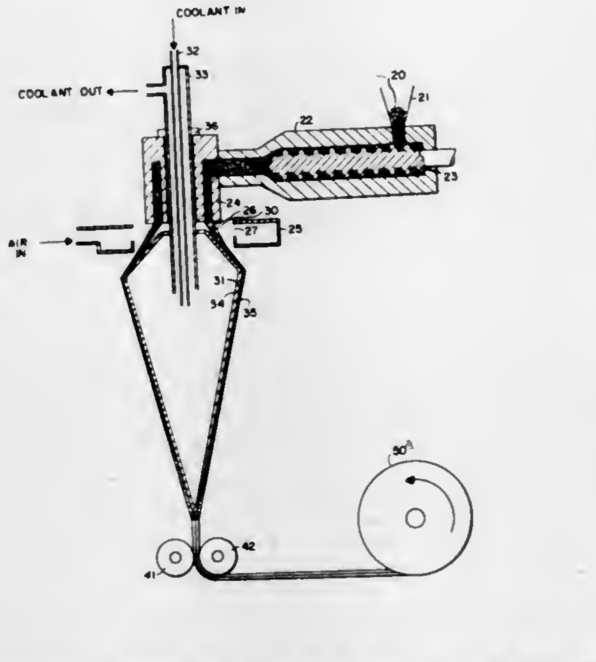
3,717,541
NON-WOVEN FABRIC-LIKE MEMBER

Henry G. Schirmer, Spartanburg, S.C., assignor to W. R. Grace & Co., Duncan, S.C.

Application June 18, 1968, Ser. No. 737,957, which is a Continuation-in-part of application Ser. No. 351,751, Mar. 13, 1964, now Patent No. 3,403,203. Divided and this application June 30, 1970, Ser. No. 60,189

Int. Cl. B32b *3/24, 5/02*

U.S. Cl. 161—169 **3 Claims**



This invention is directed to a non-woven fabric that is continuous and free of independent separate fibers; a method for producing such a fabric that includes drawing a cellular structure at its orientation temperature over a shaped surface to stretch the cell walls until they rupture; and an apparatus including an annular extrusion die and a mandrel with a frusto-conical cone portion aimed at, larger than and coaxial with the extruder die and a cylinder portion connected to, of equal external dimension with, and aligned with the cones base, the cylinder portion being flattened at its outer edge and having a uniform uninterrupted dimensional change from its circular dimension.

3,717,542
FLEXIBLE RUBBER ARTICLES REINFORCED WITH FIBER OF CERTAIN POLYAMIDE-HYDRAZIDE POLYMERS

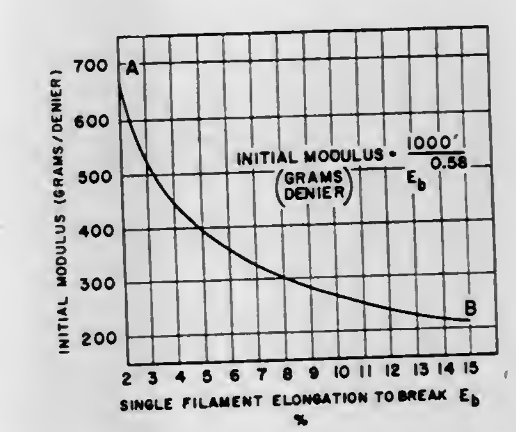
Brian K. Daniels and Jack Preston, Raleigh, N.C., and David A. Zaukelies, Pensacola, Fla., assignors to Monsanto Company, St. Louis, Mo.

Continuation-in-part of application Ser. No. 748,559, July 29, 1968, now Patent No. 3,600,269. This application June 30, 1971, Ser. No. 158,182

The portion of the term of the patent subsequent to Aug. 17, 1988, has been disclaimed

Int. Cl. B32b *25/02, 27/34*

U.S. Cl. 161—170 **11 Claims**



Flexible rubber articles reinforced with high temperature organic fibers having densities greater than 1.37 g./ml. and unusually high initial moduli of over 700 grams per denier at elongations of 2% or greater are disclosed. The reinforcing fiber elements are made from wholly aromatic polymers having melting points above 200° C. and inherent viscosities of at least 3.5. The polymers are further characterized in that the recurring divalent aromatic radicals along the polymer chain are at least about 85 weight percent para-oriented, have a plane of symmetry or are linked by ring atoms representing the maximum spacing. The fibers are particularly useful as reinforcing elements in V-belts, conveyor belts and pneumatic rubber tires, and especially in the belt plies of belted tires.

3,717,543
LAMINATIONS OF POLYIMIDE FILMS TO LIKE FILMS AND/OR TO METAL FOILS

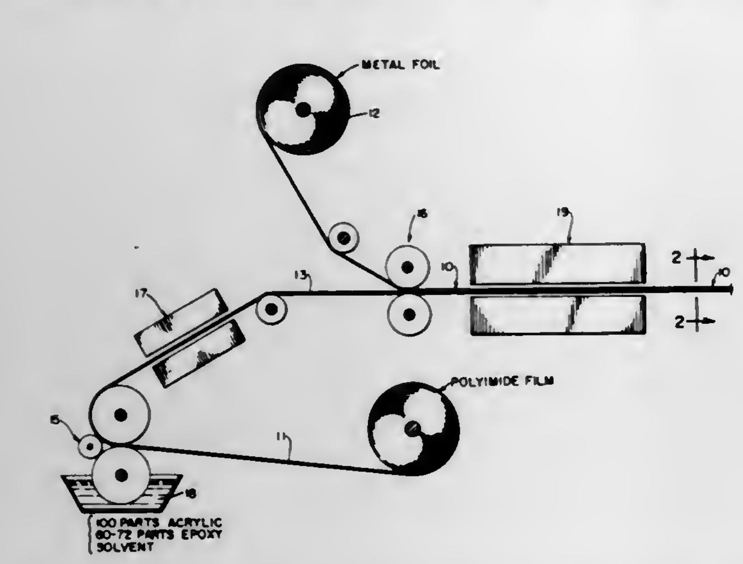
James R. Sinclair, Charlotte, and Gordon Milburn Ellis, Jr., Matthews, both of N.C., assignors to Rexham Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 868,292, Oct. 27, 1969, abandoned, which is a continuation-in-part of Ser. No. 571,520, Aug. 10, 1966, abandoned. This application Jan. 13, 1971, Ser. No. 106,251

Int. Cl. B32b *15/20, 27/38;* **H05k** *1/00*

U.S. Cl. 161—186 **13 Claims**

A high temperature polyimide film - metal foil laminate and the process for making same is disclosed. The laminate webs are jointed together by an acrylic-epoxy resin adhesive that has been found to be very resistant to delamination of the webs during high temperature applications. The epoxy component of the adhesive is of the low molecular weight epichlorohydrin bisphenol A type having an epoxide equivalent weight of less than 550. The epoxy component is present in a substantial excess in relation to the acrylic component of the adhesive.



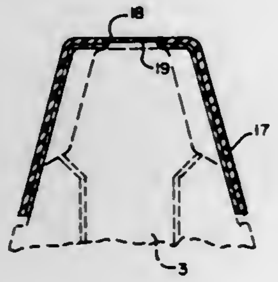
3,717,544
LINED PLASTIC ARTICLES

Emery I. Valyl, 5200 Sycamore Ave.,
Bronx, N.Y. 10471

Filed Sept. 14, 1970, Ser. No. 71,734

Int. Cl. B32b *27/08;* **B65d** *25/14*

U.S. Cl. 161—252 **6 Claims**



Method and apparatus for making lined plastic containers in which a liner is placed over a blow core, a plastic parison is injected around the blow core and liner in a parison mold and the parison together with the liner is blown in a blow mold. The liners may be preformed and inserted over the blow core before the blow core is placed in the parison mold.

3,717,545
PROCESS FOR TREATING WASTE LIQUORS

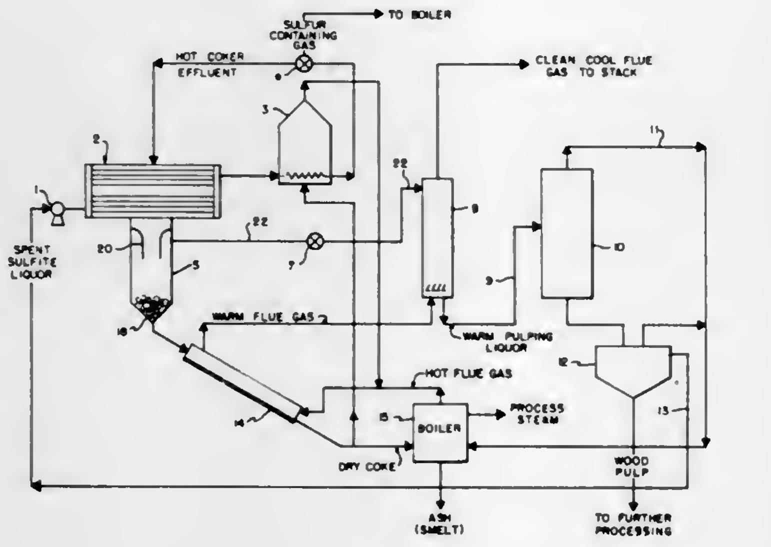
Howard V. Hess, Glenham, and Edward L. Cole, Fishkill, both of N.Y., assignors to Texaco Inc., New York, N.Y.

Filed July 17, 1970, Ser. No. 55,649The portion of the term of this patent subsequent to Jan. 26, 1988, has been disclaimed.

Int. Cl. D21c *11/14*

U.S. Cl. 162—31 **7 Claims**

Closed circuit process for treating waste liquors, such as spent sulfite liquors from wood digestion by coking the liquors in the liquid phase under pressure under turbulent flow conditions to form coke and a clear effluent of low chemical oxygen demand. In the process, a heat exchange zone, a coking zone, a steam-and flue gas-producing zone, an absorbing zone, a wood digesting zone and a kilning zone are provided and interconnected by suitable conduits. Pressurized spent liquor is sent to the heat exchange zone where it absorbs heat from the coking zone effluent before coke separation, thereby absorbing also heat content contained in the coke. The coke is discharged to the kilning zone where it is dried by hot flue gases produced by burning previously dried coke in the steam producing zone. Sulfur dioxide containing warm, flue gas from the kilning zone is contacted in an absorbing zone with cool coker effluent to produce warm ammonium bisulfite solution which is passed to a wood digestion zone as well as cool flue gas substantially free of all air pollutants. Sulfur-containing gases produced by coking and wood digestion are burned in the steam-producing zone to manufacture sulfur dioxide for recycling. Use of a closed system reduces to a minimum odors in the digestion section of a pulp plant since all the odorous sulfur compounds are burned and the sulfur dioxide is recovered.



3,717,546
METHOD AND APPARATUS OF PRODUCING A SHEET WITH ORIENTATED FIBERS BY OVERFLOW

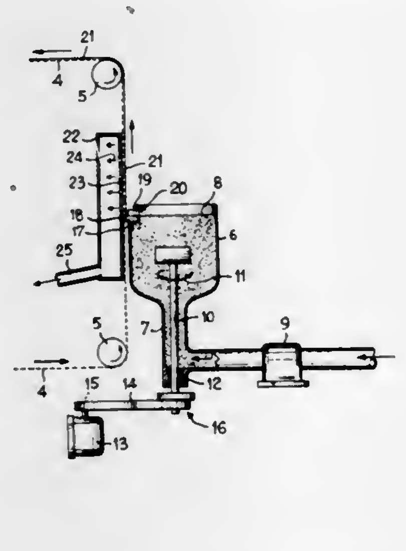
Guy Jacquelin, Grenoble, France, assignor to Centre Technique De L'Industrie Des Papiers Cartons Et Celluloses, Domaine Universitaire, Grenoble-Gare, Isere, France

Filed Sept. 16, 1970, Ser. No. 72,643

Claims priority, application France, Sept. 18, 1969, 6931865

Int. Cl. B21f *1/02;* **D21f** *11/00, 11/04*

U.S. Cl. 162—215 **9 Claims**



A method of and apparatus for producing a nonwoven material from a liquid suspension of fibers in which the suspension is fed to a container, has a gyratory motion applied

to it in the container and is fed from the container as an overflow against a receiving band fed past the overflow.

3,717,547
PROCESS FOR PRODUCING URIDINE-5'-DIPHOSPHOGLUCOSE

Kiyoshi Nakayama, Sagamihara-shi, and Hiroshi Hagino, Tokyo-to, Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan

No Drawing. Filed Dec. 31, 1969, Ser. No. 889,691

Claims priority, application Japan, Jan. 17, 1969, 44/2,932

Int. Cl. C12d *13/06*

U.S. Cl. 195—28 N **9 Claims**

Uridine-5'-diphosphoglucose is produced in a fermentation process utilizing Brevibacterium, Corynebacterium, arthrobacter or Micrococcus in a culture medium containing orotic acid and/or uracil and dry yeast.

3,717,548
METHOD FOR PREPARING AMINOCYCLOHEXYLPENICILLIN

Takashi Nara, and Ryo Okachi, both of Tokyo, Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan

Filed Oct. 12, 1970, Ser. No. 80,227

Claims priority, application Japan, Oct. 24, 1969, 44/84653

Int. Cl. C12d *9/06*

U.S. Cl. 195—36 P **10 Claims**

An enzymatic process for the preparation of aminocyclohexylpenicillin is disclosed. The process involves reacting together 6-aminopenicillanic acid or other penicillins and aminocyclohexyl carboxylic acid, or esters and/or acid addition salts thereof in the presence of an enzyme elaborated by such microorganisms as are found in the genera Pseudomonas, Kluyvera, Escherichia, Aerobacter, Micrococcus, Streptomyces, Nocardia, Aspergillus or Penicillium.

3,717,549
FERMENTATION PROCESS FOR THE PRODUCTION OF CITRIC ACID

Foy F. Roberts, Stonington, Conn., assignor to Pfizer Inc., New York, N.Y.

Continuation of Ser. No. 690,375, Dec. 14, 1967, abandoned. This application Feb. 9, 1971, Ser. No. 113,864

Int. Cl. C12d *1/04*

U.S. Cl. 195—37 **7 Claims**

A process for producing citric acid by aerobically fermenting an aqueous carbohydrate-containing nutrient medium with certain yeast strains.

3,717,550
LIQUID COMPOSITIONS OF BACTERIAL PROTEASE AND/OR AMYLASE AND PREPARATION THEREOF

Jack Ziffer, Milwaukee, Wis., assignor to Pabst Brewing Company, Milwaukee, Wis.

Filed Sept. 25, 1970, Ser. No. 75,764

Int. Cl. C07g *7/02*

U.S. Cl. 195—63 **20 Claims**

Liquid concentrates of bacterial protease and/or amylase of enhanced stability are prepared. Bacterial protease and/or amylase liquid compositions free of turbidity and a process of producing them are provided. These compositions have advantages over powdered enzymes in avoiding atmospheric contamination and are especially useful in detergents and in textile treatment.

3,717,551
METHOD OF CELL CULTURE

Bernard Bizzini, 18, rue Ernest Delosion, Neuilly; Jean-Claude Chermann, 14 rue du Prieure Saint-Nicolas, Villepreux; Claude Jasmin, 10, rue Mesnil, Paris, and Marcel Raynaud, 115, boulevard de la Reine, Versailles, all of France

Filed July 2, 1970, Ser. No. 52,062

Claims priority, application France, July 9, 1969, 6923294

Int. Cl. C12k *9/00*

U.S. Cl. 195—1.7 **2 Claims**

A method for the culture of cells of the type which grow in films and substantially in monolayers, the method being intended to be employed for virus production, the cells to be cultivated being fixed on porous silica spherules which are maintained in suspension in the culture medium.

3,717,552
APPARATUS FOR THE CULTIVATION AND RECOVERY OF MICROORGANISMS

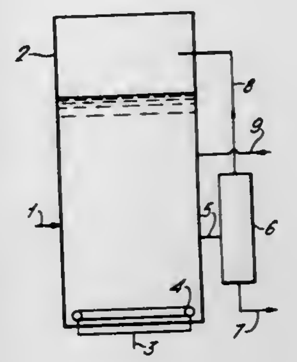
Jean Claude Hondermarck, Lavera, France; Ian Cameron Bennett, Ashford, England, and Jacques Guillo, Lavera, France, assignors to The British Petroleum Company Limited, London, England

Division of Ser. No. 867,019, Oct. 16, 1969. This application April 24, 1972, Ser. No. 246,758

Claims priority, application Great Britain, Oct. 18, 1968, 49,546/68

Int. Cl. C12b *1/18*

U.S. Cl. 195—142 **7 Claims**



A method and apparatus for the cultivation of micro-organisms wherein the pumping efficiency of cultivated broth removed from the cultivation zone is improved by first subjecting the removed cultivated broth to a separation step wherein aerated broth separated is from partially de-aerated broth under the action of the density differential between aerated broth and partially de-aerated broth, and thereafter pumping partially de-aerated broth back to the cultivation zone. The process is particularly suited to fermentations having external heat exchange means and in which the cultivated broth is highly aerated.

3,717,553

PROCESS AND APPARATUS FOR THE DISTILLATION OF A VINYL MONOMER

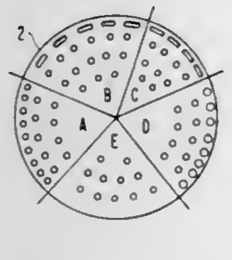
Susumu Otsuki; Kyoichi Hori, and Isao Miyanohara, all of Yamaguchi, Japan, assignors to Rohm and Haas Company, Philadelphia, Pa.

Filed June 8, 1970, Ser. No. 44,457

Claims priority, application Japan, June 6, 1969, 44/44470

Int. Cl. B01d *3/22*

U.S. Cl. 202—158 **5 Claims**



The distillation of vinyl monomers is carried out stably with inhibition of polymerization using a distillation tower having perforated trays devoid of downcomers, the trays being perforated with holes near the tower wall to cause a substantial wetting of the back surfaces of the trays and the tower wall with the liquid flowing down through the holes.

3,717,554

DEVICE FOR RECLAIMING SWEET WATER FROM SEA WATER OR BRACKISH WATER

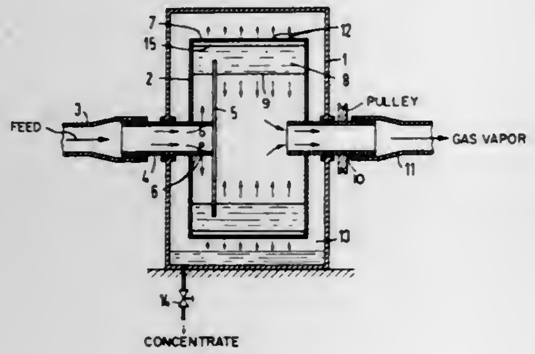
Klaus Ruthrof, Erlangen, Germany, assignor to Simens Aktiengesellschaft, Berlin and Munich, Germany

Filed March 27, 1970, Ser. No. 23,365

Claims priority, application Germany, March 29, 1969, P 19 16 337.2

Int. Cl. B01d *3/08, 1/22*

U.S. Cl. 202—238 **3 Claims**



Device for reclaiming potable water from non-potable water such as sea water or brackish water wherein the non-potable water is heated and fed into a centrifugal force field so that vaporization, due to low pressure occurring in a condenser located downstream of the centrifugal force field, takes place at the inner surface of a water ring formed by the centrifugal force field, includes an outer stationary chamber and an inner rotatably driven and rotationally symmetrical chamber, axial feeding means for non-potable water in one of the end faces of the inner chamber, axial discharge means in the end face of the inner chamber opposite the one end face thereof for gaseous medium produced in the inner chamber, the inner chamber having a casing formed with outlet openings for the water concentrated with residues, the inner and outer chambers defining an intermediate space therebetween for receiving the residue-concentrated water through the outlet openings, and an outlet line connected to the intermediate space for discharging the residue-concentrated water therefrom.

3,717,555

METHOD OF PRODUCING AN ELECTROLYTIC COATING ON ALUMINUM AND THE PRODUCT THEREOF

Diptiman Chakravarti; Jack G. Surendranath, and Richard Duncan Orth, all of Seattle, Wash., assignors to Fentron Industries, Inc., Seattle, Wash.

Continuation-in-part of Ser. No. 696,142, Jan. 8, 1968, abandoned. This application Nov. 27, 1970, Ser. No. 93,461

Int. Cl. C23b *9/02*

U.S. Cl. 204—35 N **8 Claims**

Integral anti-corrosive colored coatings on articles of aluminum or aluminum alloys free of an initial anodic coating are produced by passing an alternating current (A.C.) through a sulfuric acid bath containing metal ions which yield a colored integral metal sulfide and oxide on the aluminum article.

3,717,556

PROCESS FOR THE PREPARATION OF β-HALOGENO-ALKYL-ISOCYANATES

Klaus-Dieter Kampe, Frankfurt/Main, Germany, assignor to Farbwerke Hoechst Aktiengesellschaft vormals Meister, Lucius & Bruning, Frankfurt (Main), Germany

Filed June 5, 1970, Ser. No. 43,937

Claims priority, application Germany, June 14, 1969, P 19 30 329.8

Int. Cl. B01j *1/10;* **C07c** *119/04*

U.S. Cl. 204—158 R **14 Claims**

N-halogeno-alkyl-β-lactams are rearranged into β-halogeno-alkyl-isocyanates by contacting them with unsaturated organic compounds, optionally under irradiation. The products are highly reactive and useful for the synthesis of heterocyclic compounds.

3,717,557

POLYMERIZABLE INTERMEDIATES CONTAINING OLEFIN ANHYDRIDE COPOLYMER AND COPOLYMER OF UNSATURATED OXIRANE, AND UNSATURATED ANHYDRIDE

Frank C. Peterson, and Leslie P. Theard, both of San Diego, Calif., assignors to Fulf Oil Corporation

Filed Dec. 21, 1970, Ser. No. 100,510

Int. Cl. C08g *45/04*

U.S. Cl. 204—159.15 **10 Claims**

A new liquid composition comprising a polyanhydride, for example, the copolymer of maleic anhydride and an alpha-olefin, an olefinically unsaturated monooxirane compound such as glycidyl methacrylate, an olefinically unsaturated monoanhydride such as maleic anhydride and an olefin such as styrene. The composition is partially cured through the olefinic groups by ionizing gradiation to an intermediate homogeneous composition which is capable of being molded, particularly when in combination with a substrate such as fiber glass, and is further cured through anhydride and epoxide groups to a solid, infusible resin.

3,717,558

PHOTOPOLYMERIZATION CATALYST COMPRISING A METALLOCENE AND AN ACTIVE HALOGEN-CONTAINING COMPOUND

Vincent D. McGinniss, Middleberg Heights, Ohio, assignor to SCM Corporation, Cleveland, Ohio

Filed March 30, 1971, Ser. No. 239,709

Int. Cl. B01j *1/10, 1/12*

U.S. Cl. 204—159.15 **23 Claims**

Photosensitive catalyst compositions comprising a minor amount of a metallocene compound selected from the group consisting of Group I*b*, II*b*, IV*b*, V*b*, VI*b*, VII*b*, and VIII*b* metals having an atomic number of 22–27, excluding 26 as set forth in the Periodic Chart of the Elements and an activated halogenated compound selected from the group consisting of a halosulfonyl compound, an α,β-halo-substituted naphthalene, an allylic activated halogenated compound, and an acyl activated halogenated compound and a process for polymerizing vinyl monomers by subjecting a mixture of said photosensitive catalyst and vinyl monomer to ultraviolet light are set forth.

3,717,559

PROCESS FOR THE PREPARATION OF POLYPROPYLENE RESIN FOAMS

Minoru Oyama; Masaaki Yamada; Shunji Ohkubo, and Atsushi Osakada, all of Ohtsu-shi, Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed May 31, 1968, Ser. No. 733,584

Claims priority, application Japan, Feb. 18, 1967, 42/10159; May 31, 1967, 42/34234; Aug. 22, 1967, 42/53454; Sept. 21, 1967, 42/60165

Int. Cl. C08f *27/00, 47/10, 1/16*

U.S. Cl. 204—159.17 **12 Claims**

A process for the preparation of a polypropylene resin foam having closed cells by irradiating high energy rays onto a mixture of a polypropylene resin, a foaming agent, and a cross-linking promotor to cause cross-linking of the polypropylene resin and thereafter heating the mixture to a temperature higher than the decomposition temperature of the foaming agent.

3,717,560

MODIFICATION OF ETHYLENICALLY UNSATURATED POLYMERS WITH POLYFUNCTIONAL QUATERNARY AMIDOXIMIDINIUM SALTS

David S. Breslow, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.

Filed May 5, 1972, Ser. No. 250,774

Int. Cl. B01j *1/00;* **C08d** *1/00*

U.S. Cl. 204—159.18 **14 Claims**

The invention relates to the modification of ethylenically unsaturated polymers using polyfunctional quaternary amidoximidinium salts as the modifying agents. These salts are precursors to the corresponding polyfunctional nitrile N-oxides and the latter, upon being generated from the salt precursors, are the active modifying agents in the modification process. Representative of these salts is terephthalo-bis(hydroximoyl pyridinium chloride).

3,717,561

PHOTONITROSATION OF NORMAL PARAFFINS

Orville W. Rigdon, Groves; Robert S. Edwards, and Edward H. Holst, both of Nederland, all of Tex., assignors to Texaco Inc., New York, N.Y.

Continuation-in-part of Ser. No. 674,612, Oct. 11, 1967. This application March 15, 1971, Ser. No. 124,473

Int. Cl. B01j *1/10*

U.S. Cl. 204—162 XN **10 Claims**

A process for producing normal paraffin oximes and, in particular, normal paraffin oximes having from 10 to 13 carbon atoms wherein a C_{10} to C_{13} normal paraffin is photochemically reacted with a gaseous nitrosating agent where the photolytic reaction is conducted under the influence of a sodium arc lamp producing light in the wavelength of about 380 millimicrons to about 760 millimicrons and preferably where the principal emission spectra is from about 550 to 650 millimicrons.

3,717,562

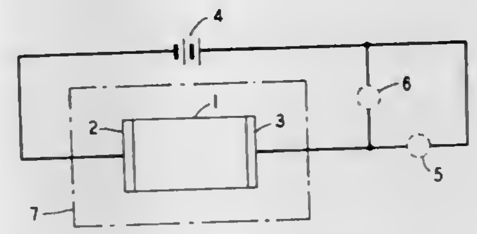
FERROELASTIC $TB_2(MOO_4)_3$ AND DEVICES INCORPORATING

David Paul Schinke, Berkeley Heights, and Le Grand Gerard Van Uitert, Morris Township, Morris County, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed July 15, 1970, Ser. No. 54,996

Int. Cl. B01d *13/02;* **B01k** *5/00*

U.S. Cl. 204—180 R **14 Claims**



High temperature electric field treatment of $Tb_2(MoO_4)_3$ in the presence of hydrogen or deuterium results in a significant decrease in the drive voltage required to switch crystals ferroelastically.

3,717,563

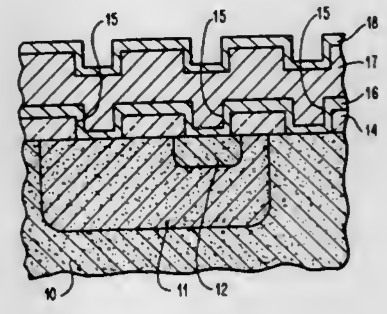
METHOD OF ADHERING GOLD TO AN INSULATING LAYER ON A SEMICONDUCTOR SUBSTRATE

Martin Revitz, Poughkeepsie, and Francis E. Turene, Wappingers Falls, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Original application Dec. 30, 1969, Ser. No. 889,203. Divided and this application June 9, 1971, Ser. No. 151,332

Int. Cl. C23c *15/00*

U.S. Cl. 204—192 **9 Claims**



A deposited film of gold is adhered to a layer of silicon dioxide by a deposited film of beta tantalum. After the gold is deposited on the beta tantalum, a second film of beta tantalum is deposited on the gold. This forms a composite sandwich adhering the gold to the silicon dioxide without decreasing the conductivity of the gold and allowing another layer of silicon dioxide to be adhered to the second film of beta tantalum.

3,717,564

FABRICATION METHOD FOR MAKING AN ALUMINUM ALLOY HAVING A HIGH RESISTANCE TO ELECTROMIGRATION

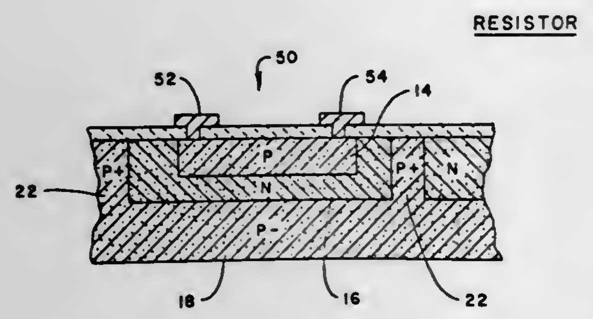
Harshad J. Bhatt, Wappingers Falls, N.Y., assignor to Cogar Corporation, Wappingers Falls, N.Y.

Division of Ser. No. 40,635, May 26, 1970, Pat. No. 3,631,304. This application Oct. 1, 1971, Ser. No. 185,695

Int. Cl. C23c *15/00*

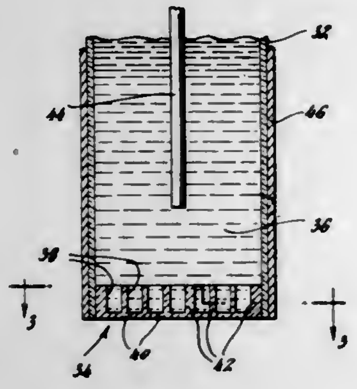
U.S. Cl. 204—192 **15 Claims**

This disclosure is directed to an improved semiconductor device, electrical conductor, thin film conductor, and fabrication methods therefor. An aluminum-aluminum oxide alloy conductor is disclosed which has a high resistance to electromigration and hence, a conductor lifetime greater by at least a factor of 10 than unalloyed aluminum conductors.



Semiconductor devices utilizing this aluminum alloy in the thin film conductive stripes interconnecting different conductivity regions or devices located in the semiconductor substrate are significantly improved and more reliable.

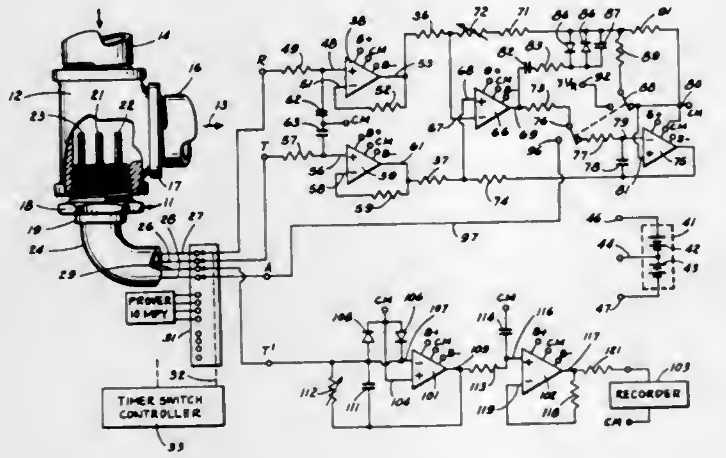
3,717,565
ION-RESPONSIVE ELECTRODE CONSTRUCTION
Nicholas E. Doyle, Jr., Norwood, Mass., assignor to The Foxboro Company, Foxboro, Mass.
Filed Aug. 19, 1970, Ser. No. 65,083
Int. Cl. G01n *27/36*
U.S. Cl. 204—195 G **5 Claims**



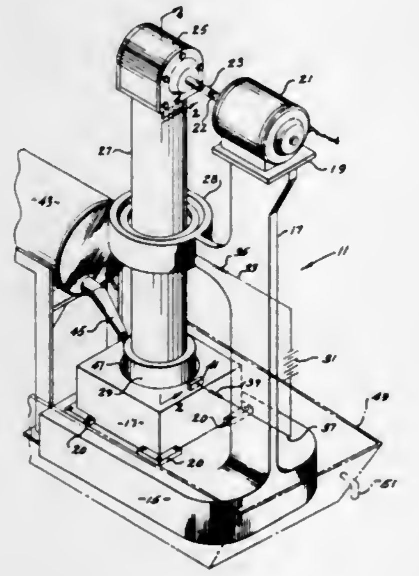
An ion-sensing electrode including a fragile ion-sensitive membrane supported by a reinforcing structure in the form of a honeycomb to provide for the membrane mechanical strength and resistance to damage. The reinforcing structure and membrane can be formed as a single homogeneous unit by molding from ion-sensitive glass, and/or by machining techniques.

3,717,566
CORROSION RATEMETER
Homer M. Wilson, Houston, Tex., assignor to Petrolite Corporation, St. Louis, Mo.
Filed Nov. 11, 1971, Ser. No. 197,871
Int. Cl. G01n *27/26*
U.S. Cl. 204—195 C **10 Claims**

A corrosion ratemeter with test specimen, reference and third electrodes contactable by a corrodant. A voltage loop circuit connects the reference and test eletrodes in first and second arms of a balanced bridge to the inputs of a differential input amplifier and circuit common. The amplifier output connects to a signal correction means in "null" operation. Third and fourth bridge arms connect the inputs of the amplifier to circuit common of the D.C. source and one arm includes the signal correction means. A reference signal in one bridge arm controls the amplifier to pass current between the test and third electrodes for producing a polarization potential (e.g. 10 mv.) between the test and reference electrodes. Readout means monitor the polarization current which is indicative of the corrosion rate occurring at the test electrode. The signal correction means balances the bridge during "null and measurement" operations relative to the freely corroding potential present at the test and reference electrodes whereby the ratemeter exhibits very high input impedance and high common mode rejection characteristics against extraneous electrical noise.

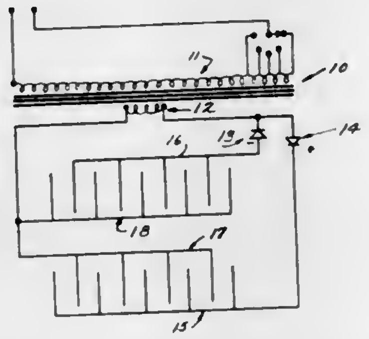


3,717,567
USE OF SONIC RESONANT ENERGY IN ELECTRICAL MACHINING
Albert G. Bodine, 7877 Woodley Ave., Van Nuys, Calif. 91406
Original application May 29, 1967, Ser. No. 642,085, now Patent No. 3,567,604. Divided and this application Oct. 26, 1970, Ser. No. 83,908
Int. Cl. B01k *3/00;* **B23p** *1/02*
U.S. Cl. 204—222 **7 Claims**



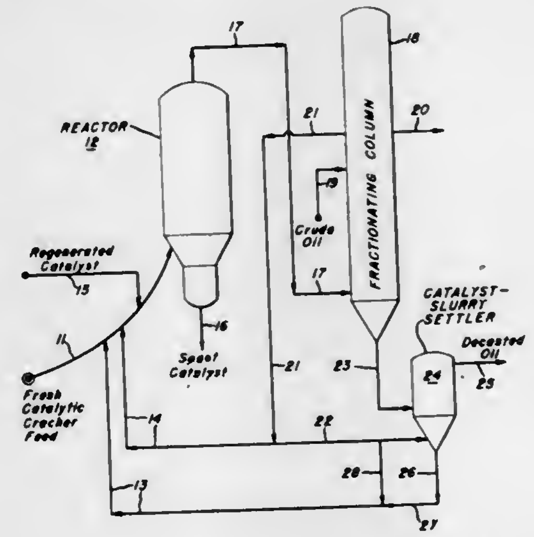
A device for electrical machining which consists of applying sonic energy to the work tool element. The work tool is resonantly vibrated so that a wave pattern is transmitted to the tip thereof adjacent the workpiece and is transmitted through the working fluid to the workpiece.

3,717,568
APPARATUS FOR REMOVING MINERALS FROM ORE
Donald A. Brown, Lakeside, and George W. Leech, Whiteriver, both of Ariz., assignors to Bro-Lee Incorporated, Globe, Ariz.
Continuation-in-part of Ser. No. 670,595, Sept. 26, 1967, Pat. No. 3,535,218. This application April 21, 1970, Ser. No. 30,502
Int. Cl. B01k *3/00*
U.S. Cl. 204—228 **11 Claims**



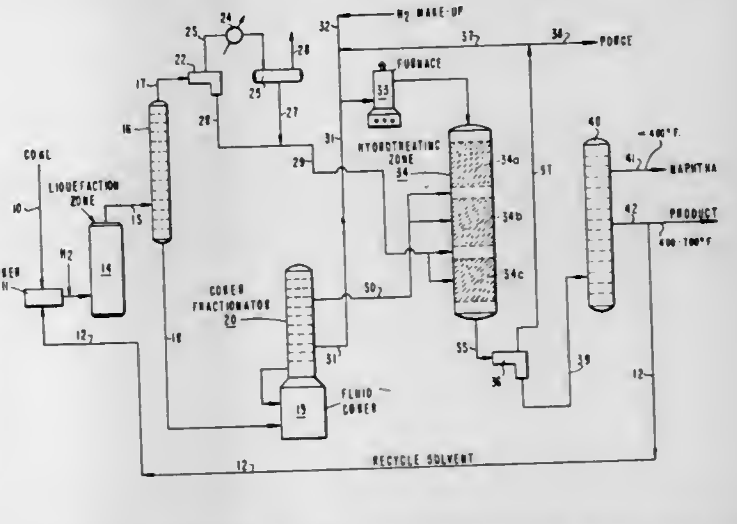
An apparatus for electrolytically precipitating copper dissolved from ores and the like wherein the precipitation is accomplished with a pulsating direct current. The direct current supplied to the anode and cathode is periodically reversed in polarity with respect to the anode and cathode whereby the previous anode becomes the cathode and the previous cathode becomes the anode. Upon reversal of the polarity, the copper precipitated on the previous cathode falls off of the then functioning anode. There is also provided an improved electrolyte for use in the process containing sulfuric acid with a minor amount of lead dissolved therein.

3,717,569
METHOD FOR INCREASING A REFINERY'S CAPACITY FOR PROCESSING METALS-CONTAINING RESIDUAL-TYPE HYDROCARBONS
LeRoy McAllister, Hammond, Ind., and Francis J Citek, South Holland, Ill., assignors to Standard Oil Company, Chicago, Ill.
Continuation of Ser. No. 694,248, Dec. 28, 1967, abandoned. This application Jan. 22, 1971, Ser. No. 108,960
Int. Cl. C10g *7/00, 11/00*
U.S. Cl. 208—92 **10 Claims**



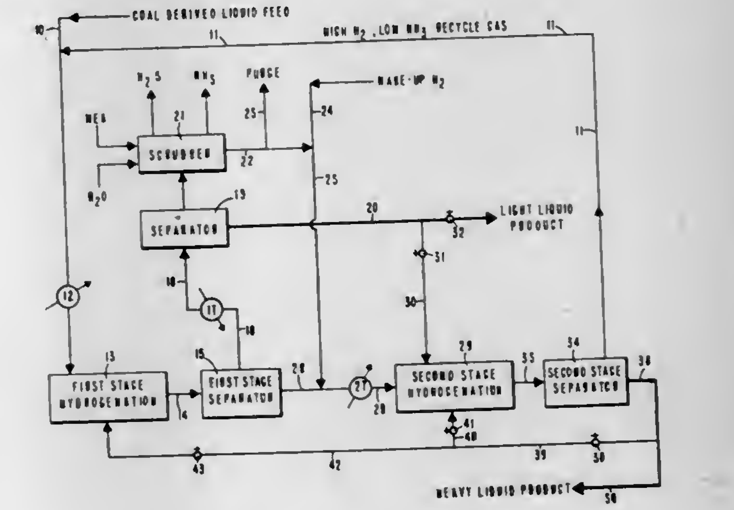
The method comprises introducing a petroleum hydrocarbon stream containing metals, hydrocarbons having coke-forming tendencies, and residual-type hydrocarbons into the fractionating column associated with a catalytic cracking unit of the refinery. The introduction of the petroleum hydrocarbon stream into the fractionating column is accomplished at a point in the fractionating column above which substantially all of the recycle material is withdrawn from the fractionating column; it may comprise the injection of the petroleum hydrocarbon stream into the baffle section of the fractionating column. The petroleum hydrocarbon stream may be a crude oil, may be desalted, and may have been treated for the removal of any amount of water which is contained therein and which would appreciably and suddenly increase the amount of liquid water being added to the fractionating column.

3,717,570
SIMULTANEOUS HYDROFINING OF COKER GAS OIL, VACUUM GAS OILS AND VIRGIN KEROSENE
Jack M. Hochman, 55 Lorraine Terrace, Boonton, N.J., and Harold N. Weinberg, 11 Straford Drive, Livingston, N.J.
Filed Feb. 5, 1971, Ser. No. 112,938
Int. Cl. C10g *23/02*
U.S. Cl. 208—210 **3 Claims**



A plurality of feedstreams are simultaneously hydrofined in a single reactor which provides four hydrofining zones. A coker gas oil is passed into the first hydrofining zone; vacuum gas oil quenches the hydrofined effluent from the first and second hydrofining zones, and virgin kerosene quenches the hydrofined effluent from the third hydrofining zone. Desulfurized and denitrogenated light ends, jet fuel and catalytic cracker feed are recovered.

3,717,571
HYDROGEN PURIFICATION AND RECYCLE IN HYDROGENATING HEAVY MINERAL OILS
Bernard L. Schulman, Livingston, N.J., assignor to Esso Research and Engineering Company
Filed Nov. 3, 1970, Ser. No. 86,494
Int. Cl. C10g *23/00*
U.S. Cl. 208—254 H **7 Claims**



Heavy mineral oils with high nitrogen contents are hydrogenated in two stages, with gas effluent from only the first stage being scrubbed to remove ammonia and then sent to the second stage with hydrogen makeup, the gas effluent from the second stage being recycled without scrubbing as the hydrogen feed for the first stage, the first stage effluent undergoes separation in two high pressure zones to produce light liquid hydrocarbons as a product of the process.

3,717,572

PROCESS OF FRACTIONATING HYDROCARBON MIXTURES CONTAINING OLEFINS AND ITS APPLICATION TO THE PURIFICATION OF ISOOLEFINS

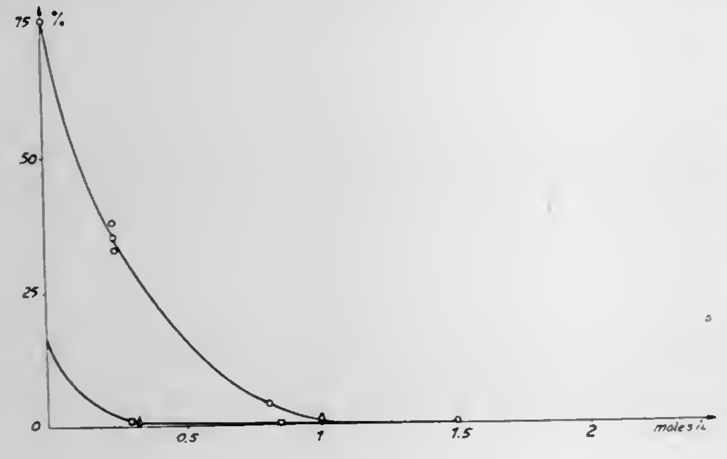
Arnaud Marie-Jose de Gramont, and Jean Maurin, both of Seine-Maritime, France, assignors to Compagnie Francoise De Raffinage, Paris, Seine, France

Continuation of Ser. No. 767,005, Oct. 10, 1968, abandoned. This application Jan. 27, 1971, Ser. No. 110,346

Claims priority, application France, Oct. 12, 1967, 67124217; Oct. 12, 1967, 67124218

Int. Cl. C10g *25/04*

U.S. Cl. 208—310 **16 Claims**



A process has been provided for fractionating mixtures of hydrocarbons which contain olefins by means of molecular sieves which comprises neutralizing said sieves by impregnating the same with a solution of a strong inorganic base, contacting a stream of hydrocarbons to be fractionated with the sieves thus neutralized, and desorbing the hydrocarbons absorbed by the sieves.

3,717,573

REMOVAL OF PETROLEUM HYDROCARBONS FROM WATER SURFACES

Joel Warren, Fort Lauderdale, Fla., assignor to Pfizer Inc., New York, N.Y.

No Drawing. Filed June 16, 1969, Ser. No. 833,725

Int. Cl. C02b *9/02*

U.S. Cl. 210—40 **6 Claims**

A process for removing petroleum hydrocarbons from the surface of fresh or saline waters by dispersing magnetic iron oxide in the presence of wetting agent on the surface of oil-contaminated water, and removing oil-adsorbed metallic particles by means of magnetic attraction.

3,717,574

FLOCCULATION OF COAL SLIMES

Michael Francis Werneke, Stamford, Conn., assignor to American Cyanamid Company, Stamford, Conn.

Filed Sept. 21, 1971, Ser. No. 182,519

Int. Cl. C02b *1/20*

U.S. Cl. 210—53 **10 Claims**

Colloidal coal particles in aqueous alkaline medium are flocculated by the combined action of a low molecular weight water-soluble anionic polymer at least 50 mol percent composed of acrylic acid linkages and a high molecular weight anionic polymer at least 95 mol percent composed of acrylamide linkages, and adjusting the pH of the aqueous medium to a value below 7. A water-soluble anionic starch may be added as supplementary flocculant.

3,717,575

SPANDEX LUBRICANT

William Wirt Rankin, Charleston, W. Va., assignor to Union Carbide Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 828,717, May 28, 1969, abandoned. This application May 25, 1971, Ser. No. 146,844

Int. Cl. C10m *1/52;* **D06m** *15/52, 15/66*

U.S. Cl. 252—8.8 **27 Claims**

This invention relates to lubricating finishes for Spandex fibers, which finishes contain a mineral oil, a silicone oil, and an aminoalkyl-modified polyorganosiloxane to which may be added oleic acid or iso-stearic acid and/or butyl stearate. The finishes of this invention prevent blocking of the Spandex fibers, inhibit build-up of the finish on processing rolls, and result in treated Spandex fibers having desirable "hand."

3,717,576

GRAPHITE FLUORIDE-SYNTHETIC RESIN COMPOSITE MATERIAL

Toshio Hiratsuka and Toshio Shimada, Yokohama, Japan, assignors to Nippon Carbon Co., Ltd., Tokyo, Japan

Filed July 14, 1969, Ser. No. 841,296

Int. Cl. C10m *5/02, 5/20*

U.S. Cl. 252—12 **2 Claims**

A method of making a composite bearing which comprises mixing and molding a synthetic resin, graphite fluoride, and a third component selected from artificial graphite, natural graphite, and non-crystalline carbon.

3,717,577

STABILIZED OLEFIN POLYMERS

Clive D. Moon, Bartlesville, Okla., assignor to Phillips Petroleum Company

No Drawing. Continuation of application Ser. No. 639,636, May 19, 1967. This application Feb. 6, 1970, Ser. No. 9,091

Int. Cl. C08g *51/54*

U.S. Cl. 260—45.7 S **5 Claims**

Olefin polymers are stabilized to minimize melt index or melt flow decrease at elevated temperatures by admixing the polymer with an alkali metal nitrite, an alkali metal nitrite and an alkali metal bisulfite, or mixtures thereof, the concentration of the alkali metal nitrite and the alkali metal bisulfite in the stabilized polymer being in the range of 0.005 to 0.3 weight per cent each. When minimum discoloration of the polymer is desired, the concentration of the alkali metal bisulfite and/or the alkali metal nitrite is maintained in the range of 0.005 to 0.01 weight percent.

3,717,578

ANNULAR MAGNET CORE BUILT UP FROM A SOFT MAGNETIC FERRITE MATERIAL AND METHOD OF MANUFACTURING THE SAME

Nicolaas Petrus Slijkerman and Cornelis Jacobus Esveldt, Emmasingel, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

No Drawing. Continuation of abandoned application Ser. No. 831,762, June 9, 1969. This application May 27, 1971, Ser. No. 147,656

Claims priority, application Netherlands, June 8, 1968, 6808112

Int. Cl. C04b *35/26*

U.S. Cl. 252—62.61 **3 Claims**

Annular ferrite cores having an outside diameter not exceeding 0.6 mm. and an inside diameter of at least half of the outside diameter as memory cores in electronic computers having a composition expressed in molar percentages of the ferrite-forming oxides within the following range: 74.5–80.0 mol percentage Fe_2O_3; 12.5–14.6 mol percent Li_2O; 3.0–8.0 mol percent ZnO; and maximally 6.1 mol percent NiO.

These cores have pulse characteristics which are substantially temperature-insensitive over an extensive temperature range, and are responsive to comparatively weak current pulses.

In the manufacture of these magnet cores they are cooled, after heating, to room temperature at a substantially constant speed.

3,717,579

BIOCIDAL PREPARATION

Eberhard Hofmann, 43 Essen-Bredeney, and Ulrich Holtschmidt, Essen, both of Germany, assignors to Th Goldschmidt A.G., Essen, Germany

Filed Oct. 5, 1970, Ser. No. 78,246

Int. Cl. C11d *3/48, 3/26*

U.S. Cl. 252—106 **5 Claims**

A synergistic, biocidally active mixture comprises surface active amines and/or aminoacids and 2-alkyl-amino-6-aminopyridines.

3,717,580

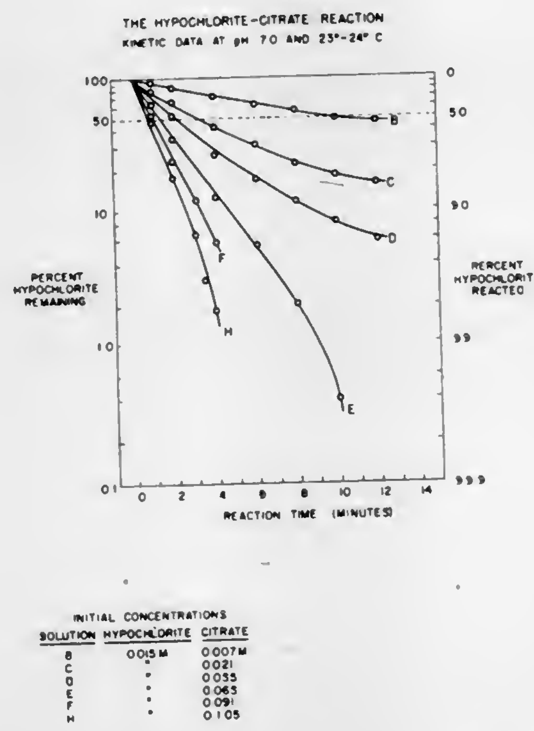
METHOD OF DISINFECTING AND SELF-LIMITING SOLUTION THEREFOR

William H. Echols, Oxon Hill, Md., George H. Fielding, Alexandria, Va., and Rex A. Neihof, Oxon Hill, Md., assignors to the United States of America as represented by the Secretary of the Navy

Filed Dec. 2, 1969, Ser. No. 881,343

Int. Cl. C11d *7/18, 3/48*

U.S. Cl. 252—106 **9 Claims**



INITIAL CONCENTRATIONS

SOLUTION	HYPOCHLORITE	CITRATE
B	0.015 M	0.007 M
C	"	0.021
D	"	0.035
E	"	0.063
F	"	0.091
H	"	0.105

A solution containing an inorganic hypochlorite salt and an inorganic salt of a hydroxy carboxylic acid and optionally containing an acid to adjust the pH to 4.5–8 and/or a detergent, which disinfects sensitive materials without harming the material by remaining active for a short period of time due to a self consummation feature of the solution.

3,717,581

METHOD FOR THE PREPARATION OF GRAINS

Arend J. Noothout, Oosterbeek, Netherlands, assignor to Reactor Centrum Nederland, The Hague, Netherlands

No Drawing. Filed Jan. 5, 1970, Ser. No. 839

Claims priority, application Netherlands, Jan. 6, 1969, 6900701

Int. Cl. C09r *3/00*

U.S. Cl. 252—301.1 R **18 Claims**

A method for preparing particles of metal hydroxide gels by treating a concentrated aqueous solution of at least one hydrolyzable metal salt, the hydroxide of which is only slightly soluble in water, simultaneously with ammonia and heat. The solid substance thus obtained is separated, washed and heated thereby converting the solid substance to metal oxide particles. The hydrolyzable metal salt starting materials are concentrated solutions anion-deficient metal salt solutions, having a ratio of conjugated base to metal lower than that of the normal salt. When a nitrate-deficient uranyl nitrate solution is mixed with an ammonia-releasing agent, then dispersed in a hot phase immiscible with the aqueous phase, the resulting solidification produces microspheres of uranyl nitrate, which are useful as fuel cells in nuclear reactors.

3,717,582

METHOD FOR REDUCING THE OXYGEN IN CERTAIN ACTINIDE OXIDES TO LESS THAN STOICHIOMETRIC LEVELS

Terrence B. Lindemer, and Ronnie A. Bradley, both of Oak Ridge, Tenn., assignors to The United States of America as represented by the United States Atomic Energy Commission

Filed April 21, 1971, Ser. No. 136,254

Int. Cl. C01g *56/00*

U.S. Cl. 252—301.1 R **5 Claims**

The oxygen content of actinide oxide nuclear reactor fuels is reduced to a value less than stoichiometric (oxygen-to-metal atomic ratio less than two, i.e., MO_{2-x}) for inhibiting corrosion or pressurization of the cladding used about the fuel. Actinide oxide particles, e.g., uranium-plutonium oxide particles, with an oxygen-to-metal atomic ratio of about two or greater (MO_{2+x}) are disposed in close proximity to carbon and contacted with carbon monoxide while at a temperature in the range of 700°–2,000°C. The CO effects diffusion of oxygen from the particles in the form of oxygenated CO, e.g., CO_2, to the carbon where the CO_2 reacts to form CO. By controlling the pressure of the CO and the temperature, a CO-to-CO_2 ratio is provided to fix the oxygen-to-metal ratio of the oxide at the desired substoichiometric value.

3,717,583

NEODYMIUM GLASS LASER HAVING ROOM TEMPERATURE OUTPUT AT WAVELENGTHS SHORTER THAN 1060 NM.

Robert R. Shaw, Sturbridge, and Donald R. Uhlmann, Newton, Mass., assignors to American Optical Corporation, Southbridge, Mass.

Filed Mar. 10, 1971, Ser. No. 122,722

Int. Cl. C03c *3/28;* **C09k** *1/04*

U.S. Cl. 252—301.4 F **2 Claims**

Laserable material doped with a quantity of neodymium ions in a low concentration (vis., .10–3 wt. percent) which results in the glass exhibiting a ratio of fluorescent intensity peaked at 920 nanometers over the fluorescent intensity peaked at approximately 1060 nanometers of at least .4 as measured by a Cary Model 14 spectrophotometer. The glasses enable the generation of laser light in a waveband with an optical center at about 920 nanometers at room temperature (approximately 20° C.) when positioned in a laser cavity which is resonant at 920 nanometers. Two such laserable glasses are given below in weight percent:

CaO	46.8	43.6
Al_2O_3	39.8	37.0
MgO	4.8	4.5
SiO_2	4.8	
BaO		11.4
N_2dO_3	3.8	3.5

3,717,584
METHOD FOR PREPARING RARE EARTH OXIDE PHOSPHORS

William H. Byler, Landing, and James J. Mattis, Long Valley, both of N.J., assignors to U.S. Radium Corporation

Continuation-in-part of Ser. No. 685,219, Nov. 22, 1967, abandoned. This application June 11, 1970, Ser. No. 45,402

Int. Cl. C09k *1/10*

U.S. Cl. 252—301.4 R **12 Claims**

Rare earth phosphors with excellent optical and screening properties and optimum particle size distribution for the preparation of color television tubes are prepared by treating rare earth salts such as oxalate, tartrate or sulfate containing at least one rare earth metal, and an activator, with a caustic solution, firing the caustic treated rare earth salts to high temperatures in a non-reducing atmosphere to form oxides, and thereafter wet milling, washing, and drying to prepare said phosphors. The phosphors thus obtained contain a small amount of retained alkali up to about 3 percent by weight, at least a major portion of which can be removed by the sequential treatment including the steps of refining, washing, neutralizing the slurry with acid and drying. The preferred phosphors have the general formula

$$[R_{1-x}Eu_x]_2O_3+(Li_{1-m}Na_m)$$

wherein R is $Gd_{1-n}Y_n$, x is a value from 0.02 to 0.10, *m* and *n* each is a value from zero to 1 and $(Li_{1-m}Na_m)$ is the retained alkali, the weight of which is preferably less than about 1.5 percent.

3,717,585
PROMOTED TRIHYDROCARBYLPHOSPHINE MODIFIED CARBONYL COBALT CATALYST SYSTEM

Darryl R. Fahey, Bartlesville, Okla., assignor to Phillips Petroleum Company

Division of Ser. No. 28,072, April 13, 1970. This application Jan. 8, 1971, Ser. No. 105,111

Int. Cl. C07c *5/14, 5/16*

U.S. Cl. 252—431 P **10 Claims**

The hydrogenation of cyclic and acyclic dienes to monoenes is improved by promoting trihydrocarbylphosphine modified carbonyl cobalt catalysts with alcohols, ethers, and amides.

3,717,586
FLUORIDED COMPOSITE ALUMINA CATALYSTS

Robert M. Suggitt; John H. Estes, and Stanley Kravitz, all of Beacon, N.Y., assignors to Texaco Inc., New York, N.Y.

Filed June 25, 1970, Ser. No. 49,958

Int. Cl. B01j *11/74, 11/78*

U.S. Cl. 252—439 **15 Claims**

A method for preparing a hydrocarbon conversion catalyst by providing a composite composed of alumina having associated therewith a Group VIB or VIII metal or compound and contacting the composite with an activator system comprising hydrogen and an organic fluoride compound having from two to 16 carbon atoms. The catalysts so prepared are useful in such hydrocarbon conversion processes as isomerization, hydrocracking, reforming, alkylation, disproportionation, polymerization and hydrogenation.

3,717,587
CATALYST AND METHOD OF PREPARING THE SAME

Leonard S. Hepner, Haddonfield, N.J., assignor to Mobil Oil Corporation

No Drawing. Filed Apr. 13, 1970, Ser. No. 27,992

Int. Cl. B01j *11/40*

U.S. Cl. 252—455 Z **14 Claims**

New catalyst for hydroconversion of organic feedstocks and method of preparing such catalyst. Catalyst comprises an inorganic oxide gel matrix having dispersed therein a crystalline aluminosilicate zeolite. Matrix is treated, prior to heat ageing, with acid to adjust the molar ratio of OH/SiO_2 to from about 0.18 to 0.21. The catalyst exhibits superior low coking tendencies.

3,717,588
AMORPHOUS ALUMINODISILICATE SUPPORTED CATALYST

Warner Alexander, Brookhaven, Kenneth F. Gosselin, Village Green, and James E. McEvoy, Springfield, Pa., assignors to Air Products and Chemicals, Inc., Philadelphia, Pa.

No Drawing. Filed Mar. 12, 1971, Ser. No. 123,844

Int. Cl. B01j *11/40*

U.S. Cl. 252—455 R **1 Claim**

A significant amount of transitional catalytically active metal component is ion-exchanged into a synthetic crystalline zeolitic alkali aluminodisulicate such as sodalite. The thus ion-exchanged zeolite, containing a measurable amount of residual alkali is hydrogen-treated at an elevated temperature such as 900° F., thereby reducing the metallic ion and decreasing zeolitic crystallinity. A catalyst comprising amorphous aluminodisilicate matrix as the support for the reduced transitional metal component is recovered after cooling. Such catalyst is effective as a hydrogenation catalyst and/or for other reactions requiring a supported metal catalyst.

3,717,589
SODIUM NITRILOTRIACETATE AND PROCESSES FOR PRODUCING SAME

William A. Feiler, Harold E. Feierstein, and Chung Yu Shen, St. Louis, Mo., and Norman Earl Stahlheber, Columbia, Ill., assignors to Monsanto Company, St. Louis, Mo.

No Drawing. Filed Sept. 17, 1970, Ser. No. 73,200

Int. Cl. C11d *3/066*

U.S. Cl. 252—523 **8 Claims**

This invention relates to a detergent additive containing sodium nitrilotriacetate prepared by spray drying and which may be post added to dry detergent formulations.

3,717,590
LIQUID WATER-SOLUBLE DETERGENT COMPOSITIONS

Robert L. Fetty, 753 31st Avenue, Columbus, Nebr.

Filed Dec. 17, 1970, Ser. No. 99,317

Int. Cl. C11d *3/065*

U.S. Cl. 252—540 **8 Claims**

Liquid water-soluble detergent compositions having improved adhesion to vertical surfaces without the tendency to evaporate yet are easily removed with water pressure are disclosed. The compositions are useful in removing grease and oil from the surfaces of automobile engines and compartments.

3,717,591
DETERGENT FORMULATIONS

Meiling T. Yang, Lubbock, Tex., assignor to Ethyl Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 825,980, May 19, 1969, abandoned, and a continuation-in-part of Ser. No. 825,981, May 19, 1969, abandoned. This application Feb. 12, 1971, Ser. No. 115,063

Int. Cl. C11d *3/26*

U.S. Cl. 252—545 **21 Claims**

To obviate eutrophication of water, non-phosphorus detergent builders are provided. These are the water-soluble salts (e.g., the trisodium salts) of taurine-N,N-diacetic acid, nitrilodiacetic acid-monomethylene sulfonic acid or mixtures thereof. Conventional detergent actives may be used with these builders.

3,717,592
CROSS-LINKING EPIHALOHYDRIN POLYMERS

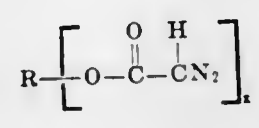
Terence W. Rave, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.

Continuation-in-part of Ser. No. 822,036, May 5, 1969, abandoned. This application Jan. 27, 1971, Ser. No. 110,322

Int. Cl. C08g *23/20*

U.S. Cl. 260—2 A **7 Claims**

Epihalohydrin polymers can be cross-linked by reaction with a poly(diazoacetate) having the general formula



$$R\left[-O-\overset{\overset{O}{\|}}{C}-\overset{\overset{H}{|}}{C}N_2\right]_x$$

where *x* is an integer greater than 1 and R is an organic radical inert to modification reactions. The reaction between the poly(diazoacetate) and polymer can be initiated either by heating or by exposing to ultraviolet radiation.

3,717,593
A COMPOSITION COMPRISING A 1,2-POLYEPOXIDE AND PIPERIDINE DERIVITIVE AS CURING AGENT

Helmut Zondler, Allschwil, Switzerland, and Wolfgang Pfleiderer, Konstanz, Germany, assignors to Ciba-Geigy AG, Basle, Switzerland

Filed March 17, 1971, Ser. No. 125,382

Claims priority, application Switzerland, March 23, 1970, 4337/70

Int. Cl. C08g *30/14*

U.S. Cl. 260—2 N **8 Claims**

The new compound 4-amino-3-aminomethylpiperidine is manufactured by hydrogenating 4-amino-3-cyano-1,2,5,6-tetrahydropyridine in a manner which is in itself known. The 4-amino-3-cyano-1,2,5,6-tetrahydropyridine used as the starting substance can be obtained by cyclisation of bis-cyanoethylenated ammonia. The new compound 4-amino-3-aminomethylpiperidine represents a valuable curing agent for epoxide resins, and advantageously 0.5 to 1.3 equivalents of nitrogen-bonded active hydrogen atoms of the 4-amino-3-aminomethylpiperidine are used per 1 equivalent of epoxide groups of the polyepoxide compound.

3,717,594
STABILIZING CATION RESINS

Leo F. Ryan, Somerville, N.J., assignor to Ecodyne Corporation, Chicago, Ill.

Filed Jan. 19, 1970, Ser. No. 4,119

Int. Cl. B01d *15/06;* **C02b** *1/76*

U.S. Cl. 260—2.2 R **11 Claims**

Polyvinyl aryl sulfonate resins are stabilized against sulfonate leakage by leaching with water at a temperature of about 340° to 400° F. for at least about one hour to remove weakly held sulfonate groups. The resin may be further stabilized by converting about 5 to 30 percent of the ion exchange sites to the divalent or polyvalent metal form; preferably the barium or calcium form.

3,717,595
CELL STABILIZER FOR VINYL RESIN FOAMS

Elwood E. Huntzinger, Springfield, and Nelson N. Schwartz, Broomal, both of Pa., assignors to Air Products and Chemicals, Inc., Philadelphia, Pa.

Filed Nov. 25, 1970, Ser. No. 92,850

Int. Cl. C08f *47/10, 29/24*

U.S. Cl. 260—2.5 P **13 Claims**

Production of cellular vinyl foams having desirably low density, good physical characteristics, fine uniform cell structure and the capability for production with short cycle times is achieved by incorporating a new cell stabilizer additive in a foamable precursor composition, such as a plastisol comprising a vinyl resin, plasticizer and blowing agent. The cell stabilizer additive is one or more of the copolymers obtained by the copolymerization of (A) a monomeric C_2 to C_6 methacrylate and (B) a nitrogen-containing, ethylenically unsaturated monomer in an amount providing nitrogen in the copolymerizate in the range of 0.1 to 10 percent by weight.

3,717,596
CARBODIIMIDE FOAMS AND PROCESS FOR PREPARING CARBODIIMIDE FOAMS FROM CO-CATALYST SYSTEMS

Peter T. Kan, Plymouth, Moses Cenker, Trenton, and John T. Patton, Jr., Wyandotte, Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

No Drawing. Filed Aug. 5, 1971, Ser. No. 169,470

Int. Cl. C08g *22/44, 22/38*

U.S. Cl. 260—2.5 BF **15 Claims**

Rigid cellular foam compositions characterized by carbodiimide linkages are prepared by catalytically condensing an organic polyisocyanate in the presence of 2,4,6-tris(N-methylethanolamino)-s-triazine or, alternatively, in the presence of a co-catalyst system of (a) 2,4,6-tris(N-methylethanolamino)-s-triazine and (b) catalyst selected from the group consisting of (1) 1,3,5-tris(N,N-dialkylaminoalkyl)-s-hexahydrotriazine, (2) 2,4,6-tris(dimethylaminoethyl) phenol, (3) o-, p-, and a mixture of o- and p-dimethylaminomethylphenol, and (4) an organotin compound.

3,717,597
SELF-EXTINGUISHING POLYURETHANE FOAM COMPOSITE MATERIALS AND METHOD OF PREPARING SAME

Robert G. Hesskamp, St. Louis County, Mo.; Kenneth P. Meyer, East St. Louis, Ill., and Rogelio Tornero, Ferguson, Mo., assignors to M R Plastics and Coatings, Inc., Maryland Heights, Mo.

Filed Oct. 26, 1971, Ser. No. 192,556

Int. Cl. C08g *51/60, 22/44*

U.S. Cl. 260—2.5 AJ **7 Claims**

Self-extinguishing composite material comprises particulate polyurethane foam bound together with a binder. The binder forms a network within which the particles of foam material are included. At least about 6.67 parts by weight urea per 100 parts by weight foam are distributed throughout the composite and located between the foam particles. The urea serves as a fire retardant for the composite. A method of preparing self-extinguishing foam composites is also disclosed.

3,717,598
POLYAMIDE COMPOSITIONS

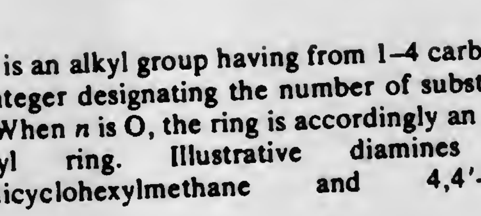
Edgar R. Rogier, Minnetonka, Minn., assignor to General Mills, Inc.

Continuation-in-part of Ser. No. 551,925, May 23, 1966, abandoned. This application Dec. 5, 1968, Ser. No. 781,587

Int. Cl. C03c *27/06;* **C09j** *3/00*

U.S. Cl. 260—18 N **1 Claim**

There is disclosed polyamide compositions of fractionated polymeric fat acids and diamines of the formula



where R′ is an alkyl group having from 1–4 carbon atoms and n is an integer designating the number of substituent groups present. When *n* is O, the ring is accordingly an unsubstituted cyclohexyl ring. Illustrative diamines are 4,4′-diaminodicyclohexylmethane and 4,4′-diamino-3,3′-

dimethyldicyclohexylmethane. Copolymerizing dibasic acids such as suberic, sebacic or dodecanedioic acids may also be present. The polyamides find utility as molding powders, adhesives and in the form of films or sheets.

3,717,599
COMPOSITION FOR FORMING STRIPPABLE AND ANTI-CORROSIVE FILM

Kazuo Miyata, Hodogaya-ku, Yokohama, Japan, assignor to Kurita Water Industries, Ltd., Osaka-shi, Japan
Continuation-in-part of Ser. No. 819,934, April 28, 1969, abandoned. This application Oct. 12, 1970, Ser. No. 80,137
Claims priority, application Japan, May 13, 1968, 43/32095
Int. Cl. C09d *5/08*
U.S. Cl. 260—23 R **7 Claims**

An anti-corrosive film forming composition for protecting corrodable metal objects comprised of a synthetic resin emulsion containing a minor amount of corrosion inhibitor is improved by incorporating 0.5 to 3 percent by weight, based on the weight of the resin, of an oleic acid compound selected from the group consisting of oleic acid and its alkali metal, ammonium and amine salts, thus rendering the emulsion capable of forming an anti-corrosive and strippable film.

3,717,600
MAGNESIUM OXIDE DISPERSIONS

Albert J. Dalhuisen, Sunnyvale, William H. Deis, Belmont, and David C. Burgett, Daly City, all of Calif., assignors to Merck & Co., Inc., Rahway, N.J.
Continuation-in-part of Ser. Nos. 19,517, March 13, 1970, abandoned, and Ser. No. 78,300, Oct. 5, 1970, abandoned. This application Jan. 13, 1971, Ser. No. 106,272
Int. Cl. C08d *9/02*
U.S. Cl. 260—23 H **47 Claims**

MgO in combination with a rubber plasticizer and a surface active agent and/or metallic soap for use in chloroprene polymer compounding and processing.

3,717,601
AMORPHOUS POLYPROPYLENE STABILIZED HOT MELT ADHESIVE

Lawrence D. Jurrens, Bartlesville, Okla., assignor to Phillips Petroleum Company
Filed May 28, 1971, Ser. No. 148,115
Int. Cl. C09j *3/26*
U.S. Cl. 260—27 EV **7 Claims**

Hot melt adhesive compositions with resistance to crusting and stable viscosity characteristics are prepared from a mixture of ethylene-vinyl acetate copolymer, glycerol ester of hydrogenated rosin, wax, and amorphous polypropylene. The improved hot melt adhesive formulation can contain from about 30 to about 50 percent by weight ethylene-vinyl acetate copolymer, from about 20 to about 40 percent by weight of glycerol ester of hydrogenated rosin, from about 20 to about 40 percent by weight of a wax, and from about 10 to about 30 percent by weight amorphous polypropylene.

3,717,602
STAMPING MASS FOR METALLURGICAL FURNACES

Karl Heinz Koch, Dortmund-Benninghofen; Paul Koch, Letmathe-Untergrune; Walter Loorz, Dortmund-Lucklenberg, and Hans Schoppa, Dortmund, all of Germany, assignors to Didier-Werke A.G., Wiesbaden, Germany
Continuation of Ser. No. 712,389, March 12, 1968, abandoned. This application Nov. 13, 1970, Ser. No. 89,481
Int. Cl. C08g *51/52*
U.S. Cl. 260—28 **1 Claim**

A refractory stamping mass wherein essentially sand or dolomite and carbon from coal or coke and a binding agent is used for metallurgical furnaces, the improvement which consists in the addition of a phenoplast precondensate.

3,717,603
PROCESS FOR PREPARING LACTONIZED ACRYLIC POLYMER SOLUTION

Yasuo Matsumura, and Kunio Maruyama, both of Okayama, Japan, assignors to Japan Exlan Company Limited, Osaka, Japan
Filed Oct. 5, 1970, Ser. No. 77,992
Claims priority, application Japan, Oct. 6, 1969, 44/79763
Int. Cl. C08f *15/02, 27/14*
U.S. Cl. 260—29.6 AB **20 Claims**

Process for preparing lactonized acrylic polymer solution by acidifying an aqueous solution of zinc chloride containing dissolved therein an acrylic copolymer of acrylonitrile and a monomer with a hydroxyl group or capable of forming a hydroxyl group, maintaining the acid concentration at 40 percent or less and the pH at 2 or lower.

3,717,604
POLYURETHANE PRODUCTION IN THE PRESENCE OF BORON TRIFLUORIDE

Robert Alan Brown, Pompton Plains, N.J., assignor to Immont Corporation, New York, N.Y.
Continuation-in-part of Ser. No. 33,887, May 1, 1970, abandoned. This application Nov. 23, 1971, Ser. No. 203,106
Int. Cl. C08g *51/44*
U.S. Cl. 260—32.6 N 7 Claims

Making linear polyurethane by reaction in solution in an amide such as DMF containing a Lewic acid such as BF_3.

3,717,605
PROCESS FOR THE PREPARATION OF POLYMER DISPERSIONS OF UNIFORM PARTICLE SIZE

Desmond Wilfrid John Osmond, Windsor; Frederick Andrew Waite, Farnham, and Derek John Walbridge, Beaconsfield, all of England, assignors to Imperial Chemical Industries Limited, London, England
Continuation of Ser. No. 807,909, March 17, 1969, abandoned, which is a continuation-in-part of Ser. No. 476,148, July 30, 1965, abandoned. This application Jan. 15, 1971, Ser. No. 106,923
Claims priority, application Great Britain, Aug. 4, 1964, 31,599/64
Int. Cl. C08f *47/20;* **C08g** *53/18;* **C08j** *1/46*
U.S. Cl. 260—34.2 **5 Claims**

A dispersion of polymer particles in organic liquid having a narrow range of particle sizes. The dispersion is produced by polymerizing monomer in organic liquid in the presence of a preformed stabilizer. The stabilizer is made by condensing a compound A with a compound B. Compound A is solvatable by the organic liquid, has a molecular weight of 500–5,000 and has a group capable of condensation reaction. Compound B has a molecular weight of at least 250, is not solvatable in the organic liquid, has different polarity from compound A and includes a group capable of condensation reaction with compound A. The weight ratio of compound A to compound B in the stabilizer is 0.5 : 1 to 5 : 1.

3,717,606
SOLVENTLESS COAL TAR EXTENDED ANTIFOULING COATING

Henry L. Lomasney, 11119 Prentiss Avenue, New Orleans, La., and William J. Lomasney, 13050 Chateau Court, New Orleans, La.
Filed April 5, 1971, Ser. No. 131,479
Int. Cl. C08g *51/04*
U.S. Cl. 260—40 R **4 Claims**

The present invention relates to a novel coating composition which is an effective heavy duty marine antifouling film

with significantly subdued human toxicological effects and which comprises a low molecular weight aromatic bitumen or related polyol; a highly polymerizable, or chemically cross-linking, film former (possessing exceptionally low initial molecular weight); and one or more highly toxic organometallic compounds. Specifically, the invention allows a unique approach toward formulating an antifouling marine coating which possesses the antifouling properties inherent in the extremely toxic microbiological poisons normally employed in such coatings yet which present a relatively safe working environment for humans. The technological significance rests in the fact that, during the transgression through the film forming phenomena, the design outline herein provides the confinement of the toxic adducts within the coating film, and precludes their migration or atomization to the surrounding atmosphere. The incorporation of a low molecular weight bituminous residue in the present coating affords significant control of film properties of the toxic coating.

The unique concept in antifoul coatings drastically alters the concern for adequate "dry time" before launch because the water sensitivity heretofore experienced in the early stage of curing of solvent releasing coating systems does not exist with this concept.

ERRATUM

For Class 260—45 see:
Patent No. 3,717,577

3,717,607
STABILIZATION OF POLY(VINYL HALIDE)

George C. Hopkins, Clarence, N.Y., assignor to Hooker Chemical Corporation, Niagara Falls, N.Y.
Filed Sept. 21, 1970, Ser. No. 74,168
Int. Cl. C08f *45/62*
U.S. Cl. 260—45.7 R **7 Claims**

This invention relates to a vinyl halide resin which has been heat stabilized by incorporating therein an aluminum compound of the formula:

$$Al(R)_{3-n}X_n$$

wherein R is R′ or OR″ and R′ is alkyl, aryl, arylalkyl, alkylaryl, and mixtures thereof; R″ is hydrogen, alkyl, aryl, arylalkyl, alkylaryl, and mixtures thereof; and *n* is an integer from 0 to 1 and X is selected from the group consisting of chlorine, bromine, fluorine, iodine and mixtures thereof. The aluminum compound is used to the extent of about 0.002 to 5 percent by weight of resin.

3,717,608
POLYMER COMPOSITIONS CONTAINING PERCHLOROFULVALENE

Raymond R. Hindersinn, Lewiston, N.Y., assignor to Hooker Chemical Corporation, Niagara Falls, N.Y.
No Drawing. Continuation-in-part of abandoned application Ser. No. 597,890, Nov. 30, 1966, which is a continuation-in-part of application Ser. No. 184,671, Apr. 3, 1962, now Patent No. 3,475,502. This application Sept. 24, 1968, Ser. No. 762,146
Int. Cl. C08f *27/06, 19/02*
U.S. Cl. 260—45.7 R **5 Claims**

Polymeric uses of perchlorofulvalene include homopolymers of the compound, copolymers with unsaturated monomers, vulcanizable and cured compositions containing the compound, and polymer compositions containing the compound as an additive. Other uses for perchlorofulvalene are in the preparation of light sensitive reproduction papers, dyestuffs and as an intermediate in the preparation of insecticides.

3,717,609
FLAME RETARDANT POLYMERS

Abraham Kutner, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.
Filed May 6, 1971, Ser. No. 140,949
Int. Cl. C08f *45/62*
U.S. Cl. 260—45.75 K **3 Claims**

Polyolefins based on propylene are made flame retardant by the addition of about 0.1 to 2 percent by weight of a dialkyltin mercaptoester and 0.1 to 2 percent by weight of an aromatic-aliphatic ether having at least one bromophenoxy linkage to an aliphatic radical and having at least three bromine substituents on each aromatic ring.

3,717,610
STABILIZATION OF POLYOLEFINS AND RUBBERS WITH A PHENOLIC PHOSPHATE

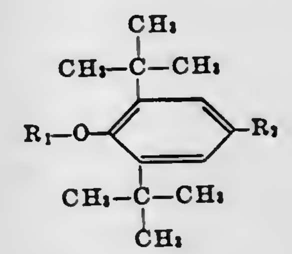
Bernard R. Meltsner, Royal Oak, Mich., assignor to Ethyl Corporation, New York, N.Y.
Division of Ser. No. 505,982, Nov. 1, 1965. This application March 17, 1969, Ser. No. 807,968
Int. Cl. C08f *45/58*
U.S. Cl. 260—45.95 **22 Claims**

Organic material is stabilized by the addition of a tris(3,5-dihydrocarbyl-4-hydroxyphenyl)phosphate, either alone or in combination with a dialkylthiodialkanoate.

3,717,611
PHENOL ETHERS AND PHENOL ESTERS AS STABILIZERS

Wilhelm Baumer, Wolfgang Fruhstorfer, Reiner Hesse, Manfred Engelhardt, and Bernd Dennler, Darmstadt, Germany, assignors to Merck Patent Gesellschaft mit beschrankter Haftung, Darmstadt, Germany
No Drawing. Filed May 5, 1970, Ser. No. 34,906
Claims priority, application Germany, May 5, 1969, P 19 22 815.0
Int. Cl. C08f *45/58;* **C08g** *51/58*
U.S. Cl. 260—45.95 G **15 Claims**

2,6-di-tert.-butyl-phenol ethers and esters of the formula



wherein R_1 is substituted or unsubstituted alkyl, alkenyl, aralkyl, or the acyl radical of an acid other than formic acid and R_2 is R_1 or H are stabilizers for plastics, oils and fats against thermal and/or oxidative degradation.

3,717,612
CURABLE EPOXY RESIN COMPOSITION CONTAINING A SUBSTITUTED DIUREA COMPOUND

Eduard P. Babayan, Inglewood, Calif., assignor to Hitco, Gardena, Calif.
Filed June 22, 1970, Ser. No. 48,538
Int. Cl. C08g *30/14*
U.S. Cl. 260—47 EN **9 Claims**

An improved curing agent for epoxy resin compositions containing a polyepoxide comprising a substituted diurea formed by the reaction of two mols of a secondary amine, preferably an aliphatic amine, such as dimethylamine with one mol of a diisocyanate containing one cycloaliphatic isocyanate group and one aliphatic isocyanate group such as isophorone diisocyanate. The curing temperature of the composition can be substantially increased to provide products having improved properties without the danger of undercuring or substantial shortening of the gel time.

3,717,613
PROCESS FOR PREPARING COPOLYMERS

Mitsuo Ichikawa; Yasumasa Takeuchi; Yoshiyuki Harita; Masayuki Endo, all of Yokkaichi; Nobuo Yamaguchi, Mie; Mitsuru Tashiro, and Akira Kogure, both of Yokkaichi, all of Japan, assignors to Japan Synthetic Rubber Co., Ltd., Tokyo, Japan

Filed March 11, 1970, Ser. No. 18,722

Claims priority, application Japan, March 14, 1969, 44/9292

Int. Cl. C08f *1/56*

U.S. Cl. 260—63 R **10 Claims**

A catalyst comprising an organoaluminum compound, an organic halogen compound containing labile halogen atom, and a compound of metal of Groups IV B–VII B or Group VIII of Deming's Periodic table is useful for copolymerizing conjugated dienes, conjugated heterodienes and, if desired, monoolfins to produce an alternate copolymer.

3,717,614
LINEAR ELASTIC POLYMERS

Theodor Lyssy, Therwil, Ernst Keller, Binningen, Hansjorg Heller, Riehen, and Helmut Muller, Binningen, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 675,784, Oct. 17, 1967. This application Apr. 6, 1970, Ser. No. 26,047

Claims priority, application Switzerland, Oct. 19, 1966, 15,140/66

Int. Cl. C08g *33/04*

U.S. Cl. 260—77.5 **34 Claims**

Linear elastic polymers are produced from soft-segment forming linear aliphatic dicarboxylic acid derivatives or bis-chloroformates of macroglycols having a molecular weight in the range of from about 400 to 5000 and a melting point of less than 70° C., by capping with certain bis-hydrazides; and reacting the resulting prepolymeric product with, as chain extender, a bifunctional low-molecular compound containing certain groups which are capable of reacting with the hydrazide end groups in the ensuing polymerization reaction; whereby certain aliphatic, aromatic or araliphatic divalent radicals are introduced into the polymer chain.

The resulting polymers are formed from a sequence of recurring units of the formula

$$\text{—NH—NH—A—NH—NH—Z—}$$

wherein A is the central portion of the molecule of the aforesaid bis-hydrazide and Z represents a divalent acyl residue of the aforesaid soft segment former or the chain-extending group —CO—Y—CO—, the final polymer containing per group —CO—Y—CO—, from 0.5 to 5 of the divalent acyl residues of the soft segment former which are distributed statistically over the whole polymer. These novel polymers are useful as material for filaments, films and protective coatings.

3,717,615
POLYIMIDES

Fred F. Holub, Schenectady, and Denis R. Pauze, Scotia, both of N.Y., assignors to General Electric Company

Filed April 25, 1969, Ser. No. 819,445

Int. Cl. C08g *20/20*

U.S. Cl. 260—78 UA **29 Claims**

Improved products are obtained from the polymerization of mixtures of mono-imides and bis-imides. The compositions thus obtained have improved physical properties and heat resistance making them especially suitable in various coating, insulating and molding applications.

3,717,616
POLYMERS OF 1-BUTENE-2,3,4-TRICARBOXYLIC ACID

Paritosh M. Chakrabarti, Highstown; Hugo Stange, and Gert Paul Volpp, both of Princeton, all of N.J., assignors to FMC Corporation, New York, N.Y.

Filed Aug. 11, 1970, Ser. No. 63,023

Int. Cl. C08f *15/36*

U.S. Cl. 260—78.5 R **6 Claims**

A water soluble salt of an aliphatic polycarboxylic acid useful as a detergent builder, and having the formula:

$$[X_{(1-m-n)}Y_mZ_n]_p$$

wherein each of m and n can be zero or a positive number, it being provided that the sum of m and n is always less than one; p is an integer the upper limit of which is determined by the solubility of the salts in an aqueous system; X is derived from the monomer 1-butene-2,3,4-tricarboxylic acid and Y and Z are each derived from a monoethylenically unsaturated monomer containing 1 to 3 substituents selected from the class consisting of carboxy, lower carboxyalkyl, lower alkyl, lower chloroalkyl, hydroxy, non-gem. dihydroxy, lower acyloxy, chloro, and lower alkoxy, it being provided that any one of the carboxy groups can be esterified with a lower aliphatic radical. Detergent compositions containing water soluble salts of the aliphatic polycarboxylic acid aforesaid are described.

3,717,617
HIGH PEEL STRENGTH POLYSULFIDE BASED SEALANTS

Oren L. Marrs, and Moses L. Thomas, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed July 8, 1970, Ser. No. 53,314

Int. Cl. C08g *43/00*

U.S. Cl. 260—75 S **11 Claims**

The adhesive characteristics of cured sealant formulations based on polysulfide polymers are substantially improved by the incorporation of glycidyl trialkyloxysilanes. The glycidyl trialkyloxysilanes provide an extremely high peel strength for coatings on various substrates, especially aluminum. The amount of curing agent required is reduced when glycidyl trialkyloxysilanes are used as adhesion-promoting additives.

3,717,618
TERMINALLY DIFUNCTIONAL POLYTHIOETHERS DERIVED VIA DITHIOL-ACETYLENE POLYADDITIONS

Alexis A. Oswald, Mountainside, N.J., assignor to Esso Research and Engineering Company, Linden, N.J.

Continuation-in-part of Ser. No. 541,696, April 11, 1966, Pat. No. 3,592,798. This application June 17, 1970, Ser. No. 47,109

Int. Cl. C08d *9/08*

U.S. Cl. 260—887 **14 Claims**

Terminally difunctional polythioether polyadducts are prepared by reacting dithiols with acetylenes under free radical conditions. Inherent to their method of preparation, the novel polythioethers contain the divalent carbon skeletons derived from their dithiol and acetylene monomer components in a regularly alternating manner. Dependent on dithiol acetylene monomer ratio, the novel polymers contain thiol and/or vinyl sulfide end groups. Owing to their reactive, diterminal functions, they can be chain extended and cross-linked via known reactions to elastomers useful as mastics.

3,717,619
TETRATHIOOXALATE POLYMERS AND THEIR PREPARATION

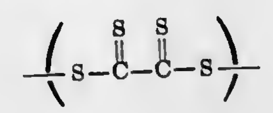
Harris D. Hartzler, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed April 22, 1971, Ser. No. 136,575

Int. Cl. C08g *23/00*

U.S. Cl. 260—79 **7 Claims**

Disclosed herein are tetrathiooxalate polymers having repeating units of the structure



$$\left(\text{S}-\overset{\text{S}}{\overset{\|}{\text{C}}}-\overset{\text{S}}{\overset{\|}{\text{C}}}-\text{S}\right)$$

a process for making said polymers comprising preparing an alkali metal tetrathiooxalate precursor and treating the precursor with an oxidizing agent to polymerize the polymers; and the use of said polymers in the vulcanization of rubber.

3,717,620
ARYLENE SULFIDE RESIN OXIDATIVE CURING PROCESS

Raymond G. Rohlfing, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed July 20, 1971, Ser. No. 164,475

Int. Cl. C08g *23/00*

U.S. Cl. 260—79 **7 Claims**

A process for oxidatively pre-curing arylene sulfide resins stepwise by subjecting the particulate resin to oxidation at a temperature below the melting point of the resin for a period of time sufficient to reduce the melt flow of the resin and withdraw periodically at least a portion of the partially cured resin to obtain successive products having decreasing melt flow suitable for special applications requiring specific melt flow range.

3,717,621
MANUFACTURE OF VINYL CHLORIDE POLYMERS

Alfred Hauss, Ludwigshafen; Fritz Kieferle, Limburgerhof; Jenoe Kovacs, Bobenheim-Roxheim, and Erich Gulbins, Heidelberg, all of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen/Rhine, Germany

Filed March 16, 1970, Ser. No. 20,128

Claims priority, application Germany, March 26, 1969, P 19 15 386.7

Int. Cl. C08f *1/11, 3/20*

U.S. Cl. 260—85.5 **7 Claims**

Vinyl chloride is polymerized in aqueous suspension at temperatures between 35° and 75 °C at a pH of less than 8.0 and in the presence of an initiator system in which acetyl cyclohexane sulfonyl peroxide is mixed either with t-butyl perpivalate or with di-isopropyl percarbonate. The product may be used like conventional polyvinyl chloride as a plastics material.

3,717,622
TRUXENE POLYMER AND METHOD FOR ITS PREPARATION

William Lyle Harper, Wartburg, and Wesley Earl Smith, Oak Ridge, Tenn., assignors to the United States of America as represented by the United States Atomic Energy Commission

Original application Sept. 9, 1968, Ser. No. 758,391. Divided and this application June 10, 1970, Ser. No. 57,029

Int. Cl. C08f *7/02*

U.S. Cl. 260—93.5 C **3 Claims**

This invention relates to a method for polymerizing truxene which comprises heating truxene in an oxygen containing atmosphere below a corbonizing temperature. The resultant polymer will yield a graphite product when exposed to graphitizing conditions if the polymer is derived from beta truxene. If the polymer is derived from alpha truxene, the resulting product is an amorphous carbon. Mixtures containing a predominant amount of beta truxene and lesser amounts of a non-graphitizing binder yield a graphitized product.

3,717,623
SULFANILYL PHENYL UREA COMPLEXES USEFUL AGAINST MAREK'S DISEASE

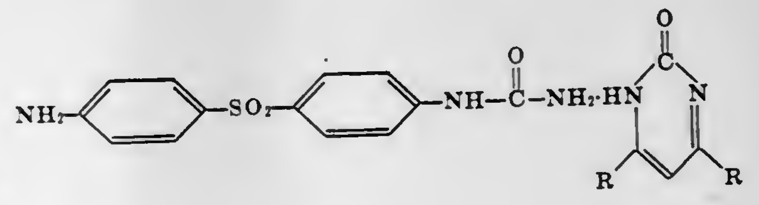
William V. Ruyle, Scotch Plains, N.J., assignor to Merck & Co., Inc., Rahway, N.J.

Filed April 22, 1970, Ser. No. 31,025

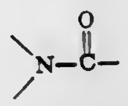
Int. Cl. C07b *21/00*

U.S. Cl. 260—96.5 C **6 Claims**

Novel complexes of 4-sulfanilylphenylurea with an organic compound



containing the amido linkage



$$>\text{N}-\overset{\text{O}}{\overset{\|}{\text{C}}}-$$

are useful in the treatment and prophylaxis of Marek's disease.

3,717,624
REACTIVE AZO COMPOUNDS CONTAINING AN ACETOACETYL GROUP

Arthur Buehler, Rheinfelden, and Rene' De Montmollin, Riehen, both of Switzerland, assignors to Ciba-Geigy AG., Basle, Switzerland

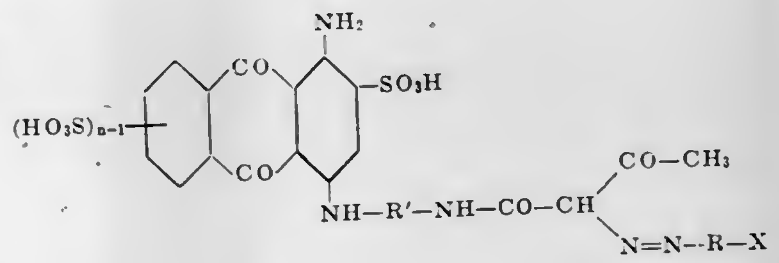
Filed Feb. 3, 1970, Ser. No. 8,408

Claims priority, application Switzerland, Feb. 13, 1969, 2166/69

Int. Cl. C09b *62/02, 62/70, 62/78*

U.S. Cl. 260—153 **16 Claims**

An azo compound of the formula



containing at least two sulfonic acid groups; in which X represents a fiber-reactive residue, $n = 1$ or 2, R′ is phenyl, diphenyl or stilbene, or substituted phenyl, diphenyl or stilbene wherein the substituent is selected from the group consisting of chloro, methyl, carboxylic acid or sulfonic acid and R is phenyl, sulfophenyl or substituted phenyl or sulfophenyl wherein the substituent is selected from the group consisting of chloro, methyl, methoxy, hydroxy or sulfonic acid. The dyestuffs are suitable for dyeing by the cold pad batch method. The dyestuffs are suitable for dyeing or printing of materials of animal origin such as leather, silk and wool, as well as cellulosic material. The dyestuffs display excellent fastness to light and wetting.

3,717,625

AZO DYESTUFFS CONTAINING A COMPLETE RADICAL OF A STYRYL DYESTUFF

Richard Peter, and Hans-Joerg Angliker, both of Basle, Switzerland, assignors to Ciba-Geigy AG., Basle, Switzerland

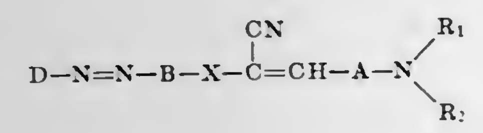
Filed July 21, 1970, Ser. No. 56,954

Claims priority, application Switzerland, Aug. 5, 1969, 11883/69

Int. Cl. C09b *29/08, 29/36, 31/18*

U.S. Cl. 260—207.1 **8 Claims**

Azo dyestuff of the formula



$$D-N=N-B-X-\overset{CN}{\overset{|}{C}}=CH-A-N\begin{array}{l}\diagup R_1\\ \diagdown R_2\end{array}$$

wherein D is a diazo component, B a coupling component, A a paraphenylene and R_1 and R_2 are alkyl that may be substituted. The dyestuffs dye synthetic fibers in bright colors.

3,717,626

WATER-INSOLUBLE PHENYL-AZO-PHENYL DYESTUFFS

Erich Brenneisen, Hofheim/Taunus; Helmut Lindner, Frankfurt/Main, and Heinz Schmidt, Kelkheim/Taunus, all of Germany, assignors to Farbwerke Hoechst Aktiengesellschaft varmals Meister Lucius & Bruning, Frankfurt/Main, Germany

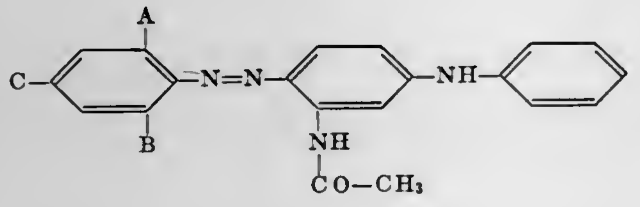
Filed Nov. 13, 1968, Ser. No. 775,515

Claims priority, application Germany, Nov. 28, 1967, P 16 44 234.5

Int. Cl. C07c *107/06;* **C09b** *29/08*

U.S. Cl. 260—207.1 **5 Claims**

Water-insoluble monoazo-dyestuffs of the formula



said dyestuffs being highly suitable for the dyeing of fibrous materials consisting of cellulose-2 ½-acetate, cellulose-triacetate, polyamide, polyurethane or, particularly, of polyesters, such as polyethyleneglycolterephthalates.

3,717,627

PROCESS FOR THE PRODUCTION OF ESTROGENIC STEROIDS HAVING A FORMYL GROUP IN THE 1- OR 4-POSITION

Stuart Bruce Laing, Greenford, England, and Peter Job Sykes, Edinburgh, Scotland, assignors to Glaxo Laboratories Limited, Greenford, England

No Drawing. Filed May 19, 1969, Ser. No. 825,999

Claims priority, application Great Britain, May 24, 1968, 25,005/68

Int. Cl. C07c *173/00, 169/08*

U.S. Cl. 260—239.55 **12 Claims**

This invention relates to a process for the production of aromatic steroids carrying a formyl group, more especially a formyl group in the 1- or 4-position.

3,717,628

METHOD FOR THE PREPARATION OF 2,3-DIMETHYL AZIRIDINE

Charles A. Rowe, Jr., Westfield, and Eugene L. Stogryn, Fords, N.J., assignors to the United States of America as represented by the Secretary of the Air Force

No Drawing. Filed Oct. 9, 1970, Ser. No. 79,622

Int. Cl. C07d *23/02*

U.S. Cl. 260—239 E **1 Claim**

This invention involves the synthesis of 2,3-dimethyl aziridine in both its cis and trans isomeric forms. Synthesis is effected by treating the appropriate isomeric form of 2-butene. Treatment is carried out by a four step process resulting in the formation of the corresponding cis-2,3-dimethyl aziridine compound or the trans-2,3-dimethyl aziridine compound. In the first step of the process, 2-butene is epoxidized with peracetic acid. The resulting epoxide is then converted to an amino alcohol by treatment with ammonia. In the third step, an inner salt is formed by reacting the amino alcohol with chlorosulfonic acid. Finally, the inner salt is treated with sodium hydroxide to produce the aziridine compound of this invention.

3,717,629

NITROFURAN DERIVATIVES

Roland Maier, Biberach/Riss, and Robert Sauter, Laupheim, both of Germany, assignors to Boehringer Ingelheim G.m.b.H., Ingelheim am Rhein, Germany

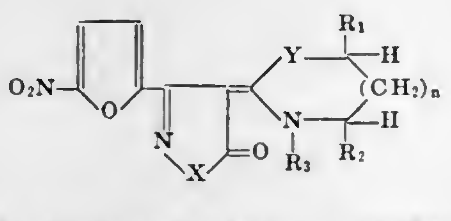
Filed Sept. 2, 1971, Ser. No. 177,435

Claims priority, application Germany, Sept. 11, 1970, P 20 45 049.1; June 4, 1971, P 21 27 735.0

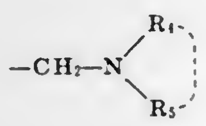
Int. Cl. C07d *87/06*

U.S. Cl. 260—244 R **10 Claims**

Compounds of the formula



wherein R_1 is hydrogen, straight or branched alkyl of one to six carbon atoms, monohydroxy-(alkyl of one to six carbon atoms), or



$$-CH_2-N\begin{array}{l}\diagup R_4\\ \diagdown R_5\end{array}$$

where R_4 and R_5 are each straight or branched alkyl of one to four carbon atoms, or, together with each other nd the nitrogen atom to which they are attached, morpholino, pyrrolidino, piperidino or N′-methylpiperazino,

R_2 is hydrogen or alkyl of one to three carbon atoms,

R_3 is hydrogen, straight or branched alkyl of one to five carbon atoms, or monohydroxy-(alkyl of one to five carbon atoms),

X is oxygen, imino(—NH—) or methylimino(—NCH_3),

X is oxygen; imino(—nH—) or methylimino(—NCH_3),

Y is oxygen, sulfur or imino, and

n is 0 or 1,

and, to the extent ahta they contain one or more basic nitrogen atoms, non-toxic acid addition salts thereof; the compounds a well as the salts are useful as bactericidal agents against grampositive and gramnegative bacteria and against trichomonas.

3,717,630

MONO- AND DIPHTHALIMIDYL DERIVATIVES

Gary E. Booth, Oxford, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

No Drawing. Continuation-in-part of application Ser. No. 679,661, Nov. 1, 1967. This application Sept. 11, 1968, Ser. No. 759,248

Int. Cl. C07d *27/40*

U.S. Cl. 260—240 CA **5 Claims**

The provision of mono- and diphthalimidyl derivatives of fluorescent, aromatic amines and their use in (1) laundry detergent compositions which contain an organic detergent and an alkaline builder salt and (2) in aqueous and granular hypochlorite bleach compositions.

3,717,631

2,4′DIOXO-1,3-BENZOXAZINOTHIONOPHOSPHONIC ACID ESTERS

Walter Lorenz, Wuppertal-Cronenberg, and Ingeberg Hammann, Cologne, both of Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

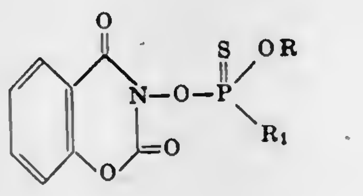
Filed Sept. 23, 1970, Ser. No. 74,856

Claims priority, application Germany, Oct. 7, 1969, P 19 50 492.8

Int. Cl. C07d *87/08*

U.S. Cl. 260—244 R **5 Claims**

2,4-Dioxo-1,3-benzoxazinothionophosphonic acid esters which possess arthropodicidal, especially insecticidal or acaricidal, properties. The compounds have the structure



(I)

in which

R and R_1 stand for the same or different straight-chain or branched lower alkyl radicals.

3,717,632

SUBSTITUTED-3-HYDRAZINO PYRIDAZINES

Paul L. Anderson, Dover; William J. Houlihan, and Robert E. Manning, both of Mountain Lakes, all of N.J., assignors to Sandoz-Wander, Inc., Hannover, N.J.

Continuation-in-part of Ser. No. 858,157, Sept. 15, 1969. This application Jan. 29, 1971, Ser. No. 111,107

Int. Cl. C07d *51/04*

U.S. Cl. 260—250 A **12 Claims**

6-Chloro-pyridazines substituted at the 3-position, e.g., 6-chloro-3-[2-(hept-4-ylidene)-hydrazino]-pyridazine are prepared from 6-chloro-3-hydrazino-pyridazines and carbonyl compounds and exhibit anti-inflammatory and anti-hypertensive activity.

3,717,633

2-ANILINO-1,3-DIAZACYCLOPENTENE-(2) DERIVATIVE

Helmut Stahle; Herbert Koppe; Karl Zeile; Martin Wolf, all of Ingelheim/Rhine; Wolfgang Hoefke, Budenheim/Rhine, and Hans-Wolfgang Samtleben, Ingelheim/Rhine, all of Germany assignors to Boehringer Ingelheim G.m.b.H., Ingelheim am Rhine, Germany

Continuation of Ser. No. 854,035, Aug. 28, 1969, abandoned, which is a continuation of Ser. No. 801,864, Feb. 24, 1969, abandoned, which is a continuation-in-part of Ser. No. 583,427, Sept. 30, 1966, abandoned. This application Nov. 19, 1970, Ser. No. 91,189

Claims priority, application Germany, Oct. 1, 1965, B 83964; Oct. 1, 1965, B 83965

Int. Cl. C07d *49/34*

U.S. Cl. 260—253 **1 Claim**

The compounds are 2-(disubstituted-anilino)-1,3-diazacyclopentenes-(2) and acid addition salts thereof, useful as hypotensives in warm-blooded animals.

3,717,634

N-(HETEROARCYCLIC)PIPERAZINYLALKYL-AZASPIROALKANEDIONES

Yao Hua Wu and James W. Rayburn, Evansville, Ind., assignors to Mead Johnson & Company, Evansville, Ind.

No Drawing. Filed Nov. 24, 1969, Ser. No. 879,604

Int. Cl. C07d *5/42*

U.S. Cl. 260—256.4 N **7 Claims**

The present invention concerns the class of heterocyclic carbon compounds comprised of N-(heteroarcyclic)-piperazinylalkyl derivatives of azaspiroalkanediones which have potent and specific tranquilizing action and anti-emetic properties. Further, this invention is concerned with the synthetic process for the preparation of N - (heteroarcyclic)piperazinylalkylazaspiroalkanediones which comprises reaction of spiro-substituted glutaric anhydride or imide with N-(heteroarcyclic)piperazine derivatives. Typical embodiments of this invention are 8-[4-[4 - (2-pyrimidinyl)-1-piperazinyl]-butyl]-8-azaspiro[4.5] decane-7,9-dione and 8-[4-[4-(2-pyridyl)-1-piperazinyl)] butyl]-8-azaspiro[4.5]decane-7,9-dione.

3,717,635

HYDRAZINO AND SUBSTITUTED HYDRAZINO PYRIDAZINE-N-OXIDES

Paul L. Anderson, Dover; William J. Houlihan, and Robert E. Manning, both of Mountain Lakes, all of N.J., assignors to Sandoz-Wander, Inc., Hanover, N.J.

Continuation-in-part of Ser. No. 111,157, Jan. 29, 1971, abandoned, which is a continuation-in-part of Ser. No. 40,697, May 26, 1970, abandoned. This application Feb. 22, 1971, Ser. No. 117,766

Int. Cl. C07d *51/04*

U.S. Cl. 260—250 A **11 Claims**

Hydrazino and substituted hydrazino pyridazine-N-oxides, e.g., 6-chloro-3-hydrazinopyridazine-N-oxide or 6-ethylamino-3-(2-isopropylidene hydrazino)pyridazine-N-oxide, are prepared from 3,6-dihalopyridazine-N-oxides, 3-halo-6-substituted aminopyridazine-N-oxide or 6-halo-3-substituted aminopyridazine-N-oxide and are active as hypotensive/anti-hypertensive agents.

3,717,636

SALTS OF PYRIDOXINE MONO-ESTERS

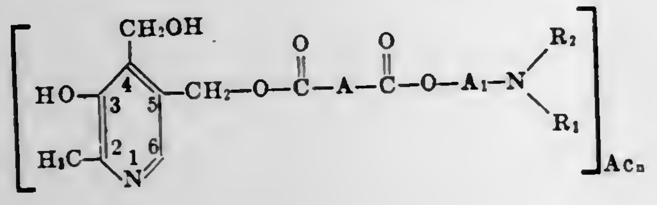
Andre Esanu, 119 Rue de la Croix-Nivert, 75-Paris, France
Filed Jan. 13, 1971, Ser. No. 106,245

Claims priority, application Great Britain, Jan. 21, 1970, 2889/70

Int. Cl. C07d *31/34*

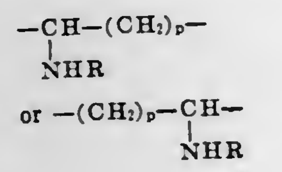
U.S. Cl. 260—268 H **1 Claim**

Pyridoxine mono-esters salts, possessing psychostimulant properties and having the general formula:



in which:

A and A_1 represent each an alkylene radical with a chain of up to 16 carton atoms or an amino-hydrocarbon residue, for example an amino-alkylene residue such as



$$-\underset{\substack{|\\ NHR}}{CH}-(CH_2)_p- \quad \text{or} \quad -(CH_2)_p-\underset{\substack{|\\ NHR}}{CH}-$$

in which

R represents a hydrogen atom or a CH_3CO group,
p being 1 or 2
R_1 and R_2 either represent each an alkyl radical containing up to five carbon atoms, said radicals being separated or forming with the nitrogen atom a heterocyclic ring.
Ac represents a pharmaceutically acceptable acid
n is an integer taking the value 1,2 or 3

3,717,637

TRIFLUOROMETHYLTHIO SUBSTITUTED DIBENZ [B, F] [1,4] OXAZEPINES

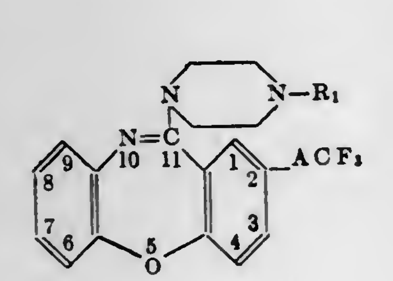
Fritz Hunziker, Bern; Jean Schmutz, Muri near Bern, and Franz Martin Kunzle, Bern, all of Switzerland, assignors to Sandoz-Wander, Inc., Hannover, N.J.
Filed July 28, 1970, Ser. No. 58,984

Claims priority, application Switzerland, Aug. 6, 1969, 11925/69; Aug. 20, 1969, 12595/69; Oct. 11, 1969, 15039/69; June 11, 1970, 8699/70

Int. Cl. C07d *51/70*

U.S. Cl. 260—268 TR **13 Claims**

The present invention concerns new compounds of the formula:



wherein A is sulphur or a sulphonyl group,

R_1 is hydrogen, alkyl of one to three carbon atoms, hydroxyalkyl of one to three carbon atoms, acetoxyalkyl, wherein the alkyl is of one to three carbon atoms, or alkoxyalkyl with a total of at most six carbon atoms,

and acid addition salts thereof. The compounds are neuroleptics and antiemetics.

3,717,638

1,2,3,4,6,7,12,12A-OCTAHYDRO-2-PHENYLPYRAZINO[2′,1′:6,1]PYRIDO[3,4-b]INDOLES AND INTERMEDIATES THEREFOR

John W. Schulenberg, Delmas, N.Y., assignor to Sterling Drug, Inc., New York, N.Y.
Division of Ser. No. 831,750, June 9, 1969, Pat. No. 3,644,384. This application March 11, 1971, Ser. No. 123,425

Int. Cl. C07d *51/70*

U.S. Cl. 260—268 PC **6 Claims**

New 1,2,3,4,6,7,12,12a-octahydro-2-phenylpyrazino[2′,1′:6,1]pyrido[3,4-b]indoles having useful psychomotor stimulant properties are prepared by thermal cyclization of a 2-(α-halo-lower-alkanoy)-3-carbo-lower-alkoxy-1,2,3,4-tetrahydro-9H-pyrido[3,4-b]indole with an aniline derivative, and alkali metal aluminum hydride reduction of the resulting 1,2,3,4,6,7,12,12a-octahydro-1,4-dioxo-2-phenylpyrazino-[2′,1<⅔$^{:6.1}$]pyrido[3,4-b]indole.

3,717,639

PROCESS FOR THE PREPARATION OF 1-(2-NITRO-3,4-DI-LOWER-ALKOXYBENZYL)ISOQUINOLINES

John L. Neumeyer, Wayland, Mass., assignor to Arthur D. Little, Inc., Cambridge, Mass.
No Drawing. Filed May 4, 1967, Ser. No. 638,184

Int. Cl. C07d *35/28*

U.S. Cl. 260—283 CN **14 Claims**

A new process for the preparation of 1-(2-nitro-3,4-di-lower-alkoxybenzyl)isoquinolines, key intermediates used in the total synthesis of dl-apomorphine and dl-N-lower-alkylnorapomorphines, via novel 1-(2-nitro-3,4-di-lower-alkoxybenzyl)-1-cyano-2-benzoyl - 1,2 - dihydroisoquinolines.

3,717,640

8-THIOUREIDOMETHYL ERGOLINE DERIVATIVES

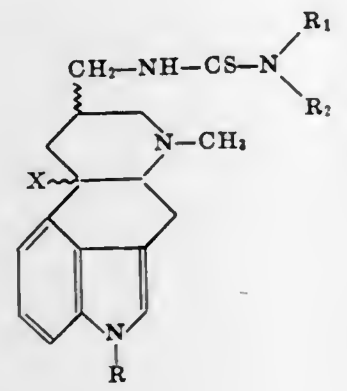
Giuliana Arcari; Gian Carlo Fregnan; Aldemio Temperilli, and Pietro Ulivi, all of Milan, Italy, assignors to Societa Farmaceutici Italia, Milan, Italy
Filed July 17, 1970, Ser. No. 55,985

Claims priority, application Italy, July 18, 1969, 19791 A/69

Int. Cl. C07d *43/20*

U.S. Cl. 260—285.5 **19 Claims**

Ergoline derivatives having anti-stress activity, and a process for making them. The compounds are of the formula:



wherein R is selected from the group consisting of hydrogen and methyl; R_1 and R_2 are selected from the group consisting of hydrogen, saturated or unsaturated lower alkyl, cycloalkyl, aryl and aralkyl; R_1 and R_2 together with the nitrogen atom to which they are attached may form a heterocyclic ring; X is selected from the group consisting of hydrogen and methoxy; the bond of the substituents in the 8- and 10-positions may be 8α-, 10β- or 8β-, 10α- respectively; except for R_1 = hydrogen and R_2 = methyl, butyl and allyl in the 8β-, 10α-substituted compounds.

3,717,641

DERIVATIVES OF DIBENZO CYCLOOCTEN-5,11-IMINE

Karoly Kocsis, Basel; Ulrich Renner, Riehen, and Knut Alfred Jaeggi, Basel, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.
Filed May 27, 1970, Ser. No. 41,099

Claims priority, application Switzerland, May 30, 1969, 8228/69

Int. Cl. C07d *39/00*

U.S. Cl. 260—286 R **3 Claims**

Compounds of the class of 5,6,11,12-tetrahydrodibenzo[a,e]cycloocten-5,11-imine and the pharmaceutically acceptable acid addition salts thereof have anti-tussive and simultaneously musculotropic spasmolytic activities; they are the active ingredients of pharmaceutical compositions and can be used for the treatment of tussive irritation; an illustrative embodiment is 2-methoxy-5,6,11,12-tetrahydrodibenzo[a,e]cycloocten-5,11-imine hydrochloride.

3,717,642

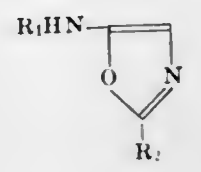
N QUINOLINE 5 AMINOOXAZOLES

Maximilian Von Strandtmann, Rockaway, N.J., assignor to Warner-Lambert Company, Morris Plains, N.J.
Division of Ser. No. 843,762, July 22, 1969, Pat. No. 3,624,097. This application June 9, 1971, Ser. No. 151,553

Int. Cl. C07d *85/44*

U.S. Cl. 260—287 R **4 Claims**

The present invention is concerned with compounds of Formula I:



I

wherein R_1 is heteroaryl and R_2 is alkyl, aryl, or heteroaryl.

Compounds of this invention exhibit central nervous system depressant properties.

3,717,643

N-SUBSTITUTED-NORAPOMORPHINES

Sydney Archer, Delmar, N.Y., assignor to Sterling Drug Inc., New York, N.Y.
Filed May 4, 1967, Ser. No. 636,022

Int. Cl. C07d *43/28*

U.S. Cl. 260—289 R **7 Claims**

Certain N-substituted-norapo-morphines useful as emetics, hypotensives, and CNS stimulants.

3,717,644

1-(DI-LOWER ALKYL AMINO LOWER ALKYL)-2-PHENYL-5,6,7,8-TETRAHYDROINDOLIZINES

Lewis A. Walter, 167 Central Ave., Madison, N.J.
Division of Ser. No. 854,015, Aug. 11, 1969, which is a continuation of Ser. No. 571,426, Aug. 10, 1966, abandoned. This application June 1, 1970, Ser. No. 42,593

Int. Cl. C07d *39/00*

U.S. Cl. 260—293.53 **4 Claims**

The tangible embodiments of this invention are the 1-(di-lower alkyl amino lower alkyl)-2-phenyl-5,6,7,8-tetrahydroindolizines and the non-toxic acid addition and quaternary salts thereof, which are of pharmacological importance in that they exert an influence on the central nervous system of animals. They vary in activity from depressants to stimulants depending upon the specific compound being used, the dose administered and the animal species to which it is administered. These compounds may be administered orally as the free base or in the form of a non-toxic acid addition or quaternary salt.

3,717,645

3-CYANO-2-SUBSTITUTED-5-ARYL-PYRIDINE DERIVATIVES

Goetz E. Hardtmann, Florham Park, N.J., assignor to Sandoz-Wander, Inc., Hanover, N.J.
Continuation of Ser. No. 42,540, June 1, 1970, Pat. No. 3,660,415. This application Dec. 14, 1970, Ser. No. 98,124

Int. Cl. C07d *31/46*

U.S. Cl. 260—294.9 **5 Claims**

The invention discloses pyridines substituted at the 2-position and also having an aryl substituent at the 5-position and cyano at the 3-position, e.g., [3-cyano-5-(p-chlorophenyl)-2-pyridyloxy]acetic acid ethyl ester and 5-phenyl-2-dimethylamino-ethylamino-nicotinonitrile. Such pyridine derivatives are useful as pharmaceutical agents, e.g., as anti-inflammatory agents. The compounds may be prepared by reacting a 2-halo-5-aryl-nicotinonitrile with the appropriate derivative of the substituent desired at the 2-position according to established procedures.

3,717,646

4,4′-(BIS N,N′-CARBAMYL METHYL) DIHYDROBIPYRIDYLS

John Edward Colchester and John Hubert Entwisle, Runcorn, England, assignors to Imperial Chemical Industries Limited, London, England
No Drawing. Filed Aug. 27, 1970, Ser. No. 67,555
The portion of the term of the patent subsequent to Dec. 16, 1986, has been disclaimed

Int. Cl. C07d *31/42*

U.S. Cl. 260—295 AM **2 Claims**

1,1′-disubstituted dihydro-4,4′-bipyridyls and a process for their manufacture by reducing an N-substituted pyridinium salt. The dihydrobipyridyls may be converted by dehydrogenation or oxidation into 1,1′-disubstituted-4,4′-bipyridylium salts which are useful herbicides.

3,717,647

ALPHA-NICOTINOYL PHENYLACETONITRILES

Frank J. Villani, West Caldwell, N.J., assignor to Schering Corporation, Bloomfield, N.J.
Continuation-in-part of Ser. No. 754,453, Aug. 21, 1968, abandoned, which is a continuation-in-part of Ser. No. 580,213, Sept. 19, 1966, Pat. No. 3,419,565, which is a continuation-in-part of Ser. Nos. 330,244, Dec. 13, 1963, Pat. No. 3,366,635, and Ser. No. 330,263, Dec. 13, 1963, Pat. No. 3,326,924, which is a continuation-in-part of Ser. No. 275,237, April 24, 1963, abandoned. This application April 9, 1971, Ser. No. 132,882

Int. Cl. C07d *31/46*

U.S. Cl. 260—294.9 **5 Claims**

The present invention concerns itself with α-nicotinoyl phenylacetonitriles and derivatives thereof which are useful as chemical intermediates in the preparation of novel aza-dibenzo [a,d]cycloheptenes.

3,717,648

1-PHENYL-AZACARBOCYCLIC-2-IMINES

Guy D. Diana, East Nassau, N.Y., assignor to Sterling Drug, Inc., New York, N.Y.
Continuation-in-part of Ser. No. 733,323, May 31, 1968, abandoned. This application Oct. 21, 1970, Ser. No. 82,799

Int. Cl. C07d *29/26*

U.S. Cl. 260—293.78 **10 Claims**

The compounds of this invention are novel 1-phenyl-3-azacarbocyclic-ureas and -thioureas and intermediates therefor which have anthelmintic activity. They are prepared by the reaction of azacarbocyclicamines or azacarbocyclicimines with appropriate phenyl isocyanates or phenyl isothiocyanates.

3,717,649

2-DIETHYLAMINO-ETHYL NICOTINATE, PARA-CHLORO-PHENOXY-ISOBUTYRIC ACID SALT

Albert R. J. Castaigne, Toulouse, France, assignor to Centre D'Etudes Pour L'Industrie Pharmaceutique, Toulouse, France

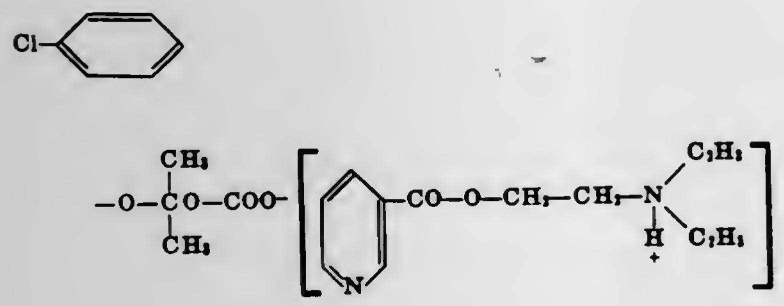
Filed Jan. 11, 1971, Ser. No. 105,625

Claims priority, application France, Jan. 20, 1970, 7001876

Int. Cl. C07d *31/36*

U.S. Cl. 260—295.5 R **1 Claim**

This invention relates to 2-diethylamino-ethyl nicotinate, para-chloro-phenoxy-isobutyric acid salt, having the formula:



which possesses in particular useful pharmacological properties, particularly blood-lipids normalizing and blood-cholesterol reducing properties which make it therapeutically valuable to reduce the concentration of cholesterol and other lipids in blood serum.

3,717,650

OXYGENATED N,2,3,3-TETRAMETHYL-EXO-2-NORBORNANAMINES

Milton E. Herr, Kalamazoo, Herbert C. Murray, Hickory Corners, and Gunther S. Fonken, Charleston Township, all of Mich., assignors to The Upjohn Co., Kalamazoo, Mich.

Filed July 15, 1970, Ser. No. 55,272

Int. Cl. C07c *87/40*

U.S. Cl. 260—295.5 S **27 Claims**

This invention relates to a novel microbiological process for the oxygenation of N-benzoyl-N,2,3,3-tetramethyl-exo-2-norbornanamine to obtain N-benzoyl-exo-6-hydroxy-N,2,3,3-tetramethyl-exo-2-norbornanamine and N-benzoyl-trans-7-hydroxy-N,2,3,3-tetramethyl-exo-2-norbornanamine, each of which are chemically converted to novel derivatives. These novel bioconversion products and their derivatives are active hypotensive agents and central nervous system stimulants.

3,717,651

THIAZOLES

Kurt H. Pilgram, and Richard D. Skiles, both of Modesto, Calif., assignors to Shell Oil Company, New York, N.Y.

Filed April 20, 1970, Ser. No. 30,367

Int. Cl. C07d *91/34*

U.S. Cl. 260—306.8 R **3 Claims**

Certain novel amides of at least three carbon atoms, which are substituted on the nitrogen by a thiazol-2-yl moiety, useful as herbicides.

3,717,652

9-CARBOXYLIC NAPHTHOXAZOLES AND PLASTICS BRIGHTENED THEREWITH

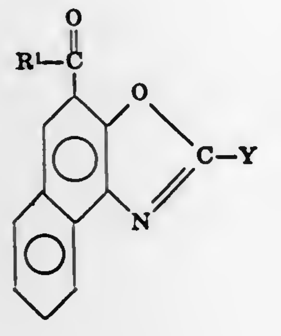
Bennett George Buell, Bound Brook, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Filed June 11, 1970, Ser. No. 45,595

Int. Cl. C07d *85/48*

U.S. Cl. 260—307 D **7 Claims**

Naphthoxazoles characterized by the presence of a carboxylic function at the 9-position are provided. They are improved mass brighteners for molded plastics, particularly polyesters, since they absorb strongly in the UV region of 370–400 nanometers and do not sublime or mark off at high molding temperatures. They correspond to the formula



in which R¹ is the hydroxyl radical, or, a monovalent dehydro radical of an alcohol, a phenol, a primary amine or a secondary amine, said monovalent radical containing about 1–8 carbon atoms, and Y is a 2-naphthoxazolyl, or a 2-naphthoxazolylphenyl having a carboxylic acid function at the 9-position, a stilbyl, a 2-benztriazolylphenyl or a 2-naphthtriazolylphenyl radical, or a styryl, 4-cyanostyryl or 4-carboxystyryl radical.

3,717,653

TRIAZOLOBENZODIAZEPINES AND THEIR PRODUCTION

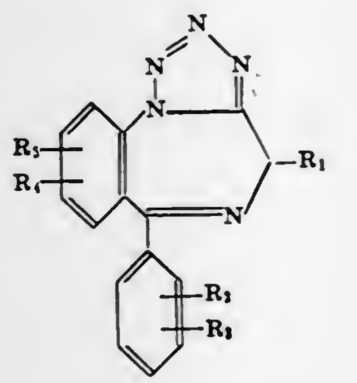
Jackson B. Hester, Jr., Galesburg, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

No Drawing. Filed Sept. 8, 1971, Ser. No. 178,789

Int. Cl. C07d *57/00*

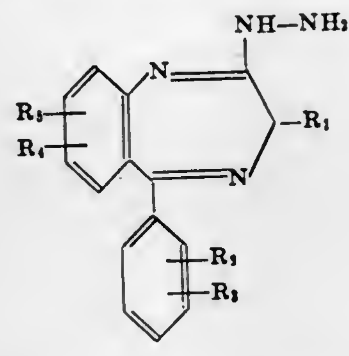
U.S. Cl. 260—308 D **7 Claims**

6 - phenyl - 4H - tetrazolo[1,5-a][1,4]benzodiazepines of the Formula II



II

wherein R_1 is hydrogen or alkyl of 1 to 3 carbon atoms, inclusive; wherein R_2, R_3, R_4 and R_5 are selected from the group consisting of hydrogen, alkyl as defined above, halogen, nitro, cyano, trifluoromethyl, and alkylthio in which the alkyl group is defined as above, are prepared by reacting a 2-hydrazino-5-phenyl-3H-1,4-benzodiazepine of the Formula I



I

with nitrous acid.

The compounds of Formula II and the pharmacologically acceptable acid addition salts thereof are useful sedatives and tranquilizers for mammals.

3,717,654

2,5,6,7 - TETRAHYDRO-3H-s-TRIAZOLO[4,3-d][1,4] BENZODIAZEPIN - 3-ONE COMPOUNDS AND THEIR PRODUCTION

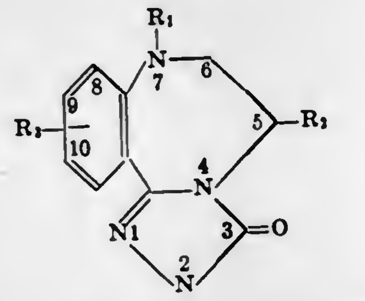
Jackson B. Hester, Jr., Galesburg, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

No Drawing. Filed Sept. 30, 1971, Ser. No. 185,380

Int. Cl. C07d *57/00*

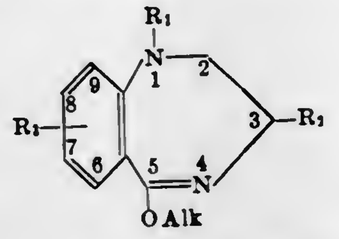
U.S. Cl. 260—308 C **6 Claims**

2,5,6,7-tetrahydro-7-alkyl-3H - s-triazolo[4,3-d][1,4] benzodiazepin-3-ones of the Formula II



II

wherein R_1 is alkyl of 1 to 3 carbon atoms, inclusive; wherein R_2 is hydrogen or alkyl defined as above; wherein R_3 is selected from the group consisting of hydrogen, alkyl as defined above, alkoxy of 1 to 3 carbon atoms; fluoro, chloro, bromo, iodo, nitro, cyano, trifluoromethyl, and alkylthio of 1 to 3 carbon atoms, inclusive, is produced by heating a 1-alkyl-5-alkoxy-2,3-dihydro-1H-1,4-benzodiazepine I



I

with a lower alkyl carbazate, e.g., ethyl carbazate.

The compounds II and pharmacologically acceptable acid addition salts thereof are useful as tranquilizers and sedatives in mammals and poultry.

3,717,655

1-(β-ARYL)ETHYL-IMIDAZOLE DERIVATIVES

Erik Fred Godefroi, Nachtegalenstraat, and Jan Heeres, Turnhout, Belgium, assignors to Janssen Pharmaceutica N.V.

No Drawing. Continuation-in-part of application Ser. No. 753,729, Aug. 19, 1968. This application July 23, 1969, Ser. No. 848,767

Int. Cl. C07d *49/00*

U.S. Cl. 260—309 **8 Claims**

The compounds are of the class of 1-(β-aryl)ethyl-imidazole ethers and amines useful for their anti-fungal and anti-bacterial activity.

3,717,656

SELECTIVE CATALYTIC HYDROGENATION OF 2-(4-NITROPHENYL)-4(5)-NITROIMIDAZOLE

William H. Jones, Metuchen, and John M. Chemerda, Watchung, N.J., assignors to Merck & Co., Inc., Rahway, N.J.

No Drawing. Filed June 29, 1971, Ser. No. 158,127

Int. Cl. C07d *49/36*

U.S. Cl. 260—309 **1 Claim**

Selective hydrogenation of 2 - (p-nitrophenyl) - 4(5)-nitroimidazole to 2-(p-aminophenyl)-4(5)-nitroimidazole is accomplished catalytically, using an improvement consisting of an aqueous ammonium hydroxide medium, at a temperature between 20–25° C. The compound produced is an intermediate useful in making compounds having utility against enteroheptatitis and trichomoniasis.

3,717,657

N-TRITYL-IMIDAZOLES

Karl-Heinz Buchel, Leverkusen; Erik K. Regel, Wuppertal-Kronenberg, and Manfred Plempel, Wuppertal-Elberfeld, all of Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

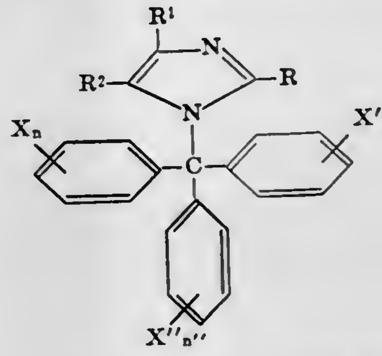
Division of Ser. No. 13,797, Feb. 24, 1970, which is a division of Ser. No. 758,594, Sept. 9, 1968, Pat. No. 3,660,577. This application Jan. 17, 1972, Ser. No. 218,524

Claims priority, application Germany, Sept. 15, 1972, F 53504

Int. Cl. C07d *49/36*

U.S. Cl. 260—309 **3 Claims**

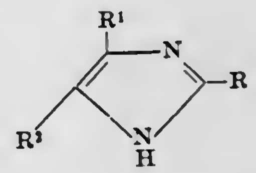
N-trityl-imidazoles and salts thereof of the formula:



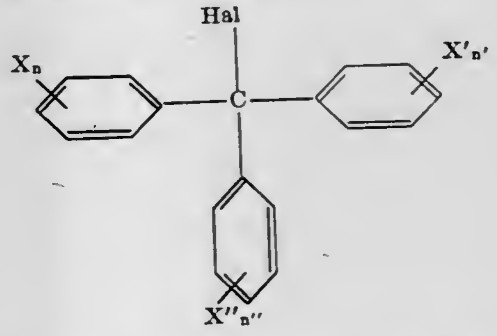
wherein R, R¹ and R² are hydrogen, lower alkyl or phenyl, or R¹ and R² together form an anellated benzene ring.

X, X' and X'' are alkyl of one to 12 carbon atoms or an electro-negative moiety, and

n, *n'* and *n''* are an integer from 0 to 2, or pharmaceutically acceptable acid salts thereof may be produced by reacting a silver salt or alkali metal salt of an imidazole of the formula:



with a trityl halide of the formula:



wherein the substituents are as above defined and Hal is halogen. These compounds are useful as antimycotics.

3,717,658

3'-ARYLSPIRO [IMIDAZOLIDINE - 2,1'-PHTHALAN] AND 2-[2' - (α-HYDROXY-ARYLMETHYL)-ARYL]-2-IMIDAZOLINE DERIVATIVES

Werner Metlesics, Clifton, and Leo Henryk Sternbach, Upper Montclair, N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

No Drawing. Filed Mar. 7, 1968, Ser. No. 711,202

Int. Cl. C07d *49/34*

U.S. Cl. 260—309.6 **5 Claims**

3' - arylspiro[imidazolidine - 2,1'-phthalan] and 2-[2'-(α - hydroxy-arylmethyl)-aryl]-2-imidazoline derivatives are prepared, inter alia, by the reduction of the corresponding 2-benzoylphenyl-2-(2-imidazolines). The end products are useful as antidepressant agents and an intermediates.

3,717,659

HETEROCYCLIC SALICYLIC ACID DERIVATIVES

Lewis H. Sarett, Skillman, and William V. Ruyle, Scotch Plains, N.J., assignors to Merck & Co., Rahway, N.J.

No Drawing. Continuation-in-part of application Ser. No. 673,273, Oct. 6, 1967. This application June 9, 1970, Ser. No. 44,867

Int. Cl. C07d *27/26*

U.S. Cl. 260—326.3 **3 Claims**

New salicylic acid compounds, particularly 5-(heterocyclic)-salicylic acid derivatives and process for their preparation are claimed. The new 5-(heterocyclic)-salicylic acid compounds described have anti-inflammatory, anti-pyretic and analgesic activity.

3,717,660

REACTION OF PHENYL(BROMODICHLOROMETHYL) MERCURY AND THE PREPARATION OF PERCHLOROTHIIRANE

Dietmar Seyferth, Lexington, Mass., and Wolfgang Tronich, 8700 Wurzburg, Germany, assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed April 8, 1970, Ser. No. 26,799

Int. Cl. C07d *59/00*

U.S. Cl. 260—327 E **3 Claims**

The reaction of phenyl (trihalo) mercury with elemental sulfur or carbon double bond sulfur substances produces thiiranes in improved yields. A novel compound useful as an insecticide, as a vulcanization agent, as a substance for the introduction of flame proofing, and as a polymer intermediate for polythioethylene polymers, is described.

3,717,661

PROCESS FOR THE PREPARATION OF 1-INDANCARBOXYLIC ACIDS AND INTERMEDIATE THEREFOR

Peter Frederick Juby, Dewitt, William Reuther Goodwin, Syracuse, and Thomas William Hudyma, Dewitt, N.Y., assignors to Bristol-Myers Company, New York, N.Y.

No Drawing. Filed Oct. 28, 1970, Ser. No. 84,892

Int. Cl. C07c *63/44;* **C07d** *73/00*

U.S. Cl. 260—327 M **6 Claims**

Levorotatory 5-cyclohexyl-1-indancarboxylic acid is a useful anti-inflammatory agent in the treatment of inflammatory diseases in animals, including man. As such, a new and more efficient process has been discovered for the preparation of large quantities of the compound.

3,717,662

PROCESS FOR MANUFACTURING EPOXYPROPANE AND ACETIC ACID

Jacob Alagy, La Celle St. Cloud; Christian Busson, Rueil Malmaison; Claude Gadelle, Rueil Malmaison, and Irenee Seree De Roch, Rueill Malmaison, all of France, assignors to Institut Francais du Petrole des Carburants et Lubrifiants, Rueil Malmaison, France

Filed June 26, 1970, Ser. No. 50,336

Claims priority, application France, July 10, 1969, 6923658

Int. Cl. C07d *1/12, 1/08;* **C07c** *53/08*

U.S. Cl. 260—348.5 V **10 Claims**

Combined process for manufacturing epoxypropane and acetic acid comprising a first stage of oxidizing, with molecular oxygen,up to 50 percent of a propylene charge dissolved in a paraffinic hydrocarbon in the presence of a molybdenum, tungsten or vanadium — containing catalyst, a second stage of fractionating the resulting product and separating from unconverted products epoxypropane and a heavy fraction, a third stage of oxidizing at least one part of said heavy fraction in the presence of a catalyst containing cobalt and/or manganese, and a fourth stage of separating the resulting acetic acid.

3,717,663

9-ALPHA-METHYL STEROIDS

Robert V. Coombs, Chatham, and Eugene E. Galantay, Morristown, both of N.J., assignors to Sandoz-Wander, Inc., Hanover, N.J.

Continuation-in-part of Ser. No. 844,183, July 23, 1969, Pat. No. 3,655,652, and a continuation-in-part of Ser. No. 848,705, Aug. 8, 1969, abandoned. This application July 1, 1971, Ser. No. 159,005

Int. Cl. C07c *169/32, 169/34*

U.S. Cl. 260—397.5 **5 Claims**

The compounds are 13-(lower)alkyl-9α-methyl-gonanes which may be aromatically unsaturated or 4-, or 5(10)-mono-unsaturated, e.g. 3-methoxy-9α-methylestra-1,3,5(10)-trien-17-one and 17β-acetyl-9α-methylestra-4-en-3-one. The compounds are useful as pharmaceuticals.

3,717,664

METHOD FOR THE PREPARATION OF CARBOXYLIC ACIDS BY AN OXIDIZING DECOMPOSITION OF ORGANIC COMPOUNDS CONTAINING LONGER CARBON CHAINS

Nguyen Dinh-Nguyen, and Aino Raal, both of Molndal, Sweden, assignors to Incentive Research & Development Aktiebolag, Bromma, Sweden

Filed Dec. 9, 1969, Ser. No. 883,642

Claims priority, application Sweden, Dec. 11, 1968, 16972/68

Int. Cl. C08h *17/36*

U.S. Cl. 260—413 **5 Claims**

Carboxylic acids can be prepared by an oxidizing decomposition of organic compounds having longer carbon chains. The organic compounds are treated with potassium permanganate in acetic acid as solvent, resulting in the long carbon chains being split up to form carboxylic acids having shorter carbon chains.

3,717,665

SILOXANE-OXYALKYLENE COPOLYMERS CONTAINING Si—Si BONDS

Ronald Sangster Stuart, Saltcoats, Scotland, assignor to Imperial Chemical Industries Limited, London, England

No Drawing. Filed Dec. 16, 1970, Ser. No. 98,903

Claims priority, application Great Britain, Jan. 5, 1970, 380/70

Int. Cl. C07b *7/10;* **C07f** *7/08*

U.S. Cl. 290—448.2 D **13 Claims**

Siloxane-oxyalkylene copolymers having at least one polysiloxane block in which at least two silicon atoms are directly attached to each other and at least one polyoxyalkylene block in which there are at least two oxyalkylene units. The novel compounds are useful as surfactants in the preparation of polyurethane foams.

3,717,666

PROCESS FOR PRODUCING ALUMINUM ALKOXIDES

Paul Kobetz; Hymin Shapiro, and Fred J. Impastato, all of Baton Rouge, La., assignors to Ethyl Corporation, Richmond, Va.

Filed Feb. 16, 1971, Ser. No. 115,887

Int. Cl. C07f *5/06*

U.S. Cl. 260—448 AD **19 Claims**

It is disclosed that the reaction of aluminum and alcohol to produce aluminum hydrocarbyl oxides is improved by catalysis with alkoxy alcohol.

3,717,667

2-N-ALKYL-AMINO-2-DEOXY-ALDITONITRILES AS BIOCIDALS

Wallace H. Pippin, Holland, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Filed July 15, 1970, Ser. No. 55,237

Int. Cl. C07c *121/46, 121/34, 121/38*

U.S. Cl. 260—464 **5 Claims**

This invention relates to novel 2-alkylamino-2-desoxy-alditonitriles, salts thereof, their preparation, biocidal compositions containing them, and their utilization in the control of living organisms.

3,717,668

SUBSTITUTED BISCARBAMATES

Wolfgang Rohr, 6800 Mannheim, and Adolf Fischer, 6704 Mutterstadt, both of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen/Rhein, Germany

Filed July 9, 1970, Ser. No. 53,680

Claims priority, application Germany, July 30, 1969, P 19 38 612.0

Int. Cl. C07c *125/06*

U.S. Cl. 260—472 **3 Claims**

New and valuable substituted 4-methylphenyl biscarbamates having a strong herbicidal action and a process for controlling the growth of unwanted plants with these compounds.

3,717,669

2-PHENOXYALKANOIC ACID ESTERS

Norman H. Grant, Wynnewood, and Harvey E. Alburn, West Chester, both of Pa., assignors to American Home Products Corporation, New York, N.Y.

Filed June 18, 1968, Ser. No. 737,837

Int. Cl. C07c *69/76*

U.S. Cl. 260—473 G **7 Claims**

This invention concerns 2-phenoxyalkanoic acid esters which are pharmacologically active as anticholesterol agents.

3,717,670

PRODUCTION OF CARBOXYLIC ACIDS AND ESTERS

Robert G. Schultz, St. Louis, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Aug. 2, 1968, Ser. No. 749,760

Int. Cl. C07c *51/12, 51/14, 67/00*

U.S. Cl. 260—476 R **33 Claims**

The present invention relates to a process for the preparation of carboxylic acids and esters, specifically by the reaction of alcohols and carbon monoxide in the presence of a supported catalyst comprising a rhodium component in combination with a metal compound selected from the IB, IIIB, IVB, VB, VIB, VIII, lanthanide and actinide groups of the Periodic Table dispersed on a carrier, the said reaction being conducted in the presence of a halide promoter. The process is also directed to the production of mixtures of organic acids together with organic esters.

3,717,671

XYLYLENE DICARBAMATES AND PROCESS FOR PREPARING THE SAME

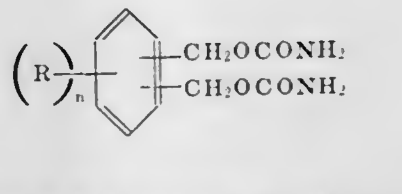
Ching Yun Huang, Tomotaka Onizuka, both of Osaka; Tamotsu Maeno, Yokohama, and Teruyuki Ninomiya, Osaka, all of Japan, assignors to Japan Gas-Chemical Company, Inc., Tokyo, Japan

Filed April 6, 1970, Ser. No. 26,104

Int. Cl. C07c *125/04*

U.S. Cl. 260—482 B **11 Claims**

Novel xylylene dicarbamate and nucleus-substituted derivatives thereof expressed by the following formula



wherein R stand for an alkyl group of one to four carbon atoms and *n* is O or an integer of 1 to 4,

and a process for the preparation of said xylylene dicarbamates.

3,717,672

NEUTRALIZATION PROCESS FOR ESTER MATERIALS

Robert V. J. McGee, Union, N.J., assignor to Esso Research and Engineering Company

Filed Oct. 22, 1969, Ser. No. 868,624

Int. Cl. C07c *69/60*

U.S. Cl. 260—485 R **5 Claims**

An organic ester, particularly one that is to be employed as a synthetic lubricating oil or as a polymerizable ester for the preparation of a polymeric additive for a lubricating oil or for fuel oil, is treated to remove undesirable acidic constituents therefrom by contacting the ester with dry slacked lime having associated therewith a very small proportion of an ionizing liquid such as water. The acidic constituents of the ester form with the slaked line a filterable curd that is easily separated from the ester. Advantages over prior art processes, such as treatment with aqueous alkaline solutions or percolation through solid beds of alkaline material include avoidance of emulsions, more rapid treatment, less expense, greatly reduced volumes of treating agent, and avoidance of the formation of undesirable eater-soluble metal salts of organic acids.

3,717,673

PROCESS FOR THE PREPARATION OF L-DOPA

Luigi Bernardi, Via Pinerolo, and Onofrio Goffredo, Via Cremosano, both of Milan, Italy

No Drawing. Filed Mar. 30, 1971, Ser. No. 129,645

Claims priority, application Italy, Apr. 4, 1970, 22,910/70

Int. Cl. C07c *101/08*

U.S. Cl. 260—519 **4 Claims**

A process for the preparation of L-β-(3,4-dihydroxyphenyl)-alanine (L-Dopa). The process comprises treating L-tyrosine methylester with acetic anhydride at a temperature between 10° and 40° C., for a period of 2–5 hours to give O,N-diacetyl-L-tyrosine methylester. Reacting said O,N-diacetyl-L-tyrosine methylester with aluminum chloride, in the presence of a suitable organic solvent at a temperature between 100° and 150° C. for a period of 2–4 hours to yield β-(3-acetyl-4-hydroxyphenyl)-N-acetyl-L-alanine. Oxidizing said N-acetyl-L-alanine with hydrogen peroxide to yield N-acetyl-L-Dopa.

Hydrolyzing said N-acetyl-L-Dopa with a hot inorganic acid to yield L-β-(3,4-dihydroxyphenyl)-alanine.

3,717,674

THERMAL PURIFICATION OF TEREPHTHALIC ACID USING A CARBOXYLIC ACID-C_8 AROMATIC SOLVENT

Jorge A. Blay, Corpus Christi, Tex., assignor to Celanese Corporation, New York, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 705,601, Feb. 15, 1968. This application Nov. 29, 1968, Ser. No. 780,268

Int. Cl. C07c *51/48*

U.S. Cl. 260—525 **13 Claims**

A process for the purification of terephthalic acid (TPA) by heating the TPA and a liquid medium comprised of a C_8 alkyl aromatic and a C_1–C_{10} monocarboxylic acid, e.g. acetic, to a temperature above 275° C. or 325° C. depending on the catalyst present and until at least 50%, preferably 100%, of the TPA no longer remains as a solid. Pressures are such that a liquid phase is maintained when below the critical temperature. Following the heating, the mixture is cooled so as to crystallize the purified TPA.

3,717,675

PROCESS FOR ISOLATING ACRYLIC ACID FROM THE REACTION GASES OBTAINED BY THE OXIDATION OF PROPYLENE OR A ACROLEIN

Kurt Sennewald; Alfred Hauser; Klaus Gehrmann, all of Knapsack near Cologne; Karl-Heinz Steil, Burbach near **Cologne, and Winfried Lork, Friesheim near Euskirchen,** all of Germany, assignors to Knapsack Aktiengellschaft, Knapsack near Cologne, Germany

Filed July 20, 1967, Ser. No. 654,876

Claims priority, application Germany, Aug. 9, 1966, K 59985

Int. Cl. C07c *57/04*

U.S. Cl. 260—530 N **6 Claims**

Process for isolating acrylic acid from the reaction gases obtained by the oxidation of propylene or acrolein, wherein the hot reaction gases, which have a temperature of 300° to 600°C, are pre-cooled, wherein the resulting aqueous acrylic acid solution is heated to be freed from the acrolein contained therein, and wherein the resulting vapors, together with non-liquefied, acrolein-containing residual gas, are returned to the oxidation zone, the said process comprising the steps of pre-cooling the reaction gas inside a heat exchanger down to a temperature of 100° to 200°C, subjecting thereafter the pre-cooled gases to direct scrubbing with water having a temperature of 10° to 50°C and thereby cooling them further down to a temperature between 30° and 90°C, and heating the resulting aqueous, 10 to 45 percent acrylic acid solution to a temperature of about 100° to 120°C to expel residual acrolein therefrom.

3,717,676

SYNTHESIS OF OXYCARBOXYLIC ACID SALTS

Ibrahim S. Bechara, Newcastle, Del.; George B. DeLaMater, Media, and Barton Milligan, Ardmore, both of Pa., assignors to Air Products and Chemicals, Inc., Wayne, Pa.

Filed Aug. 20, 1971, Ser. No. 173,648

Int. Cl. C07c *51/26*

U.S. Cl. 260—531 C **7 Claims**

Production of the oxycarboxylic acid alkali metal salts from the oxysubstituted or polyoxy-substituted primary alcohols and alkali metal hydroxide in the presence of a catalyst comprising cadmium is effected in the presence of low hydrogen partial pressure and strictly controlled water concentration. The synthesis of sodium oxydiacetate from diethylene glycol and concentrated aqueous caustic solution in the presence of CdO is particularly effective.

3,717,677

OXYGENATED 1-AMIDOADAMANTANES

Milton E. Herr, Kalamazoo; Herbert C. Murray, Hickory Corners, and Gunther S. Fonken, Galesburg, all of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 4,774, Jan. 21, 1970, which is a continuation-in-part of Ser. No. 666,990, Sept. 11, 1967, abandoned, which is a continuation-in-part of Ser. No. 528,346, Feb. 18, 1966, abandoned. This application Feb. 18, 1971, Ser. No. 116,645

Int. Cl. C07c *103/30*

U.S. Cl. 260—557 R **15 Claims**

A novel method for the introduction of oxygen into 1-aminoadamantanes by bioconversion to obtain the corresponding oxygenated 1-amidoadamantanes which can be chemically converted to novel derivatives thereof. These novel bioconversion products and their derivatives are of particular value as central nervous system stimulants.

3,717,678

BIS(HALOXIMINO)ACETONE AND METHOD OF PREPARATION

John H. Bateman, Haverstraw, N.Y., assignor to Ciba-Geigy Corporation, Greenburgh, N.Y.

Filed July 26, 1971, Ser. No. 166,245

Int. Cl. C07c *119/00*

U.S. Cl. 260—566 A **5 Claims**

Bis(haloximino)acetone derivatives are prepared by a process comprising reacting acetone with an nitrosyl halide in an inert solvent, at a temperature of from −50° to 25°C. A typical embodiment is bis(chloroximino)acetone. These compounds are useful as cross-linking agents, chain-extending and/or capping agents for unsaturated polymers.

3,717,679

FLUOROCARBON CONTAINING DIALLYL AMMONIUM COMPOUND

Ralph N. Thompson and Merwin F. Hoover, Pittsburgh, Pa., assignors to Calgon Corporation, Pittsburgh, Pa.

No Drawing. Continuation-in-part of application Ser. No. 786,742, Dec. 24, 1968. This application Sept. 2, 1971, Ser. No. 177,441

Int. Cl. C07c *93/02*

U.S. Cl. 260—567.6 M **3 Claims**

Diallyl quaternary ammonium compounds substituted with fluorinated groups are disclosed. They may be used as water and oil repellents either in polymerized or unpolymerized form.

3,717,680

PURIFICATION OF P-AMINOPHENOL

Frank A. Baron, Short Hills, and Roland G. Benner, New Providence, both of N.J., assignors to Mallinckrodt Chemical Works, Lodi, N.J.

Filed Oct. 16, 1969, Ser. No. 867,081

Int. Cl. C07c *91/44*

U.S. Cl. 260—575 **11 Claims**

A process is provided for obtaining purified p-aminophenol. The process comprises bringing an aromatic amine from the group of aniline, toluidines, xylidines and mixtures thereof into contact with crude p-aminophenol containing impurities and recovering the purified p-aminophenol. In a particularly important aspect the aromatic amine is brought into contact with an aqueous acid reaction medium containing p-aminophenol and impurities; the pH of the medium is adjusted to above 6 and preferably from about 6.5 to 7.5; the medium is cooled and the purified crystalline p-aminophenol is removed.

3,717,681

ALKENYL TRISULFIDES

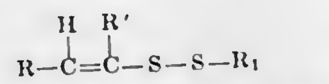
Michael Hugo Brodnitz, Matawan, N.J., assignor to International Flavors & Fragrances, Inc., New York, N.Y.

Division of Ser. No. 724,612, April 20, 1968, Pat. No. 3,615,601. This application May 26, 1971, Ser. No. 147,268

Int. Cl. C07c *149/12*

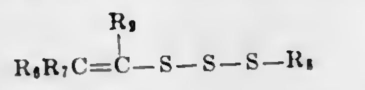
U.S. Cl. 260—608 **5 Claims**

Novel compounds have been discovered which impart cooked onion flavor and aroma to foods treated therewith. Said novel compounds are alkyl 1-alkenyl disulfides having the formula:



$$R-\overset{H}{\overset{|}{C}}=\overset{R'}{\overset{|}{C}}-S-S-R_1$$

wherein R′ is hydrogen or alkyl and R and R_1 are alkyl. Representative compounds are methyl propenyl disulfide, propyl propenyl disulfide, and ethyl propenyl disulfide. Compositions containing said compounds preferably at levels of from 0.01 to 20 percent by weight are also disclosed. Additionally, said compositions may contain other disulfides and trisulfides including novel alkenyl trisulfides having the formula:



$$R_8R_7C=\overset{R_9}{\overset{|}{C}}-S-S-S-R_6$$

wherein R_7 and R_8 are alkyl groups and R_6 and R_9 are hydrogen or alkyl.

3,717,682

PROCESS OF PREPARING MERCAPTOPHENOLS

Emil J. Geering, Grand Island, and George B. Stratton, Lewiston, both of N.Y., assignors to Hooker Chemical Corporation, Niagara Falls, N.Y.

Division of Ser. No. 788,100, Dec. 30, 1968, abandoned. This application May 21, 1971, Ser. No. 145,960

Int. Cl. C07c *149/36*

U.S. Cl. 260—609 D **14 Claims**

A process is described for preparing polythiobisphenols and for converting these into mercaptophenols. The reaction between a phenol and sulfur as catalyzed by a Friedel-Crafts catalyst is interrupted before completion, and the product, a phenol polysulfide mixture is reduced to mercaptophenol. A continuous process is described wherein by-product phenol monosulfides are converted to a phenol.

3,717,683

PROCESS FOR PREPARING HYDROQUINONE FROM p-NITROSOPHENOL

William von E. Doering, Cambridge, William J. Farrissey, Jr., Northford, Floro F. Frulla, Wallingford, and Adnan A. R. Sayigh, North Haven, Conn., assignors to The Upjohn Company, Kalamazoo, Mich.

No Drawing. Filed Jan. 12, 1970, Ser. No. 2,430

Int. Cl. C07c *37/00*

U.S. Cl. 260—621 R **5 Claims**

A novel process for preparing hydroquinone by conversion of p-nitrosophenol is disclosed.

3,717,684

PROCESS FOR PREPARING CHLORINATED AROMATICS

Vincent A. Notaro, and Charles M. Selwitz, both of Monroeville, Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Sept. 11, 1970, Ser. No. 71,429

Int. Cl. C07c *25/04, 25/14*

U.S. Cl. 260—650 R **6 Claims**

A process for preparing a nuclear polychloro alkyl aromatic compound which involves heating an alkyl aromatic in the presence of a nitrate ion, a nitrite ion, NO or NO_2, HCl, water, oxygen and a strong acid, wherein the molar ratio of HCl to aromatic compound is initially at a level of about 4:1 to about 10:1 and such ratio is maintained at approximately such level during the course of the reaction.

3,717,685

PROCESS FOR PREPARING CHLORINATED AROMATICS

Russell G. Hay, Gibsonia; Vincent A. Notaro, and Charles M. Selwitz, both of Monroeville, all of Pa., assignors to Gulf Research and Development Company, Pittsburgh, Pa.

Filed Sept. 28, 1970, Ser. No. 76,318

Int. Cl. C07c *25/04, 25/14*

U.S. Cl. 260—650 R **7 Claims**

A process for preparing a chloroaromatic compound which involves heating an aromatic compound in the presence of a nitrate ion, a nitrite ion, NO or NO_2, HCl, water, oxygen, a strong acid and a paraffin or a cycloalkane.

3,717,686

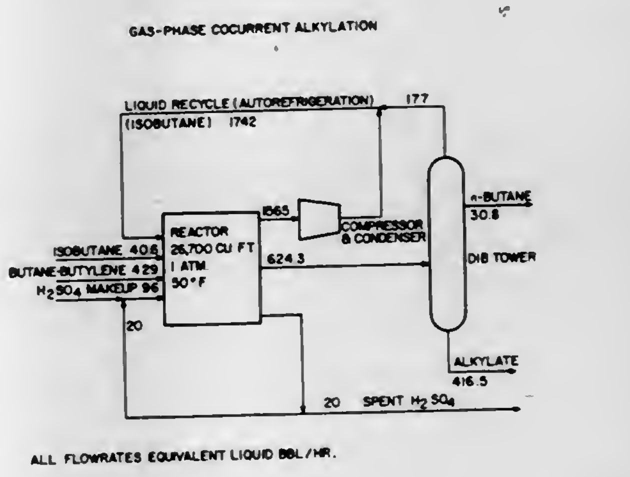
GAS-FOG ALKYLATION PROCESS

Jaydee W. Miller, Wallingford, Pa. (% Sun Oil Company, P.O. Box 426, Marcus Hook, Pa. 19061)

Filed June 7, 1971, Ser. No. 150,607

Int. Cl. C07c *3/54*

U.S. Cl. 260—683.59 **11 Claims**



A process for alkylation of gaseous C_2–C_5 monoolefin with gaseous C_4–C_8 branched paraffin comprises contacting the mixed gases at alkylation conditions with a fog or mist of strong mineral acid. Preferably, the catalyst and hydrocarbon reactants are maintained in a concurrent flow. For C_3 or C_4 acyclic monoolefin and C_4 or C_5 isoparaffin, the preferred alkylation conditions include a temperature in the range of about 30–80° F. and a pressure about atmospheric (e.g., 5–25 p.s.i.a., typically 14–20 p.s.i.a.). The feed mole ratio, paraffin to olefin, can be in the range of 1:1 to 60:1, typically 2:1 to 30:1. Liquid paraffin (e.g., isobutane) can be injected into the reactor in order to control the reaction temperature. Preferably, the liquid acid droplets have a mean diameter in the range of 5–50 microns, typically 10–25 microns. For example, isobutane can be premixed with butylenes at the desired mole ratio and the gaseous mixture reacted in the presence of a fog of sulfuric acid droplets of about 10 microns in diameter at atmospheric pressure and 50° F. The product contains about 30–40% isobutane and the remainder is alkylate; whereas, the product from conventional liquid phase sulfuric acid alkylation contains 80–85% isobutane. Therefore, an advantage of the present process is a substantial savings in distillation costs.

3,717,687

COMPOSITION AND METHOD OF IMPARTING PREMANENT PRESS AND SOIL RELEASE PROPERTIES TO FABRICS

Edward S. Shanley, Winchester, and Roger H. Doggett, Natick, both of Mass., assignors to The Lubrizol Corporation, Wickliffe, Ohio

Filed March 24, 1971, Ser. No. 127,755

Int. Cl. C08g *37/32*

U.S. Cl. 260—851 **20 Claims**

Textile materials are given permanent press and soil release properties by treating them with a textile resin and a polymer of an N-sulfohydrocarbon-substituted acrylamide, preferably 2-acrylamido-2-methylpropanesulfonic acid, and usually also with a textile resin catalyst. The textile resin is normally cured on the fabric by heating the same to 130°–200° C.

3,717,688

METHODS FOR PREPARING GRAFT POLYMERS AND RESIN COMPOSITIONS

Shunichi Koyanagi, Naoetsu, and Hajime Kitamura and Shigehisa Sonegawa, Ohkata, Japan, assignors to Shinetsu Chemical Company

No Drawing. Filed Nov. 16, 1970, Ser. No. 90,116

Claims priority, application Japan, Nov. 22, 1969, 44/94,103

Int. Cl. C08f *41/12, 19/08*

U.S. Cl. 260—876 R **7 Claims**

When from 25 to 70% by weight of a prepolymer having a viscosity of from 1 to 100 cps. at 60° C. and obtained by partially polymerizing a mixture containing as its main components styrene monomer and at least one of the monomers selected from the group consisting of methyl methacrylate and acrylonitrile, are added to from 75 to 30% by weight of an aqueous emulsion of diene rubber polymer mainly composed of conjugated diene hydrocarbon, and the mixture thus prepared is subjected to graft-polymerization, an easily processable graft polymer composition superior in impact strength and transparency is obtained. From 5 to 30 parts by weight of said graft polymer composition mixed with from 95 to 70 parts by weight of vinyl chloride resin will give a vinyl chloride resin composition superior in impact strength.

3,717,689

PROCESS FOR IMPROVING THE ANTISTATIC PROPERTIES OF HYDROPHOBIC SYNTHETIC FIBERS

Hiroyoshi Tanaka; Hiroshi Aotani; Masaharu Shimamura, and Kazuo Yuki, all of Ehime, Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Continuation-in-part of Ser. No. 812,418, April 1, 1969, abandoned. This application Sept. 20, 1971, Ser. No. 182,172

Claims priority, application Japan, April 3, 1968, 43/21420; Oct. 1, 1968, 43/70817

Int. Cl. C08f *29/56*

U.S. Cl. 260—898 **14 Claims**

The antistatic properties of hydrophobic synthetic fibers are improved by treatment with an aqueous mixture containing at least one copolymer prepared by copolymerization of a mixture of (I) monoester selected from alkoxy-polyalkyleneglycol-acrylates or alkoxy-polyalkylene-glycol-methacrylates and (II) diester selected from diacrylates and dimethacrylates of polyols. An improvement in the treatment is made by addition of (III) acrylonitrile or vinyl esters of alkyl-alcohols with more than 8 carbon atoms to the copolymerization mixture in order to increase the durability of the antistatic properties of the fibers as a result of laundering and dry cleaning, and to improve the handling qualities.

3,717,690

N,N-DIALKYLAMIDOXIME PHOSPHATES

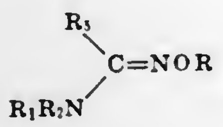
Neil F. Newman, Matawan, N.J., assignor to Esso Research and Engineering Company

Filed July 1, 1970, Ser. No. 51,688

Int. Cl. C07f *9/08, 9/16, 9/32*

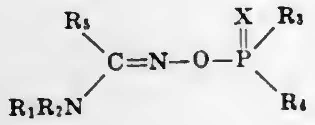
U.S. Cl. 260—945 **13 Claims**

N,N-dialkylamidoximes and their derivatives are biologically active compounds possessing exceptional herbicidal activity. These compounds can be characterized by the following structural formula:



in which R can be hydrogen, C_1—C_6 alkyl, C_3—C_6 cycloalkyl, C_1—C_6 monoalkyl or C_2—C_6 dialkyl carbamoyl, C_6—C_{10} aryl carbamoyl, C_1—C_6 mono- or C_2—C_6 dialkyl or C_6—C_{10} aryl thiocarbamoyl, C_6—C_{10} aryl, C_1—C_6 acyl, C_1—C_6 alkylsulfonyl, C_6—C_{10} arylsulfonyl, or a phosphorus-containing moiety defined below; wherein R_5 is a C_1—C_6 alkyl, C_2—C_6 alkoxyalkyl, C_2—C_6 alkylthioalkyl, C_1—C_6 haloalkyl, C_6—C_{10} aryl, C_6-—C_{10} halo-substituted aryl, C_7—C_{11} arylalkyl and C_7—C_{11} halo-substituted arylalkyl, C_2—C_6 alkenyl and C_2—C_6 alkynyl; R_1 and R_2 can be the same or different and are C_1—C_6 alkyl or C_3—C_6 cycloalkyl or taken together can form a cyclic ring. Similarly, R_1 and R_5 taken together can form a cyclic ring.

A preferred embodiment of these compounds is characterized by the following structural formula:



R_3 and R_4 can be the same or different and are C_1—C_6 alkyl, C_1—C_6 alkoxy, C_6—C_{10} aryloxy, C_1—C_6 alkylthio, C_6—C_{10} arylthio, C_1—C_6 haloalkyl, C_6—C_{10} aryl, C_6—C_{10} halo-substituted aryl, C_7—C_{11} arylalkyl and C_7—C_{11} halo-substituted arylalkyl; C_2—C_6 alkenyl and C_2—C_6 alknynl; X is either O or S.

In a preferred embodiment, when R_5 is limited to C_6—C_{10} aryl, the phosphorylated compounds have been shown to possess an exceptionally good herbicidal activity.

3,717,691

TRI-[p-(2-BUTENYL)-PHENYL]-PHOSPHITE

Frederick Harold Howell, Maghull, near Liverpool, and Wilfred Pickles, Stockport, England, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

No Drawing. Filed Nov. 20, 1969, Ser. No. 878,568

Claims priority, application Great Britain, Dec. 3, 1968, 57,190/68, 57,191/68

Int. Cl. C07f *9/12;* **C08f** *45/58*

U.S. Cl. 260—956 **1 Claim**

Tri - [p - (2-butenyl)-phenyl]-phosphate and -phosphite and tri-[p-(2,3-epoxybutyl)-phenyl]-phosphate are stabilizers of organic material. The compounds are obtained by

(a) contacting p-(2-butenyl)-phenol with a phosphorylating agent,
(b) contacting p-(2-butenyl)-phenol with a phosphorus trihalide, and
(c) contacting the products of (a) or (b) with an epoxidising agent.

3,717,692

PROCESS FOR THE MANUFACTURE OF SALT MIXTURES OF ALKALI METAL SALTS OF O,O-DIALKYLDITHIO-PHOSPHORIC ACIDS

Hilmar Roszinski, Kendenich near Cologne, and Hermann Schmadel, Hofheim/Taunus, both of Germany, assignors to Knapsack Aktiengesellschaft, Knapsack bei Koln, Germany

Filed Sept. 14, 1970, Ser. No. 72,177

Claims priority, application Germany, Oct. 24, 1969, P 19 53 614.2

Int. Cl. C07f *9/16*

U.S. Cl. 260—987 **5 Claims**

Production of salt mixtures comprised of alkali metal salts of O,O-dialkyldithiophosphoric acids of the general formula $(RO)_2PS(SMe)$, in which Me stands for the alkalies sodium or potassium, and R stands for identical or different alkyl radicals of branched or unbranched linear hydrocarbon compounds having from one to 18 carbon atoms, and of corresponding alkali metal carbonates by reacting an 0,0-dialkyldithiophosphoric acid with an excess of carbonates of the said alkalies Me. The salt mixtures are more particularly produced by introducing into the 0,0-dialkyldithiophosphoric acid at least one of the above alkali metal carbonates so as to produce a mixture of alkali metal salt of 0,0-dialkyldithiophosphoric acid and excess alkali metal carbonate with an overall alkali metal carbonate content of between 10 and 30 weight percent, and subjecting the resulting reaction product to finishing treatment.

3,717,693

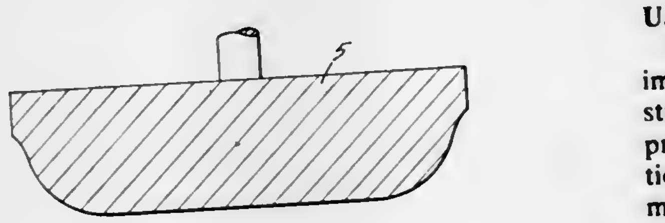
DRY PRESSING CERAMIC DISK IN MOLD HAVING A MULTI-PART FEMALE DIE

Lou Kohl, Palatine, and Daniel Joseph Shea, Fox River Grove, both of Ill., assignors to American Can Company, Greenwich, Conn.

Filed March 15, 1971, Ser. No. 124,062

Int. Cl. B28b *7/02;* **C04b** *33/24*

U.S. Cl. 264—56 **3 Claims**



A method for forming a uniformly compacted ceramic dish having at least one angled sidewall comprising the use of a multiple section female die having a dish-shaped mold designed to produce a dish with a sidewall having a thinner upper edge and a slight foot at its base. One or more bottom, intermediate, movable, sidewall punches are employed in the die to obtain a more uniform fill and a more uniform compaction ratio.

3,717,694

HOT PRESSING A REFRACTORY ARTICLE OF COMPLEX SHAPE IN A MOLD OF SIMPLE SHAPE

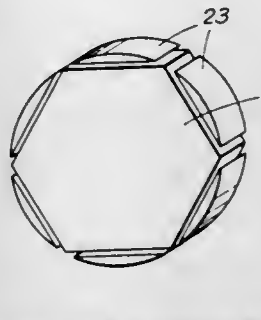
Edison P. Mt. Pleasant, III, Lewiston, N.Y., assignor to The Carborundum Company, Niagara Falls, N.Y.

Filed Nov. 9, 1970, Ser. No. 87,674

Int. Cl. C04b *35/64;* **B22f** *3/14*

U.S. Cl. 264—67 **7 Claims**

In a method for making various hot pressed shapes using simple mold or die forms, a simple compacted refractory form is machined to a desired shape with the removal of a part. The desired shape and part are reassembled with the distribution of a parting agent therebetween within a mold so as to substantially conform to the configuration of the mold. After hot pressing the shape and part, the desired shape is removed.



3,717,695

PROCESS FOR PREPARING TEXTURED FILLED OLEFIN POLYMER EXTRUSIONS

Estil N. Barnes, and Harold T. Collins, both of Bartlesville, Okla., assignors to Phillips Petroleum Company

Filed Oct. 28, 1970, Ser. No. 84,914

Int. Cl. B29c *17/04, 25/00;* **B29d** *23/03*

U.S. Cl. 264—90 **7 Claims**

A textured extruded article which can be decorated to a wood-like finish is made by extruding and vacuum sizing a filled resin of olefin polymer which has adsorbed up to about 0.25 percent by weight of water. The texturized extruded articles can be used as a wood substitute in furniture, paneling, and the like.

3,717,696

PROCESS FOR THE PREPARATION OF POLYAMIDE-IMIDE FILAMENTS

Vincent Rochina, Lyon, and Pierre Allard, Cailloux-sur-Fontaines, both of France, assignors to Societe Rhodiaceta, Paris, France

Continuation of Ser. No. 829,914, June 3, 1969, abandoned. This application Feb. 9, 1971, Ser. No. 114,082

Claims priority, application France, June 4, 1968, 6850063

Int. Cl. D01d *5/04;* **D01f** *7/04;* **D02j** *13/00*

U.S. Cl. 264—205 **10 Claims**

This invention provides a process for producing polyamide-imide filaments which are heat-stable and have high tensile strength by solvent spinning under specified conditions. In a preferred embodiment the polyamide-imide polymers in solution are extruded into filaments and fibers through a spinneret maintained at a temperature between 60° C. and 180° C. heated at a temperature higher than 160° C. up to about 240° C. at a constant length for 2 to 6 hours, and subsequently drawn at a drawing ratio of at least 3:1 at a temperature generally in the range of about 220° C. up to about 420° C.

3,717,697

PROCESS FOR PURIFICATION OF TUNGSTEN

William Clarence Gillchriest, Los Angeles, Calif., assignor to International Development Labs, Los Angeles, Calif.

No Drawing. Filed Aug. 6, 1970, Ser. No. 61,812

Int. Cl. C01g *41/00*

U.S. Cl. 423—58 **12 Claims**

A process for removing tungsten from scheelite ore by first treating the ore with an oxy acid that forms an insoluble calcium salt and forms a soluble complex with the tungstate anion, or hydrogen fluoride, or a sodium or potassium salt of the oxy acid or hydrogen fluoride, or mixtures thereof. The scheelite ore is treated at a pH of about —1 to about 14 with agitation and using slight heating if desired until the tungsten is substantially removed from the ore as a soluble complex in the supernatant liquid. The supernatant liquid may then be treated with a water soluble monovalent sulfide at a pH of less than about 7 to precipitate the tungsten as an insoluble complex. The sulfide may be heated in air to convert it to an oxide. The supernatant liquid, if it contains an oxy acid as defined, may also be treated with a soluble aluminum salt in the presence of phosphate or pyrophosphate ions or mixtures thereof to precipitate the tungsten as an insoluble complex. The complex may be resolubilized in acid media and treated with a soluble monovalent sulfide to precipitate the tungsten as an insoluble sulfide which may be heated in air to convert it to an oxide.

3,717,698

MANUFACTURE OF SODA ASH FROM WYOMING TRONA

Joseph M. Ilardi, East Brunswick, and Eric Rau, Trenton, both of N.J., assignor to Intermountain Research and Development Corp., Green River, Wyoming

Filed Jan. 29, 1971, Ser. No. 111,118

Int. Cl. C01d *7/30*

U.S. Cl. 423—206 **2 Claims**

Soda ash is prepared from crude trona containing organic impurities by calcining the crude trona to produce crude soda ash containing the organic impurities, dissolving the resultant anhydrous sodium carbonate in aqueous medium to produce a substantially saturated solution of sodium carbonate containing organics, and deactivating the organics with hydrogen peroxide, activated by sodium persulfate.

3,717,699

TREATMENT OF GASES

Thomas Nicklin, Middleton, and Frederick Farrington, Stretford, England, assignors to The Gas Council, London, England

Filed May 21, 1970, Ser. No. 39,223

Claims priority, application Great Britain, May 22, 1969, 26,278/69

Int. Cl. C01b *17/16, 31/20*

U.S. Cl. 423—222 **14 Claims**

Sulphur is produced from gaseous mixtures of hydrogen sulphide and sulphur dioxide by contact with a catalyst comprising an oxide of uranium, preferably admixed with a thorium oxide and preferably disposed on a carrier. If steam together with carbon oxysulphide and/or carbon disulphide are present, the carbon sulphides will react with steam in the presence of the catalyst to yield hydrogen sulphide. This latter reaction may take place simultaneously with the reaction of hydrogen sulphide and sulphur dioxide.

3,717,700

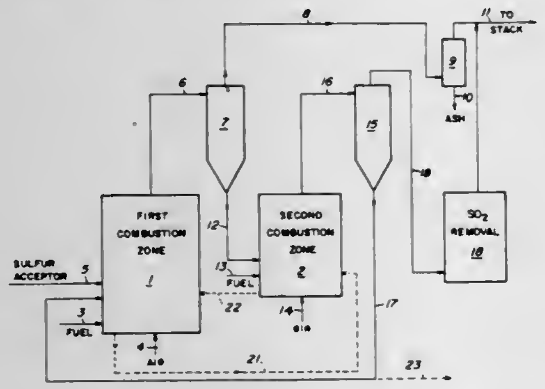
PROCESS AND APPARATUS FOR BURNING SULFUR-CONTAINING FUELS

Ernest B. Robison, Silver Spring; Shelton Ehrlich, Bowie, both of Md., and John W. Bishop, Alexandria, Va., assignors to The United States of America as represented by the Secretary of the Interior

Filed Aug. 25, 1970, Ser. No. 66,724

Int. Cl. C01b *17/60*

U.S. Cl. 423—244 **19 Claims**



Sulfur-containing fuels such as coal are burned in a two-zone system. Circulating sulfur acceptor material absorbs sulfur in the first zone and releases it in the second zone thus concentrating most of the sulfur oxides in a small fraction of the flue gas.

3,717,701

PROCESS FOR SEQUESTERING METAL IONS BY USE OF AN AMINO CARBOXYLIC PHOSPHINE

Ronald H. Carlson, Lewiston, N.Y., assignor to Hooker Chemical Corporation, Niagara Falls, N.Y.

Continuation-in-part of Ser. No. 680,040, Nov. 2, 1967, Pat. No. 3,578,708. This application Dec. 9, 1970, Ser. No. 96,610

Int. Cl. C01b *15/02;* **C07c** *101/00;* **C07d** *105/02*

U.S. Cl. 423—272 **16 Claims**

By contacting an amino carboxylic phosphine sequestering agent with an aqueous solution containing ions of transition metals, said ions react with the amino carboxylic phosphine to form soluble complexes. Since the decomposition of hydrogen peroxide is catalyzed by the presence of trace metal ions, such as Cu^{++}, MN^{++}, and Fe^{+++}, the addition of these sequestering agents to peroxide solutions serves to deactivate such metal ions and thus reduce their catalytic effect on peroxide composition. Such agents also serve to control hardness of water and to deactivate objectionable metal ions in textile processing and in metal cleaning and finishing.

3,717,702

PROCESS FOR TREATING PHOSPHATE ORE

Alfred W. Petersen, Salt Lake City, Utah, assignor to Stauffer Chemical Company, New York, N.Y.

Filed Feb. 2, 1971, Ser. No. 112,035

Int. Cl. C01b *25/16*

U.S. Cl. 423—320 **5 Claims**

A process of treating phosphate ore prior to the wet process phosphoric acid that comprises the addition of an acid material or acid forming material to a calcined or uncalcined finely divided phosphate ore to form a solution that dissolves the Mg and Ca carbonate or oxide impurities. The pH of the solution is maintained at a range of from 2.0 – 5.0. The ore is retained in the acid medium a sufficient length of time to dissolve the above-noted impurities and then separated therefrom. The ore is then treated in the conventional manner to recover its phosphoric acid content.

3,717,703

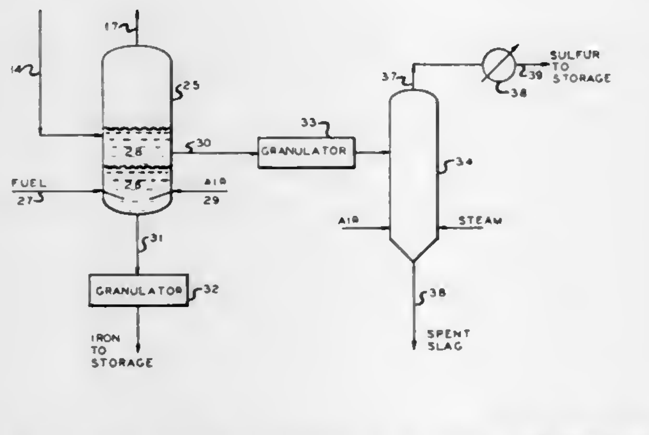
PURIFICATION OF MINE WATER AND THE LIKE

Eugene A. Pelczerski and James A. Karnavas, Pittsburgh, Pa., assignors to Black, Sivalls & Bryson, Inc., Oklahoma City, Okla.

Continuation-in-part of application Ser. No. 745,528, July 17, 1968. This application Sept. 14, 1970, Ser. No. 71,995

Int. Cl. C01b *17/06;* **C21b** *3/04;* **C22b** *5/00*

U.S. Cl. 423—571 **28 Claims**



The present invention relates to a process for the purification of mine water whereby potable water is produced and elemental sulfur and iron are recovered as salable products. Solids dissolved and entrained in the mine water are separated therefrom and purified water is withdrawn. The solids are dried and introduced to a molten iron bath containing carbon wherein sulfates contained in the solids are reduced to sulfides, and iron contained in the solids is accumulated. The resultant solids containing sulfides are withdrawn from the iron bath and the sulfides are converted to elemental sulfur. Fuel for providing heat to the molten iron bath may be high sulfur content coal normally unsuitable as fuel because of the air polluting properties of resultant products of combustion. Waste from the process consists of slag which when deposited in a refuse pile will set up into a hard stable product.

3,717,704

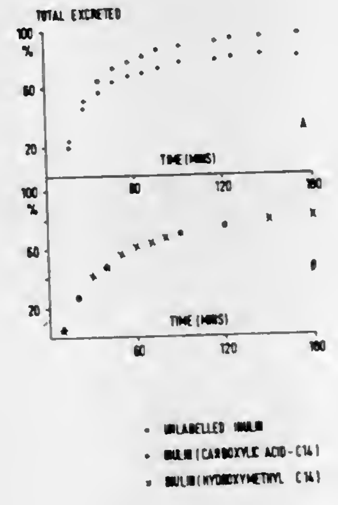
INULIN TYPE RADIOACTIVE DIAGNOSTIC MATERIALS

John Christopher Turner, Chesham, and Geoffrey Sheppard, Amersham, England, assignors to United Kingdom Atomic Energy Authority, London, England

Filed Jan. 6, 1970, Ser. No. 929

Int. Cl. A61k *27/04*

U.S. Cl. 424—1 **4 Claims**



For use as a diagnostic composition, there is provided inulin having a hydroxymethyl group of which the carbon atom is a carbon-14 atom. This material is prepared from inulin (carboxylic acid C-14) by methylating and reducing.

3,717,705

PROTEIN-BACTERIOPHAGE CONJUGATES

Joseph Haimovich, 12 Krumer St., and Michael Sela, Meonot Wix, both of Rehovot, Israel

No Drawing. Filed Jan. 9, 1970, Ser. No. 1,848

Claims priority, application Great Britain, Jan. 16, 1969, 2,697/69

Int. Cl. G01n *31/02, 33/16*

U.S. Cl. 424—12 **6 Claims**

The novel conjugates are prepared by using bifunctional molecules as linking agents. The conjugates which survive the coupling process can be used for detecting and determining quantitatively very small quantities of anti-protein antibodies. Quantities as little as 0.2 to 2.0 nanograms per milliliter of antiserum can be detected. Insulin-bacteriophage conjugate was inactivated to a significant extent by sera of diabetic patients, who had received injections of insulin, which was diluted a hundred to ten-thousand fold. The inactivation of protein-bacteriophage conjugates by the corresponding anti-protein can be inhibited by the addition of predetermined quantities of the said protein and this inhibition can be used for the determination of very small quantities of the protein.

3,717,706

ATTRACTANTS FOR THE YELLOW JACKET WASP (VESPULA SPP: VESPIDAE)

Terrence P. McGovern, Bowie, and Morton Beroza, Silver Spring, Md., Harry G. Davis, Fresno, Calif., and Gaines W. Eddy, McAllen, Tex., assignors to the United States of America as represented by the Secretary of Agriculture

No Drawing. Filed June 16, 1970, Ser. No. 46,796

Int. Cl. A01n *17/14*

U.S. Cl. 424—84 **32 Claims**

A number of saturated esters having a carboxylic acid moiety and an alcohol moiety and containing from 9 to 14 carbon atoms were prepared from C_1 through C_6 normal carboxylic acids, C_4 through C_6 branched acids, and C_2 through C_4 monochlorinated acids and found to be potent and highly specific attractants for the yellow jacket wasp (Vespula spp.). Incorporated into compositions containing an insecticide, chemosterilant, or other control agent, the attractants provide an improved means of reducing or eliminating populations of yellow jackets.

3,717,707

ANTIBIOTIC B-2847RB AND PRODUCTION THEREOF

Toyokazu Kishi, Nara; Mitsuko Asai, Takatsuki; Setsuo Harada; Masayuki Muroi, both of Suita, and Komei Mizuno, Settsu, all of Japan, assignors to Takeda Chemical Industries, Ltd., Higashi-ku, Osaka, Japan

Filed March 31, 1970, Ser. No. 24,130

Claims priority, application Japan, March 31, 1969, 44/24672

Int. Cl. A61k *21/00*

U.S. Cl. 424—122 **2 Claims**

A novel antibiotic B-2847RB, which is obtained by reducing antibiotic B-2847Y and/or antibiotic B-2847R, shows strong antimicrobial activities against Gram-positive bacteria and is characterized by a lessened toxicity against mammals and an increased stability in an aqueous solution in comparison with the antibiotics B-2847Y and B-2847R.

3,717,708

BLOOD COAGULATION COMPLEX

Shohachi Wada, Oakland, and Milton Michael Mozen, Berkeley, both of Calif., assignors to Cutter Laboratories, Inc., Berkeley, Calif.

Filed Oct. 24, 1968, Ser. No. 770,424

Int. Cl. A61k *25/00*

U.S. Cl. 424—177 **7 Claims**

A lyophilized mixture of coagulation components of human origin useful in the treatment of patients, who bleed due to a congenital or acquired deficiency of one or more of the coagulation Factors II, VII, IX, X, prepared from human plasma collected in a citrate anticoagulant, free of heparin, free of thrombin, free of the activated form of Factor X, free of depressor activity, free of anti-complement activity, and comprising the coagulation components Factors II, VII, IX, X in essentially the same proportions as normal human plasma and of a potency equivalent to a specific activity of more than 0.5 clinical unit of each component per milligram of protein; and the process of preparing such product by selective adsorption and selective fractional elution.

3,717,709

FUNGICIDAL AND ACARICIDAL COMPOSITION AND METHOD OF USE

Walter Ost; Klaus Thomas; Dietrich Jerchel, all of Ingelheim, Rhine, and Karl-Richard Appel, Biberach-Rissegg, all of Germany, assignors to C. H. Boehringer Sohn, Ingelheim/Rhine, Germany

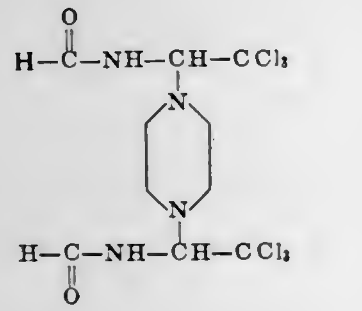
Continuation-in-part of Ser. No. 793,187, Jan. 22, 1969, Pat. No. 3,595,916. This application July 1, 1971, Ser. No. 159,030

Claims priority, application Austria, Jan. 23, 1968, A 674/68; May 17, 1968, A 4795/68

Int. Cl. A01n *5/00*

U.S. Cl. 424—250 **2 Claims**

Biocidal compositions containing as an active ingredient the compound of the formula



the compositions are useful for combatting fungi, helminths and acarids.

3,717,710

INDICINE-N-OXIDE AS AN ANTITUMOR AND ANTILEUKEMIC AGENT FOR MICE AND RATS

Koppaka V. Rao, Granesville, Fla., and Tom J. McBride, Ridgewood, N.J., assignors to Pfizer Inc., New York, N.Y.

Filed Jan. 28, 1971, Ser. No. 110,750

Int. Cl. A61k *27/00*

U.S. Cl. 424—274 **2 Claims**

This invention relates to a process for inhibiting transplanted heoplasias selected from the group consisting of Walker-256 carcinosarcoma, melanoma B-16, leukemia L-1210, leukemia P-388 and leukemia P-1534 in a rat or mouse using N-oxide of the pyrrolizidine alkaloid indicine.

3,717,711

REDUCING FATTY ACID SYNTHESIS WITH A DIET CONTAINING XYLITOL

Oscar Neal Miller, Montclair, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

No Drawing. Filed June 22, 1970, Ser. No. 48,549

Int. Cl. A61k *27/00*

U.S. Cl. 424—343 **1 Claim**

The inhibition of fatty acid synthesis is obtained in biological systems by utilizing xylitol as a replacement for other carbohydrates in the diet. The present method involves the inhibition of the lipogenic enzyme activities with resultant inhibition of fatty acid synthesis. Inhibition of fatty acid synthesis by the present method is useful in the treatment of obesity and in correcting conditions of lipid abnormalities.

ELECTRICAL

3,717,712

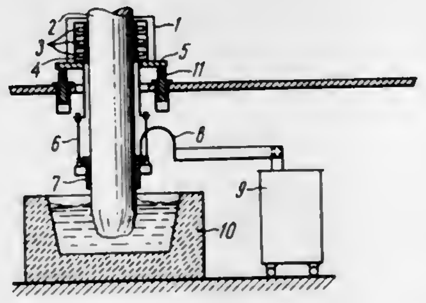
DEVICE FOR HOLDING AND LONGITUDINAL DISPLACING OF ELECTRODE

Viktor Petrovich Zinkovsky, ulitsa Zorge 123, kv. 48; Nariman Alexandrovich Sukoian, ulitsa Pamirskaya 48, kv. 78; Vladimir Fedorovich Alyanov, ulitsa Stepnaya 225; and Jury Fedorovich Frolov, prospek k. Marxa 8/2, kv. 70, all of Novosibirsk, U.S.S.R.

Filed May 18, 1971, Ser. No. 144,562

Int. Cl. H05b *7/12*

U.S. Cl. 13—15 **9 Claims**



The present invention relates to the industrial electric furnaces and more particularly it relates to the devices for holding and longitudinal displacing of the electrode.

The device for holding and longitudinal displacing of the electrode is characterized in that it has at least three friction clamps fitting around the electrode and clamping it, said clamps moving along the electrode with relation to the frame; each friction clamp is provided with an individual power drive for moving it along the electrode, said drive being supplied from the working medium distributor; said working medium distributor ensures independent control of the forward and reverse travel of each power drive.

3,717,713

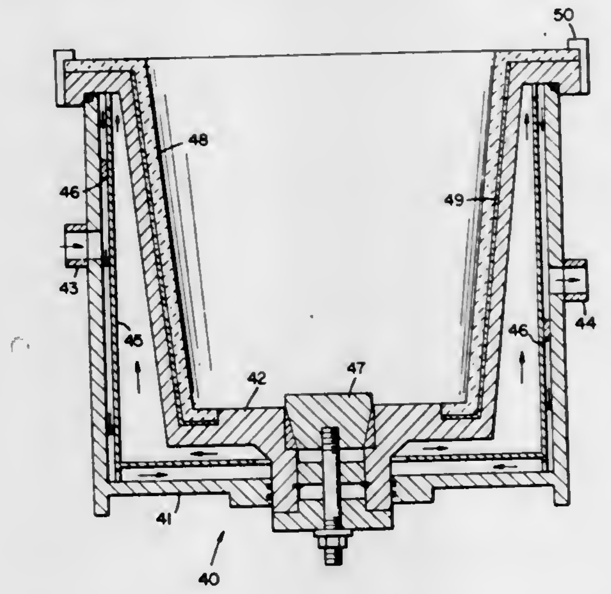
ARC FURNACE CRUCIBLE

Max P. Schlienger, 19 Rollingwood Drive, San Rafael, Calif.

Filed Feb. 18, 1971, Ser. No. 116,428

Int. Cl. H05b *7/02;* **F27b** *14/10*

U.S. Cl. 13—9 **15 Claims**



An arc furnace crucible having a central recess. A preformed, conically-tapered plug of the material to be melted is secured within the recess in good electrical connection with the inner wall of the crucible. The plug of material to be melted may be employed as the starting material for the arc furnace and will thereafter insure good electrical conductivity between the crucible and the melt. According to a second embodiment of the present invention, an arc furnace crucible is provided with a liner of refractory material covering the sidewalls of the crucible. The refractory liner functions to minimize heat conduction from the melt to the crucible, thus improving the thermal efficiency of the arc furnace. A layer of heat insulating material may be disposed between the refractory liner and the crucible to further minimize heat loss.

3,717,714

COMBINED EQUIPMENT OF ELECTRODE HOLDER SEGMENTS AND FASTENING MEANS FOR USE WITH A CLOSED ELECTRIC SMELTING FURNACE

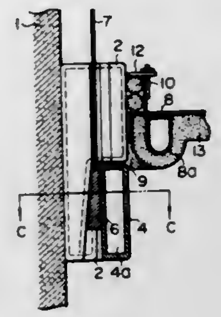
Tatu Tisaki, Tokyo, Japan, assignor to Tanabe Kakoki Co., Ltd., Niigata-ken, Japan

Filed Aug. 30, 1971, Ser. No. 176,193

Claims priority, application Japan, Sept. 7, 1970, 45/88548

Int. Cl. H05b *7/10*

U.S. Cl. 13—15 **2 Claims**



A plurally segmented electrode holder, the horizontal width of the lower half part being about one half the upper part one, and each of which has two caved adjoining parts in both sides thereof, is fitted with a pressure resistive cylinder, whose outside diameter, inside diameter and height are substantially the same as the upper part outside diameter, the lower part outside diameter and the height of the lower half part of the electrode holder respectively, so as to be received in a surrounding outside space defined by the lower parts. Plural pieces of tapered cotter are inserted between the coincident sides of caved adjoining lower parts of the electrode holder segments, which have tapers corresponding to those of the cotters, and the inside of the cylinder so as to cause the holder segments to be in press-contact with the electrode by pulling up the cotters.

This equpment fixed to the electrode moves up and down through a furnace lid hole equipped with a packing ring case at the periphery thereof.

3,717,715

ELECTRONIC MUSICAL INSTRUMENT PROVIDED WITH VARIABLE COUPLING OF THE KEYBOARDS

Peter Jordy, Urdorf, Switzerland, assignor to U.S Philips Corporation, New York, N.Y.

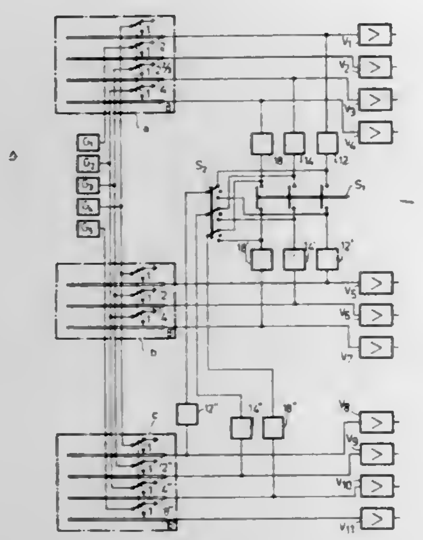
Filed Oct. 14, 1971, Ser. No. 189,173

Claims priority, application Netherlands, Oct. 23, 1970, 7015522

Int. Cl. G10h *1/00*

U.S. Cl. 84—1.17 **2 Claims**

An electronic musical instrument having at least two keyboards which are intercoupled in such a manner that the signals on the bus-bars of a keyboard are applied with controllable volume to the bus-bars associated with the same foot pitches of another keyboard.



3,717,716

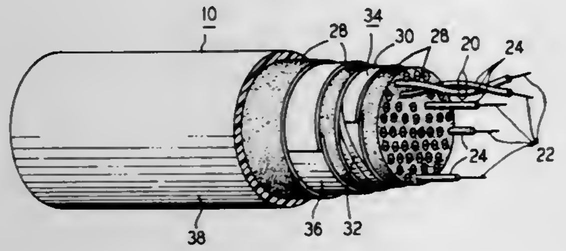
PLASTIC INSULATED CONDUCTOR COMMUNICATIONS CABLE WATERPROOFED WITH AN INTERNAL VOID-FILLING MIXTURE OF PETROLEUM JELLY AND HIGH MOLECULAR WEIGHT POLYETHYLENE OR POLYPROPYLENE

Merle C. Biskeborn, Chatham, Joseph P. McCann, Colonia, and Raffaele A. Sabia, Lincroft, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill and Berkeley Heights, N.J.

Original application Dec. 2, 1968, Ser. No. 780,314, now Patent No. 3,607,487, dated Sept. 21, 1971. Divided and this application Oct. 7, 1970, Ser. No. 78,736

Int. Cl. H01b *7/02*

U.S. Cl. 174—25 R **5 Claims**



An electrical communications cable having a plurality of insulated conductors is made waterproof by filling the intersticial spaces with a heated mixture of 85 percent petroleum jelly and 15 percent high molecular weight polyethylene and cooling the mixture.

3,717,717

SHRINKABLE CABLE JOINT SLEEVE, CABLE JOINT EMPLOYING THE SAME, AND METHOD OF FORMING A CABLE JOINT

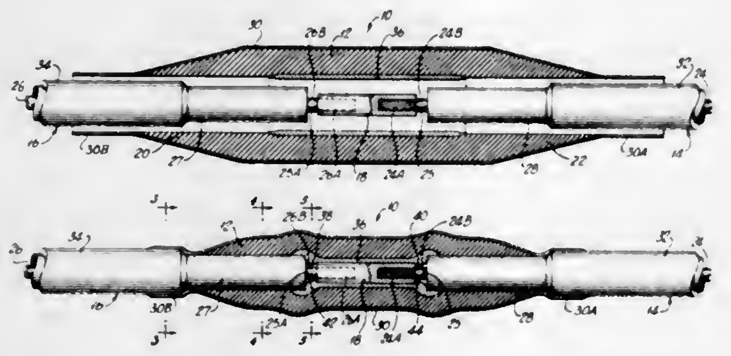
Francis V. Cunningham, Western Springs, and John S. Wicks, Glen Ellyn, both of Ill., assignors to Joslyn Mfg. and Supply Co., Chicago, Ill.

Filed April 20, 1970, Ser. No. 30,056

Int. Cl. H02g *15/08*

U.S. Cl. 174—73 R **14 Claims**

A shrinkable cable joint sleeve includes a hollow tube of shrinkable insulating material having tapered end portions and a first conductive shield along its outer surface. The cable joint sleeve is slidably mounted over an end portion of a cable to be spliced or coupled to another cable by a connector. After the cables are spliced or otherwise connected together, the shrinkable cable joint sleeve is moved into position about the connection. Upon the application of a high temperature, the sleeve shrinks and forms an insulated seal for the cable splice with a second conductive shield along a portion of the inner surface of the tube encompassing the connector.



3,717,718

HIGH PRESSURE CABLE

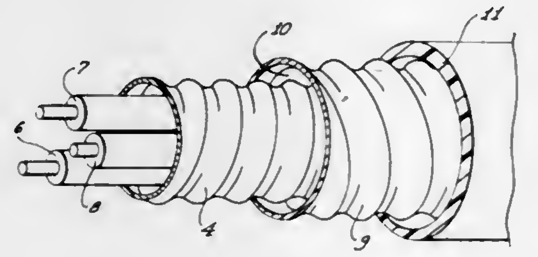
Hans-Martin Schmidtchen, Osnabruck, Germany, assignor to Kabel-und Metallwerke Gutehoffnungshutte Aktiengesellschaft, Hannover, Vahrenwalden, Germany

Filed Nov. 29, 1971, Ser. No. 202,752

Claims priority, application Germany, Dec. 1, 1970, P 20 58 971.3

Int. Cl. H01b *7/20*

U.S. Cl. 174—106 D **3 Claims**



Pressurized high voltage cable with a tubular, corrugated envelope that holds a high pressure medium, and a corrugated tube receiving the envelope and provided for radially supporting the envelope. Preferably, envelope and tube each being helically corrugated with opposite sense of winding and pitch, and a pressurized medium is maintained in the space between tube and envelope, the pressure of the medium being higher than the pressure on the outside of the tube but lower than the pressure in the envelope.

3,717,719

COAXIAL CABLE INNER CONDUCTOR

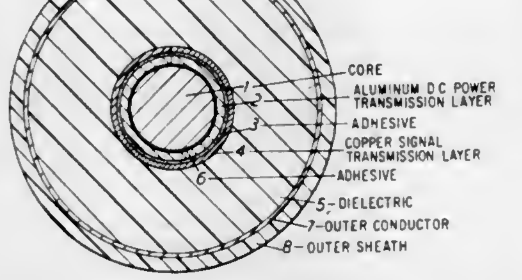
Colin Francis Greening Smith, Chandlers Ford, and Norman Stanley Bliss, East Wellow, both of England, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Nov. 17, 1971, Ser. No. 199,465

Int. Cl. H01b *5/14*

U.S. Cl. 174—107 **7 Claims**

A laminate structure for the inner conductor of a coaxial cable includes a thin outer copper layer and an inner aluminum layer over a central core. The outer layer is used for signal transmission and the inner layer for direct current, with adhesives bonding the layers together and to the core. A dielectric layer and outer conductor and sheath are added to complete the cable structure. Use of copper in the inner conductor is reduced without increasing high frequency attenuation and direct current resistance.


CORE
1
ALUMINUM D C POWER TRANSMISSION LAYER
2
ADHESIVE
3
COPPER SIGNAL TRANSMISSION LAYER
4
ADHESIVE
6
5–DIELECTRIC
7–OUTER CONDUCTOR
8–OUTER SHEATH

3,717,720

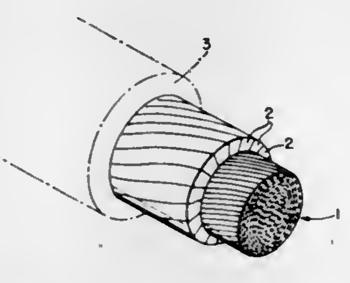
ELECTRICAL TRANSMISSION CABLE SYSTEM

Donald L. Snellman, Seattle, Wash., assignor to Norfin, Inc., Seattle, Wash.

Filed March 22, 1971, Ser. No. 126,407

Int. Cl. H01b *5/10*

U.S. Cl. 174—131 A **3 Claims**



A glass fiber cable is used as the tensile strength member of an overhead electrical transmission cable with the conductor wires being laid over the fiberglass cable as the core. Any configuration of conductor wires may be utilized either with or without an external insulation system on the outside of the electrical conductor.

3,717,721

AUTOMATIC CHROMA COMPENSATING SYSTEM

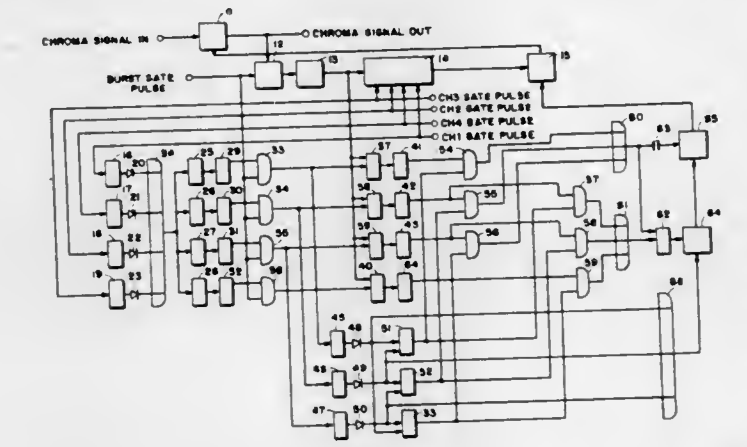
Satoshi Makara; Kazuo Kashigi, and Yasuhiro Taniguchi, all of Tokyo, Japan, assignors to Nippon Electric Company, Limited, Tokyo, Japan

Filed Oct. 12, 1971, Ser. No. 188,182

Claims priority, application Japan, Oct. 14, 1970, 45/90802

Int. Cl. H04n *9/48*

U.S. Cl. 178—5.4 AC **4 Claims**



To compensate the chroma component of a color video signal produced by a playback apparatus having a plurality of magnetic heads, the amplitude of selected color burst signals derived from the video signal is detected and stored. At least the first and last signals of each head-channel period are included. A difference signal indicative of the difference between adjacent detected amplitude components is generated, and added to the stored amplitude components to form a control signal. The amplitude of the chroma component of the composite color video signal is varied in response to this control signal.

3,717,722

APPARATUS FOR PRINTING CONTINUOUS RUNS OF MATERIAL

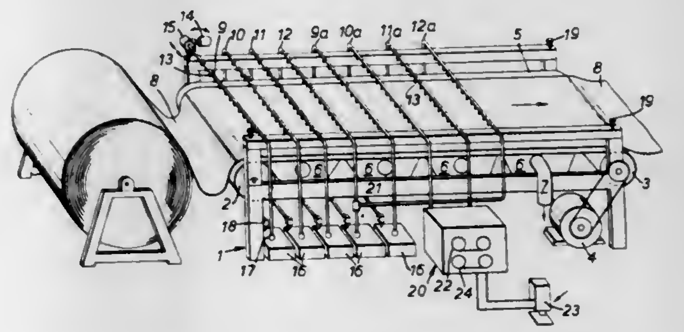
Jakob Messner, 66 Unterschauersberg, A-4600, Wels/Thalheim, Austria

Filed April 27, 1971, Ser. No. 138,006

Claims priority, application Germany, April 27, 1970, P 20 20 445.9

Int. Cl. H04n *1/24, 1/28, 1/46*

U.S. Cl. 178—5.2 R **11 Claims**



Apparatus for printing continuous runs of material comprises rows of nozzles extending across the path of movement of the material. Colored printing fluid is supplied to each row of nozzles, each nozzle being controlled by a valve. A program control unit controls the pressure of fluid supplied to each row of nozzles and operation of the individual valves so as to maintain the quantity of fluid applied per unit area of the material substantially constant, irrespective of the speed of movement of the material.

3,717,723

PROCESS AND APPARATUS FOR THE SELECTION AND INTERROGATION OF CONNECTIONS IN DIAL EXCHANGE DATA SYSTEMS WITH CENTRAL PROGRAMABLE CONTROL

Gerhard Jaskulke, Munich; Max Mayer, Unterpfaffenhofen; Bernt Lampe; Fritz Giebler, both of Munich, and Hasso Steigenberger, Unterhaching, all of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Germany

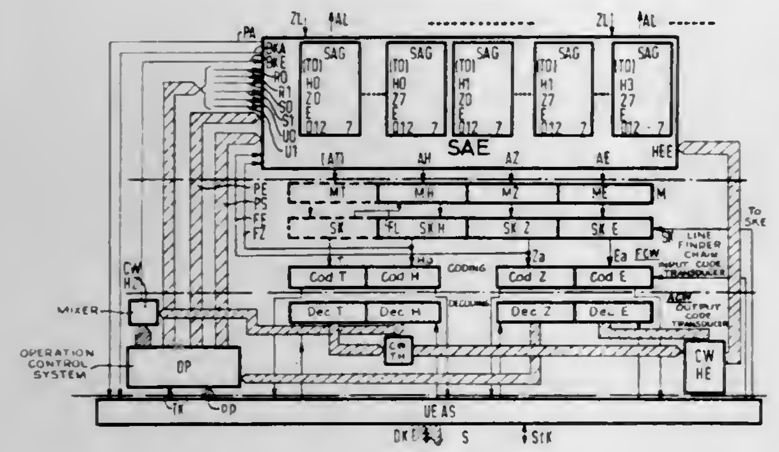
Filed Sept. 14, 1970, Ser. No. 71,675

Claims priority, application Germany, Sept. 12, 1969, P 19 46 389.9

Int. Cl. H04l *11/00*

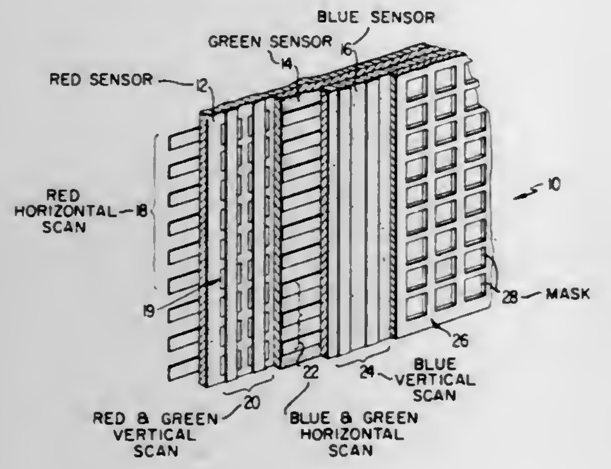
U.S. Cl. 178—3 **11 Claims**

A process and apparatus are described for the exchange of pulse coded messages between connections in line connection units in dial exchange data systems having programable, central control means, wherein connections are established between incoming and outgoing connections according to the principle of request and proceed to send. The connections are made utilizing data and programs contained in a central storage means. Input code transducers are provided for identifying incoming connections, e.g. from transmitters, and output code transducers are provided for identifying and addressing outgoing connections, e.g. to receivers. The selection of incoming connections, i.e. those transmitting requests, for example polarity changes, takes place using binary address information and said selection is determined by an input code transducer in the known manner. The same principle is used for addressing a storage cell in the central store assigned to the incoming connection and selecting the outgoing connection using an output code transducer. Simultaneously with the foregoing selection process, further operation modes, for example polarity interrogation, setting back, transmitting and repoling, can be carried out through a logical connection of the address information over the appropriate connection by means of a signal indicating the desired one of said modes of operation.



3,717,724
SOLID STATE MULTI-COLOR SENSOR

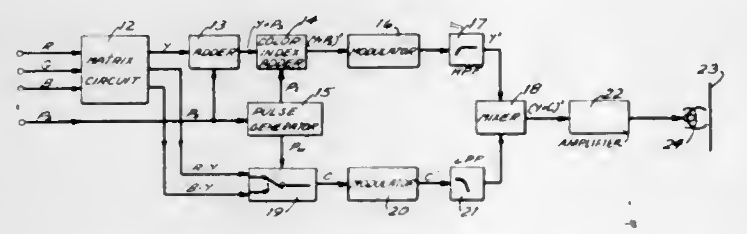
William E. Montgomery, III, Severna Park, Md., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.
Filed Feb. 2, 1971, Ser. No. 111,810
Int. Cl. H01j *31/26;* **H04n** *9/06*
U.S. Cl. 178—5.4 R **27 Claims**



A solid state sensor comprises multiple layers of semiconductor material having selectively wavelength absorption characteristics in accordance with predetermined regions of a spectrum to be detected. Arrays of contact elements provide selective connection to elemental areas of each layer and enable selective scanning of the elemental areas for deriving an output signal from each layer. Both electron beam scanning and electrical switching in a matrix-type scan are provided, permitting simultaneous derivation of multiple color output signals from the sensor. A specific application is a three color sensor for a color television camera.

3,717,725
TELEVISION SIGNAL RECORDING SYSTEM WITH COLOR INFORMATION RECORDED ON A LOW FREQUENCY CARRIER AT REDUCED AMPLITUDE WITH RESPECT TO THE LUMINANCE INFORMATION

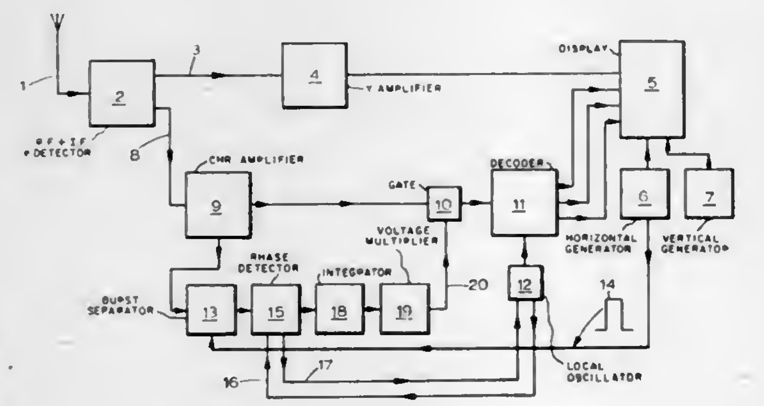
Toshihiko Numakura, Tokyo, Japan, assignor to Sony Corp., Tokyo, Japan
Continuation-in-part of Ser. No. 654,632, July 19, 1967, abandoned. This application Aug. 5, 1970, Ser. No. 61,388
Claims priority, application Japan, July 19, 1966, 41/47208
Int. Cl. H04m *5/84*
U.S. Cl. 178—5.4 CD **2 Claims**



A standard color television signal which has a luminance signal component and at least two chrominance signal components is recorded with one head on a magnetic tape or other medium. The chominance signal components are combined alternately into a line sequential chrominance signal, and the luminance signal component and line sequential chrominance signal are modulated on separate carriers having relatively high and low carrier frequencies, respectively, to form two independent modulated carriers which are mixed or combined to constitute a single channel composite signal recorded by the one head and in which the carrier modulated with the line sequential chrominance signal has an amplitude of from one-fifth to one-third the amplitude of the carrier modulated with the luminance signal component. During reproduction, the reproduced composite signal is separated into the luminance signal component and the line sequential chrominance signal, and the latter is separated into the two chrominance signal components with the aid of a delay line.

3,717,726
NOISE IMMUNE COLOR KILLER CIRCUIT

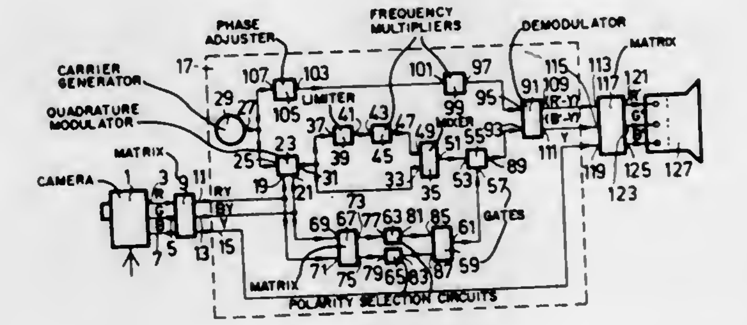
Derek Henry Howe, Cambridge, England, assignor to Pye Limited, Cambridge, England
Filed March 25, 1971, Ser. No. 128,092
Claims priority, application Great Britain, April 10, 1970, 17,208/70
Int. Cl. H04n *9/48*
U.S. Cl. 178—5.4 CK **6 Claims**



A color killer circuit for preferably a PAL color set has a gate in the chrominance channel. When a color signal is being received a burst separator applies the color burst to a phase detector to enable the gate. To reduce the possibility that noise will enable the gate a voltage multiplier is coupled between the phase detector and the gate.

3,717,727
COLOR SHIFTING CIRCUIT FOR A COLOR TELEVISION DISPLAY APPARATUS

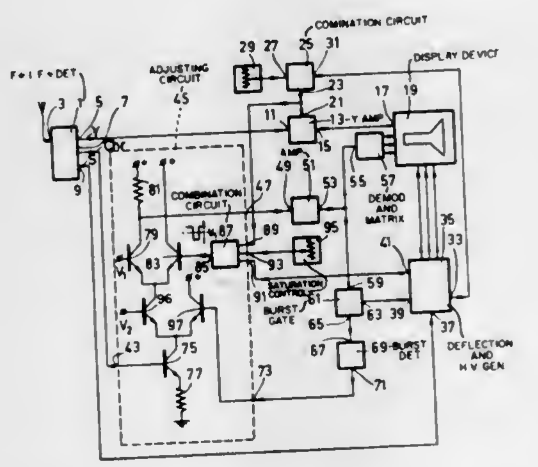
Jan Davidse, Cypruslaan, and Hendrik Johannes Saderson, Emmasingel, both of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.
Filed Nov. 5, 1970, Ser. No. 87,158
Claims priority, application Netherlands, Nov. 7, 1969, 6916801
Int. Cl. H04n *9/50*
U.S. Cl. 178—5.4 HE **7 Claims**



A color shifting circuit for a color television circuit in which a carrier is quadrature modulated with the aid of color difference signals whereafter the phase modulation thus obtained is deepened with the aid of a phase multiplier circuit while means are present for substantially maintaining the amplitude modulation obtained and in which the obtained signal of the deepened phase modulation is demodulated along a number of demodulation axes so as to obtain new color difference signals and in which optionally a correction of the saturation of the transformed colors may be effected with the aid of a saturation correction circuit.

3,717,728
ADJUSTING CIRCUIT FOR A CHROMINANCE SIGNAL AMPLIFIER IN A COLOR TELEVISION RECEIVER USING A DIFFERENTIAL AMPLIFIER SUITABLE FOR AN INTEGRATED CIRCUIT

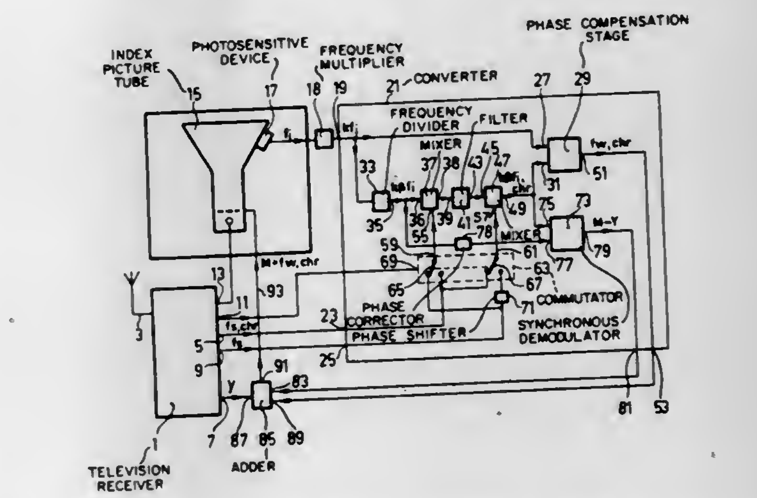
Wouter Smeulers, Emmasingel, Eindhoven, Netherlands
Filed April 8, 1971, Ser. No. 132,278
Claims priority, application Netherlands, April 28, 1970, 7006144
Int. Cl. H04n *9/46*
U.S. Cl. 178—5.4 AC **2 Claims**



In a chrominance signal amplifier stage including a current branch circuit of the long-tailed pair type and a load resistor in one of the current branches from which a burst signal is obtained, the amplitude of this burst signal is rendered independent of a bias or control voltage active on a branch current by blocking current branches which are not connected to the load resistor.

3,717,729
COLOR TELEVISION RECEIVER FOR DISPLAYING A RECEIVED TELEVISION SIGNAL ON A PICTURE TUBE OF THE INDEXING TYPE

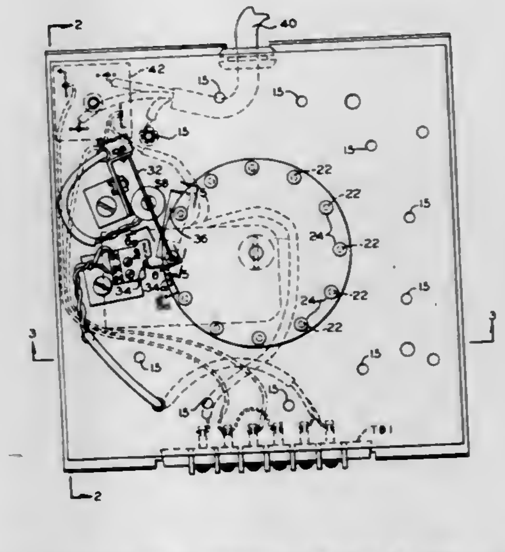
Johan Leendert van de Polder, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Continuation of Ser. No. 804,410, March 5, 1969, abandoned. This application June 9, 1971, Ser. No. 151,586
Int. Cl. H04m *9/24*
U.S. Cl. 178—54 F **6 Claims**



A circuit for converting a PAL television signal so that it can be displayed on an index picture tube features two mixer stages. An index signal is applied to the mixers. A line frequency commutator alternately applies the modulated and unmodulated subcarrier signal to each of the mixer stages.

3,717,730
MEMORY TIMING DISC STRUCTURE WITH ADJUSTABLE PINS WHICH ARE SET AND RESETTABLE BY AUTOMATIC MEANS DURING CONTINUOUS CYCLIC OPERATION

Wallace Utter, Vestal, N.Y., assignor to Thunder Projects Incorporated, Binghamton, N.Y.
Filed June 14, 1971, Ser. No. 152,856
Int. Cl. H01h *43/10*
U.S. Cl. 200—38 CA **12 Claims**



A mechanical storage register having a disc rotated by a stepping motor to a successive index positions. Holes spaced about the periphery of the rotatable disc have pins which are translated perpendicular to the plane of the disc to raised or lowered positions to indicate binary conditions. A groove in the periphery of the disc contains a rubber O-ring to engage the pins and hold them in raised or lowered conditions unless and until they are raised or lowered by solenoid and/or spring-operated devices arranged around the outside of the periphery of the disc.

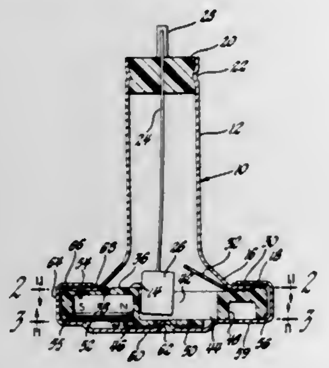
3,717,731
ACCELERATION RESPONSIVE SENSOR

Glenn A. Porter, Greendale, and Norman J. Roth, Hales Corners, both of Wis., assignors to General Motors Corporation, Detroit, Mich.

Filed June 30, 1971, Ser. No. 158,170

Int. Cl. H01h *35/14*

U.S. Cl. 200—61.45 M **4 Claims**



A sensor includes a vertical housing and a plastic base member secured thereto. The base member includes an upper wall having a sector shaped recess cooperatively defined by a pair of angular integral side walls joined by integral walls at their proximal and distal ends. The base member further includes an integral recess which mounts a pole magnet with its axis coplanar with a bisector of the recess. The upper end of a deflectable spring rod is insulated from the housing and located coaxial thereof. The lower end of the rod mounts a cylindrical mass which is attracted by the magnet into tangential engagement with the side walls of the recess adjacent their proximal ends to bend the lower portion of the deflectable rod out of coaxial relationship with the housing. A contact plate between the housing and base member includes a plurality of spring fingers which are cantilevered over the recess. The spring rod and housing are connected across a source of power and a mechanism to be actuated. A pulse of predetermined amplitude and time moves the mass against the magnetic attraction of the magnet into engagement with one or more of the spring fingers to close the circuit.

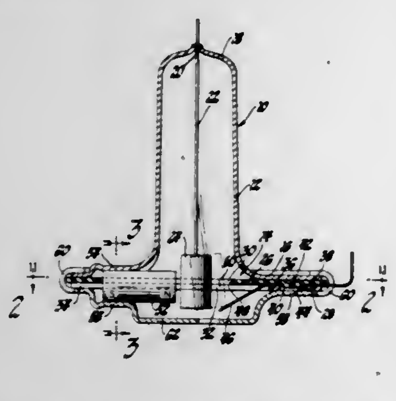
3,717,732
ACCELERATION RESPONSIVE SENSOR

Glenn A. Porter, Greendale, Wis., assignor to General Motors Corporation, Detroit, Mich.

Filed June 30, 1971, Ser. No. 158,171

Int. Cl. H01h *35/14*

U.S. Cl. 200—61.45 M **8 Claims**



A sensor includes a housing and a base assembly secured thereto. The base assembly includes angularly diverging side walls and an arcuate end wall which cooperatively define a sector shaped recess. A contact member on the base assembly includes a plurality of cantilever spring fingers extending angularly to the sector recess. A pole magnet has its axis coplanar with a bisector of the recess. A resiliently deflectable rod is secured at its upper end thereof to the housing. The lower end of the rod mounts a cylindrical mass movable along a multiplicity of paths within the sector recess. The magnet normally holds the mass in tangential engagement with the side walls of the sector recess. An acceleration pulse of predetermined amplitude and time moves the mass into engagement with one or more of the contact fingers to close a circuit across a source of power, a mechanism to be actuated, the contact member, and the mass.

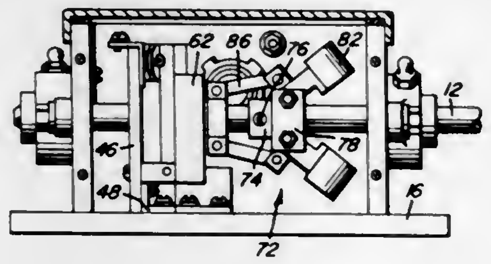
3,717,733
CENTRIFUGAL SWITCH

Louis P. Berezansky, P.O. Box 303, Seward, Pa.

Filed Aug. 20, 1971, Ser. No. 173,587

Int. Cl. H01h *35/10*

U.S. Cl. 200—80 **8 Claims**



An over-center spring device displaces a switch element between open and closed circuit positions with a snap-action motion. A centrifugal mechanism on a rotatable shaft extending through the switch housing, axially shifts a sleeve on the shaft for engagement with the spring device through a bearing member. The sleeve is connected by links to weight elements of the centrifugal mechanism.

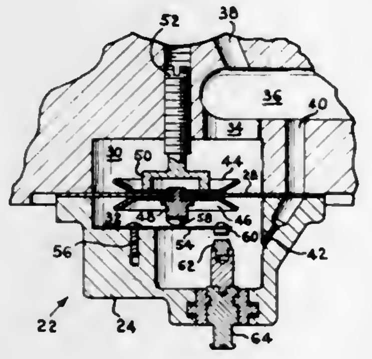
3,717,734
PRESSURE RATE CHANGE RESPONSIVE DIAPHRAGM SWITCH WITH RELATIVELY HARD REBOUND PREVENTION MEMBER ON DIAPHRAGM

Harry P. Wertheimer, Horseheads, and Thomas Curran Sekella, Elmira, both of N.Y., assignors to The Bendix Corporation

Filed Sept. 2, 1971, Ser. No. 177,557

Int. Cl. H01h *35/34, 3/60*

U.S. Cl. 200—83 R **2 Claims**



A pressure switch arrangement having a diaphragm exposed to a sensed pressure on both sides; one side communicating through a fluid delay restriction so that the delta pressure across the diaphragm is a function of rate of change of sensed pressure. A spring metal blade member bears against the rate diaphragm to provide a spring bias and also operates as an electrical contact support. A hard rubber abutment member forms the contact point between spring blade and diaphragm to dampen and suppress contact bounce.

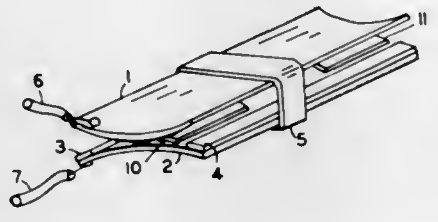
3,717,735
FLEX SENSITIVE NORMALLY CLOSED RIBBON SWITCH

Robert H. Koenig, Huntington Hills, N.Y., assignor to Tapeswitch Corporation of America, Farmingdale, N.Y.

Filed Sept. 14, 1971, Ser. No. 180,319

Int. Cl. H01h *1/26, 3/14*

U.S. Cl. 200—85 R **2 Claims**



A normally closed ribbon switch has two conductor strips each having transverse curvature. The strips are mounted to touch on their convex sides. The conductor strips have a pair of insulation strips mounted along and between the outer edges of the conductor strips whereby when the ribbon switch is flexed the strips lose their transverse curvature and the electrical contact between the conductor strips opens.

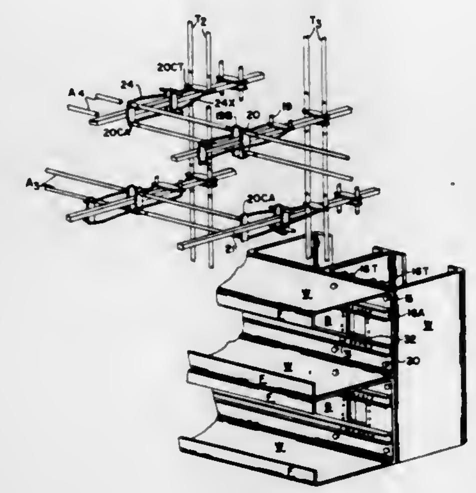
3,717,736
BALANCED LINE SWITCH SYSTEM WITH U-SHAPED CROSSED CONDUCTIVE CHANNELS ARRANGED BACK TO BACK

Stephen W. Kershner, Falls Church, and Kenneth Owen, Springfield, both of Va., assignors to Delta Electronics, Inc., Alexandria, Va.

Division of Ser. No. 867,044, Sept. 25, 1969, Pat. No. 3,588,390, which is a continuation-in-part of Ser. No. 628,501, April 4, 1967, Pat. No. 3,500,004. This application Aug. 6, 1970, Ser. No. 61,585

Int. Cl. H01h *15/24;* **H02b** *1/08;* **H01h** *63/00*

U.S. Cl. 200—153 S **9 Claims**



A switch system using a plurality of multi-contact reciprocating switch plungers to selectively connect any one of a plurality of multi-conductor lines running in one direction to any one of a plurality of multi-conductor lines running in a transverse direction with each plunger switch unit and its cooperating contacts being made in a module whereby a switch system of any number of switches can be readily assembled, particularly for the purpose of connecting any one of a plurality of transmitters to any one of a plurality of directional antennas for directing radio waves in a particular direction as required.

Provision is made for shielding the conductor lines, whether a multiconductor line or a single conductor line, by means of shielding channels arranged with their backs in supporting engagement and fixed together providing the framework for the switch system. Suitable insulators are provided for supporting the multiconductor or single conductor lines in proper relation and the plunger switch unit serves to make the necessary connections without leaving an objectionable line stub on the energized portion of the lines.

3,717,737
RESILIENT OMNIDIRECTIONAL PUSH-BUTTON FOR AN ELECTRICAL SWITCH

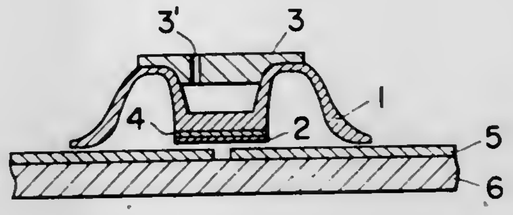
Takemi Shimojo, Tokyo, Japan, assignor to Alps Electric Co., Ltd., Tokyo, Japan

Filed July 2, 1971, Ser. No. 159,450

Claims priority, application Japan, July 4, 1970, 45/66848

Int. Cl. H01h *13/04, 13/52*

U.S. Cl. 200—159 B **6 Claims**



An omnidirectional push-button for a switch has a resilient inverted cup member with thin sides and a relatively thick base. The sides become thinner as they approach the top portion of the push-button. A cap is positioned across the recess of the cup member, while a base fixed to a substrate is connected on the bottom portion of the cup member adjacent an electrical circuit.

3,717,738
ELECTRIC SWITCH CONTACTS

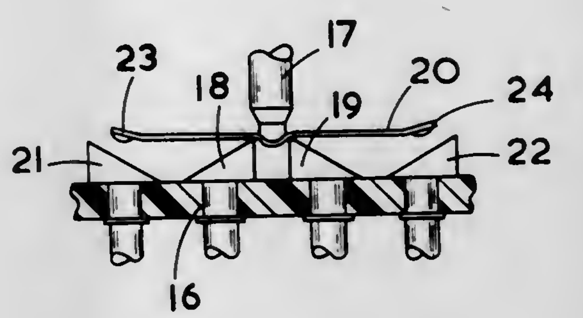
Keith Lewis, Burnley, England, assignor to Joseph Lucas (Industries) Limited, Birmingham, England

Filed March 1, 1972, Ser. No. 230,565

Claims priority, application Great Britain, March 5, 1971, 6,211/71

Int. Cl. H01h *1/06*

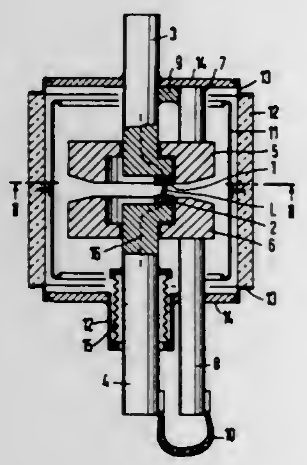
U.S. Cl. 200—166 BH **6 Claims**



An electrical switch contact comprises having contacts including a generally cylindrical stem and an integral head which takes the form of a right triangular prism with an edge thereof perpendicular to the stem axis. A movable contact arm supported by a pair of said contacts for pivotal movement relative thereto on the edges thereof.

3,717,739
CONTACT ARRANGEMENT FOR VACUUM SWITCHES

Wilfried Kuhl, Grossschwarzenlohe, and Leonhard Klug, Nuernberg, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Germany
Filed April 4, 1972, Ser. No. 241,036
Claims priority, application Germany, April 13, 1971, P 21 17 845.0
Int. Cl. H01h *1/06*
U.S. Cl. 200—166 C **3 Claims**

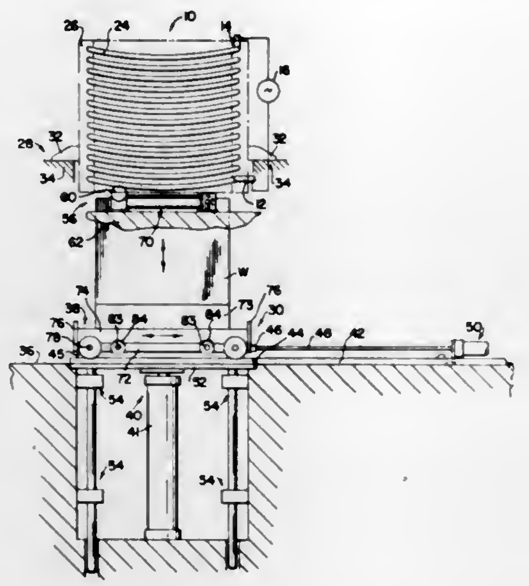


A contact arrangement comprises two inner contacts which can be moved relatively to each other, and two immovable outer contacts. The inner contacts comprise a contact carrier and a contact piece, and the outer contact comprises a contact carrier and a ring-shaped high-current piece. The high-current contact pieces surround the contact pieces of the inner contacts and partially surround the contact carriers of the inner contacts and are spaced at a distance therefrom. The inner contact pieces are arranged eccentrically with respect to the longitudinal axis of the contact carrier at the latter, in such a way that a narrow gap will exist on one of the sides of the passage from the high-current contact piece to the contact carrier, between the inner contact pieces to the contact carrier, between the inner contact pieces and the high-current contact pieces, and the position of the inner contact can be firmly adjusted within an angular range of 0° through 30°, with respect to the passage. The high-current contact pieces are furthermore provided with a slot on the other side of the junction with the contact carrier. On one hand, the slots of the high-current contact pieces and, on the other hand, the inner contact pieces are arranged symmetrically opposite each other.

3,717,740
SLAB HEATING DEVICE

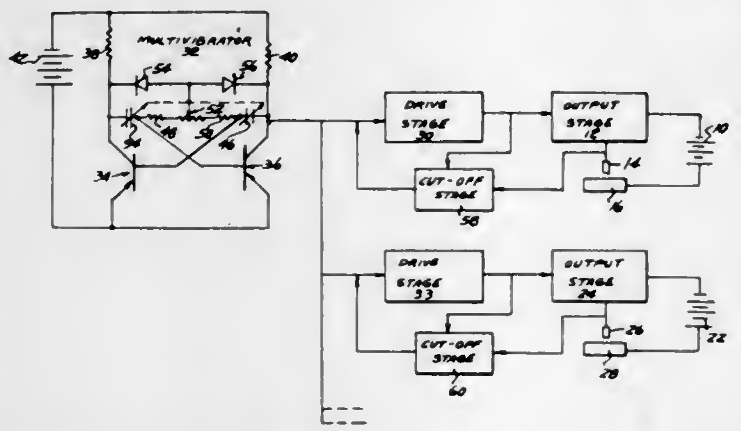
Robert V. Vickers, Shaker Heights, Ohio, assignor to Park-Ohio Industries, Inc., Cleveland, Ohio
Filed July 9, 1971, Ser. No. 161,277
Int. Cl. H05b *9/02*
U.S. Cl. 219—10.57 **10 Claims**

Apparatus is provided for inductively heating a metal ingot or workpiece. The apparatus comprises a heating coil having convolutions spaced apart axially of the coil. The area within the coil is adapted to receive a workpiece to be heated, and means is provided to relatively reciprocate the coil and workpiece a distance equal approximately to one-half the pitch distance between adjacent convolutions of the coil, whereby more uniform heating of the workpiece surface is achieved. The convolutions of the coil are of rectangular configuration when viewed axially of the coil, and opposed portions of the convolutions are arcuately contoured in the direction of the coil axis, thus to increase the coil area available for heating the workpiece.



3,717,741
SHORT CIRCUIT PROTECTION SYSTEM FOR ELECTRICAL DISCHARGE MACHINING APPARATUS

Dalton R. Verner, Orchard Lake, Mich., assignor to Elox Inc., Davidson, N.C.
Filed March 10, 1971, Ser. No. 122,838
Int. Cl. B23p *1/08*
U.S. Cl. 219—69 C **4 Claims**



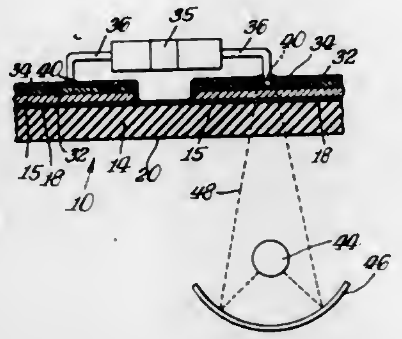
A protective system is provided for an electrical discharge machining apparatus of the multiple type in which there are a single pulse generator and a plurality of drive and output stages, each associated with a different machining gap. A separate cutoff stage is keyed into operation in phased relationship with the machining power pulses to each gap and control of machining power pulses is exercised through switching of a flip-flop stage operatively connected in each drive stage.

3,717,742
METHOD AND APPARATUS FOR FORMING PRINTED CIRCUIT BOARDS WITH INFRARED RADIATION

Stanley A. Fottler, Glen Ellyn, Ill., assignor to Circa Tran. Inc., Glen Ellyn, Ill.
Filed June 26, 1970, Ser. No. 50,221
Int. Cl. B23k *1/02*
U.S. Cl. 219—85 **8 Claims**

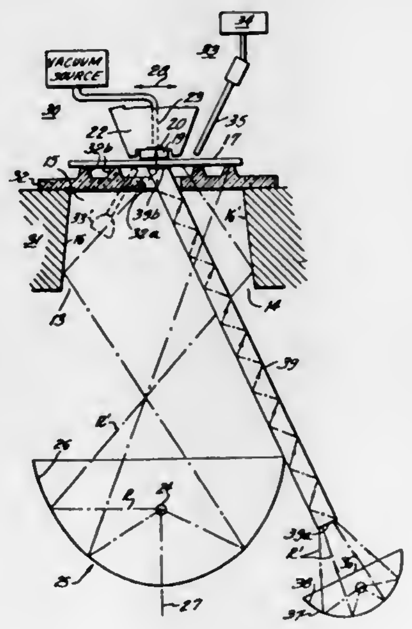
The printed circuit board includes a base made of an infrared radiation transparent material and, on one side of the base, electrical conductors. Between the base and the electrical conductors is an infrared radiation-absorbing interface.

The interface and the conductors are bonded to the base by pressure and heat or by heating the board with infrared radiation transmitted through the base and onto the interface which converts the infrared radiation to heat to complete the bonding cure cycle. Electronic components having leads shaped as supporting feet may be reflow soldered to the conductors by similarly transmitting infrared radiation through the base onto the interface. The heat required for soldering is then carried by the conductors from the interface to the solder by thermal conduction. The components are not exposed to the infrared radiation, and no shields or special solders are needed to solder the components to the printed circuit board.



3,717,743
METHOD AND APPARATUS FOR HEAT-BONDING IN A LOCAL AREA USING COMBINED HEATING TECHNIQUES

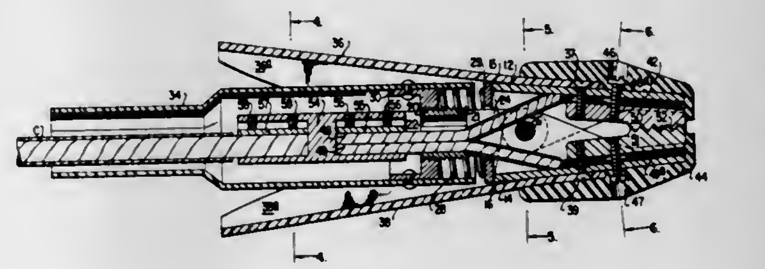
Bernard J. Costello, Ringoes, N.J., assignor to Argus Engineering Company, Inc., Hopewell, N.J.
Division of Ser. No. 863,163, Oct. 2, 1969, abandoned. This application Dec. 7, 1970, Ser. No. 95,536
Int. Cl. B23k *1/02*
U.S. Cl. 219—85 **3 Claims**



Method for joining a dielectric or semi-conductive element to a metallic layer employing a combination of heating techniques. The substrate upon which the metallic layer is already deposited is heated to a "background" temperature substantially below the temperature required for bonding, to reduce the local temperature rise required to perform the bond and to reduce the shock experienced by the substrate due to thermal gradients which occur during the bonding cycle. The bonding energy in the form of radiant energy, is focussed upon the side of the substrate opposite to the side on which the bond is to be formed, and in the region of said bond, and is at a level sufficient to heat the interface to a temperature greater than the bond point to enable the two materials to flow together and form the bond. Focussing the bonding energy upon the opposite surface of the substrate causes the bonding surface of the element to be hotter than the bulk of the element thus causing a thermal gradient across the element such that the top surface of the semi-conductor element is much cooler than the under surface, providing an enhanced margin of safety in preventing thermal damage to active zones or thermally sensitive regions in the element being bonded. The dielectric or semi-conductive element being bonded to the metal layer is often scrubbed across the metal layer to enhance formation of the bond by removing oxide coatings which may have formed on the element and which would otherwise reduce the effectiveness of the bond.

3,717,744
ELECTRODE HOLDER

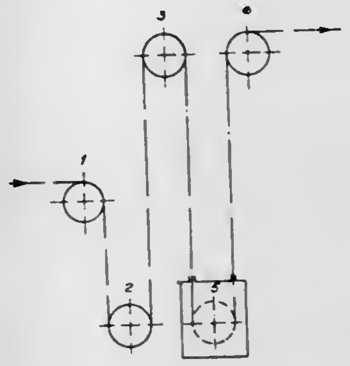
Philip J. Pishioneri, 321 Third Street, Ellwood City, Pa.
Filed June 23, 1971, Ser. No. 155,785
Int. Cl. B23k *9/28*
U.S. Cl. 219—138 **5 Claims**



An electrode holder having jaws which are spring-urged together and carry electrode grippers directly connected to a power cable, the spring pressure on the jaws being adjustable and the grippers being easily changeable. The conductive parts of the holder are contained within exterior members made of insulating material and including jaw covers, insulated jaw opening levers, and an insulated sleeve rotatable to change the spring force closing the jaws. The exterior members are shaped to protect the moving parts of the holder from flying molten metal, and a cable connector is located inside for the purpose of facilitating the assembly of the holder to a power cable.

3,717,745
CONTINUOUS RESISTANCE ANNEALING METHOD FOR WIRES

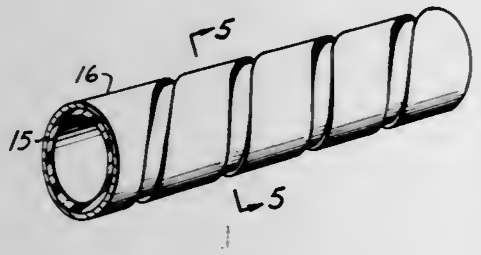
Ahti A. Kosonen, and Seppo A. Nieminen, both of Pori, Finland, assignors to Outokumpu Oy, Outokumpu, Finland
Filed Feb. 17, 1971, Ser. No. 116,193
Claims priority, application Finland, Feb. 25, 1970, 511
Int. Cl. C21d *9/62*
U.S. Cl. 219—155 **6 Claims**



A wire running through contact wheels is resistance heated by a current set to heat the wire in a first step to a relatively low temperature which has been determined experimentally and which is dependent upon, e.g., the drawing rate, the protective gas used, cooling, the thickness of the wire, the length of the annealing distances, and the solidus temperature of the wire to create a controlled number of crystal nuclei in the wire and then the actual annealing is effected in a second step by a current heating the wire to a high temperature to recrystallize the wire completely.

3,717,746
THERMALLY SHRINKABLE DEVICES

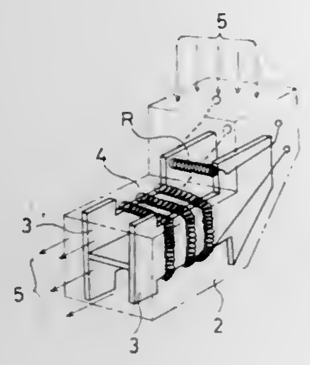
Gary C. Breitweiser, Santa Barbara, Calif., assignor to Sloan Technology Corporation, Santa Barbara, Calif.
Filed June 8, 1970, Ser. No. 44,006
Int. Cl. H05b *1/00*
U.S. Cl. 219—200 **4 Claims**



A uniformly shrinkable device having regions which are to be selectively shrunk, and a method for locally shrinking those regions. A body which is shrinkable by the application of heat has a surface carrying a layer of electrically conductive material which generates heat as a consequence of passage of an electrical current. The layer is in thermal contact with the surface and covers an area of it to be shrunk which is of less extent than the total area of the surface. Passing electrical current through the layer thereby selectively shrinks a selected surface pattern of the surface, namely that adjacent to it.

3,717,747
DRYING MEANS FOR ELECTROPHOTOGRAPHIC COPYING MACHINES

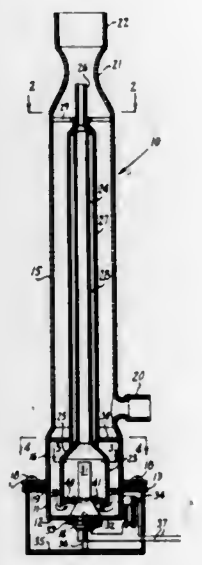
Minoru Fuyuki, Hanno, Japan, assignor to Konishrioku Photo Industry Co., Ltd.
Filed Sept. 1, 1971, Ser. No. 176,821
Claims priority, application Japan, Sept. 4, 1970, 45/87645 (utility model)
Int. Cl. H05b *1/00*
U.S. Cl. 219—216 **2 Claims**



Apparatus for controlling the current to a lamp in an electrophotographic copying machine as provided comprising a resistor mounted in the power circuit to the lamp, said resistor being mounted in the copy paper drying means associated with said copying machine whereby the heat generated by said resistor does not raise the temperature within the copying section of the apparatus.

3,717,748
HOT WATER CIRCULATOR

Carl E. Imler, 213 W. Kirwin, Salina, Kans. 67401
Filed July 2, 1971, Ser. No. 159,148
Int. Cl. H05b *1/00;* **F04b** *19/24*
U.S. Cl. 219—306 **1 Claim**



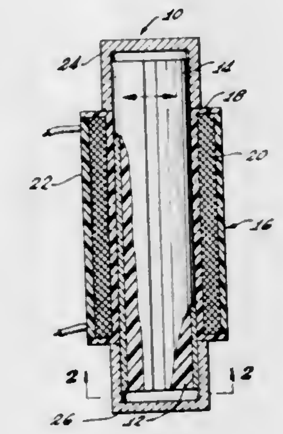
A domestic hot water circulator for a loop type domestic hot water system includes an upright cylindrical conduit having a venturi formed as an upward extension thereof. An inlet pipe communicates with the lower end of the conduit and an outlet fitting is formed on the upper end of the venturi. An annular flange is provided on the lower end of an enlarged collar section integrally formed on the lower end of the conduit and a generally cylindrical housing underlies the conduit. The housing has a hollow base member formed therein corresponding in diameter to the collar section and an annular flange on the base member is detachably secured to the flange on the collar section. An electric heater is mounted on the bottom wall of the base member and extends axially upwardly in the base member and collar section. A cylindrical pot encompasses the heater and a tube extending coaxially with the conduit is connected at its lower end to the pot. A nozzle forming a reduced upper end portion on the tube terminates in the venturi. The heater extends through and is secured to a lower wall on the pot. A flexible valve plate secured to the lower wall covers a plurality of water flow apertures in the wall. A screen in the collar section beneath the inlet pipe filters the water flowing from the inlet pipe to the apertures. An insulating tubular housing surrounds the tube. The conduit is normally filled with water flowing therein by convection and the water in the pot is heated by the heater and expelled through the tube into the venturi to induce increased flow through the system with replacement water flowing into the pot through the apertures past the check valve plate.

3,717,749
ELECTROMAGNET SENSOR STRUCTURE FOR MAGNETIC CARDS

Waldo I. Rogers, Arcadia, Calif., assignor to Rusco Industries, Inc., Los Angeles, Calif.
Filed May 17, 1971, Ser. No. 143,979
Int. Cl. G06k *7/08, 19/08;* **H01h** *43/08*
U.S. Cl. 235—61.11 D **5 Claims**

For sensing the polarity of a magnetized spot in a card, an electromagnetic sensor structure is shown in which a coil surrounds a strip of saturable core material of high initial permeability that saturates at a substantially higher flux density than that available from the spot. Pole pieces in the form of end caps are mounted on the ends of a cylinder on which the strip

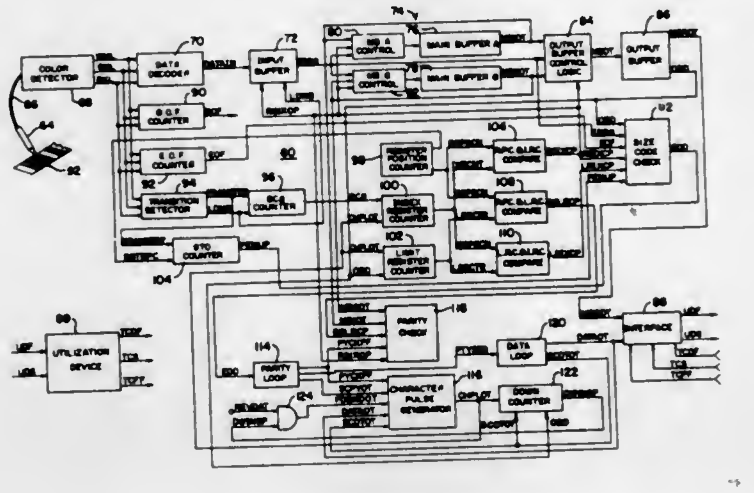
is located, and are in contact with the ends of the strip. The pole pieces are of such size that when a card spot is aligned with either, it intercepts all flux from the spot. The cross section of the strip is such that flux gathered by the pole piece adjacent the card spot is concentrated therein so as to substantially saturate the strip. With the sensor thus conditioned, a pulse applied to the coil causes the strip to remain saturated



when the coil field aids the spot field, and to be driven away from saturation when the coil field opposes the spot field. Due to the effect of the strip on the change of inductance of the coil, the voltage drops across the coil in the aiding and opposing situations are significantly different in character, thereby to clearly distinguish between the polarity orientations of different spot fields aligned therewith.

3,717,750
INPUT CONTROL LOGIC FOR A CODE READING SYSTEM

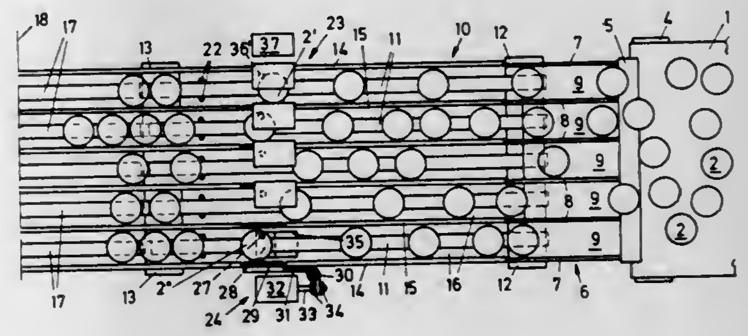
Robert C. Gilberg, Dayton, James P. Donohue, Fairborn, and Ramesh S. Patel, Kettering, Ohio, assignors to The National Cash Register Company, Dayton, Ohio
Filed Dec. 7, 1971, Ser. No. 205,543
Int. Cl. G06k *7/12*
U.S. Cl. 235—61.11 E **10 Claims**



A system for processing a color bar code read optically from a coded medium is disclosed. The system includes logic for determining the binary code from color signals and storage means for temporarily storing the binary code. Logic is also provided which allows the reading of a double field tag and which checks the parity and the size of the captured message. Further, logic is provided for transmitting the captured message to a utilization device.

3,717,751
COUNTING DEVICE FOR REGULARLY SHAPED, PREFERABLY FLAT ARTICLES, FOR EXAMPLE, BISCUITS (OR COOKIES)

Rene Fluck, Neuhausen am Rheinfall, Switzerland, assignor to Schweizerische Industrie-Gesellschaft, Neuhausen am Rheinfall, Switzerland
Filed July 29, 1971, Ser. No. 167,360
Claims priority, application Switzerland, Aug. 3, 1970, 11,673/70
Int. Cl. G06m *7/00, 7/06*
U.S. Cl. 235—92 PK **6 Claims**

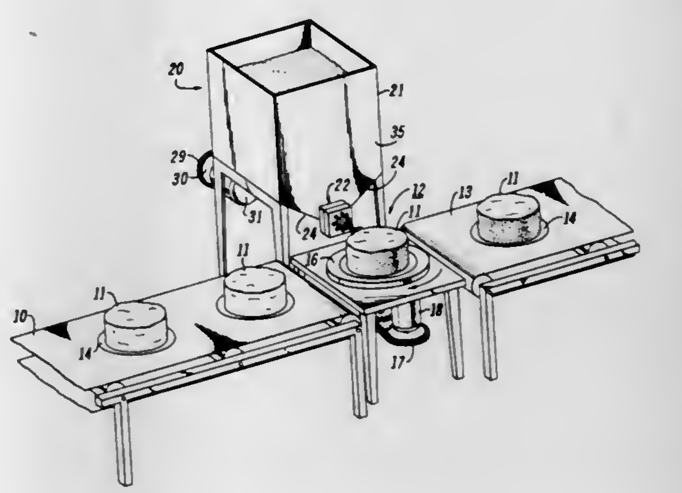


A counting device for uniformly shaped, preferably flat articles, such as biscuits, is provided with a wide conveyor belt to one end of which the articles to be counted are supplied in irregularly spaced manner.

These articles are supplied and distributed by the other end of said conveyor to a plurality of parallel counting channels, each of which receives a single row of articles and each of which is provided with a barrier past which said articles are caused to move and whose interruption and restoration serve for a counting of the articles. An adding device counts the articles which move past said barriers in each of said channels and after a predetermined number of articles has been counted, a braking device becomes effective and prevents any additional articles to be added to the group of articles already counted and to be found behind said barriers.

3,717,752
PARTICLE SPRAYING DEVICE

Walter B. Warning, 2424 N. Nordica Ave., Chicago, Ill.
Filed June 24, 1971, Ser. No. 156,232
Int. Cl. A01c *3/06*
U.S. Cl. 239—654 **8 Claims**



A multiple screw auger mounted at the bottom of a hopper carries the particles to a spray device which extracts the particles from the outlet end of the auger and directs them in a predetermined pattern toward a workpiece.

3,717,753

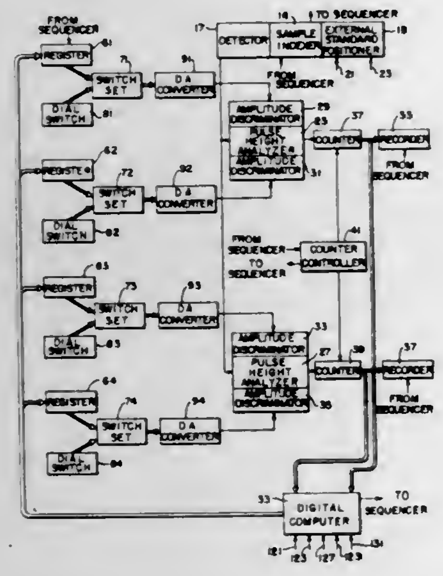
LIQUID SCINTILLATION SPECTROMETER WITH AUTOMATIC SETTING OF CHANNEL LIMITS

Edward Wherry Thomas, Morris Plains, N.J., assignor to Intertechnique S.A., Plasir, France

Filed Oct. 1, 1969, Ser. No. 862,891

Int. Cl. G01t *1/20*

U.S. Cl. 235—151.3 **24 Claims**



This specification discloses a liquid scintillation spectrometer which analyzes a plurality of liquid scintillation test samples in sequence. The system measures the level of quenching in each sample and then measures the rate that scintillations are produced in selected ranges of intensities. The system sets the limits of the intensity ranges for each sample at values determined from the level of quenching found in such sample. A computer is used to determine the range limits from the level of quenching.

3,717,754

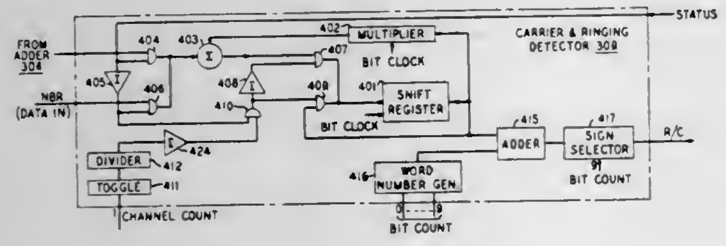
DIGITAL FILTER ARRANGEMENT WHICH ALTERNATIVELY FILTERS TWO SIGNALS DIFFERING IN FREQUENCY

Clair A. Buzzard, Eatontown; Gerald P. Pasternack, Colts Neck, and Burton R. Saltzberg, Middletown, all of N.J., assignor to Bell Telephone Laboratories Incorporated, Murray Hill, N.J.

Division of Ser. No. 884,251, Dec. 11, 1969. This application May 26, 1971, Ser. No. 147,272

Int. Cl. G06f *7/38*

U.S. Cl. 235—152 **3 Claims**



A plurality of telephone lines which convey frequency-shift signals and a corresponding plurality of data machines, which send and receive do baseband data are interconnected via a time-shared digital (filter) circuit receiver and digital circuit modulator under the supervision of a common central processor. A low-pass digital filter is arranged to filter the incoming signals to detect ringing or, alternatively, to filter the sum of the signaling frequencies to detect carrier. To detect the low frequency ringing, the response of the filter is modified by limiting the rate at which the input signals are applied thereto and by "holding" the processed signals in the filter for the prolonged interval between the input signal applications.

3,717,755

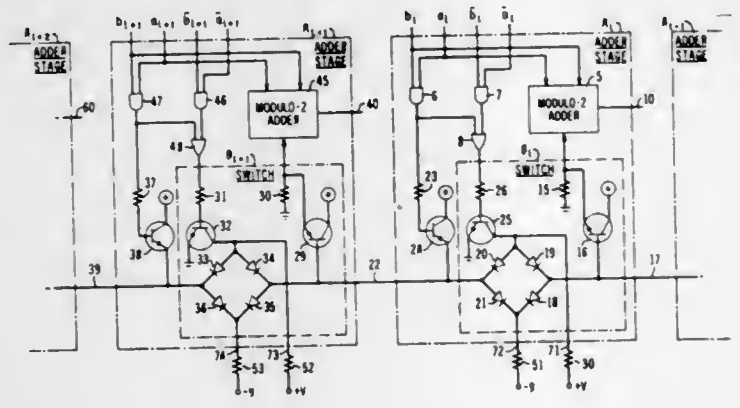
PARALLEL ADDER USING A CARRY PROPAGATION BUS

Bruce Edwin Briley, Countryside, Ill., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill and Berkeley Heights, N.J.

Filed May 21, 1971, Ser. No. 145,696

Int. Cl. G06f *7/50, 7/385*

U.S. Cl. 235—175 **7 Claims**



A parallel adder is implemented using low loss, diode switches in the carry propagation bus of the multistage adder. One switch is associated with an adder stage and each switch presents a shunt impedance to the carry propagation bus that is a function of the numerical significance of the adder stage with which it is associated.

3,717,756

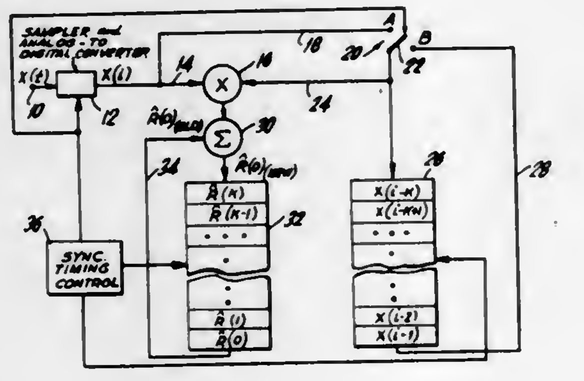
HIGH PRECISION CIRCULATING DIGITAL CORRELATOR

James R. Stitt, St. Petersburg, Fla., assignor to Electronic Communications Inc., St. Petersburg, Fla.

Filed Oct. 30, 1970, Ser. No. 85,532

Int. Cl. G06f *15/34*

U.S. Cl. 235—181 **7 Claims**



A digital correlator of high precision and relative simplicity includes a pair of circulating memories, a multiplier and an accumulator. The input signal to be studied is sampled to produce a series of binary samples which are stored in one of the memories. The correlation coefficients of the input signal are computed by forming the products of the samples and summing those products to the corresponding correlation coefficients previously stored in the other memory, to thereby update the coefficients during each sampling of the input signal.

3,717,757

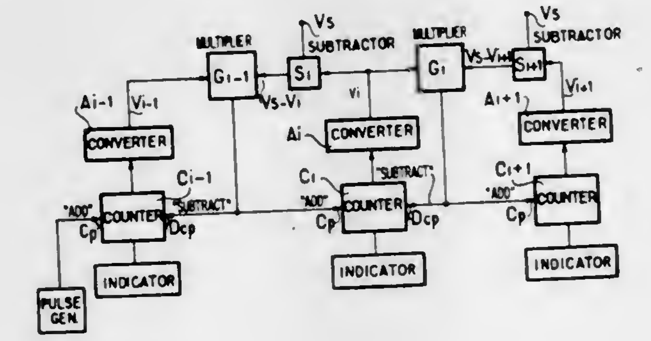
TRAFFIC SIMULATOR

Daniel Falvert, Antony; Andre Raciazek, Paris; Gerard Authie, Toulouse; Jean Clot, Montaudran, and Alain Giraud, Toulouse, all of France, assignors to Compagnie Generale D'Automatisme, Paris, France

Filed June 1, 1971, Ser. No. 148,757

Int. Cl. G06g *7/48;* **G06f** *15/48*

U.S. Cl. 235—184 **8 Claims**



Traffic simulator for vehicles on a unidirectional route, comprising a plurality of reversible counters for which the contents of each corresponds to the number of vehicles on a section of given length of the route, a plurality of analog converters each associated with a reversible counter, and a plurality of generators corresponding to two successive sections of the route and furnishing "substract" transfer pulses to the reversible upstream counter and "add" transfer pulses to the downstream counter, the upstream and downstream counters corresponding to the two sections concerned.

3,717,758

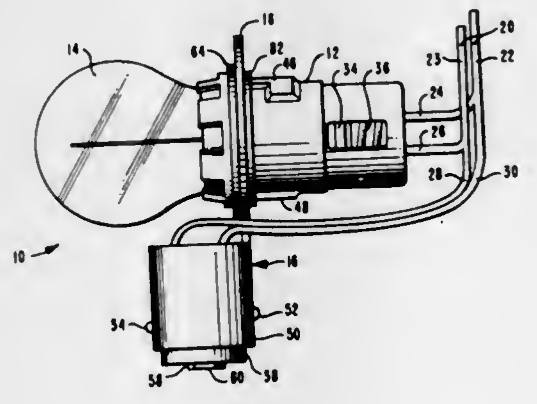
TAIL LIGHT ADAPTER ASSEMBLY

Alvin B. Willis, 705 East Hickory Avenue, Lompoc, Calif.

Filed Nov. 29, 1968, Ser. No. 779,857

Int. Cl. B60g *1/30*

U.S. Cl. 240—8.3 **1 Claim**



A tail light adapter assembly having a T-shaped configuration with the bulb and a socket to hold the bulb forming the crossbar of the T, and a standard lamp base forming the leg of the T, and an electrical cable extending away from the assembly with leads interconnecting the contacts in the socket and the lamp base.

3,717,759

FLASHLIGHT

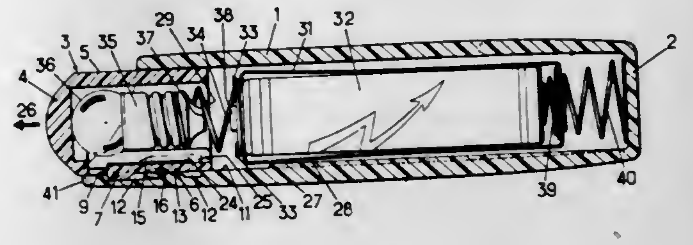
Jean-Pierre Rousseau, 4 Andersen L'Oree de Senart, 91 Dravell, France

Filed April 21, 1971, Ser. No. 136,131

Claims priority, application France, April 27, 1970, 7015346

Int. Cl. F21l *5/00, 15/00*

U.S. Cl. 240—10.66 **6 Claims**



Pocket battery-operated flashlight comprises casing and lens mounting unit longitudinally slidable and rotatable in said casing, together with means for latching the unit in an inner lighted position and a second unlit position.

3,717,760

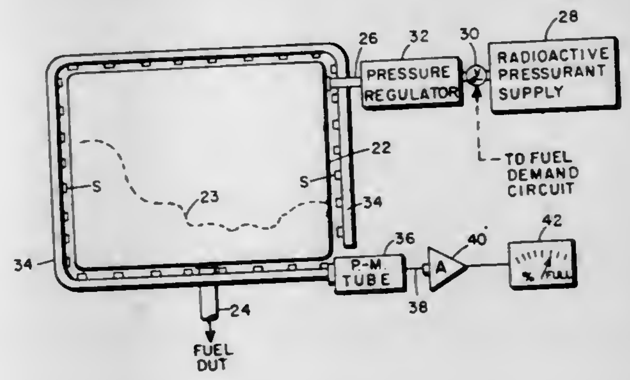
RADIATION FILL GAUGE

Philip T. Martin, Columbus, Ohio, assignor to Industrial Nucleonics Corporation

Filed Aug. 16, 1965, Ser. No. 479,974

Int. Cl. G01n *23/10*

U.S. Cl. 250—43.5 FL **13 Claims**



A nucleonic fill gauge for a vessel is provided by mounting a source of radiation inside the vessel to direct radiation in all directions toward the walls of the vessel. A plurality of radiation detectors mounted on the walls around the outside of the vessel respond to radiation passing through the material in the vessel. The signals from each detector are coupled, for example, by light pipe means to a central processor which generates an output signal proportional to the amount of material in the vessel.

3,717,761

SCANNING ELECTRON MICROSCOPE

Hirotami Koike and Katuyoshi Ueno, Tokyo, Japan, assignors to Nihon Denshi Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 14, 1971, Ser. No. 133,894

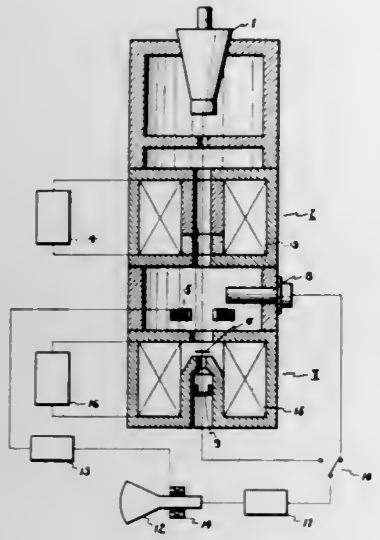
Claims priority, application Japan, Apr. 18, 1970, 45/33,284

Int. Cl. H01j *37/26*

U.S. Cl. 250—49.5 PE **8 Claims**

A scanning electron microscope equipped with a high excitation electron lens in which the specimen to be analyzed is placed in a magnetic field produced by the lens. In this arrangement, the incident electron beam is focused and deflected by the magnetic field before the specimen.

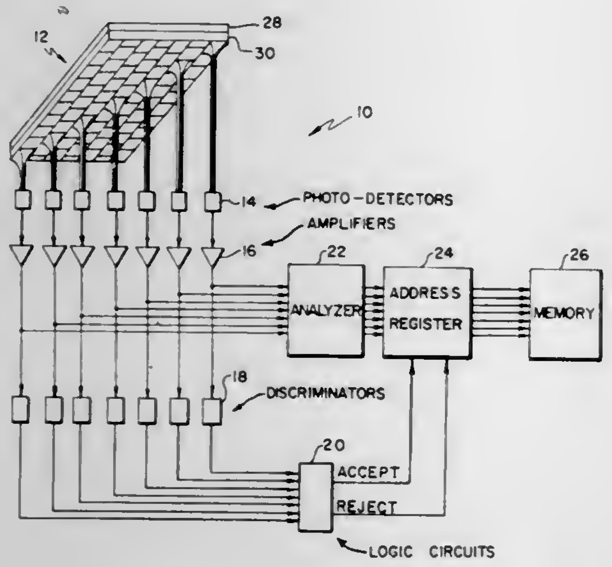
Further, secondary electrons emitted from the specimen by the irradiation of the electron beam are focused spirally by the said magnetic field and removed from the magnetic field along the optical axis.



3,717,762
SENSING MATRIX FOR A RADIOACTIVITY-DISTRIBUTION DETECTOR

Raymond P. Grenier, Wilmington, and William F. Welsh, Waltham, both of Mass., assignors to Baird-Atomic, INc., Bedford, Mass.

Filed Sept. 21, 1970, Ser. No. 74,030
Int. Cl. G01t *1/20*
U.S. Cl. 250—71.5 R **12 Claims**

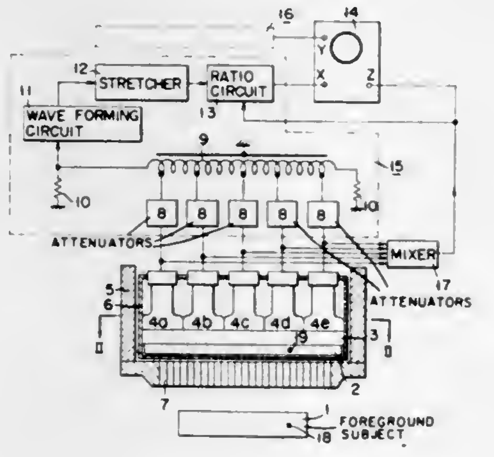


In a radioactivity-distribution detector, an array of light conduits in spaced relation to a plurality of visible light emitters defining a grid network is provided for identifying and specifying the location of an active or light generating emitter. The conduits are disposed in a plurality of row pairs, the first of the pair being in bisecting staggered spaced relation to the second of the pair. Specific ones of the light emitters are in exclusive spatial relationship with selected ones of the light conduits and other ones of the light emitters are in spatial relationship with a specified combination of light conduits, whereby each emitter is identified by either a single light conduit or a unique combination of light conduits.

3,717,763
SCINTILLATION CAMERA DEVICE

Eiichi Tanaka, Tokyo; Toshiyuki Hiramoto; Norimasa Nohara, both of Chiba, and Shigeyasu Kurihara, Yokohama, all of Japan, assignors to Director of the National Institute of Radiological Sciences, Science and Technology Agency, Anagawa, Chiba-shi and Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, both of Japan

Filed Oct. 1, 1970, Ser. No. 77,188
Claims priority, application Japan, Oct. 1, 1969, 44/77804
Int. Cl. G01t *1/20*
U.S. Cl. 250—71.5 S **8 Claims**

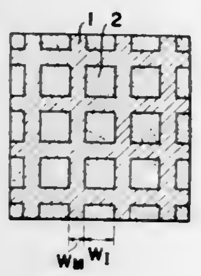


A scintillation camera device wherein output pulse signals from photomultipliers optically coupled with a scintillator giving forth light upon absorption of radiation emitted from a radioactive isotope taken into a foreground subject are used as an input to a delay element such as a delay line for separating said signals in time sequence in proportion to the position of each of said photomultipliers; output signals from said delay element are shaped into single polar symmetrical wave forms in a wave forming circuit comprises of a single delay line in such a manner that the peak amplitude of the mixed wave form obtained in accordance with the position of each photomultiplier becomes proportionate to the position of a scintillation point; and the peak amplitude of said mixed wave forms is indicated on a cathode ray tube as a signal representing the position of the scintillation point.

3,717,764
INTENSIFYING SCREEN FOR RADIOGRAPH USE

Ikuo Fujimura, and Masao Takano, both of Ashigarakami-gun, Kanagawa-ken, Japan, assignors to Fuji Shashin Film Kabushiki Kaisha, Ashigarakami-gun, Kanagawa-ken, Japan

Filed March 5, 1970, Ser. No. 16,756
Claims priority, application Japan, March 7, 1969, 44/17260; Oct. 18, 1969, 44/83338
Int. Cl. H01j *1/62*
U.S. Cl. 250—80 **17 Claims**

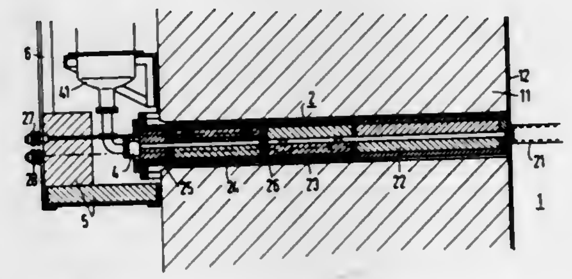


Disclosed is an intensifying screen for X-ray radiograph use having a striped or checkered pattern of metal strips embedded in a high-sensitive phosphor layer, thereby reducing "mottles" which are offensive to the eye in examining an X-ray picture and at the same time absorbing the scattered X-ray in the screen. The combined effects of reduction of "mottles" and absorption of scattered X-rays improve the image quality of an X-ray picture.

3,717,765
DEVICE FOR NON-DESTRUCTIVE CONSUMPTION TESTING OF REACTOR FUEL ELEMENTS

Sigwart Hiller, Lauf, Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed March 30, 1971, Ser. No. 129,537
Claims priority, application Germany, April 4, 1970, P 20 16 206.5
Int. Cl. G01t *1/16, 1/24*
U.S. Cl. 250—83.3 R **10 Claims**

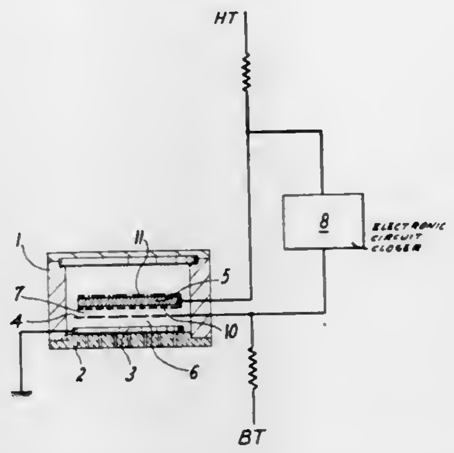


Apparatus for the non-destructive consumption testing of nuclear fuel elements in a basin includes inserting at least one gamma ray collimator through the wall of the basin and having one end thereof connected to a gamma spectrometer. The other end of the collimator is coupled to a water evacuated tube connected with the guide structure of the fuel element being tested. The fuel element is vertically moved past the collimator so that the consumption state of the element can be tested.

3,717,766
SPARK CHAMBER RADIATION-DETECTING DEVICE

Gilles Allard, Villejuif, and Alain Lansiart, Orsay, France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Oct. 22, 1970, Ser. No. 83,060
Claims priority, application France, Oct. 30, 1969, 37,300
Int. Cl. G01t *1/18*
U.S. Cl. 250—83.6 R **3 Claims**

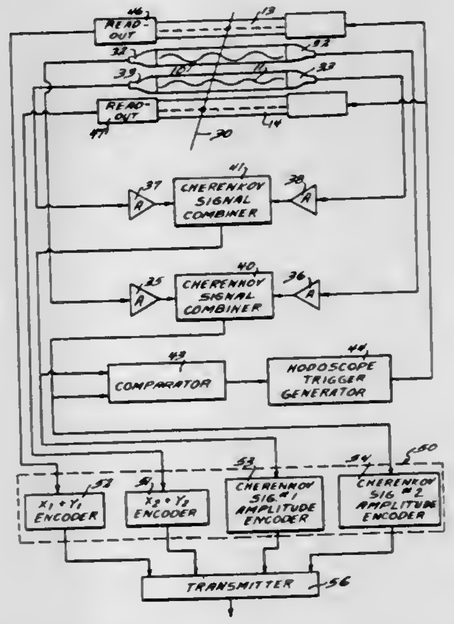


A device for detecting and visualizing the spatial distribution of radiation comprises three parallel electrodes disposed within an enclosure which contains an ionizable gas mixture and consisting of a grid between a cathode which is transparent to said radiation and an anode. The grid defines with the cathode a detection space in which the incident radiation causes ionization of the gas mixture and defines with the anode a space for the multiplication of electrons which are produced in the detection space and pass through the grid, thereby initiating the production of sparks. The detecting device further comprises an external circuit which provides a connection between the anode and the grid and includes means which are triggered by the sparks produced within the multiplication space in order to short-circuit said multiplication space temporarily at the time of appearance of each spark. The anode is essentially provided with two conductive coatings which are electrically connected to each other respectively on the two faces of an optically transparent support plate. One of the two coatings has high surface resistance and limits the electron multiplication space whilst the other coating has low surface resistance.

3,717,767
DETECTION SYSTEM FOR HEAVY AND SUPER-HEAVY COSMIC RAY NUCLEI

Raymond Gold, Woodridge, and Karl G. Porges, Evanston, Ill., assignors to the United States of America as represented by the United States Atomic Energy Commission

Filed Nov. 2, 1971, Ser. No. 194,962
Int. Cl. G01t *1/18*
U.S. Cl. 250—83.6 R **5 Claims**


READ-OUT
13
READ-OUT
CHERENKOV SIGNAL COMBINER
CHERENKOV SIGNAL COMBINER
COMPARATOR
HODOSCOPE TRIGGER GENERATOR
ENCODER
ENCODER
CHERENKOV SIG. #1 AMPLITUDE ENCODER
CHERENKOV SIG. #2 AMPLITUDE ENCODER
TRANSMITTER
56

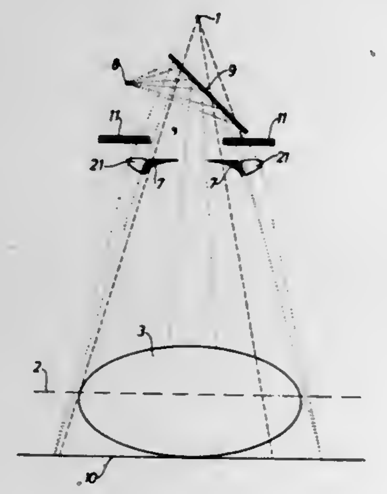
A detection system using a pair of Cherenkov detectors of different refractive indices is used for the observation of heavy and superheavy relativistic cosmic ray nuclei. Hodoscopes are used in conjunction with the Cherenkov detectors to determine the path of the nuclei through the Cherenkov detectors. The velocity and charge of the cosmic ray nuclei are determined from conventional pulse height analysis.

3,717,768
X-RAY FILTER DEVICE IN COMBINATION WITH A POSITIONING LIGHT CONVERGING MEANS

Paul Ragnvald Edholm, Linkoping, and Nils Bertil Jacobson, Solna, Sweden, assignors to Medinova AB, Solna, Sweden

Filed Feb. 2, 1971, Ser. No. 111,828
Claims priority, application Sweden, Feb. 9, 1970, 1,651/70; Aug. 20, 1970, 11,356/70
Int. Cl. H01j *5/16*
U.S. Cl. 250—86 **12 Claims**

The invention relates to a radiographic apparatus provided with an absorption filter device inserted in the radiation path between the radiation source and the object to be radiographed for compensating the variations in thickness, density and absorption properties in different parts of the object to be radiographed so as to produce a more uniform average exposure of the film and thereby a more uniform image contrast in all parts of the radiograph of the object. The absorption filter device includes one or several bodies of a radiation absorbing material, which are shaped to give varying absorption of the radiation in different parts of the radiation beam and which are displaceable relative the radiation beam so that their positions can be adjusted with regard to the size and shape of the actual object to be radiographed. For facilitating the adjustment of the absorption body or bodies of the filter device to correct positions relative to the radiation beam the radiographic apparatus is provided with an optical system for directing a beam of visible light towards the absorption body or bodies, respectively, in such a manner that the visible light beam after having been affected by the absorption body leaves this body in the same direction towards the object as if it originated from the source of ionizing and penetrative radiation, whereby the visible light beam produces a visible image representation of the absorption body upon the object to be radiographed and its support surface, respectively.



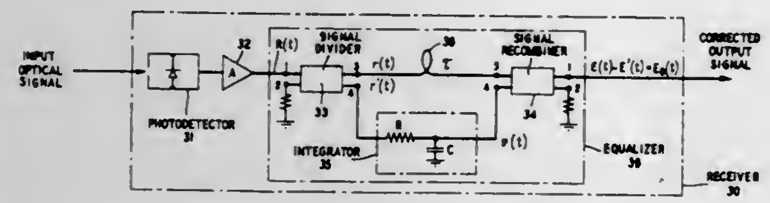
3,717,769
OPTICAL FIBER EQUALIZER

William Marshall Hubbard, Colts Neck Township, Monmouth County, and Tingye Li, Rumson, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill and Berkeley Heights, N.J.

Filed Aug. 16, 1971, Ser. No. 171,984

Int. Cl. H04b *9/00*

U.S. Cl. 250—199 **5 Claims**



Because of imperfections in optical fibers, light propagating therealong is continuously being scattered and rescattered. Some of this scattered energy is trapped within the fiber in a propagating mode and ultimately reaches the output of the fiber delayed relative to the input signal. It is shown that the double-reverse scattering response of a fiber is very nearly the same as the response of an R-C integrator for the same input. Accordingly, the effects of double-reverse scattering interference can be substantially reduced by passing a portion of the received signal through an R-C integrator and injecting the integrated signal thus produced back into the main signal path in time coincidence with the signal so as to cancel the interference component.

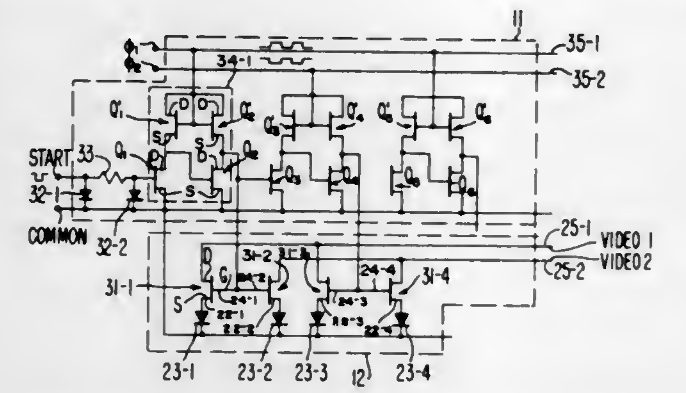
3,717,770
HIGH-DENSITY LINEAR PHOTOSENSOR ARRAY

Rudolph H. Dyck, Palo Alto, Calif., and Louis J. Kabell, Palm Bay, Fla., assignors to Fairchild Camera and Instrument Corporation, Mountain View, Calif.

Filed Aug. 2, 1971, Ser. No. 168,249

Int. Cl. H01l *15/00*

U.S. Cl. 250—211 J **2 Claims**



A plurality of semiconductor chips each containing a multiplicity of light sensitive elements formed in a line near one principle edge of each chip are arranged in two rows so as to form two lines of light sensitive elements. The semiconductor chips in each row are staggered so as to be substantially opposite the spaces between the semiconductor chips in the other row. The light sensitive elements on the chips in the two rows are arranged so as to effectively form one line of light sensitive elements.

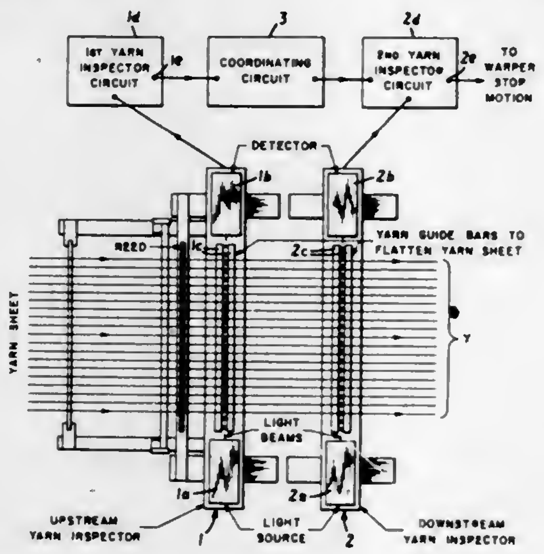
3,717,771
SYSTEM FOR DETECTING DEFECTS IN CONTINUOUS TRAVELING MATERIAL

Solomon Abilock, Brooklyn; Richard Shottenfeld, Jamaica, both of N.Y., and Thomas Brown, Taylors, S.C., assignors to Lindly & Company, Inc., Mineola, N.Y.

Filed April 2, 1971, Ser. No. 130,700

Int. Cl. G01n *21/32*

U.S. Cl. 250—219 DF **29 Claims**



An inspecting system for detecting defects in continuous traveling material such as a sheet of yarn comprises two detecting units, one disposed upstream of the other. The two units are interconnected by a coordinating circuit which disables the downstream unit except for a short period after an apparent defect has been detected by the upstream unit. The period during which the downstream unit is enabled to function begins just before a defect detected by the upstream unit would have time to reach the downstream unit and ends shortly after such defect would have time to pass the downstream unit. The beginning and end of the period during which the downstream unit is enabled may be controlled by a delay circuit triggered by the upstream unit when it detects an apparent defect and set to provide delay times according to the speed the material is traveling. Alternatively, the period may be determined by a counter counting pulses generated by a pulse generator driven in synchronism with movement of the material so as to compensate automatically for changes in the speed of movement of the material. Since the downstream unit is normally disabled, the likelihood of its being triggered by something other than an actual defect, for example a jumping yarn or an electric discharge, is greatly reduced.

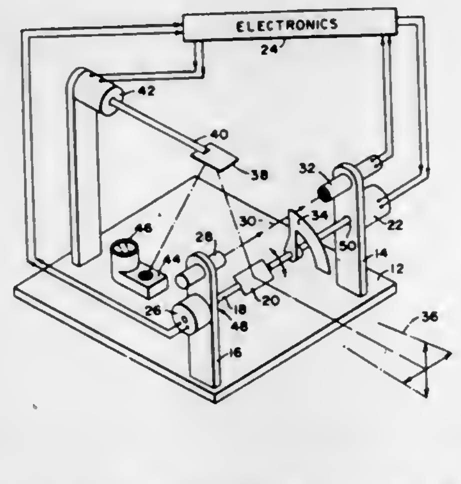
3,717,772
LINEAR BIDIRECTIONAL SCANNING SYSTEM

George E. Engman, Framingham, Mass., assignor to Midland Capital Corporation, New York, N.Y.

Filed Sept. 3, 1971, Ser. No. 177,638

Int. Cl. H01j *3/14*

U.S. Cl. 250—235 **14 Claims**



A constant scan rate bidirectional infrared scanning system. A low momentum oscillatory scanning mirror is servo controlled to provide bidirectional linear frame scanning which results in a doubling of display intensity and reduction of flicker awareness. The sensitivity of the scanning system to vibration is reduced and the scan rate made readily available without loss of linearity or the other advantages of bidirectional scanning.

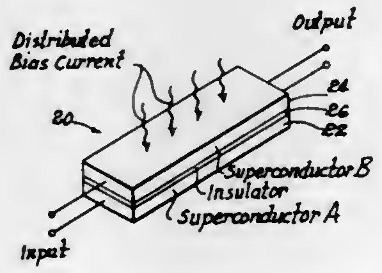
3,717,773
NEURISTOR TRANSMISSION LINE FOR ACTIVELY PROPAGATING PULSES

Robert D. Parmentier, Brooklyn, and Alwyn C. Scott, Madison, both of Wis., assignors to Wisconsin Alumni Research **Foundation, Madison, Wis.**

Division of Ser. No. 746,087, July 19, 1968, Pat. No. 3,599,009. This application May 10, 1971, Ser. No. 141,773

Int. Cl. H03k *3/26*

U.S. Cl. 307—201 **24 Claims**



A neuristor transmission line is disclosed, capable of propagating a pulse without substantial attenuation, and comprising a pair of elongated closely spaced line conductors made of superconductive materials, and a thin barrier layer of non-superconductive material disposed between said line conductors, said layer being sufficiently thin to be readily penetrable by tunneling electrons. A learning junction is also disclosed, adapted to be connected between neuristor transmission lines, and comprising a pair of superconductive elements, and an intermediate element of saturable ferromagnetic material disposed between said superconductive elements. Also disclosed is an array of artificial neurons, comprising a plurality of neuristor transmission lines as described above, and a plurality of learning junctions connected between at least some of said neuristor transmission lines.

3,717,774
TRANSISTOR AMPLIFIER AND LIMITER CIRCUITS

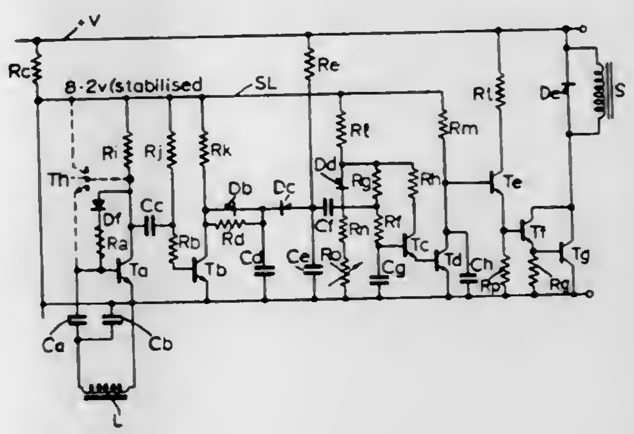
Denis Sharp, East Grinstead, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed July 27, 1970, Ser. No. 58,348

Claims priority, application Great Britain, July 25, 1969, 37,577/69

Int. Cl. H03k *5/08*

U.S. Cl. 307—237 **18 Claims**



A transistor amplifier-limiter circuit that includes a transistor in a common emitter configuration with its base connected to receive an AC input signal via a capacitor. In order to maintain the transistor at the threshold of conduction with a constant DC base bias, a unidirectional constant voltage element, e.g. a diode, is provided in a feedback connection between the collector and base of the transistor and poled to conduct from said collector to base. The unidirectional element varies the current flowing in the feedback connection as a function of the instantaneous amplitude of an AC input signal which tends to turn off the transistor.

3,717,775
COUPLING OF BISTABLE ELEMENTS BY CONDUCTIVITY MODULATION

Wolfdietrich Kasperkovitz, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

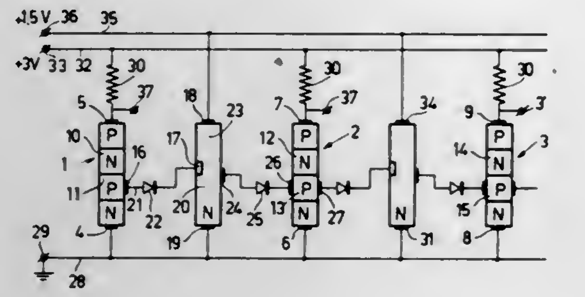
Continuation of abandoned application Ser. No. 824,502, May 14, 1969. This application May 6, 1971, Ser. No. 141,022

Claims priority, application Netherlands, May 17, 1968, 6806967

Int. Cl. H01l *19/00*

U.S. Cl. 307—221 B **4 Claims**

A semiconductor shift register, memory or ring counter is described using bistable elements, such as thyristors or unijunction transistors, coupled by means of conductivity modulation devices, such as a unijunction type of transistor, with the coupling such that the current which causes conductivity modulation of the coupling device drains off accumulated minority carriers in a turned-ON preceding bistable element. Advantages include faster speed and simpler construction.



3,717,776

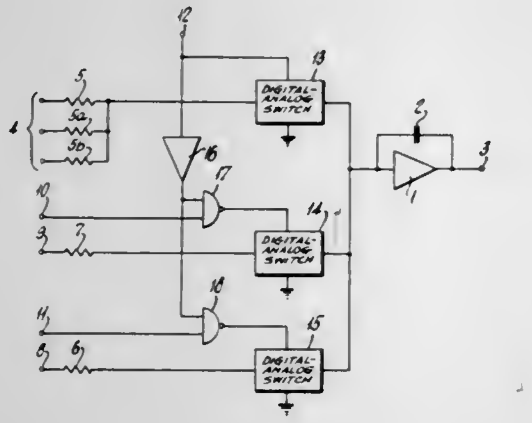
ANALOG SUMMER/INTEGRATOR MODE CONTROL CIRCUIT HAVING DIGITAL/ANALOG SWITCHED INPUTS

Gordon E. Sickel, Eatontown, and George F. Tempel, Neptune, N.J., assignors to Electronic Associates, Inc., Long Branch, N.J.

Filed Sept. 23, 1971, Ser. No. 183,070

Int. Cl. G06g *7/12*

U.S. Cl. 307—229 **11 Claims**



An analog integrator is disclosed in which multiple input resistors are provided thereto. The gain from some of the input resistors to the output of the integrator is higher than the gain from the other input resistors. The lower gain producing resistors are connected to the input of the integrator through a single field-effect transistor digital/analog switching device while each of the higher gain providing input resistors have separate field-effect transistor digital/analog switching devices connecting them to the input. Logic circuitry is provided to interconnect the field-effect transistor digital/analog switching devices to operate as a single switch so that the integrator may be switched thereby from an operate mode (resistors connected) to a hold mode (resistors disconnected). Details of the digital/analog switch are also disclosed in which an inverted transistor is employed to connect each resistor to ground when it is not connected to the input of the integrator.

3,717,777

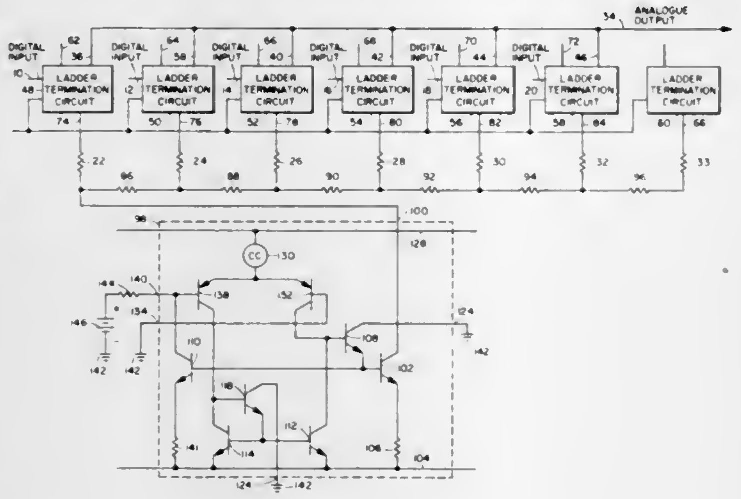
DIGITAL TO ANALOG CONVERTER INCLUDING IMPROVED REFERENCE CURRENT SOURCE

James Barton Cecil, Tempe, Ariz., assignor to Motorola, Inc., Franklin Park, Ill.

Filed March 24, 1971, Ser. No. 127,464

Int. Cl. H03k *1/02*

U.S. Cl. 307—296 **11 Claims**



This disclosure relates to a digital to analog converter including a simplified reference current source whose current output may be determined by a reference resistor and a positive or negative reference voltage source.

3,717,778

PIEZOELECTRIC CERAMIC RESONATOR WITH ASYMMETRICALLY ROUGH EDGE

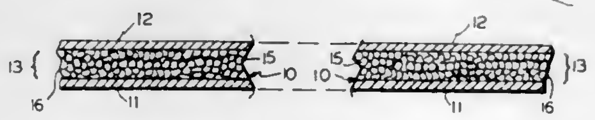
Takashi Nagata, Ikeda, and Yasuo Nakajima, Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Osaka, Japan

Filed June 3, 1971, Ser. No. 149,529

Claims priority, application Japan, June 5, 1970, 45/49,011

Int. Cl. H01v *7/00, 7/02*

U.S. Cl. 310—9.5 **7 Claims**



A piezoelectric ceramic resonator which is free from spurious vibrations when operating in a high frequency range. The resonator is composed of a thin piezoelectric ceramic plate having an electromechanical coupling factor for the thickness-extensional mode vibration at least four times higher than the mechanical coupling factor for the contour mode. The thin ceramic plate has a thickness for causing it to vibrate at a preselected frequency in the thickness-extensional vibration mode at a frequency range higher than twenty megacycles and has an asymmetrically rough peripheral edge having a roughness on the order of one quarter wavelength of the preselected frequency for eliminating unwanted vibrations. Electrodes are provided on said ceramic plate for causing said vibration when an alternating current is supplied thereto.

3,717,779

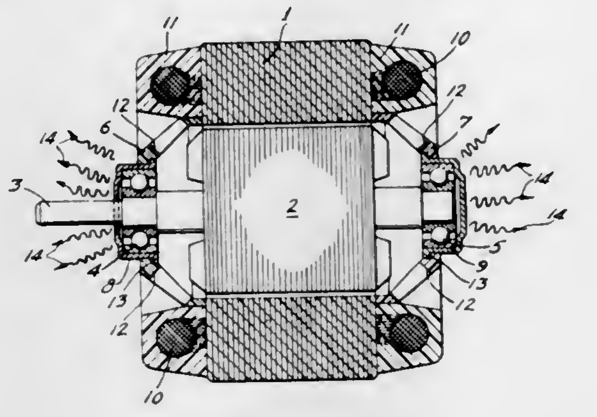
BEARING SUPPORT

Stig Lennart Hallerback, Vastra Frolunda, Sweden, assignor to SKF Industrial Trading and Development Company N.V., Amsterdam, Netherlands

Filed May 20, 1971, Ser. No. 145,155

Int. Cl. H02k *5/16*

U.S. Cl. 310—91 **4 Claims**



A bearing support for apparatus having a rotor and a stator member and a bearing assembly for rotatably supporting one of said members on a shaft. The bearing support including a flange made of a non-metallic material connected at its outer edge portion to the stator radially inwardly of the windings and a bearing housing of metallic material connected to the inner edge portion of said flange. The housing including radial portions in direct contact with ambient air to effectively dissipate heat generated by the bearing.

3,717,780

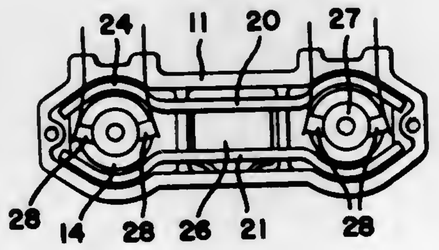
DUAL MOTOR FOR CASSETTE DRIVE

John C. Hohne, Jr., Tipp City, and Carl J. Johnson, Dayton, Ohio, assignors to TRW Inc., Cleveland, Ohio

Filed May 5, 1971, Ser. No. 140,416

Int. Cl. H02k *7/20*

U.S. Cl. 310—112 **4 Claims**



A dual armature motor particularly adapted for the direct drive of tape cassettes has a permanent magnet and a pair of armature plates which define a tapered air gap at the pole, and in which the armature is formed with winding slots which are skewed at an angle to the rotor axis to eliminate cogging when the motor armatures are driven at low speed.

3,717,781

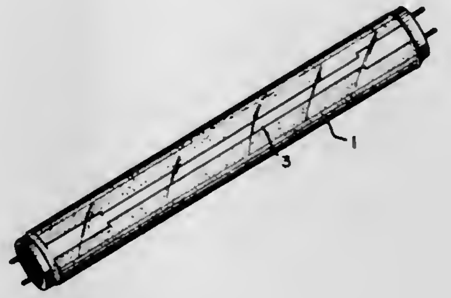
APERTURE FLUORESCENT LAMP HAVING UNIFORM SURFACE BRIGHTNESS

Tadius T. Sadoski, Salem, and Walter A. Johnson, Beverly, Mass., assignors to Sylvania Electric Products Inc.

Filed Sept. 19, 1969, Ser. No. 859,290

Int. Cl. H01j *61/35, 61/42*

U.S. Cl. 313—109 **1 Claim**



The aperture of an aperture fluorescent lamp is wider at the ends of the lamp than at the center in order to improve the uniformity of the light output profile along the entire length of the lamp.

3,717,782

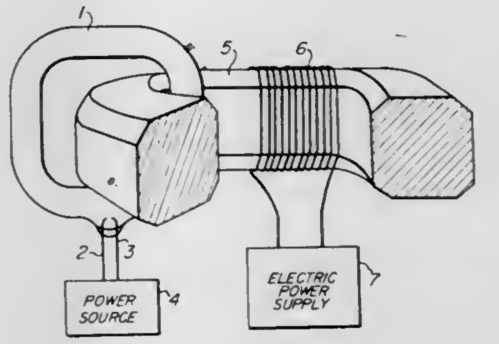
INDUCTION-COUPLED RING DISCHARGE DEVICE

Manabu Yamamoto, Odawara, and Yukio Suzuki, Tokyo, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed March 3, 1970, Ser. No. 16,053

Int. Cl. H01j *1/50*

U.S. Cl. 313—161 **9 Claims**



An induction-coupled ring discharge tube having a reduced electric field strength in the tube due to the charging of cadmium within the tube so that the discharge tube can operate with an electric power supply of relatively lower frequencies and the size of the magnetic core and discharge tube kept to a reasonable size.

3,717,783

ELECTRIC INCANDESCENT LAMP COMPRISING AN INTERNAL FUSE

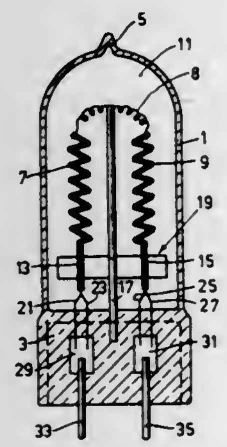
Victor Rosalie Noteiteirs, and Eduard Jozef Philomena Janssen, both of Emmasingel, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 19, 1970, Ser. No. 12,692

Claims priority, application Netherlands, Feb. 21, 1969, 6902806

Int. Cl. H01j *17/04*

U.S. Cl. 313—217 **3 Claims**



A halogen filament lamp comprising an internal fuse having at least two conductors of different diameters electrically connecting series arranged filaments to current conductors embedded within the pinch seal.

3,717,784

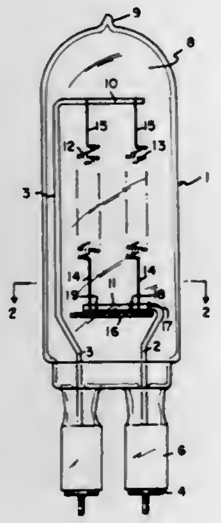
TUNGSTEN HALOGEN LAMP WITH TUNGSTEN MESH DEFLECTOR

Wilfrid G. Matheson, Marblehead, Mass., assignor to Sylvania Electric Products Inc.

Filed June 25, 1970, Ser. No. 49,710

Int. Cl. H01k *1/04, 1/50*

U.S. Cl. 313—222 **3 Claims**



A high power tungsten halogen lamp in which a convection shield is used near the base to control redeposition of tungsten on the filament and prevent the formation of needle-like crystals extending out of the filament.

3,717,785

SYSTEM OF ELECTROSTATIC QUADRUPOLE MICRO-LENSES

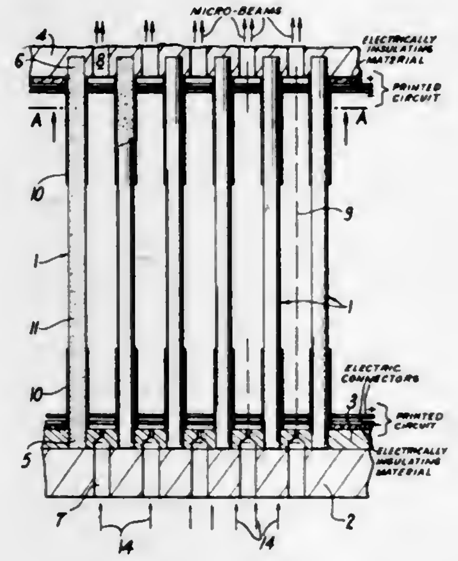
Georges Guernet, Grenoble, France, assignor to Commissariat A L'Energie Atomique, Paris, France

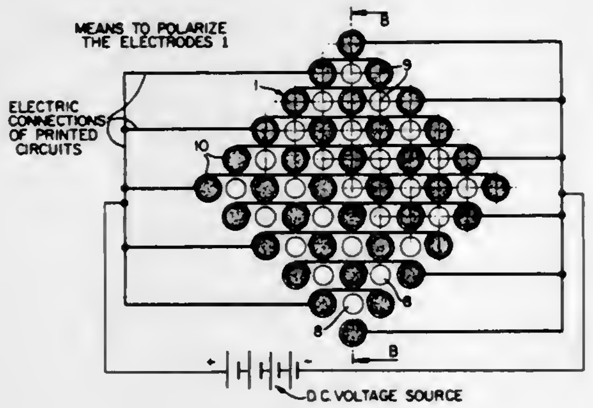
Filed Jan. 19, 1971, Ser. No. 107,720

Claims priority, application France, Jan. 20, 1970, 7001862

Int. Cl. H01j *17/26, 61/28*

U.S. Cl. 313—231 **11 Claims**




MEANS TO POLARIZE THE ELECTRODES 1
ELECTRIC CONNECTIONS OF PRINTED CIRCUITS
B
B
1
10
D.C. VOLTAGE SOURCE

The system comprises an array of parallel filiform electrodes and each micro-lens is made up of at least four adjacent electrodes which define a tunnel having a cross-section in the shape of a square. Each vertex of the square is intercepted by a quarter-circle of the cross-section of the adjacent one of said electrodes and the cross-section of said array in a plane at right angles to said electrodes forms a substantially square lattice. Means are also provided for electrically polarizing said electrodes.

3,717,786

POST-DEFLECTION ACCELERATION STORAGE TUBE

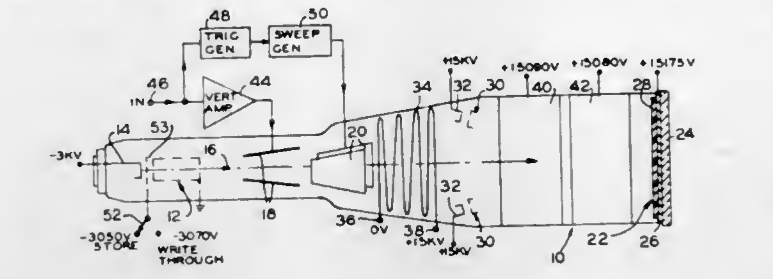
Ernst M. Massey, and William C. Brown, both of Portland, Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Filed July 20, 1970, Ser. No. 56,478

Int. Cl. H01j *29/41*

U.S. Cl. 315—12 **16 Claims**

A direct viewing bistable storage tube is described in which post-deflection acceleration of the writing electron beam is employed to provide a high writing rate during conventional nonstorage operation without affecting the storage operation by separating the flood electrons from the high acceleration field in space or time. This is achieved either by positioning the post-deflection acceleration electrode between the output of the beam deflection means and the flood gun so that the low velocity flood electrons do not pass through the post-deflection acceleration field, or by adjusting the voltage on the acceleration electrode to eliminate the post-deflection acceleration field during storage. In addition, the first-mentioned type of storage tube is provided with an improved write-through operation using a reduced current writing beam due to the post-deflection acceleration so that a nonstored image of high brightness is produced simultaneously with a stored image on the same area of a phosphor storage dielectric in such tube.



3,717,787

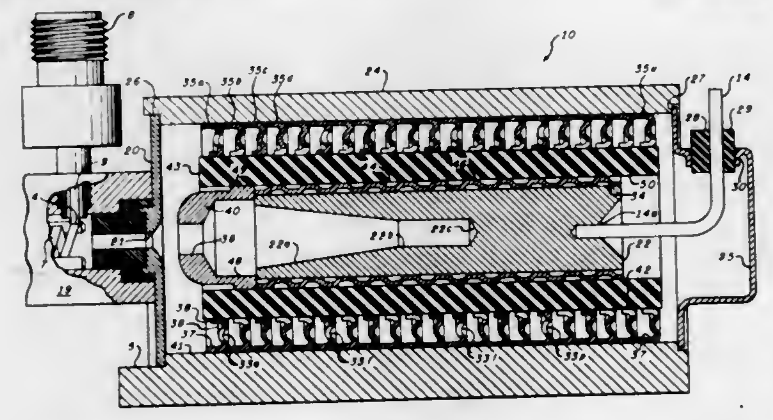
COMPACT DEPRESSED ELECTRON BEAM COLLECTOR

Thomas R. Doyle, Hawthorne, Fla., assignor to Sperry Rand Corporation, New York, N.Y.

Filed Aug. 19, 1971, Ser. No. 173,053

Int. Cl. H01j *25/34*

U.S. Cl. 315—3.5 **9 Claims**



A rugged and compact electron beam collector structure for velocity modulation or other high power electron beam vacuum tubes is characterized by means for providing high electrical voltage insulation along a low thermal impedance heat flow path. The device employs a central beam collector as a core flexibly supported within a hollow cylindrical insulator in turn flexibly supported within a vacuum envelope.

3,717,788

CATHODE RAY TUBE ARRANGEMENT UTILIZING MAGNETIC SHUNTS FOR CONTROLLING COLOR REGISTRATION

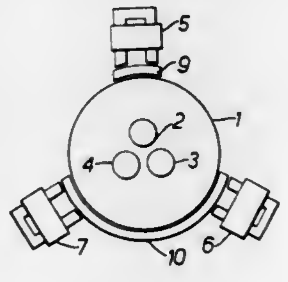
Bernhard J. Rogers, London, England, assignor to The Rank Organisation Limited, London, England

Filed May 14, 1970, Ser. No. 37,139

Claims priority, application Great Britain, May 16, 1969, 24,534/69

Int. Cl. H01j *29/50*

U.S. Cl. 315—13 C **3 Claims**



A control apparatus for a cathode ray tube of the shadow mask type has magnetic shunts movable in field-distorting proximity to electromagnets provided to influence magnetically the pole pieces associated with the electron guns of a cathode ray tube to which the apparatus is fitted. The apparatus includes a main beam-deflecting yoke. Each electromagnet is connected electrically in series with the beam-deflecting yoke.

3,717,789

CIRCUIT ARRANGEMENT FOR CORRECTING THE DEFLECTION OF AN ELECTRON BEAM

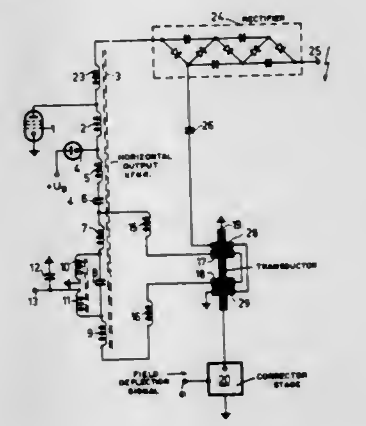
Jorg Wolber, Hamburg-Stellingen, Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 3, 1970, Ser. No. 94,853

Claims priority, application Germany, Dec. 13, 1969, P 19 62 569.5

Int. Cl. H01j *29/76*

U.S. Cl. 315—26 **4 Claims**



A circuit arrangement for the East-West correction in a picture display apparatus by means of a transductor which is controlled by a current of field frequency and whose power winding is connected in series with the line deflection coils. A field frequency variation of the flyback pulses and hence of the EHT is prevented because flyback pulses generated by the power winding are also applied to the EHT rectifier.

3,717,790

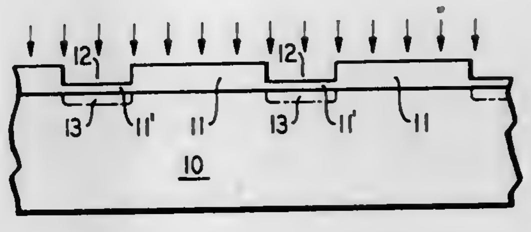
ION IMPLANTED SILICON DIODE ARRAY TARGETS FOR ELECTRON BEAM CAMERA TUBES

John Vincent Dalton, Oldwick; Alfred Urquhart MacRae, Berkeley, both of N.J.; James Robert Mathews, Reading, Pa.; Robert Alan Moline, Gillette; Kenneth Arnold Pickar, Westfield, both of N.J., and Harvey Donald Seidel, Pennside, Pa., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed June 24, 1971, Ser. No. 156,440

Int. Cl. H01l *17/00, 15/00*

U.S. Cl. 148—1.5 **9 Claims**



The specification describes processes using ion implantation for preparing silicon diode array targets for video camera tubes. Bulk silicon prepared in the conventional way has sufficient nonuniformity over the target area to produce contrast patterns in the video output. This effect can be eliminated by initially preparing high resistivity bulk material and implanting the bulk impurities to obtain the desired bulk resistivity. Advantageous procedures for implanting the diodes are also described.

3,717,791
REMOVAL OF ELECTRIC CHARGES

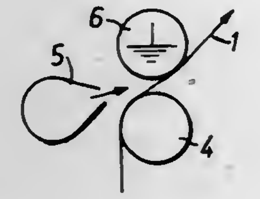
Gerhard Heyl; Gunter Luttgens; Rolf Behr, all of Leverkusen; Fritz Maus, Odenthal-Hannenberg; Hans Frenken, Leverkusen; Josef Busch, Bensberg-Refrath; Herbert Bruck, Leverkusen, and Helmut Schaffer, Opladen, all of Germany, assignors to Agfa-Sevaert Aktiengesellschaft, Leverkusen, Germany

Filed March 18, 1971, Ser. No. 125,477

Claims priority, application Germany, April 28, 1970, P 20 20 600.2

Int. Cl. H05f *3/00*

U.S. Cl. 317—2 R **13 Claims**



Electric charges on moving webs are removed by condensing such a very small quantity of liquid within a confined region of the surface that the temporary increase in moisture remains very small compared with the total amount of moisture of the material.

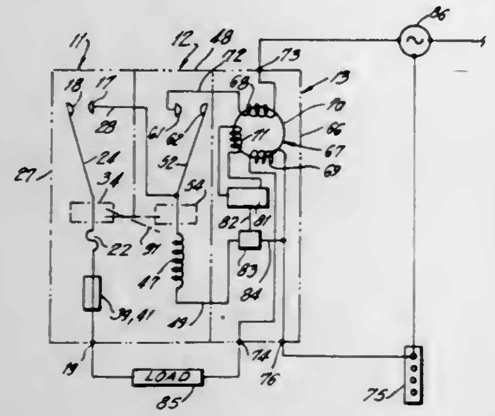
3,717,792
LEAKAGE CURRENT INTERRUPTER DEVICE

Carl E. Gryctko, Haddon Heights, N.J., assignor to I-T-E Imperial Corporation, Philadelphia, Pa.

Filed July 23, 1971, Ser. No. 165,678

Int. Cl. H02h *3/28*

U.S. Cl. 317—18 D **3 Claims**



Ground fault protective apparatus is constructed as a stack of three side by side housings, each having substantially the same outer dimensions as a standard 1" wide molded case circuit breaker. One of the housings contains a standard circuit breaker mechanism including thermal and magnetic trip means, but does not contain an external line terminal. The second housing contains standard circuit breaker contacts connected in series with the contacts of the circuit breaker in the first housing. Also in the second housing is a contact operating mechanism and electromagnetic means for operating the mechanism in response to a trigger signal generated by a trigger device in the third housing. The output of a differential transformer in the third housing is monitored by a sensor in the third housing and when a predetermined imbalance is present at the transformers the sensor causes the trigger to generate a signal which operates the electromagnetic trip means in the second housing.

The third housing also mounts a plug-in type line terminal connected through one of the inputs of the differential transformer to the set of contacts in the second housing. The other input circuit of the transformer is connected to the second load terminal and to a neutral point external of the combination. The sets of circuit breaker contacts are tripped open independently of each other, so that opening of one of the sets of contacts due to a leakage current problem will not require tripping of the other set of contacts, and wearing of the latch associated with the latter.

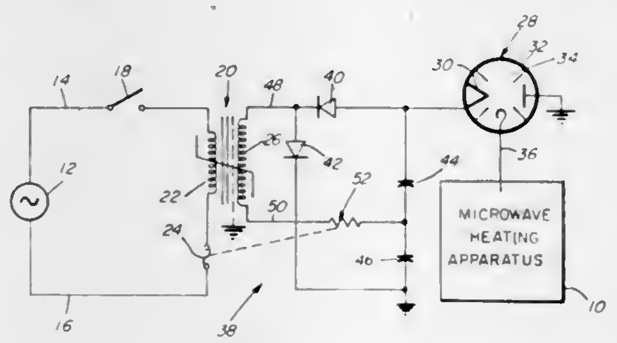
3,717,793
CIRCUIT PROTECTOR

Donald E. Peterson, Iowa City, Iowa, assignor to Amana Refrigeration, Inc., Amana, Iowa

Filed March 30, 1972, Ser. No. 239,480

Int. Cl. H02h *5/04*

U.S. Cl. 317—40 A **6 Claims**



An electrical circuit and means for protecting the high voltage supply of a microwave oven against faults, shorts or failures. Any failure in, for example, the magnetron energy generator, voltage rectifiers, capacitors or other components in the electrical circuit forming the secondary winding loop coupled to a high voltage step-up transformer, particularly, of the ferroresonant saturable core type results in the actuating of thermally controlled deenergizing means to decouple the oven from the line voltage source thereby preventing damage and/or unsafe operation.

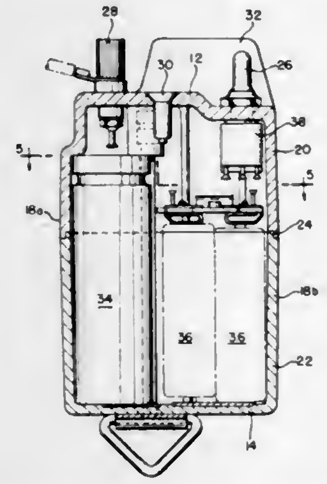
3,717,794
BLASTING DEVICE

Patrick A. Yates, Issaquah, and Robert P. Higgins, Seattle, both of Wash., assignors to Explosive Corporation of America, Issaquah, Wash.

Filed March 8, 1971, Ser. No. 121,690

Int. Cl. F23g *7/02*

U.S. Cl. 317—80 **18 Claims**



A blasting device adapted to be carried and operated within a person's hand, the device comprising a small rectangular case having on its top surface an operating switch, an indicating light and a pair of binding posts. The case contains a pair of batteries and a capacitor. The switch is movable to a first position to connect the indicating light and the capacitor in parallel relationship to the batteries so as to charge the capacitor, with the indicating light being lit while the batteries are imposing a voltage across the capacitor, and the switch is movable to a second detonating position in which the charge of the capacitor is imposed across the binding posts so that when leads from the binding posts are connected to a detonator with explosive charge, the explosive is detonated.

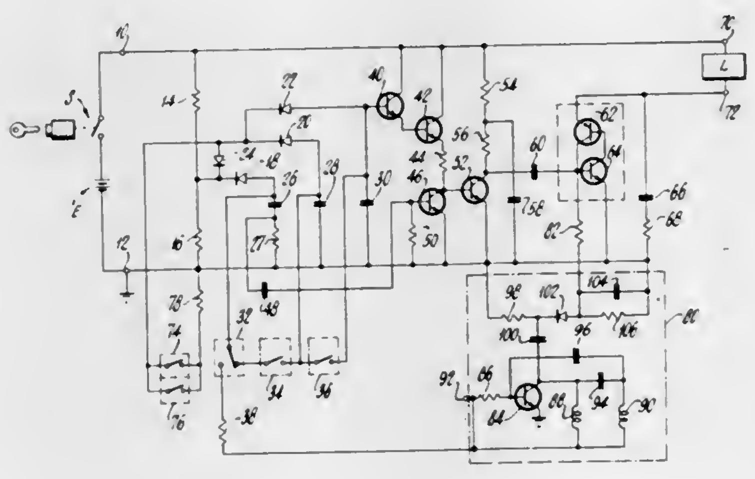
3,717,795
CODE-RESPONSIVE CONTROL CIRCUIT

Carl E. Atkins, Montclair, N.J., assignor to Wagner Electric Corporation, Newark, N.J.

Filed Aug. 10, 1971, Ser. No. 170,484

Int. Cl. E05b *49/00*

U.S. Cl. 317—134 **10 Claims**



A control circuit operative to change the energization state of a controlled device (e.g., a relay) only in response to the momentary closing of a series of charging/discharging circuits in a predetermined sequence, in which sequence the first path closed is also the last path closed. Control of the charging/discharging circuits is preferably effected by a group of symbol-bearing, pushbutton-actuated switches, including several penalty switches which are not part of the combination and which will "erase" the effect of previously-actuated combination switches if actuated at an intermediate stage of the combination sequence.

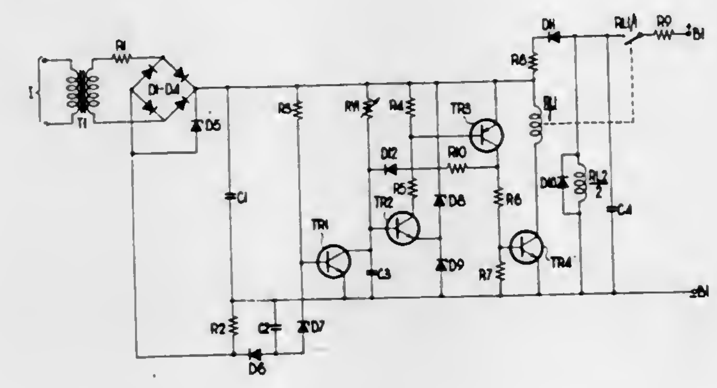
3,717,796
RELAY POWER SUPPLY

Michael Charles Stephen Simpson and Barrie Felton, Stafford, England, assignors to The English Electric Company Limited, London, England

Filed Dec. 21, 1970, Ser. No. 99,867

Int. Cl. H01h *47/32*

U.S. Cl. 317—148.5 R **4 Claims**



The invention provides a power supply for a monitoring circuit for an AC transmission system. Such a power supply normally has to provide only a small, continuous current, but occasionally much heavier currents. To eliminate internal batteries, station batteries can be used; but this tends to impose a small but continuous drain on them. By the invention, the signal being monitored is used to provide sufficient power to meet the normal demand of the monitoring circuit, and also to charge a capacitor C1. When relay operation is required, C1 is discharged through coil

$$\frac{RL1}{1}$$

of a relay, this being sufficient to energize the coil transiently. This closes a contact RL1/1 which connects the station battery B1 to the monitoring circuit. The monitoring circuit then draws any required power from the station battery, for as long as necessary.

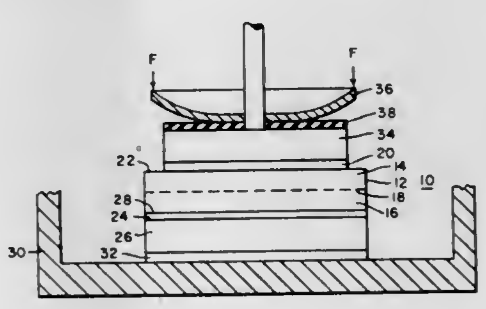
3,717,797
ONE PIECE ALUMINUM ELECTRICAL CONTACT MEMBER FOR SEMICONDUCTOR DEVICES

Julian A. Rydeski, Oakmont, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed March 19, 1971, Ser. No. 126,189

Int. Cl. H01l *3/00, 5/00*

U.S. Cl. 317—234 R **5 Claims**



A solid one piece electrical contact member is resiliently held in direct physical, electrical, and thermal conductive contact with an electrode affixed to a surface of a body of semiconductor material.

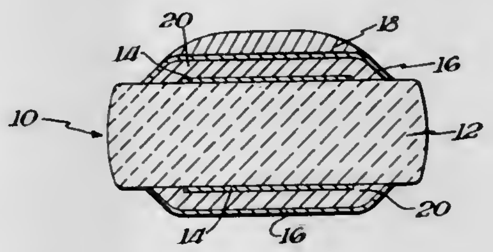
3,717,798
OVERLAY FOR OHMIC CONTACT ELECTRODES

Manfred Kahn, Williamstown, Mass., assignor to Sprague Electric Company, North Adams, Mass.

Continuation-in-part of Ser. No. 860,343, Sept. 23, 1969, abandoned. This application Jan. 21, 1971, Ser. No. 108,492

Int. Cl. H01l *5/00*

U.S. Cl. 317—234 R **6 Claims**



An ohmic contact electrode is overlaid with a fritless bicomponent silver or gold composition that is alloyed or soldered so as to provide a continuous layer having low lateral resistance. The overlay is composed of a sintered mixture of metal flakes approximately one-half to one micron in size and of a very fine metal powder whose particle size is between 100–1000 A. The ohmic contact electrode is on an electrical device employing an inorganic substrate of the type having a highly electronegative element adsorbed at least on the external surface thereof. The substrate is either an insulator or a semiconductor. In ohmic or low loss contact with said substrate is at least one electrode consisting of an intimate mixture of a first metal in powdered form and selected from the group consisting of the platinum group metals, gold, silver and mixtures thereof, and a second metal being an organo compound of at least one metal selected from the group consisting of calcium, magnesium, barium, strontium, zinc, tin, vanadium, nickel, indium, titanium and chromium. The mixture is alloyed and oxidized in situ with at least some of the electronegative element of said substrate.

3,717,799

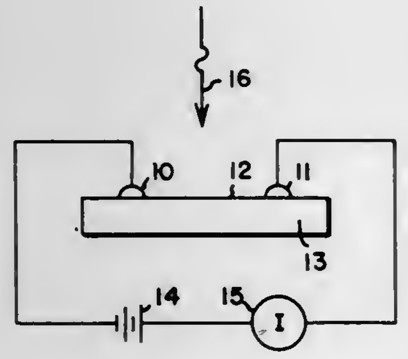
$KTaO_3$ ULTRAVIOLET DETECTOR

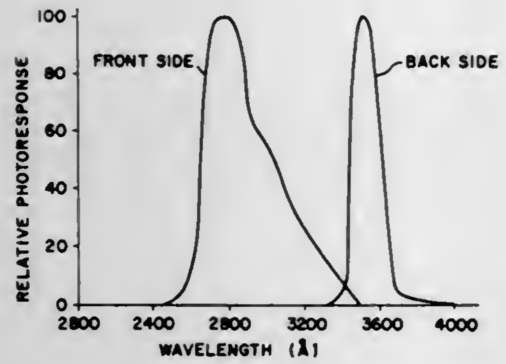
Paul W. Chapman, Burnsville, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Feb. 19, 1971, Ser. No. 116,844

Int. Cl. H01l *15/00, 15/02*

U.S. Cl. 317—234 R **13 Claims**





Solid state photo-conductive and photo-voltaic ultraviolet detectors having a peak response at about 2600 to 2800 A. are formed from a body of potassium tantalate ($KTaO_3$) having an "as-grown" surface and first and second metal contacts attached to the as-grown surface, forming surface barrier junctions. The radiation which is detected is incident upon the as-grown surface.

3,717,800

DEVICE AND BASE PLATE FOR A MOSAIC OF SEMICONDUCTOR ELEMENTS

Jacques Thillays, Herouville Saint Clair, and Jacques Fertin, Caen, both of France, assignors to U.S. Philips Corporation, New York, N.Y.

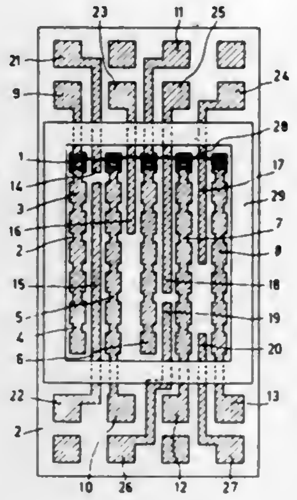
Filed June 18, 1971, Ser. No. 154,556

Claims priority, application France, June 18, 1970, 7022499; June 18, 1970, 7022498

Int. Cl. H01l *15/00, 19/00*

U.S. Cl. 317—234 R **11 Claims**

A mosaic of semiconductor elements on an insulating base plate including interconnections made by two groups of parallel and alternating conductive strips and a plurality of conductors orthogonal to the conductive strips. Each of the conductive strips in one group is connected to selected semiconductor elements for excitation and each of the orthogonally disposed conductors is connected to a selected conductive strip in the second group and selected semiconductor elements for excitation. The device can be made compact and compatible for use in alpha-numeric displays.



3,717,801

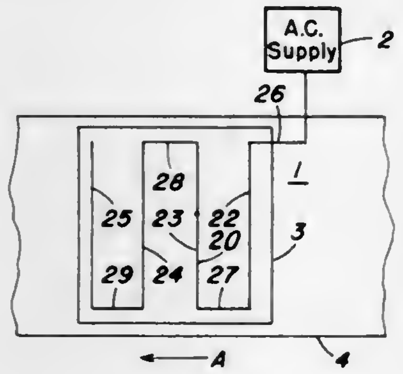
METHODS AND APPARATUS FOR ELECTROSTATICALLY PERFORMING A TACKING OPERATION

Morton Silverberg, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed April 12, 1971, Ser. No. 133,021

Int. Cl. H05 ; G09f *7/02*

U.S. Cl. 317—262 E **19 Claims**



Methods and apparatus for electrostatically performing a tacking operation are provided in accordance with the teachings of the instant invention wherein tacking charges are imposed by a coronode connected to an ac source and disposed in a charging relationship with the medium to be tacked. As the coronode is connected to an ac source, ion charging currents delivered thereby will exhibit the periodic variation and alternating polarity of the ac source. The tacking force applied to such medium will thereby display a periodic variation having a magnitude which is sufficient to maintain the medium in a tacked relationship with a desired surface when the medium is in the immediate environment of the coronode; however, as the medium is increasingly displayed from the immediate environment of the coronode, the magnitude of such tacking force will approach a zero value because the ion charging current delivered manifests a variation resembling a damped sinusoid or the like depending upon the nature of the periodic variation of said ac source. Therefore, upon the completion of the tacking operation, stripping of the medium may be readily achieved.

3,717,802

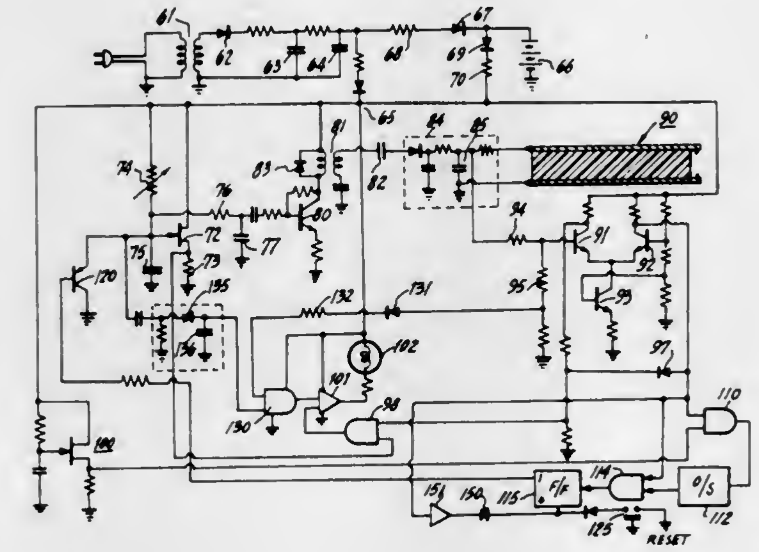
SOLID STATE ELECTRONIC BIRD REPELLENT SYSTEM

Arthur L. Plevy, East Brunswick, and Vincent Wepprecht, Greenbrook, both of N.J., assignors to Serex, Inc., Garwood, N.J.

Filed April 24, 1972, Ser. No. 246,686

Int. Cl. H05c *1/02*

U.S. Cl. 317—262 S **10 Claims**



An electronic bird repellent system utilizes a "sandwich like" transmission line assembly for conducting high voltage about an area to be protected. The transmission line comprises a top and bottom conductive foil separated by a suitable insulating member, for providing support and separation. The system includes high voltage protection circuitry to prevent prolonged shock hazard and voltage monitoring circuitry to provide an indication determinative of an open circuit in said transmission line.

3,717,803

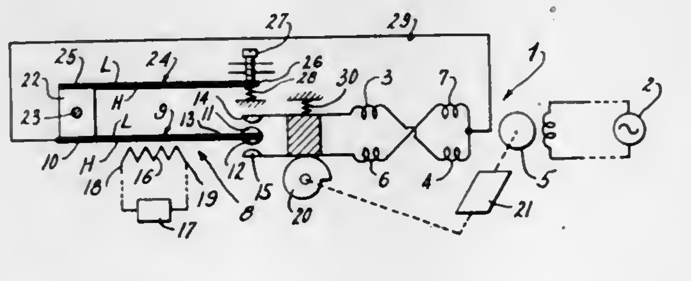
SERVO CONTROL

Russell P. Sweger, Rockford, Ill., assignor to Barber-Colman Company, Rockford, Ill.

Filed March 29, 1971, Ser. No. 128,891

Int. Cl. G05b *11/01*

U.S. Cl. 318—471 **9 Claims**



A thermostatic bimetal strip heated by an input signal tends to close contacts causing a motor to move a driven device in a predetermined direction, while a cam moved in agreement with the driven device tends to open the contacts. The driven device may be biased to move in the opposite direction or may be driven in the opposite direction by a similar circuit responding to cooling of the bimetal strip.

3,717,804

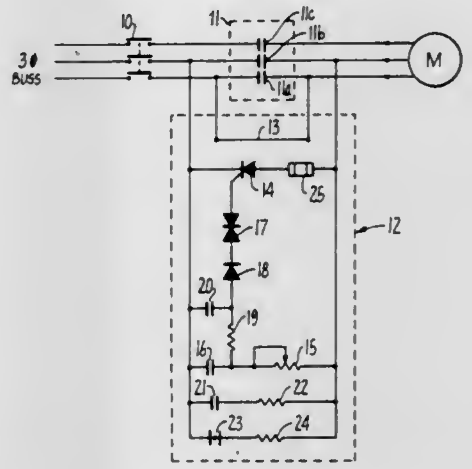
IN-LINE MOTOR HEATER CIRCUIT

Daumantas V. Dikinis, San Rafael, and Moon H. Yuen, San Francisco, both of Calif., assignors to Bechtel International Corporation, San Francisco, Calif.

Filed April 28, 1972, Ser. No. 248,745

Int. Cl. H02b *1/02, 9/00, 5/04*

U.S. Cl. 318—436 **10 Claims**



A solid state circuit for maintaining the temperature of an ac motor winding at a desired level above ambient temperatures, including an electronic switch that conducts a small heating current while the motor is on standby, and control means for setting the firing angle of the electronic switch to maintain a winding temperature of at least 3° C. above ambient temperatures.

3,717,805

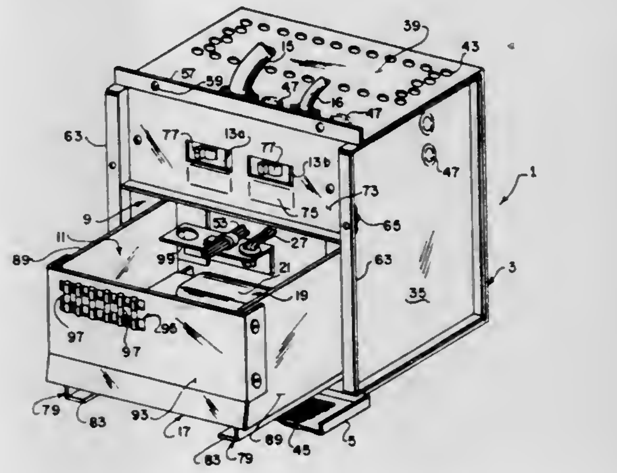
ELECTRICAL POWER CENTER FOR RECREATIONAL VEHICLES

Donald J. Gnaedinger, and Gerald E. Staley, both of Highland, Ill., assignors to Basler Electric Company, Highland, Ill.

Filed July 9, 1971, Ser. No. 161,156

Int. Cl. H02m ; H02b

U.S. Cl. 321—8 R **9 Claims**

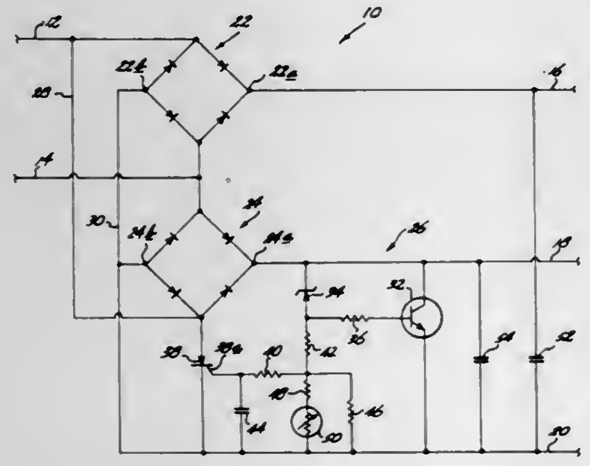


An electrical power center for recreational vehicles comprising a cabinet which is adapted to be framed in the interior structure of a recreational vehicle and which has a circuit breaker box and a power converter unit mounted therewithin. The power converter unit may be conveniently removed from the cabinet for servicing. This converter unit includes a step-down transformer and means for rectifying the output of the secondary of the transformer for supplying low voltage d.c. to various d.c. loads in the recreational vehicle. The converter unit is connected to the circuit breaker box by a flexible, detachable input cable to supply a.c. power thereto and is connected to the d.c. loads by flexible output cables for supplying low voltage d.c. thereto. These input and output cables are of sufficient length to permit substantial removal of the power converter unit from the cabinet. The output cables connected to receptacles which are removably mounted in a side wall of the cabinet for interconnection to the various d.c. loads by conventional plug and cable connectors.

3,717,806

AC-TO-DC CONVERTER

Rex G. Sebring, 8850 Lower River Road,
Grants Pass, Oreg. 97526
Filed Mar. 31, 1972, Ser. No. 240,157
Int. Cl. H02m *7/00*
U.S. Cl. 321—18 **9 Claims**

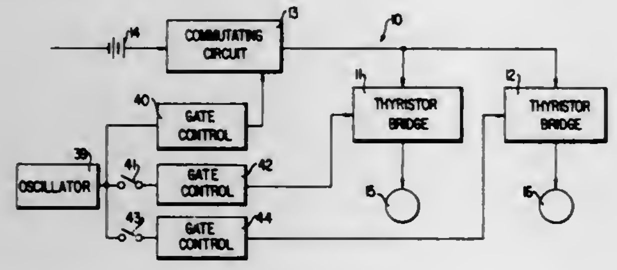


A low-heat-dissipation AC-to-DC converter capable of supplying regulated DC to one or a pair of output terminals, and suitable particularly for use in the electrical system of a vehicle, such as a motorcycle. The converter includes a pair of rectifier circuits which produce DC from a single AC input, with a shared voltage-regulating circuit employed to regulate the output voltages of both rectifier circuits. Heat dissipation in the converter is minimized through the intermittent conduction of a silicon-controlled rectifier which produces momentary short-circuiting of the AC input.

3,717,807

INVERTER DEVICE

Nagataka Seki, Tokyo, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan
Filed Oct. 15, 1970, Ser. No. 81,049
Claims priority, application Japan, Oct. 15, 1969, 44/82,034
Int. Cl. H02m *7/48*
U.S. Cl. 321—27 R **5 Claims**

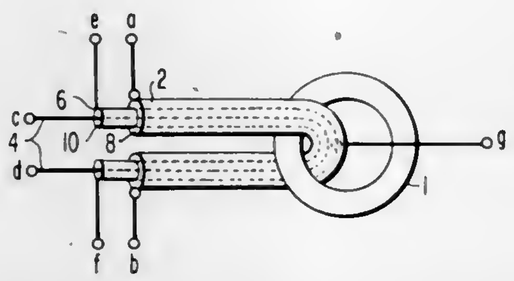


An inverter device includes a plurality of thyristor bridges respectively connected to a corresponding load for enabling the separate energization thereof. An essentially single commutating circuit device is provided in common with all of the bridges for enabling thyristors therein to be simultaneously turned on and off. A common frequency source is provided for supplying synchronized gating pulses to the common commutating circuit as well as to the thyristor bridges. The thyristor bridges respectively receive the gating pulses from the frequency source through separate gate controls. In this manner, it is possible to selectively energize a plurality of loads from an essentially single inverter device.

3,717,808

SHIELDED COAXIAL CABLE TRANSFORMER

Otakar Antonin Horna, Bethesda, Md., assignor to Communications Satellite Corporation, Washington, D.C.
Filed May 19, 1971, Ser. No. 144,940
Int. Cl. H01f *27/36*
U.S. Cl. 323—44 R **5 Claims**

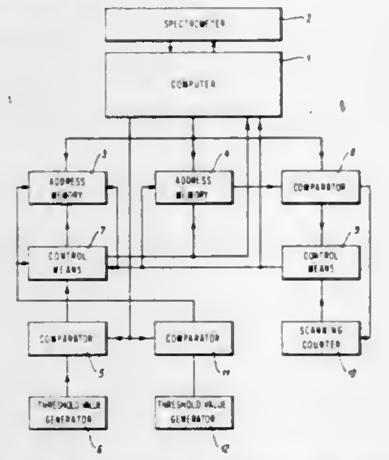


A coaxial cable transformer which includes a shielded conductor for reducing primary to secondary winding capacitive coupling which results from the mutual capacitance therebetween. Included between and concentric with inner and outer coaxial conductors, operating as primary and secondary windings, is a selectively grounded shield conductor. This shield conductor is grounded such that there is no instantaneous potential difference between corresponding points on the shield and secondary winding. To reduce indirect primary to secondary capacitive coupling which results from capacitive current between the primary and shield conductors, additional capacitance is included in the transformer circuit.

3,717,809

DEVICE FOR AUTOMATIC RECORDING OF SPECTRA

Gunther Rudl Laukien, Am Silberstreifen, 7501 Karlstruhe-Forchheim, Germany
Continuation-in-part of Ser. No. 872,712, Oct. 30, 1969. This application July 6, 1970, Ser. No. 52,486
Claims priority, application Germany, April 10, 1970, P 20 17 138.4
Int. Cl. G01n *27/78*
U.S. Cl. 324—0.5 R **6 Claims**

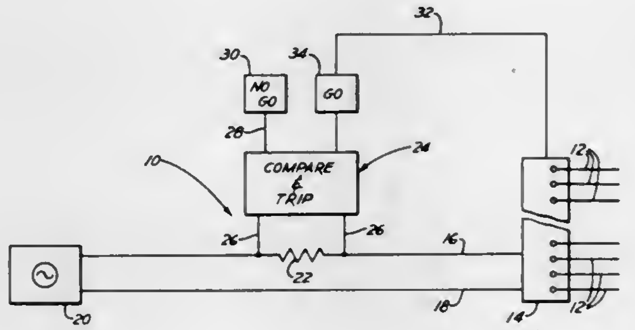


A device for the automatic recording of spectra includes a spectrometer the scanning of which is controlled by a computer over a prescribed number of scans. The computer produces output signals indicative of the mean values resulting from the scans over the prescribed number of scans, as a result of scanning the values over the number of scans divided by either the number of scans or the square root of the number of scans. Address memories are coupled to the computer for identifying the position of the initiation of a point in the scan where the signal amplitude resulting therefrom exceeds a predetermined value and that point subsequent thereto where the signal value drops below the mean value. Threshold generators and comparators are employed to control the initiation of storage and resetting of the address memories. Furthermore, the scanning counter is connected to a control system which, in turn, controls the storage of information in the address memories.

3,717,810

ABNORMAL IMPEDANCE TEST FOR A STRING OF GEOPHONES

Francis L. Spanbauer, Lower Burrell, Pa., assignor to Gulf Research & Development Company, Pittsburgh, Pa.
Filed July 15, 1971, Ser. No. 162,788
Int. Cl. G01c *27/00*
U.S. Cl. 324—57 R **13 Claims**

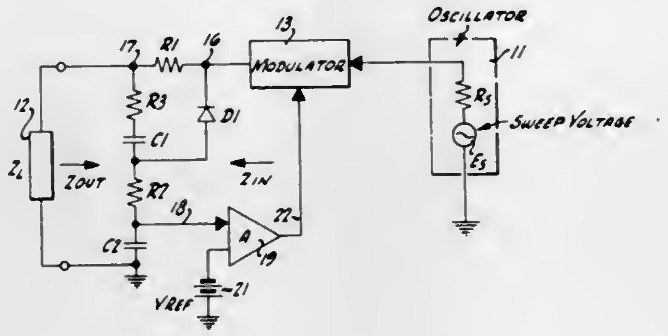


A system for dynamically checking a string of geophones as are used in seismic exploration by means of supplying power to the string to thereby operate the geophones in motor mode to thereby check the impedance of the string against a selected acceptable value of impedance.

3,717,811

COUPLING APPARATUS

Daniel E. Wheeler, Soquel, Calif., assignor to Wiltron Company, Palo Alto, Calif.
Filed Dec. 2, 1971, Ser. No. 204,217
Int. Cl. G01r *27/00*
U.S. Cl. 324—57 R **10 Claims**



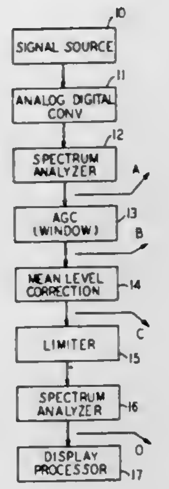
Coupling apparatus for coupling an a.c. signal generator to a load and detecting the output level of the generator without appreciable power loss and without the use of a directional coupler or balun. The detected load voltage is coupled to a reference comparator to regulate the generator output in a leveling mode. Reflection coefficients may also be determined by interchanging the location of the load and the generator.

3,717,812

REAL TIME ANALYSIS OF WAVES

Peter Hirsch, Parsippany, N.J., assignor to Bell Telephone Laboratories, Incorporated, Berkeley Heights, N.J.
Filed Feb. 19, 1971, Ser. No. 116,885
Int. Cl. G01r *23/16*
U.S. Cl. 324—77 B **8 Claims**

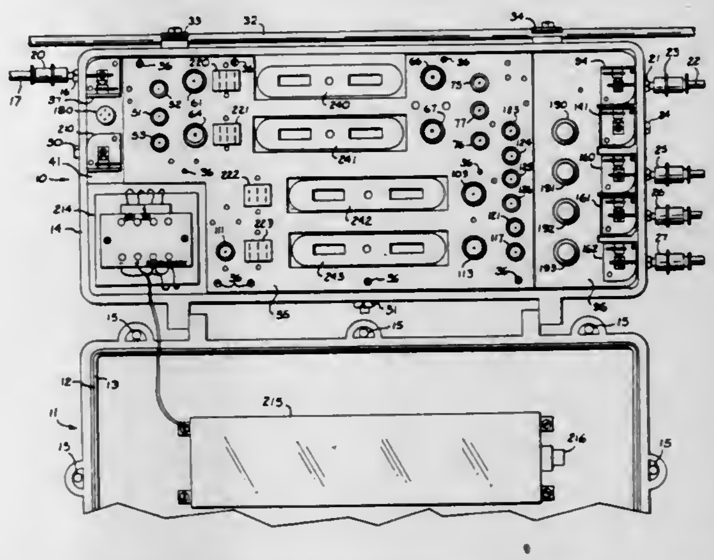
Deficiencies, both functional and computational, in the detection and measurement of echoes in a time series function by means of a cepstrum operation are largely overcome by replacing the logarithmic stage of the cepstrum analyzer by a more ideal compressor function. According to the invention, spectrum ripple components are made independent of the spectrum level by dividing each point in the spectrum by an estimate of the local mean, and the effect of strong periodicities in the time series are reduced by spectral limiting. Finally, the spectrum of the mean-corrected, limited spectrum is developed to yield peaks representative of echoes. Advantageously (and unlike the log operation of the cepstrum), processing may be carried out economically on a computer.



3,717,813

AMPLIFIER STATION

Daniel Lieberman, and Ralph E. Neuber, both of Seneca Falls, N.Y., assignors to GTE Sylvania Incorporated, Seneca Falls, N.Y.
Filed April 1, 1971, Ser. No. 130,088
Int. Cl. H04b *1/60*
U.S. Cl. 325—3 **8 Claims**



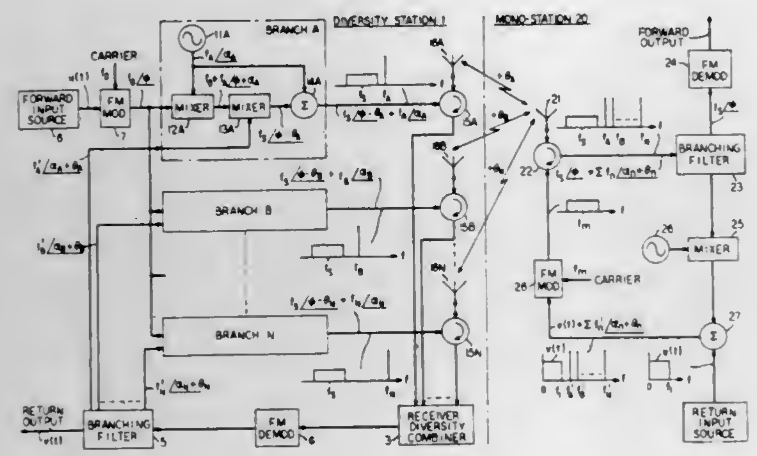
An amplifier station for community antenna television (CATV) signal distribution systems is shown. The amplifier station includes an enclosed housing with ports for connection to trunk and distribution cables. A chassis is disposed within the housing and includes a base plate carrying a number of radio frequency terminals. Modules carrying mating connectors are plugged into the radio frequency terminals.

3,717,814

COPHASING DIVERSITY COMMUNICATION SYSTEM WITH PILOT FEEDBACK

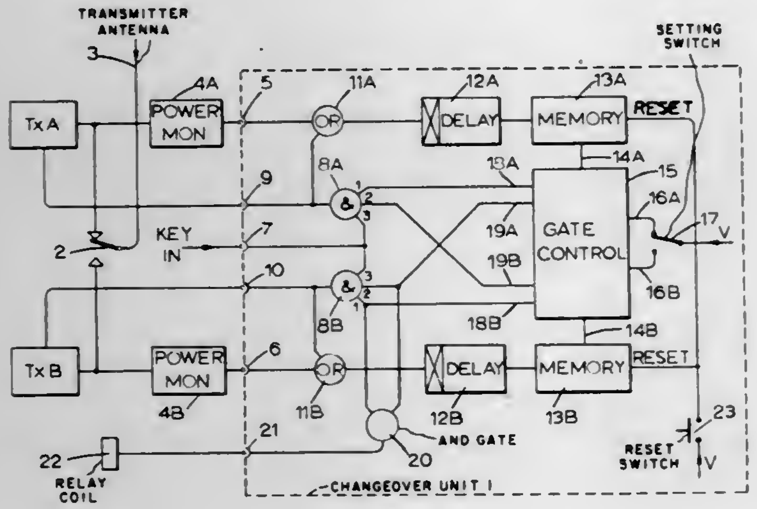
Michael James Gans, New Shrewsbury Township, Monmouth County, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.
Filed Sept. 23, 1971, Ser. No. 183,074
Int. Cl. H04b *7/02*
U.S. Cl. 325—56 **11 Claims**

Phase corrected intelligence signals are transmitted from a diversity array transmitter and receive in-phase at a mono-channel receiver. An individual pilot associated with each diversity branch and frequency separated from the pilots of the other branches is received along with the in-phase intelligence. All of the pilots are fed back, as part of the return modulation, to the diversity transmitter where they are used to establish the proper phase correction for the modulated intelligence transmission.



3,717,815
INTERMITTENT CARRIER TRANSMITTER CHANGEOVER SYSTEM

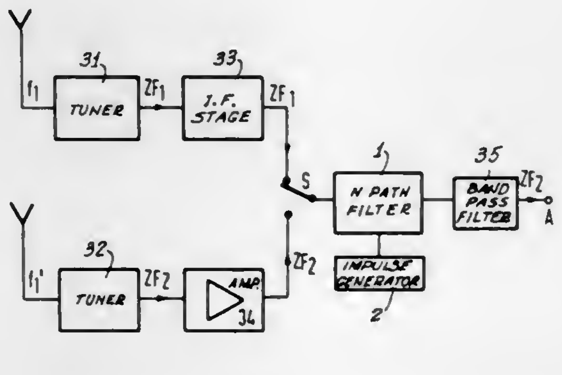
Ivan John Coussell, and Roy Pattison, both of Cambridge, England, assignors to Pye Limited, Cambridge, England
Filed Oct. 12, 1970, Ser. No. 80,012
Claims priority, application Great Britain, Sept. 18, 1969, 46,050/69
Int. Cl. H04b *1/04*
U.S. Cl. 325—158 **4 Claims**



A first memory circuit can be set to a state representing failure of a first transmitter. It remains so set when the first transmitter is keyed off. A second memory circuit is settable by the output of a second power monitor circuit when a second transmitter is keyed on. When set to a condition representing failure of the second transmitter it remains so set when the second transmitter is keyed off. A control circuit supplies control signals to first and second gate circuits, such that initially either the first gate circuit or the second gate circuit may be selected to permit a keying signal to reach the corresponding transmitter. The selection is reversed in the event of the memory unit corresponding to the initially selected transmitter is set to the condition representing failure of that transmitter.

3,717,816
IMPULSE-SCANNED N-PATH FILTER FOR SEVERAL FREQUENCY RANGES

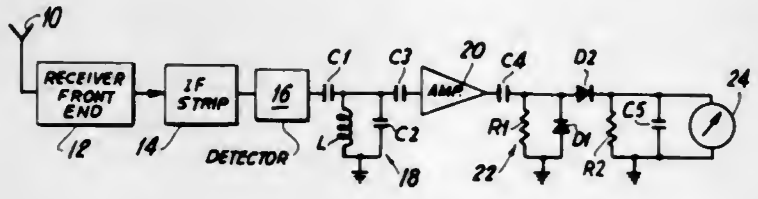
Erik Langer, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Germany
Continuation of Ser. No. 758,421, Sept. 9, 1968, abandoned. This application March 19, 1971, Ser. No. 126,328
Int. Cl. H04b *1/27*
U.S. Cl. 325—430 **3 Claims**



The use of N-path filters for converting a frequency to a lower frequency range is disclosed. The invention allows selectivity and frequency conversion. The arrangement according to this invention may be used as a secondary intermediate frequency stage of a double superhetrodyne receiver, for example. It may also be used as a selective multiple converter.

3,717,817
TUNING OPTIMIZATION CIRCUIT FOR F.M. TUNER INCLUDING MEANS FOR DETECTING MAXIMUM QUIETING

Richard Auerbach, Smithtown, N.Y., assignor to Harmon-Kardon, Incorporated, Plainview, Long Island, N.Y.
Filed Sept. 30, 1970, Ser. No. 76,750
Int. Cl. H04b *1/06*
U.S. Cl. 325—455 **5 Claims**

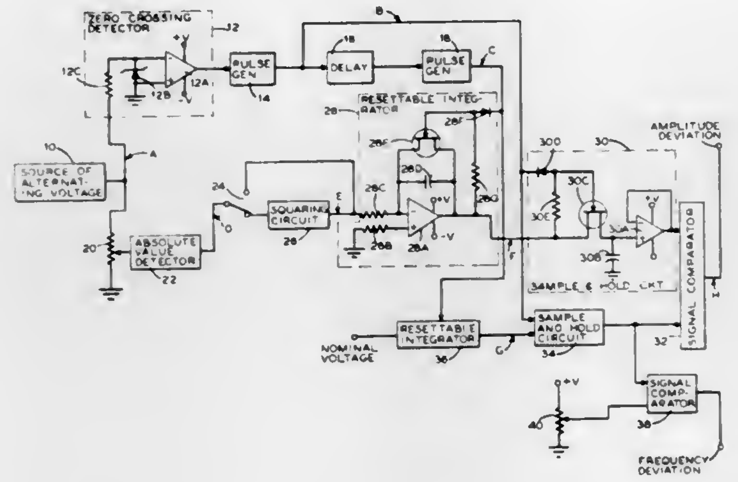


A tuned circuit resonant at a frequency outside the audio frequency range is coupled to the output of the front end and i.f. stages of a communication receiver. A detector is coupled to the tuned circuit and an indicator is coupled to the detector. Optimum receiver tuning and antenna orientation is indicated when the indicator reading is at a minimum.

3,717,818
INSTANTANEOUS VOLTAGE DETECTOR

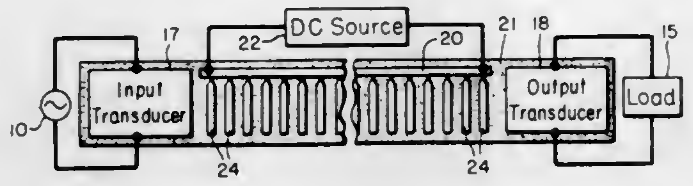
John A. Herbst, 320 South Street, Morristown, N.J.
Filed Jan. 10, 1972, Ser. No. 216,535
Int. Cl. H03k *5/20;* H03b *3/08;* H03d *13/00*
U.S. Cl. 328—141 **10 Claims**

An apparatus for indicating the amplitude of an alternating voltage signal including first and second cyclically operating signal integrators which periodically integrate the alternating voltage signal and a reference D.C. signal related to the nominal or desired amplitude of the alternating voltage signal. The integrators operate in synchronism with the alternating voltage signal. The two integrated signals are periodically compared for amplitude and polarity differences. There is also provided means for periodically comparing the integrated alternating voltage signal with another reference D.C. signal representing the nominal or desired frequency thereof to indicate the instantaneous frequency of the alternating voltage signal.



3,717,819
ACOUSTIC WAVE AMPLIFICATION SYSTEM

Robert Adler, Northfield, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.
Continuation-in-part of Ser. No. 82,919, Oct. 22, 1970, abandoned. This application Jan. 26, 1972, Ser. No. 220,944
Int. Cl. H03f *3/16*
U.S. Cl. 330—5.5 **29 Claims**

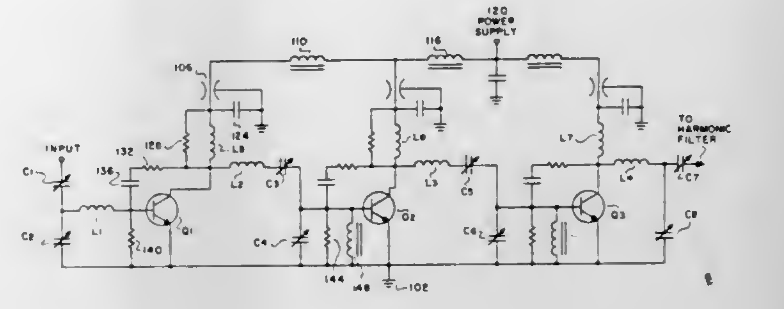


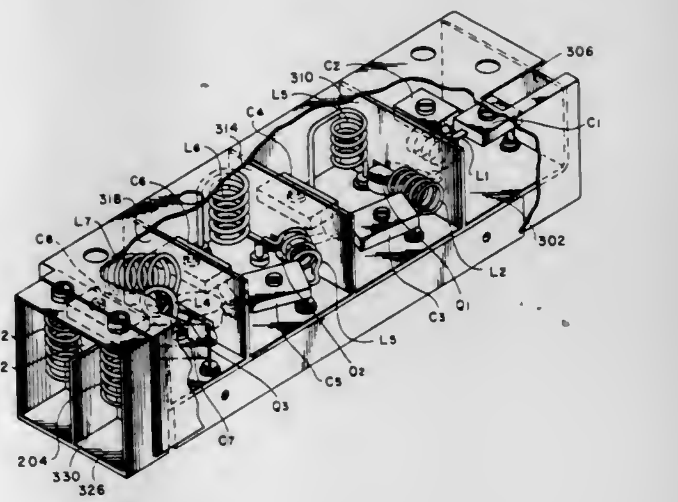
Acoustic waves are propagated along a path in a piezoelectric medium. A semiconductive strip is disposed parallel to that path while a plurality of electrodes extend across and are spaced successively along the path. The electrodes in conjunction with the strip comprise a plurality of field effect transistors distributed along the propagation path to intercouple charge carriers in the strip with the waves to achieve amplification. In some versions, the semiconducting strip and the electrodes are all disposed across the acoustic wave propagating path, while in other embodiments only the electrodes are in the acoustic wave path.

3,717,820
RADIO FREQUENCY POWER AMPLIFIER

Hernando Javier Garcia, San Francisco, Calif., and Benjamin Roger Peek, Garland, and Jose Meza, Dallas, Tex., assignors to Integrated Systems Technology, Inc., Garland, Tex.
Filed Nov. 10, 1971, Ser. No. 197,386
Int. Cl. H03f *3/04*
U.S. Cl. 330—21 **19 Claims**

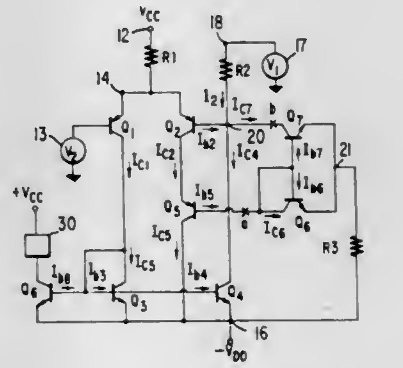
An efficient and compact solid state radio frequency power amplifier is disclosed. The amplifier includes a plurality of transistors, capacitors and inductance coils interconnected and grouped in a particular spatial relationship to minimize intercomponent interference. Various groups of components are segregated from the other components of the amplifier by conductive shields and are positioned and oriented in a particular manner with respect to the shields and to each other.





3,717,821
CIRCUIT FOR MINIMIZING THE SIGNAL CURRENTS DRAWN BY THE INPUT STAGE OF AN AMPLIFIER

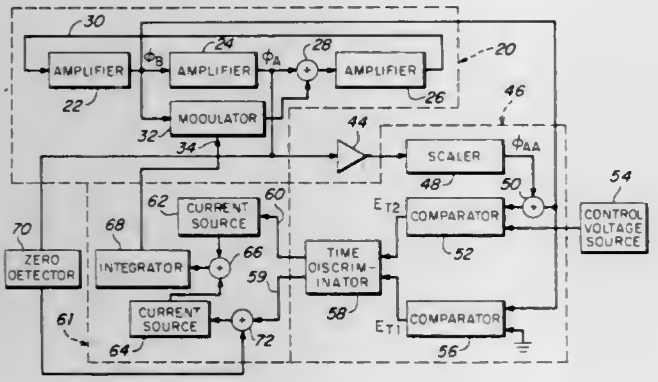
Hiroshi Amemiya, Morrisville, Pa., and Stefano Arturo Graf, Somerville, N.J., assignors to RCA Corporation
Filed Feb. 11, 1972, Ser. No. 225,498
Int. Cl. H03f *1/08*
U.S. Cl. 330—26 **9 Claims**



A circuit for reducing the signal current flowing into the base of a bipolar input transistor and which dissipates relatively little power. The collector current of the input transistor is passed through the collector-to-emitter path of a second transistor. A current mirror, comprising a third transistor connected at its collector to the base of the second transistor and a fourth transistor connected at its collector to the input transistor, conducts the base current of the second transistor and in response thereto causes an approximately equal current to flow to the base of the input transistor.

3,717,822
PHASE SHIFT OSCILLATOR

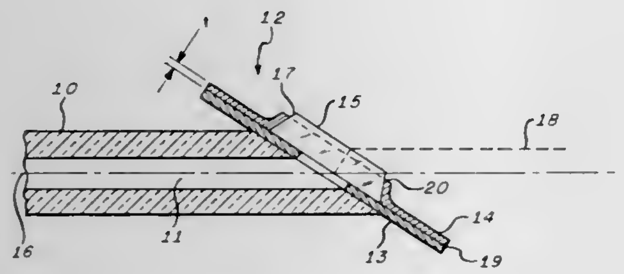
James L. West, Concord, Mass., assignor to Rotek Instrument Corp., Waltham, Mass.
Filed Feb. 25, 1972, Ser. No. 229,336
Int. Cl. H03b *3/04*
U.S. Cl. 331—11 9 Claims



This invention provides a sinusoidal phaseshift type of oscillator having two phase related outputs and having improved means for controlling the value of the amplitude of one of the output signals at a specific phase or reference time determined by the second signal.

3,717,823
METAL-GLASS LASER WINDOW ASSEMBLY

John M. Abdale, East Meadow; Robert J. Gartner, Carle Place, both of N.Y., and Karl J. Knudsen, Oradell, N.J., assignors to Sperry Rand Corporation, New York, N.Y.
Filed Sept. 20, 1971, Ser. No. 181,899
Int. Cl. H01s *3/02, 3/22*
U.S. Cl. 331—94.5 4 Claims

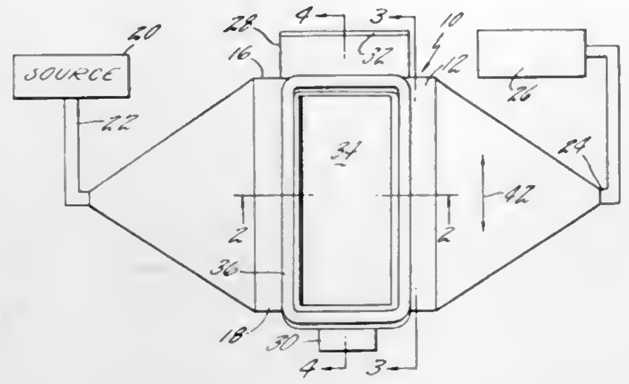


A laser tube end window assembly comprising a first apertured metallic plate bonded to an end of the laser tube with the aperture aligned with the tube bore, a second apertured metallic plate also positioned with its aperture aligned with the tube bore and sealed about its periphery to the periphery of the first plate, and an optical window secured within the aperture of the second plate.

3,717,824
APPARATUS AND METHOD FOR MAGNETICALLY SCANNING AN ELECTRIC DISCHARGE GAS LASER

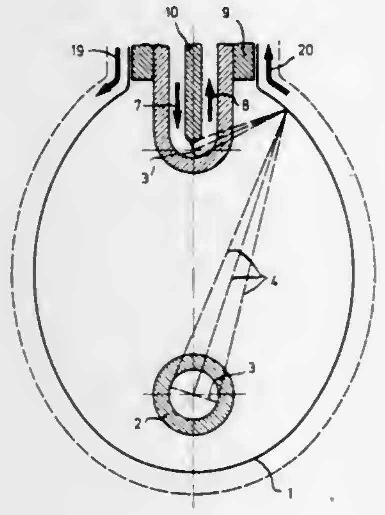
Carl J. Buczek, Manchester, Anthony J. De Maria, West Hartford, Carl M. Ferrar, Rockville, and Robert J. Wayne, East Hartford, Conn., assignors to United Aircraft Corporation, East Hartford, Conn.
Filed Dec. 2, 1971, Ser. No. 204,247
Int. Cl. H01s *3/10*
U.S. Cl. 331—94.5 10 Claims

An apparatus and method for magnetically scanning the beam of output radiation from an electric discharge flowing gas laser are disclosed. Magnetic stabilization means are used to neutralize the effects of gas flow on the discharge plasmas which is maintained as a straight line discharge in a degenerate optical resonator. A variable intensity magnetic field is applied transverse to the discharge causing movement of the laser medium within the resonator and providing a corresponding scan of the output laser beam.



3,717,825
LIQUID LASER

Helmut Gerlach, Aalen, Germany, assignor to Carl Zeiss-Stiftung, Wuerttemburg, Germany
Filed March 3, 1972, Ser. No. 231,547
Claims priority, application Germany, March 19, 1971, P 21 13 464.5
Int. Cl. H01s *3/20*
U.S. Cl. 331—94.5 8 Claims



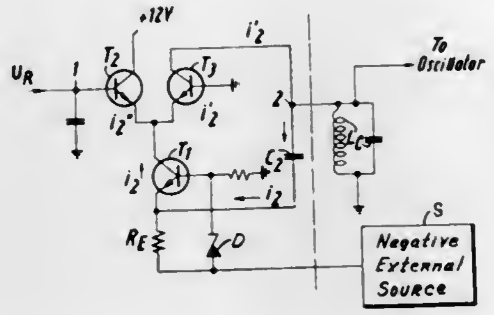
A liquid laser, particularly a dyestuff laser, is provided with a liquid guiding chamber through which circulates a cooled laser liquid and which is provided with a U-shaped laser active zone formed by a light transmitting longitudinal cap into which extends a tongue forming in said cap a U-shaped zone of uniform cross section. This U-shaped laser active zone is disposed in a focal line of an elliptically shaped pump light reflector while a source of pump light is disposed in the other focal line.

3,717,826
VARIABLE REACTANCE CIRCUIT

Ernst Legler, Seeheim, Germany, assignor to Fernseh G.m.b.H., Darmstadt am Alten Bahnhof, Germany
Filed Aug. 20, 1971, Ser. No. 173,387
Claims priority, application Germany, Aug. 31, 1970, P 20 43 074.4
Int. Cl. H03b *3/04*
U.S. Cl. 331—117 R 8 Claims

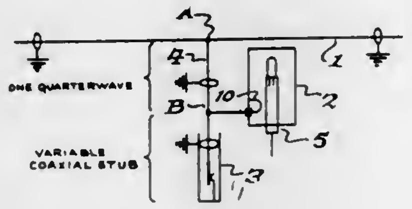
A variable control voltage U_R is applied between the bases of two differential-amplifier output transistors, which

are connected in cascade to an input transistor. One of the output transistors is connected to provide a current to an input point by feedback. The input point is connected through a capacitor or a resistor and a capacitor to the input transistor. An LC parallel circuit is connected between the input point and ground. Current from the LC circuit is applied to the input point, and, because of the capacitor, the current thus applied to the input transistor is phase displaced in comparison with the current at the input point. By adjusting the control voltage across the output transistors, the effective capacitance in parallel with the LC reactance circuit is varied.



3,717,827
NOTCH FILTER NETWORK HAVING RESONANT AND ANTIRESONANT MEANS

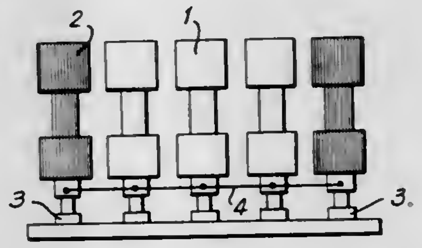
Daniel P. Kaegebein, 199 Lou Ann Drive, Depew, N.Y. 14043
Continuation-in-part of abandoned application Ser. No. 646,064, June 14, 1967. This application July 27, 1970, Ser. No. 58,357
Int. Cl. H01p *1/20*
U.S. Cl. 333—73 C 10 Claims



A duplex arrangement of filter networks has, on the transmitter side, a quarter wave cavity resonator tuned to the transmitter carrier frequency and coupled to the coaxial transmission line in quarter wave spaced relation. A variable quarter wave reactance section is similarly coupled to the line and coacts with the resonator to create a condition of antiresonance at the receiver frequency. On the receiver side, a quarter wave resonator and a variable quarter wave section are similarly coupled to the transmission line a quarter wave from the antenna connection, the resonator being tuned to the receiver frequency, and the reactance section coacting with the resonator reactance to create a condition of anti-resonance at the transmitter carrier frequency. A line connecting the resonator to the transmission line can be of the same characteristic impedance or, if greater attenuation at a greater frequency separation is desired, of a lower characteristic impedance than that of said transmission line.

3,717,828
MULTISECTION ELECTROMECHANICAL BAND PASS FILTER WITH RESONATORS AND TRANSDUCERS MECHANICALLY CONNECTED TOGETHER AND TO THE FILTER BASEPLATE

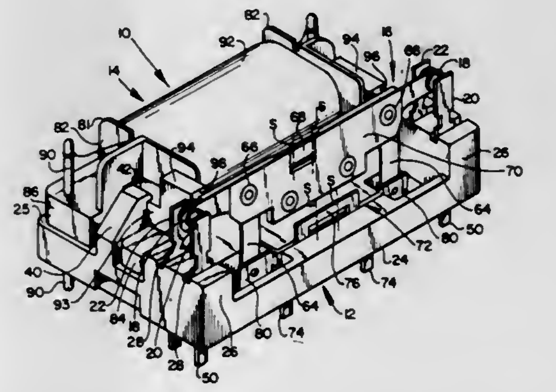
Natalia Yakovlevna Arleevskaya, Drezdenskaya ulitsa 10, korpus 2, kv. 52; Allanikolievna Kalyaeva, prospekt M. Toreza 102, korpus 5, kv. 177; and Dmitry Vasilievich Pletnev, ulitsa komsomola 10, kv. 26, all of Leningrad, U.S.S.R.
Continuation of abandoned application Ser. No. 762,940, Sept. 26, 1968. This application Apr. 7, 1971, Ser. No. 132,872
Int. Cl. H03h *9/04, 9/26*
U.S. Cl. 333—71 3 Claims



A filter is provided with a resonant system which comprises dumbbell shaped resonators, dumbbell shaped ferrite transducers and dumbbell shaped mounting elements. End sections of the mounting elements are connected at respective ends thereof to corresponding end sections of the resonators and transducers. The other end sections of the mounting elements are connected to a baseplate. The mounting elements prevent transmission of the mechanical oscillations from the transducers and resonators to the baseplate. Further provided are wire links directly connected to the mounting elements and providing mechanical connection between the transducers and resonators through the mounting elements.

3,717,829
ELECTROMAGNETIC RELAY

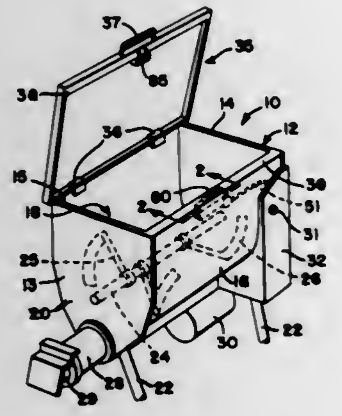
Roger J. Flaherty, Oxford, Conn., assignor to Allied Control Company, Inc., Plantsville, Conn.
Filed Aug. 27, 1971, Ser. No. 175,584
Int. Cl. H01h *13/12*
U.S. Cl. 335—187 20 Claims



A low profile electromagnetic relay of modular construction having integrated coil, base-contact and armature-contact assemblies to facilitate flexibility of preassembly. The armature-contact assembly includes a unitary contact-return spring which supports an armature and movable contacts on the base-contact assembly for movement toward the coil assembly in parallel relation to the axis thereof in response to energization of an actuating coil associated with the coil assembly.

3,717,830
MAGNETIC SWITCH CONTROL AND INTERLOCK SYSTEM

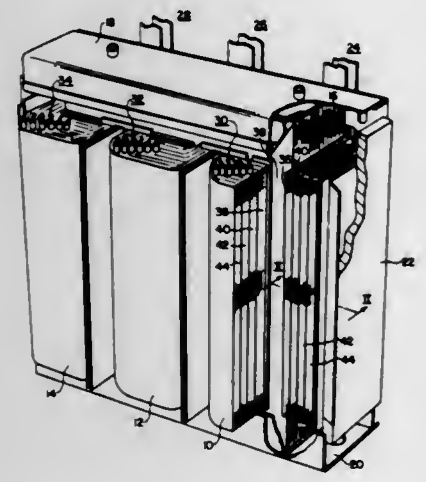
Stuart E. Athey, Troy, Ohio, assignor to The Hobart Manufacturing Company, Troy, Ohio
Filed July 29, 1971, Ser. No. 167,404
Int. Cl. H01h *36/00*
U.S. Cl. 335—207 **15 Claims**



A first magnet is removably mounted in a water-tight case to actuate a switch therein, and the case may be mounted on the housing of an appliance or the like. A second magnet is movably mounted outside the case, as on a cover for closing the housing. The magnets are multi-pole magnets, each having at least three poles arranged in alternating relation along an operative surface, and are effective when the second magnet is properly oriented on the case to establish a unique force effective to move the first magnet to actuate the switch.

3,717,831
TRANSFORMER HAVING SERIES-MULTIPLE WINDINGS

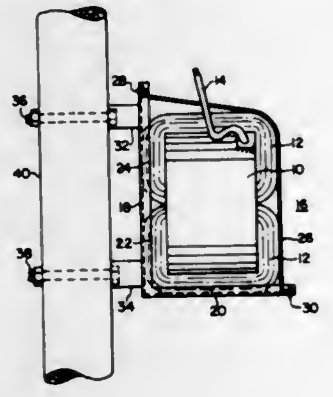
Charles R. Murray and Robert L. Plaster, South Boston, Va., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.
Filed July 26, 1971, Ser. No. 166,232
Int. Cl. H01f *29/02, 33/00*
U.S. Cl. 336—5 **1 Claim**



Transformer apparatus wherein a winding thereof may be connected in different arrangements to change the voltage rating of the transformer. The winding consists of three sections which are wound concentrically around a magnetic core. Two sections of the winding are connected in series to provide one of the voltage ratings. When the other voltage rating is desired, the third winding section is interconnected to provide a voltage rating equal to the sum of all the winding sections.

3,717,832
DISTRIBUTION TRANSFORMER

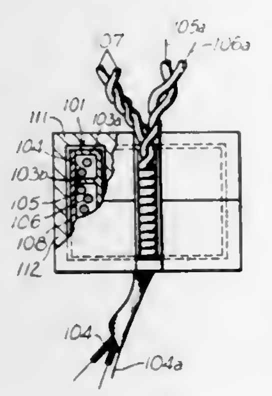
John F. Cotton, Athens, Ga., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.
Filed Aug. 2, 1971, Ser. No. 167,938
Int. Cl. H01f *15/02, 27/06*
U.S. Cl. 336—67 **6 Claims**



Pole mounted dry-type distribution transformer having a cast epoxy coil. The coil and its associated core structure are mounted in an L-shaped frame member and secured in place by a strap member. The L-shaped frame member furnishes the supporting means for attaching the core and coil to a utility pole. A polygonally shaped protective housing encloses the frame and the coil and core assembly. The low voltage bushings are attached to the bottom portion of the protective housing adjacent to louvres which aid in cooling the transformer.

3,717,833
TRANSFORMER

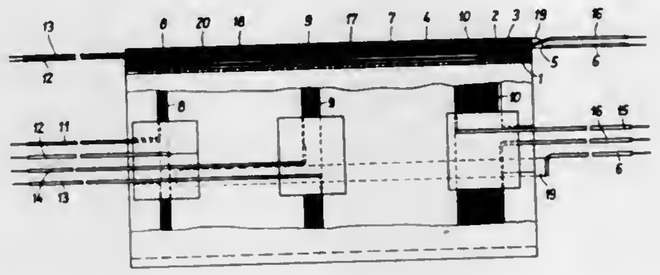
Yasuharu Kubota, Fujisawashi, Kanagawaken, and Susumu Agawa, Kamakura-shi, Kanagawa-ken, both of Japan, assignors to Sony Corp., Tokyo, Japan
Filed Aug. 23, 1971, Ser. No. 173,979
Claims priority, application Japan, Aug. 22, 1970, 45/83785
Int. Cl. H01r *15/04*
U.S. Cl. 336—69 **2 Claims**



A transformer having primary and secondary windings on a conductive non-magnetic bobbin. A pot-type core surrounds the bobbin and windings and has a central magnetic core extending axially into the bobbin and windings. Flanges on the bobbin separate the primary from the secondary, and the flanges and bobbin have a slot to limit induction current losses. The secondary is center-tapped, and the flanges and conductive, non-magnetic outer case prevent electric field coupling and suppress leakage at the center tap.

3,717,834
VOLTAGE TRANSFORMER WITH MEANS CONNECTED TO THE PRIMARY WINDING FOR EQUALIZING THE WINDING RATIO

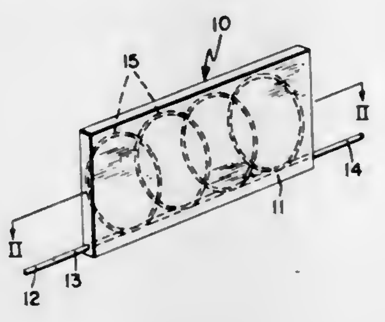
Holger Wittich and Wolfgang Spanek, Berlin, Germany, assignors to Siemens Aktiengesellschaft, Berlin, Germany
Filed Mar. 17, 1971, Ser. No. 125,130
Claims priority, application Germany, Mar. 19, 1970, P 20 14 141.7
Int. Cl. H01f *15/04, 21/12*
U.S. Cl. 336—70 **5 Claims**



A voltage transformer has an equalizing winding connected to the primary winding for equalizing the winding ratio. The equalizing winding is connected to the end of the primary winding at the low voltage side and at least one of its turns is structurally separated from the primary winding and is mounted on the iron core of the voltage transformer or on the secondary winding arrangement.

3,717,835
ELECTRICAL COIL

William H. Roadstrum, 9 Juniper Lane, Holden, Mass.
Filed Feb. 24, 1970, Ser. No. 13,539
Int. Cl. H01f *27/28*
U.S. Cl. 336—84 **9 Claims**

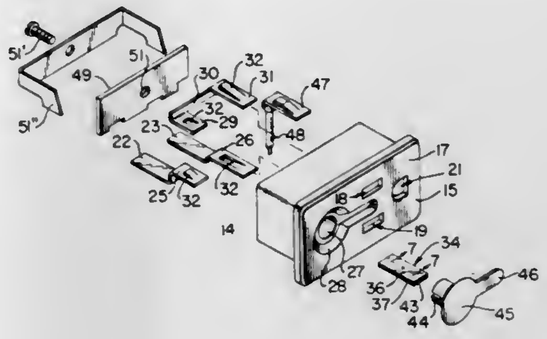


An electrical coil having a strand of conductive material formed into a series of loops lying substantially in the same plane to produce a field substantially perpendicular to the plane.

3,717,836
ELECTRICAL OUTLET MEANS AND FUSE THEREFOR

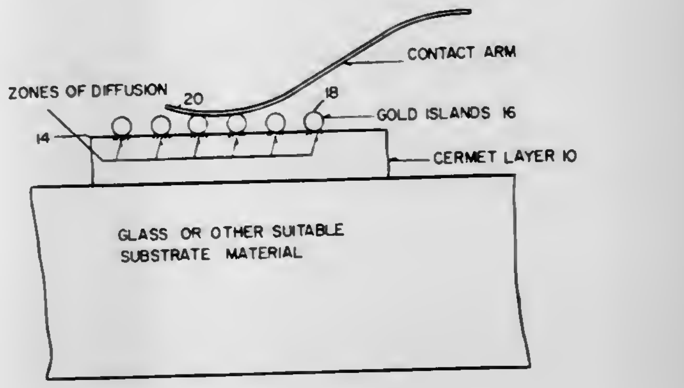
Robert B. Humphreys, Kettering, Ohio, assignor to Micro Devices Corp., Dayton, Ohio
Filed April 6, 1971, Ser. No. 131,655
Int. Cl. 337 *268;* **H01h** *85/14*
U.S. Cl. 337—271 **7 Claims**

A self-contained electrical receptacle having a pair of terminals for respectively being interconnected to an electrical power source and having a pair of opening means for respectively receiving the prongs of an electrical plug of an electrically operated appliance or the like. The receptacle has a pair of lines respectively and electrically leading from the terminals to the opening means to be respectively and electrically interconnected together by the prongs of the plug. A fuse is disposed in one of the lines for opening that one line in a protecting manner when blown whereby the fuse when blown prevents electrical interconnection between the terminals through the opening means. The fuse is changeable through an opening in the receptacle adjacent the plug opening means thereof so that when the fuse is disposed in its opening, a part thereof will be overlapped by the plug when the plug is disposed in the opening means therefor whereby the fuse cannot be changed until the plug is removed from the electrical receptacle.



3,717,837
POTENTIOMETER

Donald Fulton Alexander MacLachlan, Skye, Scotland, assignor to Micro-Electric AG, Zurich, Switzerland
Continuation-in-part of Ser. No. 554,653, June 2, 1966, abandoned. This application Dec. 9, 1970, Ser. No. 96,622
Claims priority, application Germany, June 4, 1965, M 6549021; May 3, 1966, M 6937821
Int. Cl. H01c *5/02*
U.S. Cl. 338—160 **11 Claims**

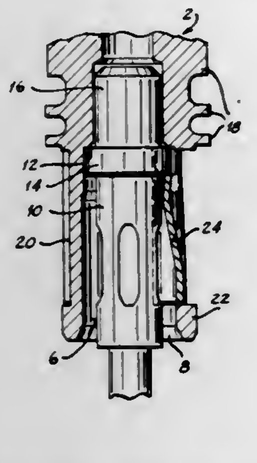


Cermet resistance element for use in potentiometers having a noble metal infused into the surface which is contacted with the slider, thus reducing the irregularity of its potentiometric resistance behavior, i.e., increasing its resolution, and reducing contact noise.

3,717,838
INTEGRATED WIRE TERMINATION SYSTEM HAVING INTEGRALLY FORMED RETAINER

Werner B. Halbeck, Cedarburg, Wis., assignor to Cutler-Hammer, Inc., Milwaukee, Wis.
Filed Sept. 9, 1971, Ser. No. 179,110
Int. Cl. H01r *13/54*
U.S. Cl. 339—74 R **4 Claims**

A connector socket of the integrated wire termination system (IWTS) type adapted to receive a "standard" terminal (connector) pin inserted therein by a split-sleeve tool. The socket includes an integral retainer formed thereon for engaging the annular shoulder of the terminal pin to lock it in electrically conducting relation therewithin. This integral retainer is a split spring sleeve that has a notch at its forward end on the side opposite the split providing a catch. The socket has an aperture in one side. This split and notched sleeve is placed around the aperture section, and the part back of the notch is formed partly through such aperture to form a catch for engaging the annular shoulder of the terminal pin. Insertion of a split-sleeve release tool from the rear allows release of the terminal pin for disconnection.



3,717,839

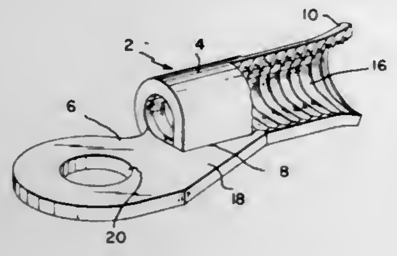
THREADED ELECTRICAL CONNECTIONS

Lionel Dennis Aldridge, Seminole, Fla., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Jan. 8, 1971, Ser. No. 104,944

Int. Cl. H01r *11/20*

U.S. Cl. 339—95 R **7 Claims**



Electrical terminal device comprises tubular member having axially extending seam which is flared at one end to facilitate wire entry. Internal surface is threaded so that threads are cut into surface of wire when terminal is threaded onto wire end. An axially extending slot may be provided which extends partially along the tubular member from the flared end to permit radial expansion when the tubular member is threaded onto a wire.

3,717,840

ELECTRICAL CIRCUIT CONNECTION

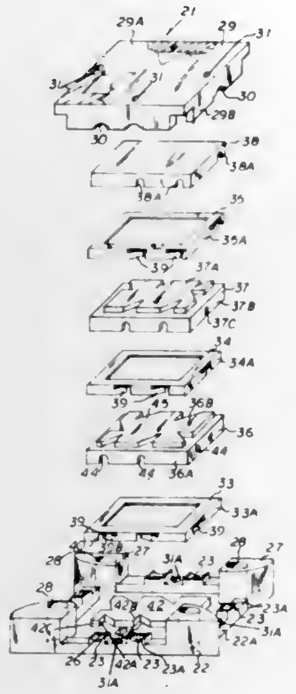
William Lee Vaughan, Concord, and Basil Graeme-Noel, Wellesley, both of Mass., assignors to N.V. Inc., Concord, Mass.

Filed Feb. 3, 1971, Ser. No. 112,324

Int. Cl. H01r *9/00*

U.S. Cl. 339—198 R **18 Claims**

This disclosure is directed to an elastic circuit connector comprising a plurality of stacked alternately spaced conducting and non-conducting elements to define a terminal block interposed between complementary housing members. The conducting elements of the terminal block are formed with a flange portion having blanked therefrom a locking tongue to form a screwless electrical connection between a conducting wire and an electrical element. The arrangement is such that the connecting wires of like circuits are co-plannarily connected. The complementary housing member includes an opening formed therein to frictionally secure the enclosing sheath of a conducting wire or the like in the assembled position.



It is also contemplated that the housing may include an outlet in the nature of a plug socket or toggle switch having contacts complementing a quick connect control formed integral to the conducting element of the terminal block.

3,717,841

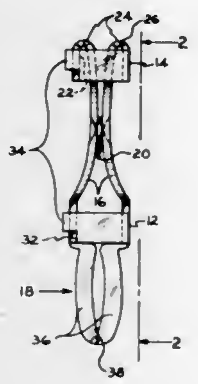
SOCKET TERMINAL

Lloyd Mancini, New Cumberland, Pa., assignor to Berg Electronics, Inc., New Cumberland, Pa.

Filed May 18, 1972, Ser. No. 254,369

Int. Cl. H01r *11/22*

U.S. Cl. 339—258 **11 Claims**



A socket terminal for removably receiving an elongate lead having a pair of spaced collars connected by a pair of opposed and inwardly bowed spring contacts. The contacts extend through the interior opening of one collar to join the outer edge of the collar away from the other collar.

3,717,842

METHOD OF CONNECTING ALUMINUM WIRE TO ELECTRICAL TERMINALS

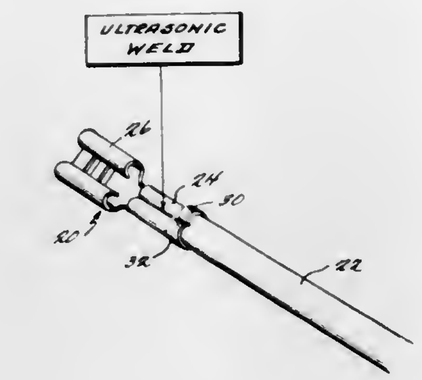
Richard Douglas, Jr., Nashville, Tenn., assignor to Perfection Electrical Products, Inc., Nashville, Tenn.

Filed Feb. 26, 1971, Ser. No. 119,309

Int. Cl. H01r *5/04, 5/08*

U.S. Cl. 339—275 T **1 Claim**

A method of connecting conventional electrical terminals having at least non-aluminum portions, such as nickel-plated steel, to solid or stranded aluminum wire so that aluminum oxide on the surfaces of the strands does not prevent a satisfactory electrical contact. Such conventional terminals have a channel portion with extending tabs so that the wire can be placed in the open channel and the tabs crimped to close the channel and hold the wire in electrical connection with the terminal. According to this invention, after the aluminum wire is held by crimping, the solid or stranded wire is then ultrasonically welded to the channel portion to remove the oxide already on the aluminum wire and preclude any further build-up of aluminum oxide.



3,717,843

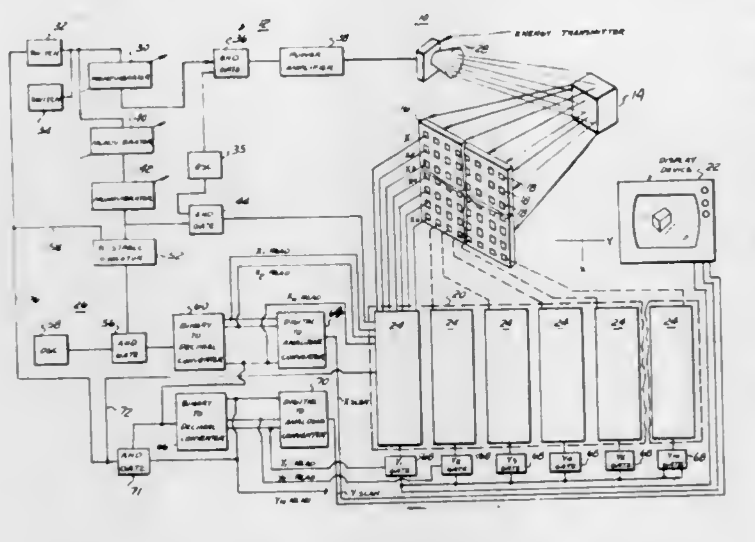
HOLOGRAPHIC SYSTEM FOR FORMING IMAGES OF BOTH STATIONARY AND MOVING OBJECTS

Harry Robert Farrah; Emanuel Marom, both of Oak Park, and Rolf K. Mueller, Brighton, all of Mich., assignors to The Bendix Corporation

Filed March 6, 1970, Ser. No. 17,274

Int. Cl. G01s *9/66*

U.S. Cl. 340—1 R **6 Claims**



A holographic system capable of forming images of both stationary objects and objects that are moving with respect to the holographic system is described which includes means for irradiating an object with coherent, long wavelength radiation such as coherent acoustic or radio waves. The system also includes a receiving surface for receiving this radiation from the object and producing a plurality of electrical signals, each with a phase and amplitude determined by the nature of the object irradiated and equal to the phase and amplitude of the radiation received from the object at a particular position on the receiving surface. A hologram is produced from these signals by processing apparatus including gating means responsive to an electric reference signal which allows only those electric signals representing radiation received during a selected time interval to be further processed and used in forming the hologram. This time interval is selected considering the velocity of the relative movement between the object and the receiving means so that there will not be enough motion to degrade the hologram during the time interval in which signals which are actually used to form the hologram are received.

3,717,844

PROCESS OF HIGH RELIABILITY FOR COMMUNICATIONS BETWEEN A MASTER INSTALLATION AND SECONDARY INSTALLATIONS AND DEVICE FOR CARRYING OUT THIS PROCESS

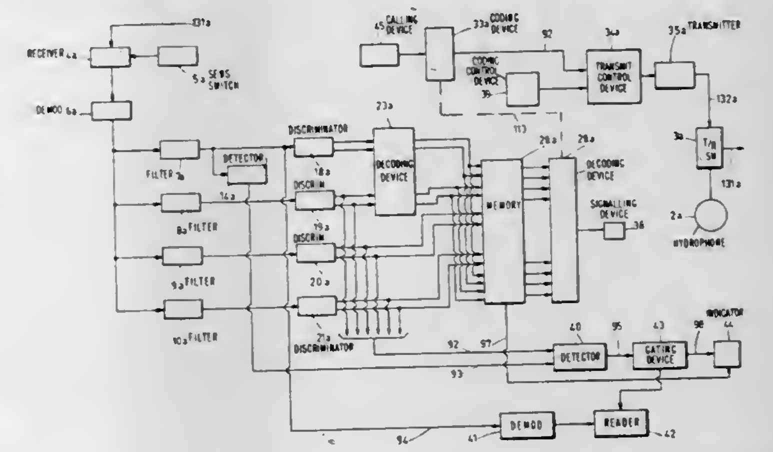
Jean Pierre Barret, Marly le Roi; Gerard Jourdan, Paris, and Jacques Harbonn, Jouars Ponchartrain, all of France, assignors to Institut Francais Du Petrole, Des Carburants Et Lubrifiants, Pueil Malmaison Hauts de Seine, France

Filed April 2, 1970, Ser. No. 25,017

Claims priority, application France, April 3, 1969, 6910366

Int. Cl. H04f *11/00*

U.S. Cl. 340—5 R **30 Claims**



A process of transmission wherein each transmitted message is constituted by sequences containing element of information numerically coded by amplitude modulation of a carrier wave through at least one subcarrier oscillation. The coded values of each subcarrier oscillation are selected between two values close to a basic frequency of this subcarrier oscillation.

The apparatus for carrying out this process includes in combination a number of means providing for a high reliability of the transmission.

3,717,845

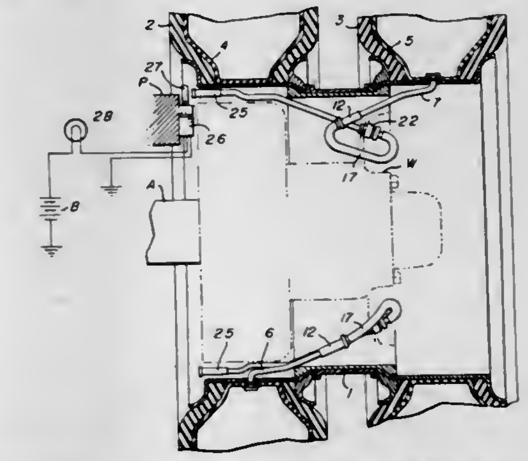
VEHICLE TIRE DEFLATION SIGNALLING SYSTEM

Harry C. Winther, Glen Mills, Pa., assignor to Harry C. Winther; Walter J. Winther; Charles R. Winther; William J. Winther and Shirley N. Winther, part interest to each

Filed Feb. 8, 1971, Ser. No. 113,566

Int. Cl. B60c *23/02*

U.S. Cl. 340—58 **6 Claims**



A mechanism for actuating signalling means primarily at the operator's station of an automotive vehicle to indicate deflation or under inflation of a pneumatic tire on any of the load-carrying wheels of the vehicle, mechanical means carried by the wheels being provided for actuating an electrical switch positioned on a relatively fixed portion of the vehicle to activate the signalling means upon the pressure in the adjacent tire falling below a predetermined value.

3,717,846
SYSTEM FOR THE DETECTION OF FAULTS IN A MAGNETIC RECORDING MEDIUM

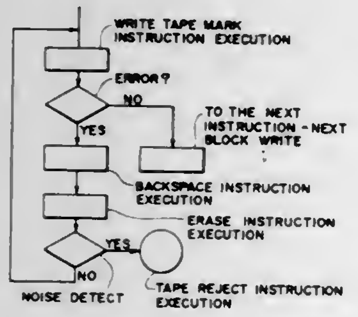
Kaoru Kanda, Yokohama, and Tetuo Nagahori, Kawasaki, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Dec. 22, 1971, Ser. No. 210,805

Claims priority, application Japan, Dec. 25, 1970, 45/129744

Int. Cl. G11b *27/36*

U.S. Cl. 340—146.1 F **8 Claims**


WRITE TAPE MARK INSTRUCTION EXECUTION
ERROR?
NO
YES
TO THE NEXT INSTRUCTION - NEXT BLOCK WRITE
BACKSPACE INSTRUCTION EXECUTION
ERASE INSTRUCTION EXECUTION
YES
NO
NOISE DETECT
TAPE REJECT INSTRUCTION EXECUTION

A system for the detection of faults in a magnetic recording medium such as a magnetic tape used in an information processing unit. The system is adapted to directly record information, provide an indication of erroneously recorded information, and erase that portion of the recording medium upon which information is erroneously recorded. The erase procedure is accompanied by a simultaneous reading by the read head of the portion of the magnetic recording medium being erased to determined the presence or absence of faults thereon which is indicated by the generation of corresponding noise signals. The system issues a tape reject signal when the noise signals generated by the faults comprise at least a predetermined number.

3,717,847
METHOD AND APPARATUS FOR TRACING THE CONTOUR OF A PATTERN

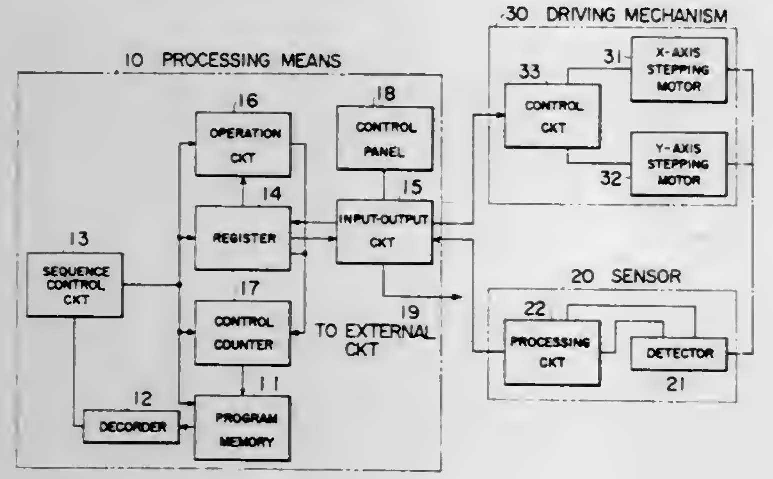
Kazuhiko Kakuta, Tokyo, Japan, assignor to Iwatsu Electric Company Ltd., Tokyo, Japan

Filed May 28, 1970, Ser. No. 41,471

Claims priority, application Japan, May 31, 1969, 44/42080

Int. Cl. G06k *9/16*

U.S. Cl. 340—146.3 AE **1 Claim**



The tone of a point on a drawing is read out by a detector and the output of the detector is used to perform a judgment regarding the tracing of the pattern contour. The detector is moved to a predetermined point on a drawing in accordance with the result of judgment which is made by referring to the direction of previous tracing operation.

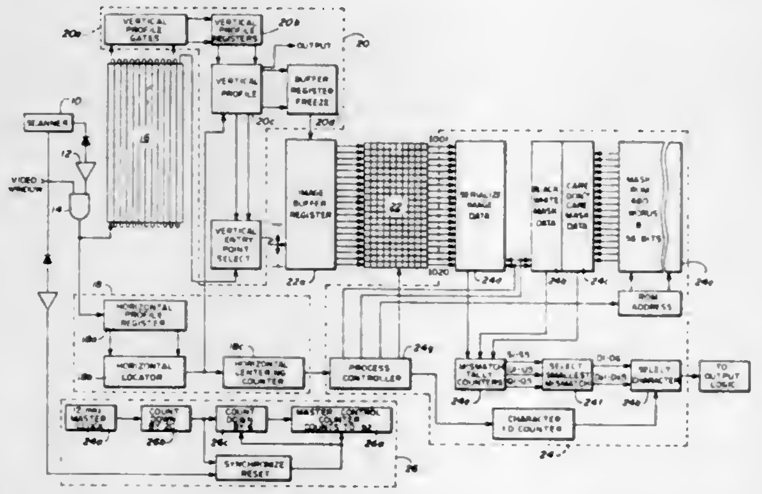
3,717,848
STORED REFERENCE CODE CHARACTER READER METHOD AND SYSTEM

Donald L. Irvin, Clarksville, Md., and Alan J. Rider, Reston, Va., assignors to Recognition Equipment Incorporated, Irving, Tex.

Filed June 2, 1970, Ser. No. 42,694

Int. Cl. G06k *9/08*

U.S. Cl. 340—146.3 Q **21 Claims**



Multi-level coded data representing a plurality of laterally spaced vertical scans of a character field passes serially through a multi-column, multi-row shift register synchronously with the scan operation. When a character is centered in the register, its height is measured and the register output is fed to an image register at an input position dependent upon character height. Each character representation is thus loaded with precision as to location in the image register. Subsequently, the loaded character is compared with each of a library of characters in a read only memory. More particularly, each element from the read only memory is compared with the element at a corresponding character location in the image register and with each of eight contiguous locations. A count is accumulated and stored indicative of the number of times a mismatch criteria is satisfied from the element comparison. A code is then generated to identify the character from the read only memory for which the count is optimum.

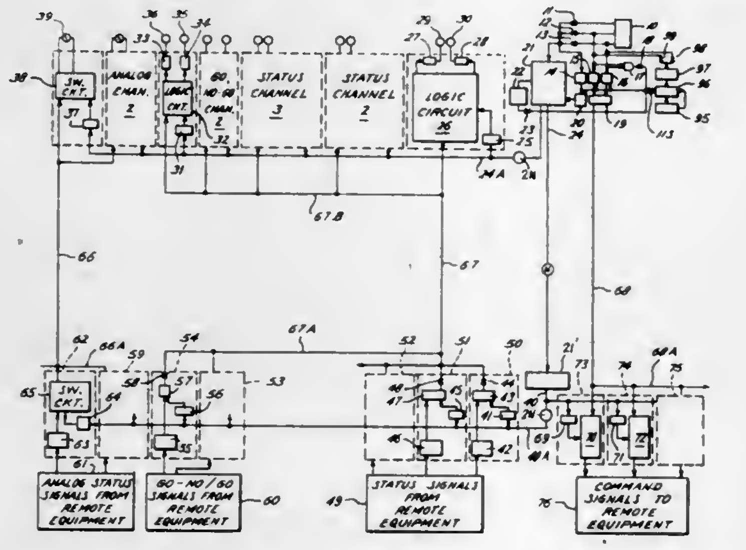
3,717,849
COMMUNICATION AND CONTROL SYSTEM

Roland L. Thornton, Jr., Severn, Md., assignor to Cameron Iron Works, Inc., Houston, Tex.

Filed March 25, 1970, Ser. No. 22,536

Int. Cl. H04q *9/00*

U.S. Cl. 340—163 **12 Claims**


ANALOG CHAN. 1
STATUS CHANNEL 3
STATUS CHANNEL 2
LOGIC CIRCUIT
ANALOG STATUS SIGNALS FROM REMOTE EQUIPMENT
GO-NO/GO SIGNALS FROM REMOTE EQUIPMENT
STATUS SIGNALS FROM REMOTE EQUIPMENT
COMMAND SIGNALS TO REMOTE EQUIPMENT

A communication and control system, as for example for underwater petroleum wells, utilizing a minimum number of connections between the surface and subsurface units and employing integrated circuit logic components.

3,717,850
PROGRAMMED DATA PROCESSING WITH FACILITATED TRANSFERS

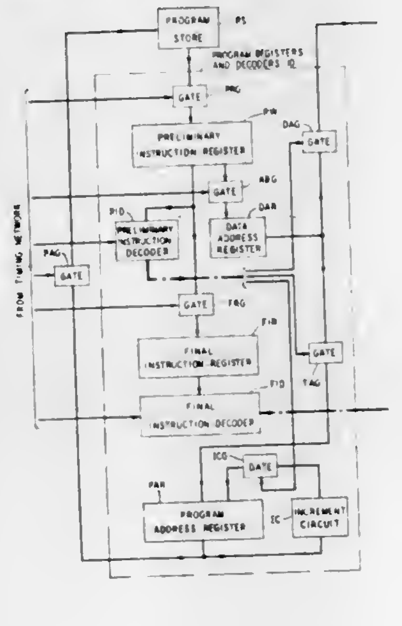
Hugo Ghiron, Chatham, and Werner Ulrich, Colts Neck, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, New York, N.Y.

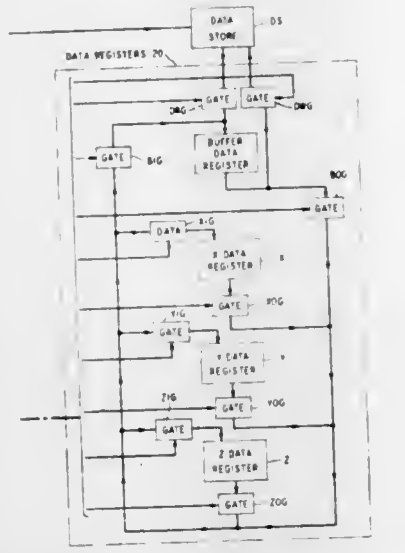
Continuation of Ser. No. 543,756, April 19, 1966, which is a continuation of Ser. No. 244,396, Dec. 13, 1962, abandoned.

This application March 17, 1972, Ser. No. 235,603

Int. Cl. G06f *7/00*

U.S. Cl. 340—172.5 **12 Claims**


PROGRAM STORE
PROGRAM REGISTERS AND DECODERS
GATE
PRELIMINARY INSTRUCTION REGISTER
DATA ADDRESS REGISTER
FINAL INSTRUCTION REGISTER
FINAL INSTRUCTION DECODER
PROGRAM ADDRESS REGISTER
INCREMENT CIRCUIT



An overlap mode computer is disclosed in which delays in making transfers are minimized by placing the transfer instruction in a position in the subset of instructions prior to the last position. The position of the transfer instruction is selected such that its execution in the overlapped sequence of executions is completed immediately after the accessing of the last instruction of the subset transferred from.

3,717,851
PROCESSING OF COMPACTED DATA

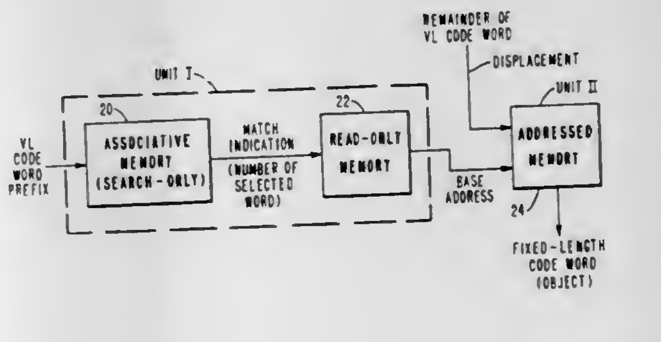
John Cocke, Mount Kisco, Jacques H. Mommens, Briarcliff Manor, and Josef Raviv, Ossings, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

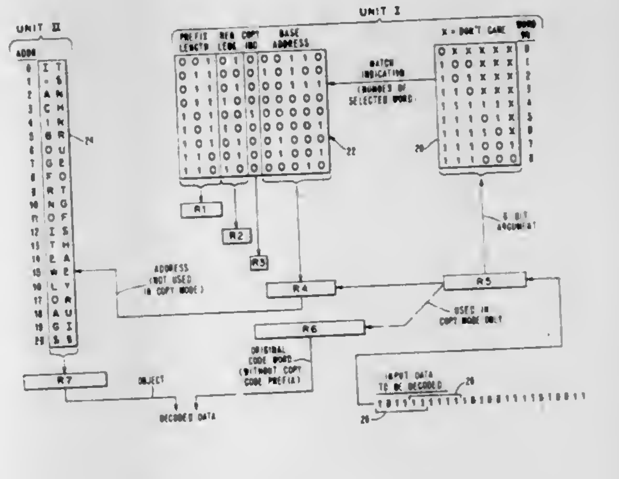
Filed March 3, 1971, Ser. No. 120,572

Int. Cl. G06f *5/02, 7/34*

U.S. Cl. 340—172.5 **8 Claims**

This data processing technique utilizes compacted data in the form of variable-length codes having length-representing prefix portions which themselves are variable-length encoded. The relatively small amount of storage needed when such a code format is used enables data to be conveniently encoded and handled as groups of characters rather than as single characters. The variable-length prefixes are decoded by a small, fast, search-only type of associative memory which furnishes a match-indicating signal as an address to another memory having conventional storage elements. The output of the latter may contain a base address in still another memory of conventional type and an indication of how many bits remain in the current variable-length code word. These remaining bits furnish a displacement value which, in combination with the base address, will locate the decoded fixed-length word or character group in the last memory unit. In those instances where the length of the variable-length codes would become excessively long (for the less frequently occurring character groups) the original fixed-length codes are employed, each being preceded by a common "COPY" code. A special decoding procedure is invoked by this copy code.


REMAINDER OF VL CODE WORD
DISPLACEMENT
UNIT I
UNIT II
20
22
VL CODE WORD PREFIX
ASSOCIATIVE MEMORY (SEARCH-ONLY)
MATCH INDICATION (NUMBER OF SELECTED WORD)
READ-ONLY MEMORY
BASE ADDRESS
ADDRESSED MEMORY
24
FIXED-LENGTH CODE WORD (OBJECT)



3,717,852
ELECTRONICALLY REWRITABLE READ-ONLY MEMORY USING VIA CONNECTIONS

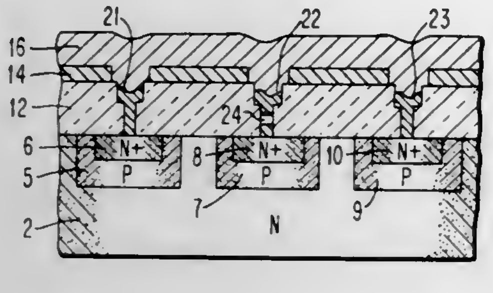
Shakir A. Abbas, Wappingers Falls, and Paul G. Stern, Poughkeepsie, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sept. 17, 1971, Ser. No. 181,503

Int. Cl. G11c *17/00, 11/36*

U.S. Cl. 340—173 SP **18 Claims**

An electronically rewritable read-only memory comprising an integrated semiconductor array of P-N junctions formed in a semiconductor substrate. A dielectric film is formed on the surface of the substrate on top of which a thin metallic film is deposited. The dielectric is thinner above an active region of each of the junctions than it is above the other regions of the substrate. When a suitable voltage is applied across the metallic film and dielectric, the metallic film diffuses through the dielectric film at the thinner areas, thereby forming ohmic via connections with the active junction regions. At the same time, the dielectric "self-heals" i.e., the via connections are disconnected from the metallic film around the periphery of the thin areas of the dielectric. A second layer of metallization over the metallic film establishes conductive contact between the layer and the active junction region. The contacts can be broken at selected junctions by passing a current through the diffused metallization. The contacts can be reestablished at selected junctions by applying a suitable healing voltage across the metallic film and the dielectric.



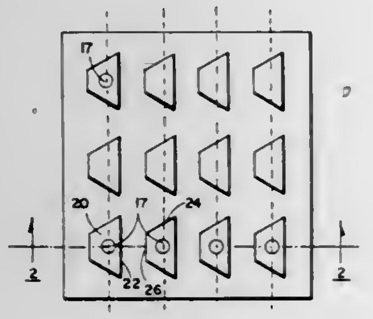
3,717,853
MAGNETIC BUBBLE DOMAIN SYSTEM

Cedric F. O'Donnell, Fullerton, and George R. Pulliam, Anaheim, both of Calif., assignors to North American Rockwell Corporation

Filed April 1, 1971, Ser. No. 130,130

Int. Cl. G11c *11/14*

U.S. Cl. 340—174 TF **3 Claims**



A magnetic bubble domain system having localized areas of bubble domain spatial stability of a particular shape which have a preferred unidirectional movement for bubble domains is disclosed. The bubble domain system includes a thin film of single crystal magnetic bubble domain material on a single crystal substrate. The film has a plurality of isolated thick portions with a truncated shape surrounded by relatively thin regions which serve as energy barriers to the movement of bubble domains and which confine the bubble domains in the relatively thick portions. The truncated shaped thick portions have a narrow end and a wide end. Moving a bubble domain from the wide end of one thick portion to the narrow end of another portion takes place along the preferred "easy" movement direction. Moving a bubble domain along the "hard" movement direction from the narrow end of one portion to the wide end of another thick portion requires a larger force than along the easy movement direction.

3,717,854
CONDUCTOR GRIDS FOR POST AND FILM MEMORY SYSTEMS

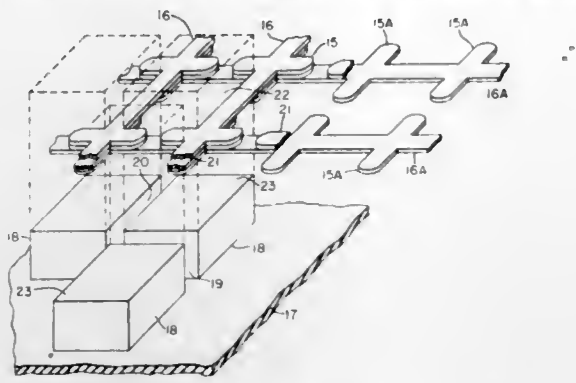
Kenneth R. Carter, Woodland Hills, Calif., assignor to Litton Systems, Inc., Beverly Hills, Calif.

Filed July 14, 1971, Ser. No. 162,391

Int. Cl. G11c *5/08, 11/10*

U.S. Cl. 340—174 VA **6 Claims**

A conductor grid for a post and film memory system comprises first elongated, flat conductors having arms extending orthogonally to the length of the conductors. The conductors may be assembled to a post structure having orthogonal slots so that the conductors will fit snuggly in one set of slots and the arms will extend into the orthogonal slots at the intersections of the orthogonal slots.



3,717,855
MAGNETIC HEAD UNIT

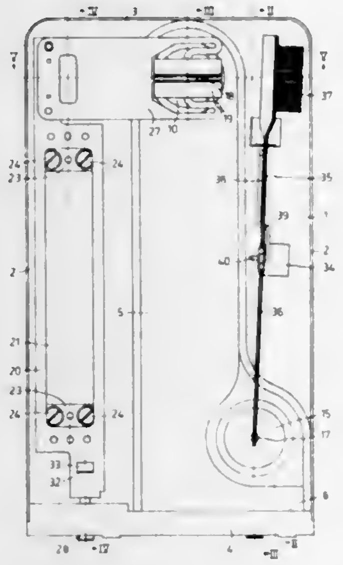
Paul Antonius Ferdinand Van Acker, Rijswijk, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Sept. 13, 1971, Ser. No. 179,873

Claims priority, application Netherlands, Sept. 29, 1970, 7014265

Int. Cl. G11b *5/60, 3/58*

U.S. Cl. 340—174.1 E **5 Claims**



A magnetic head unit for use in a data processing apparatus employing magnetizable recording discs, which unit comprises a plate-shaped support and a flat box which is made of sheet material and is secured to the support and defines a chamber which may be connected to a source of a pressurized fluid and has two openings which are closed by diaphragms. When pressure is set up in the chamber, one of the diaphragms moves a magnetic head, which is secured in a shoe and is resiliently connected to the support, in a direction towards the recording disc, while by means of the other diaphragm a brush pivotally supported on the support is lifted from the recording disc against a spring force under the influence of the fluid pressure.

3,717,856
DUAL HEADS WITH SELECTIVE DATA DEPENDENT ENERGIZATION

Moritada Kubo, Shibuya-ku, Tokyo, and Yasuo Shinomiya, Setagaya-ku, Tokyo, both of Japan, assignors to Tokyo Shibaura Electric CO., Ltd., Hawasaki-shi, Japan

Filed Dec. 30, 1971, Ser. No. 214,270

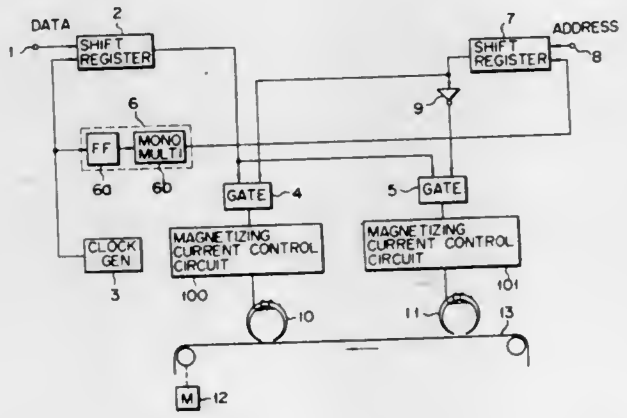
Claims priority, application Japan, Dec. 30, 1970, 45/122953

Int. Cl. G11b *5/02*

U.S. Cl. 340—174.1 G **8 Claims**

Magnetic tape memory apparatus consisting of a writing unit and a reading unit, the writing unit comprising a magnetic

tape feeding device, a first and a second writing magnetic heads which are juxtaposed along the travelling direction of the magnetic tape in such a manner that the directions of magnetization thereof intersect substantially orthogonally to each other, and a logical circuit which effects change-over such that data are fed to the first magnetic head when each bit level of a plurality of bits constituting an address at each predetermined bit is "1" and that they are fed to the sevond magnetic head when it is "0," the reading unit comprising the first and second reading magnetic heads which individually read information stored on the magnetic tape by the first and second writing magnetic heads, means to combine outputs from the first and second reading magnetic heads and to thereby reproduce the data, and means to compare an output from the first magnetic head of the reading unit and an information representative of an aimed address and to lower the travelling speed of the magnetic tape when the two outputs are coincident.



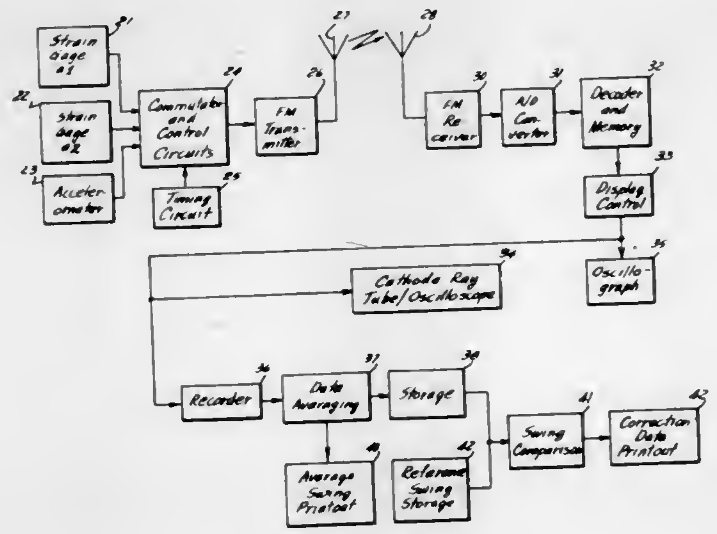
3,717,857
ATHLETIC SWING MEASUREMENT SYSTEM

James W. Evans, Largo, Fla., assignor to Athletic Swing Measurement, Inc., Clearwater, Fla.

Filed Nov. 27, 1970, Ser. No. 93,200

Int. Cl. G08c *15/00*

U.S. Cl. 340—177 R **12 Claims**



An athletic swing measurement method and apparatus for measuring characteristics of the swing of an athlete's arm, bat or club. An accelerometer is provided for measuring acceleration or velocity and strain gages for measuring flex and twist of a plate placed on an athlete's arm or within a bat or club, such as a golf club. Electrical signals analagous to the measurements of each gage are transmitted by a single transmitter to a receiver where they are converted for display, storage and comparison.

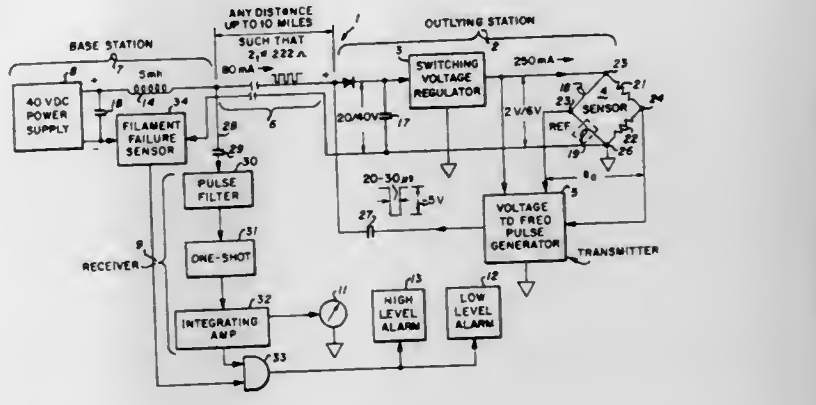
3,717,858
TWO CONDUCTOR TELEMETERING SYSTEM

David M. Hadden, 750 Saratoga Ave., San Jose, Calif.

Filed Aug. 12, 1970, Ser. No. 63,155

Int. Cl. G08c *19/16*

U.S. Cl. 340—203 **6 Claims**



In a two conductor telemetering system, a sensor and transmitter are disposed at an outlying station. The transmitter produces a train of pulses having a repetition rate which is a function of the quantity being measured by the sensor. The pulses are transmitted over a two conductor transmission line to a base station counter to the flow of power from the base station to energize the sensor and transmitter. A switching voltage regulator is provided at the outlying station for converting the supplied dc power of a relatively high unregulated voltage and low current to a regulated relatively low voltage at high current for energizing the sensor and transmitter.

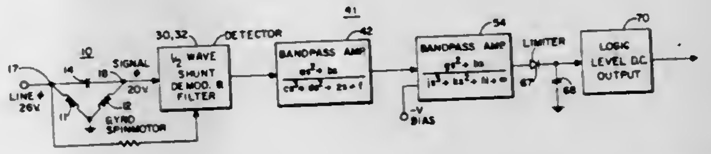
3,717,859
SUPERVISORY OR MONITORING APPARATUS

Jack C. Walter, Falcon Heights, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Jan. 20, 1970, Ser. No. 4,242

Int. Cl. G08b *21/00*

U.S. Cl. 340—213 R **6 Claims**



A spin motor rotation detector for a split phase or two phase motor drive for a gyroscope applies the spin motor supply voltage and the phase winding voltage to a semi-conductor, e.g., the supply voltage is applied as a reference voltage to the gate on a semi-conductor such as a FET used as a demodulator while the phased motor winding provides the source or (signal) input voltage to the FET demodulator. The phase modulation of the phase winding voltage resulting from hunting during operation of the motor is reflected in the output from the demodulator, and the output is applied to a logic level DC output to indicate satisfactory or unsatisfactory speed of operation of the split phase motor during changes in physical orientation of the gyroscope.

3,717,860
RATE OF RISE THERMAL DETECTOR

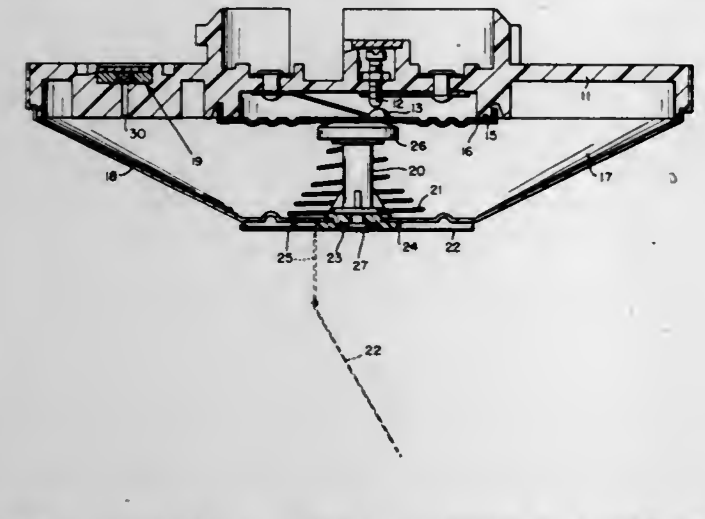
William C. Tipton, 23 Melrose Avenue, Newark, N.J., and Joseph E. Langan, 21 Glenview Road, North Caldwell, N.J.

Filed Sept. 17, 1970, Ser. No. 72,950

Int. Cl. G08b *17/04, 17/06*

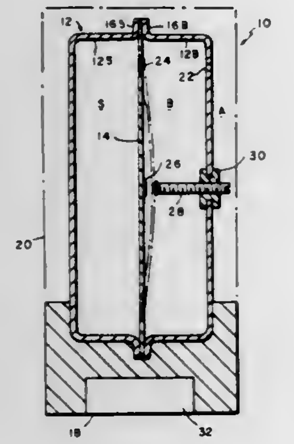
U.S. Cl. 340—229 **2 Claims**

A rate of rise thermal detector has been provided having a chamber for enclosing an atmosphere, control means within the chamber responsive to increases in the atmospheric pressure within the chamber occasioned by a relatively rapid rise in ambient temperature for producing a warning signal and governing means communicating within and without the chamber for regulating the rate equalization of the atmospheric pressure within the chamber. The improved governing means comprises a restrictor mounted in a wall of the chamber for permitting a selected calibrated rate of atmospheric equalization. The restrictor includes a body of precalibrated porous metal in a mounting ring fitted into a counterbore in a wall of the chamber over an opening in the chamber.



3,717,861
TORNADO ALARM

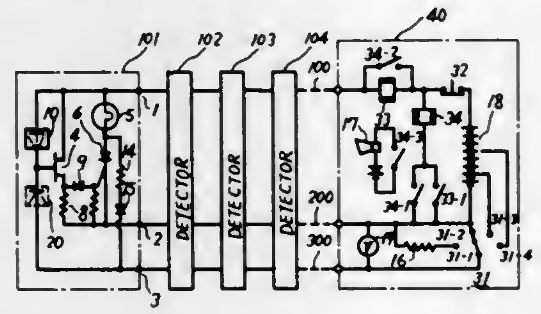
Robert C. Wright, Jr., 5 North Street, Hingham, Mass.
Filed Sept. 8, 1970, Ser. No. 70,267
Int. Cl. G08b *21/00*
U.S. Cl. 340—236 **10 Claims**



A tornado alarm of the pressure responsive type which responds only to the particular barometric phenomena associated with a tornado while remaining insensitive to pressure fluctuations of different origin. The device comprises a housing divided into a sensing chamber and a buffer chamber by a flexible diaphragm. The buffer chamber communicates with the atmosphere through an orifice sized so that pressure in the buffer chamber is insensitive to atmospheric pressure variations at rates higher than those produced by the tornado and arising from such extraneous causes as door or window closing. The sensing chamber communicates with the atmosphere through another orifice, sized so that pressure in the sensing chamber can follow only slow atmospheric pressure variations, such as result from the progression of atmospheric highs and lows across the country. The diaphragm thus has a pressure differential across it only when the pressure conditions associated with a tornado are present. A switch, actuated by the diaphragm, controls an alarm to signal the presence of these conditions and permit safety measures to be taken before the tornado strikes.

3,717,862
FIRE DETECTING SYSTEM AND TESTING MEANS THEREFOR

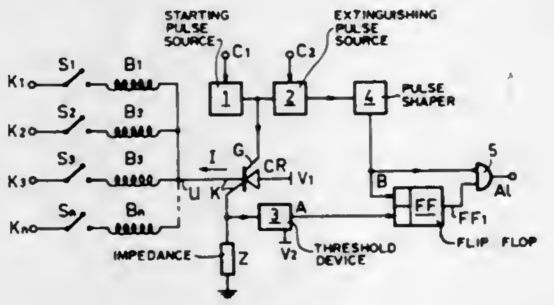
Koju Sasaki, Tokyo, Japan, assignor to Nittan Company, Limited, Tokyo, Japan
Filed Oct. 9, 1970, Ser. No. 79,536
Claims priority, application Japan, Oct. 16, 1969, 44/82247
Int. Cl. G08b *17/10;* **H01j** *39/28*
U.S. Cl. 340—237 S **4 Claims**



A fire detecting system embodying a plurality of ionization smoke detectors and a receiving unit for supplying electrical energy to the smoke detectors, for sounding an alarm in the event a detector is actuated and for applying predetermined voltages to the detectors to test both operability and sensitivity.

3,717,863
SWITCH POSITION SUPERVISING DEVICE

Dick van Kempen, and Hans Spaargaren, both of Rijswijk, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.
Filed Oct. 19, 1971, Ser. No. 190,579
Claims priority, application Netherlands, Oct. 22, 1970, 7015436
Int. Cl. G08b *21/00;* **H03k** *17/72*
U.S. Cl. 340—253 R **2 Claims**

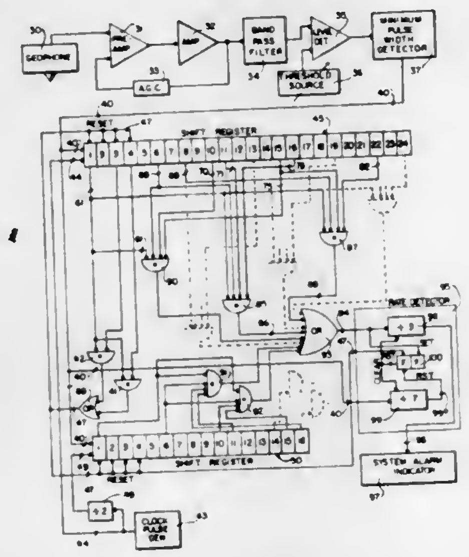


A device for the electronic supervision of a number of switching devices, each of which is connected to one side of a load, the other side of the loads being connected to a further switching device which is constructed as a controlled rectifier. After a starting pulse, the controlled rectifier receives an extinguishing pulse of a given value which can bring the controlled rectifier to the non-conducting state only if the current flowing through the rectifier due to the non-conducting state of all other switching devices has reached a given minimum value. If at least one of the said number of switching devices has remained conducting, the controlled rectifier continues to carry current, said current being detected, thus causing an alarm.

3,717,864
PERIODIC EVENT DETECTOR SYSTEM

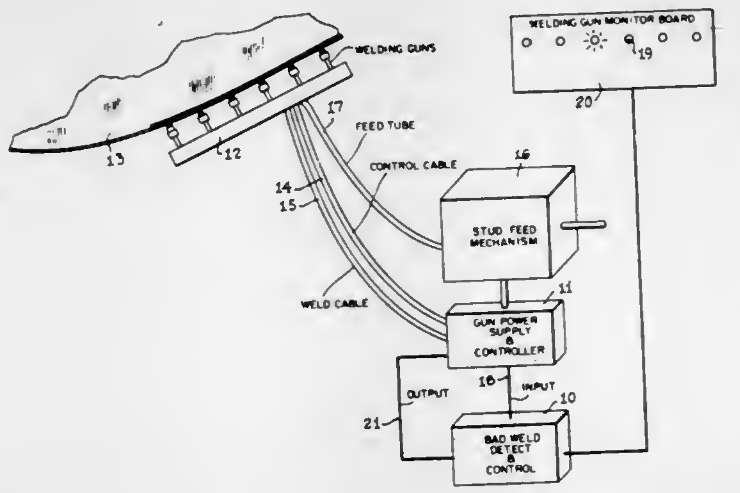
John C. Cook, Dallas, and M. Duane Wilt, Quinlan, both of Tex., assignors to Teledyne Industries, Inc.
Filed Nov. 2, 1971, Ser. No. 194,812
Int. Cl. G08b *13/00*
U.S. Cl. 340—261 **12 Claims**

An intrusion detector system for detecting periodic events such as footsteps in the illustrative example, such events being picked up by a vibration transducer and being distinguished from other random vibration events by virtue of their regular periodicity, the system using ordinary frequency and amplitude techniques in early stages to eliminate undesirable vibrational waves or "signatures" which are probably not attributable to footstep events, and then using digital filtering techniques to detect significant periodicity among the filtered event signals remaining. The system uses the latter techniques to clock such event signals comprising discrete energy bursts through long shift registers at clock rates which are high as compared with the rate of occurrence of the events, and then employs many different groups of sampling gates to examine differently spaced stages in the shift registers to test for different periodicities. The system further compares periodicity determinations made in this way using digital techniques with characteristics of the incoming event signals themselves to ascertain whether at any particular time the number of event signals which actually result in detections of periodicities is reliably high.



3,717,865
STUD WELDING BAD WELD DETECTION CIRCUIT

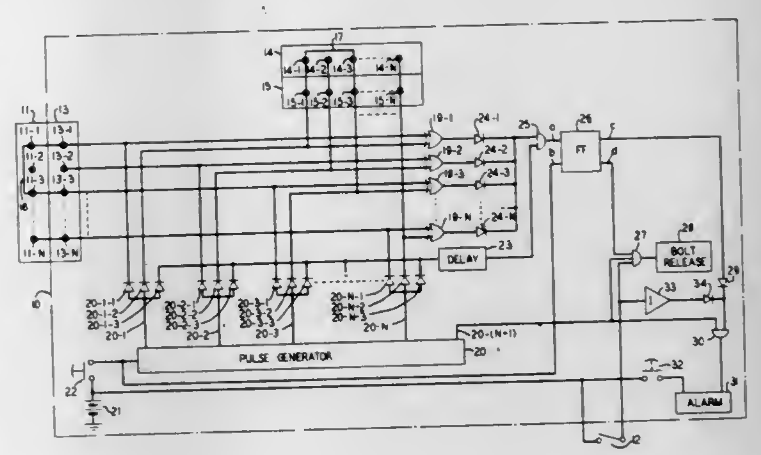
James S. Hughes, Jr., Bellmawr, N.J., assignor to Omark Industries Inc.
Filed June 30, 1970, Ser. No. 51,271
Int. Cl. G08b *21/00*
U.S. Cl. 340—267 W **9 Claims**



Apparatus for use with stud welding equipment employing a stud welding gun, a power supply and a controller for initiating the welding cycle and controlling the discharge of welding energy from the power supply across the stud and workpiece which detects the occurrence of bad welds and operates to generate an alarm signal and/or discontinue further operation of the welding apparatus. A first circuit is employed across the welding power supply and senses the discharge thereof to generate a first signal indicative that a normal weld has occurred. A second circuit connected through the controller generates a second signal upon the weld command to the controller indicating an attempted weld. The first and second signals are fed into a binary counter wherein the first signal indicating a successful weld resets the counter to 0 and the second signal indicating the weld command advances the counter to a count of 1. Upon the occurrence of the first bad weld indicated by the absence of a first signal, the second signal will advance the binary counter to a binary count of 2 upon which a signal light will be turned on. Upon the second successive weld failure, the next appearing second signal indicating a second weld command will advance the binary counter to a count of 3 which functions through circuit relays to disable the welding apparatus from further operation. One bad weld followed by a normal weld will result in the first signal resetting the binary counter to 0 and permitting continued operation.

3,717,866
ELECTRONIC LOCK

Nathan Ehrlich, Morris Township, Morris County, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.
Filed Dec. 23, 1971, Ser. No. 211,544
Int. Cl. G08b *13/08*
U.S. Cl. 340—147 MD **9 Claims**

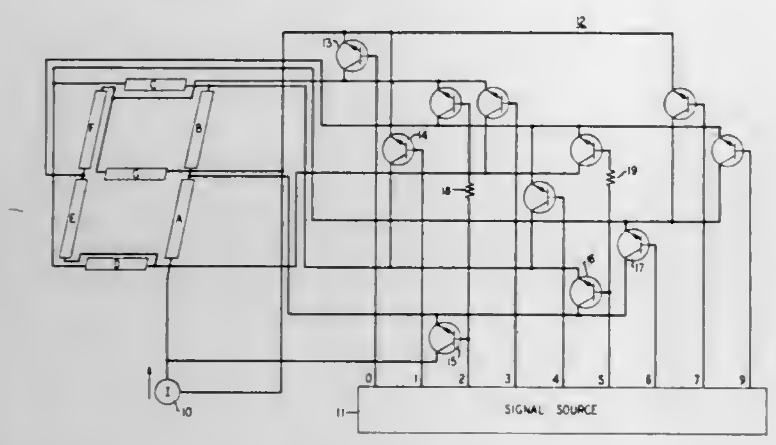


An electronic lock in which the key combination necessary for opening it is determined by an easily replaceable plug whose terminals have been jumpered or strapped in an arbitrary arrangement. The key for the lock is a second plug. When strapping in the second plug is identical to that in the first plug, insertion thereof permits the lock to be opened; if the strapping does not match, the lock cannot be opened. Options include initiation of an alarm if a key with incorrect strapping is inserted, and remote disablement of the lock.

3,717,867
DISPLAY DEVICE

Walter Rosenzweig, 238 St. Cloud Avenue, West Orange, N.J.
Filed Jan. 20, 1971, Ser. No. 108,054
Int. Cl. G08b *5/36*
U.S. Cl. 340—336 **6 Claims**

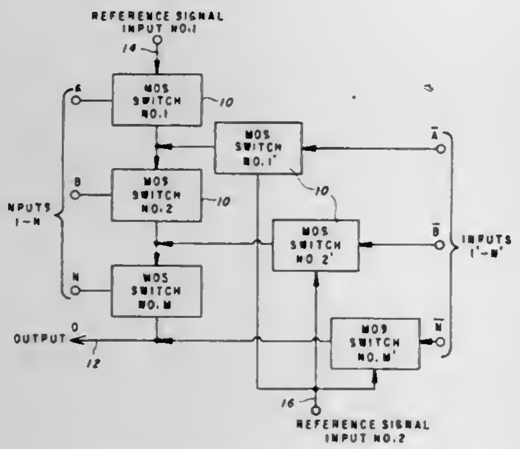
A device utilizing a minimum number of switches which will convert a signal from one of a plurality of inputs to a visual display. Light emitting elements are connected in series to a current source such that all elements are normally energized until a figure is selected for display. Figures are displayed in response to a signal from one of the input conductors by means of switches arranged to shunt unwanted elements. This arrangement allows several contiguous elements to be shut off by a single switch.



3,717,868
MOS MEMORY DECODE

Robert H. Crawford, Richardson, and Marvin W. Smith, Austin, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed July 27, 1970, Ser. No. 58,297
Int. Cl. H03k *17/00*
U.S. Cl. 340—347 DD **8 Claims**



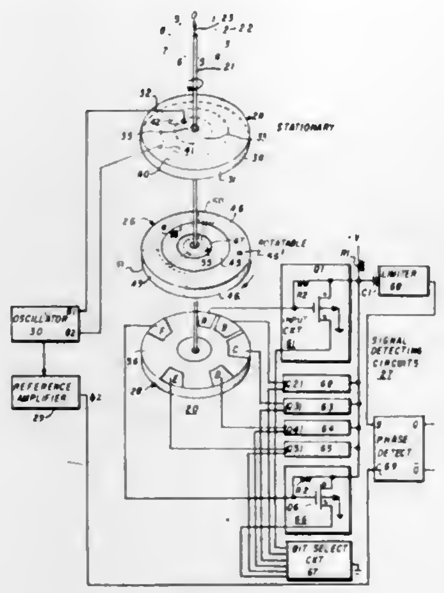
A digital decoding system for decoding multi-bit parallel channel digital input signals utilizing a cascaded (series) MOSFET switching circuit of one channel type, a cascoded (parallel) MOSFET switching circuit of the same channel type interconnected to produce a first output when the digital input is at a predetermined value and to produce a second output when the digital input is at all other values. This system provides relatively high speed operation and relatively low power consumption by virtue of complementary circuitry between the cascaded MOSFET switching circuits.

3,717,869
ANALOG TO DIGITAL CONVERTER HAVING AN ELECTROSTATIC ENCODER

James E. Batz, Northbrook, Ill., assignor to Northern Illinois Gas Company, Aurora, Ill.

Filed Nov. 24, 1970, Ser. No. 92,445
Int. Cl. G08c *9/02*
U.S. Cl. 340—347 P **17 Claims**

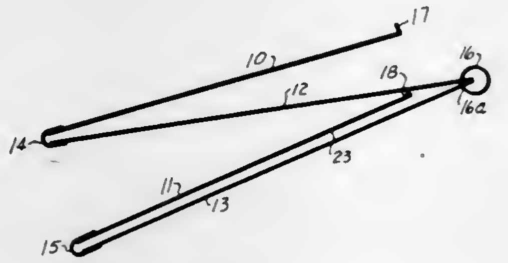
An analog-to-digital converter including a encoder for electrostatically coupling signals of different phases from a signal generator to sense elements selectively as a function of the angular position of a shaft, and phase detection circuits connected to the sense elements for determining the phase of the signals coupled to each sense element to provide a binary coded word representing the angular position of the shaft.



3,717,870
CARD DIRECTORY

Jimmy C. Mathews, Canoga Park, and George R. Kaelin, Woodland Hills, both of Calif., assignors to Litton Systems, Inc., Beverly Hills, Calif.

Filed Feb. 14, 1972, Ser. No. 225,964
Int. Cl. G08c *9/00*
U.S. Cl. 340—365 R **10 Claims**



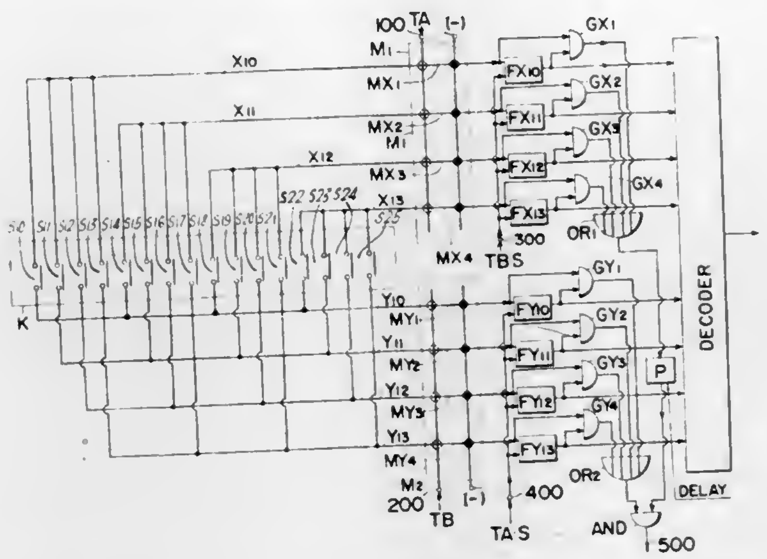
A plurality of individually folded cards, each bearing indicia relating to the location of individual switches of a switch array, is hingedly attached to a housing. Selection means is provided for selecting one of the cards so that the certain of the cards become stacked in a region of the housing and the selected card unfolds across the switch array. Registration means may be provided for fixedly positioning the selected card with respect to the switch array. The cards may be translucent so that light emitting indicators associated with the switches may be viewed through the selected card.

3,717,871
KEYBOARD INPUT DEVICE

Isao Hatano, Akira Nagano, and Kazuaki Urasaki, all of Kyoto-fu, Japan, assignors to Omron Tateisi Electronics Co., Ukyo-ku, Kyoto-shi, Kyoto-ku, Japan

Filed Nov. 26, 1971, Ser. No. 202,462
Claims priority, application Japan, Nov. 25, 1970, 45/118681
Int. Cl. H04q *3/00*
U.S. Cl. 340—365 E **17 Claims**

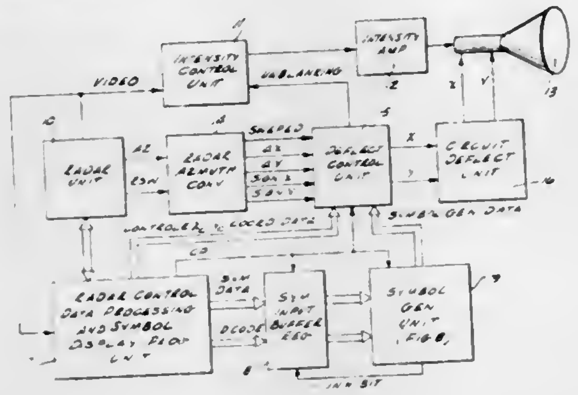
A keyboard input device wherein means is provided for obtaining an inhibit signal to prevent the entry of unnecessary input signals resulting from keys operated in such a way that during depression of one key another key is singly or repeatedly operated. According to the present invention, the inhibit signal obtaining means essentially comprises a combination of a plurality of AND gates.



3,717,872
HIGH FIDELITY SYMBOL DISPLAY THROUGH LIMITED BANDWIDTH SYSTEM

Melvin E. Snook, Fullerton, Phillip J. Joujon-Roche, Anaheim, Calif., and Warren L. Yancey, Fullerton, all of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed June 1, 1970, Ser. No. 57,847
Int. Cl. G01s *7/22*
U.S. Cl. 343—5 EM **13 Claims**



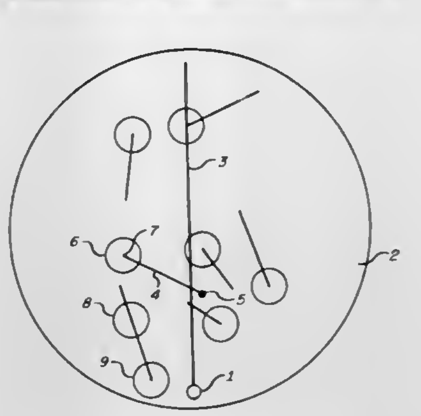
A symbol display system is disclosed which uses short strokes to form a symbol. The strokes proceed from point to point, each stroke being defined by cumulative changes in X and Y coordinates from a designated starting point. Each change from one point to another is sequentially read from a storage unit addressed by a symbol select matrix and a time counter. To maximize the speed of the strokes without distortion at corners of more than about 45°, a zero change is stored as the next change following a change leading to the corner point. More than one symbol may be programmed for display on a line. A program counter controls a sequencer to address the symbols to be displayed in sequence through the symbol display matrix, and to initiate displacement of the starting point for the next symbol a predetermined distance from the starting point of the last symbol.

3,717,873
SHIP'S MANEUVER ASSESSMENT SYSTEM

Robert F. Riggs, Charlottesville, Va., assignor to Sperry Rand Corporation

Filed Nov. 5, 1970, Ser. No. 87,025
Int. Cl. G01s *7/22*
U.S. Cl. 343—5 EM **8 Claims**

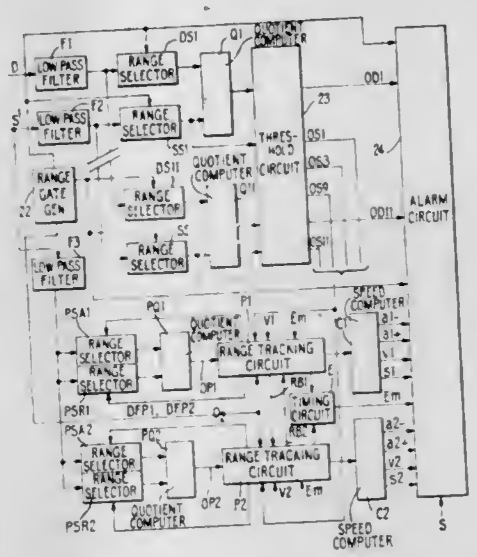
A ship's maneuver assessment system is provided as a radar system accessory for permitting identification of intruding ships that demonstrate collision threat characteristics and for the generation of a maneuver assessment display providing the ship's operator with an evaluation of possible maneuvers for avoiding collision with such intruding vessels.



3,717,874
SURVEILLANCE DOPPLER RADARS

Georges Jean Joseph Barriere, Mesnil-Saint-Denis, and Michel Rene Joseph Dalbera, Chatillon-Sous-Bagneux, both of France, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Sept. 8, 1971, Ser. No. 178,665
Claims priority, application France, Sept. 10, 1970, 7032847
Int. Cl. G01s *g/14, 9/22*
U.S. Cl. 343—7 ED **2 Claims**



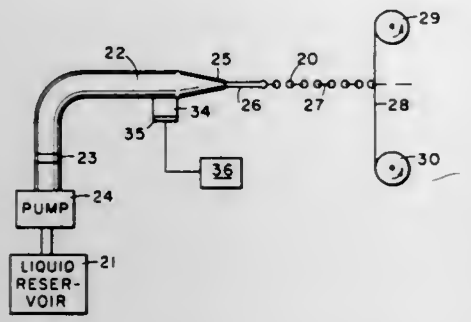
This invention relates to a monopulse coherent doppler radar system for use at the end of a runway for detecting moving targets on the runway and vicinity of said runway. A multiplicity of range gates and threshold circuits define contiguous range increments on the runway. When a target is detected, a light signal indicates the proper range increment.

3,717,875
METHOD AND APPARATUS FOR DIRECTING THE FLOW OF LIQUID DROPLETS IN A STREAM AND INSTRUMENTS INCORPORATING THE SAME

Genio R. Arciprete, Lexington, Walter J. Cairns, Marblehead, both of Mass.; Carl Hellmuth Hertz, Lund; Jell Ake Gosta Mansson, Genarp, both of Sweden, and John L. Rothery, Marblehead, Mass., assignors to Arthur D. Little, Inc., Cambridge, Mass.

Filed May 4, 1971, Ser. No. 140,145
Int. Cl. G01d *15/18*
U.S. Cl. 346—1 **41 Claims**

Method and apparatus for effecting the divergence of liquid droplets formed from a liquid stream ejected under pressure through a small-diameter nozzle. By imparting to the stream periodic mechanical oscillations within a predetermined frequency range, the droplets are caused to split into two or more separate and distinct streams which diverge angularly from the normal axis of the droplet stream. Those droplets in the stream travelling along the normal axis are separated from those travelling in the diverged streams thus providing a means for accurately measuring extremely small quantities of liquid delivered to a desired collection point. The method and apparatus are particularly suited for ink jet recording as well as for metering out small amounts of a liquid.



3,717,876

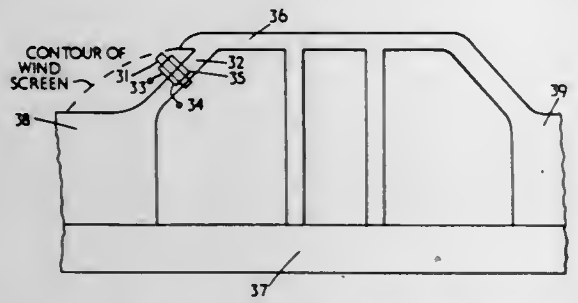
FERRITE ANTENNA COUPLED TO RADIO FREQUENCY CURRENTS IN VEHICLE BODY

Walter K. Volkers, deceased, late of Sand Point, (by Daphne Volkers, executrix), and Edward N. Willie, Locust Valley, both of N.Y., assignors to Volkers Research Corp., Port Washington, N.Y. by said Willie

Continuation of Ser. No. 658,995, Aug. 4, 1967, abandoned. This application April 23, 1971, Ser. No. 137,021

Int. Cl. H01q *1/32*

U.S. Cl. 343—712 **1 Claim**



An antenna system in which a Faraday cage acts as the primary antenna which intercepts the electromagnetic waves and reradiates them to a secondary antenna located within the Faraday cage.

3,717,877

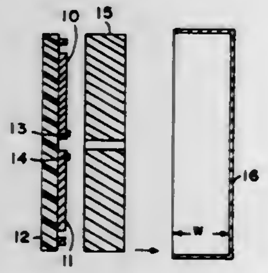
CAVITY BACKED SPIRAL ANTENNA

Albert E. Hanninen, Londonderry and Shaun M. Scanlon, Nashua, both of N.H., assignors to Sanders Associates, Inc., Nashua, N.H.

Filed Feb. 27, 1970, Ser. No. 15,102

Int. Cl. H01q *1/36*

U.S. Cl. 343—872 **3 Claims**



Cavity backed spiral antenna apparatus having an extremely narrow depth. The spiral antenna elements are preferably equiangular and comprise less than a full turn but more than a half turn and are ferrite loaded to result in a cavity depth which is on the order of 1/80 of the wavelength of the highest frequency of interest.

3,717,878

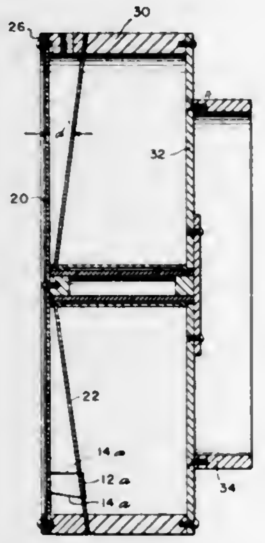
SPIRAL ANTENNA

Joseph A. Mosko, China Lake, Calif., assignor to the United States of America as represented by the Secretary of the Navy

Filed Jan. 31, 1968, Ser. No. 707,352

Int. Cl. H01q *1/36*

U.S. Cl. 343—895 **4 Claims**



Spiral antenna in which adjacent conductors are three dimensional and composed of spaced segments of a spiral disposed in one plane, the ends of which are joined by conductors disposed in another plane which have lengths greater than the spacing between the ends of the segments, thereby increasing the wire length of the convolutions over that of conductors having convolutions which lie only in one plane.

3,717,879

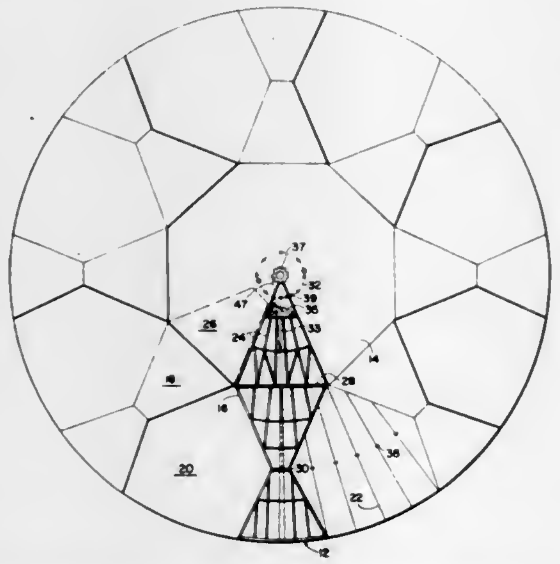
COLLAPSIBLE REFLECTOR

Eugene R. Ganssle, Silver Spring, Md., assignor to Neotec Corporation, Rockville, Md.

Filed Dec. 3, 1968, Ser. No. 780,771

Int. Cl. H01q *15/20*

U.S. Cl. 343—915 **10 Claims**



This disclosure is directed to a collapsible reflector including a number of substantially rigid foldable panels covered with a reflecting surface spaced around a central hub and flexible reflecting material located between adjacent panels; the substantially rigid panels being folded adjacent the hub in a small volume for stowing and upon deployment providing the required stiffness and contour control for the reflector.

ERRATUM

For Class 346—1 see:
Patent No. 3,717,875

3,717,880

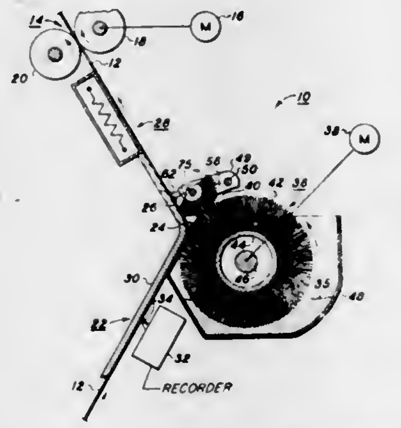
DUAL MODE ELECTROGRAPHIC RECORDER

Richard S. Howell, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Oct. 29, 1970, Ser. No. 85,055

Int. Cl. G03g *15/08, 15/22*

U.S. Cl. 346—74 ES **10 Claims**



Dual mode electrographic recording apparatus comprising a slow speed input generated by a typewriter keyboard and a high speed input via a computer. The recording apparatus of the present invention is characterized by the provision of a developer structure having two modes of operation during one of which developer material is applied to the recording medium along a recording zone traversed by the slow speed recorder and during a second mode of operation adjacent a second recording zone occupied by a stationary high speed recording structure.

3,717,881

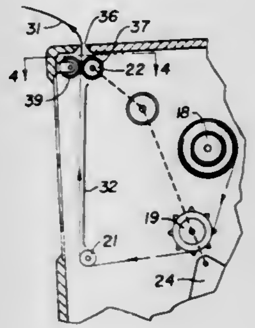
STRIP CHART DRIVE FOR RECORDER

John G. Bunning, Indianapolis, Ind., assignor to Esterline Corporation, New York, N.Y.

Filed Feb. 1, 1971, Ser. No. 111,210

Int. Cl. G01d *15/28*

U.S. Cl. 346—136 **8 Claims**



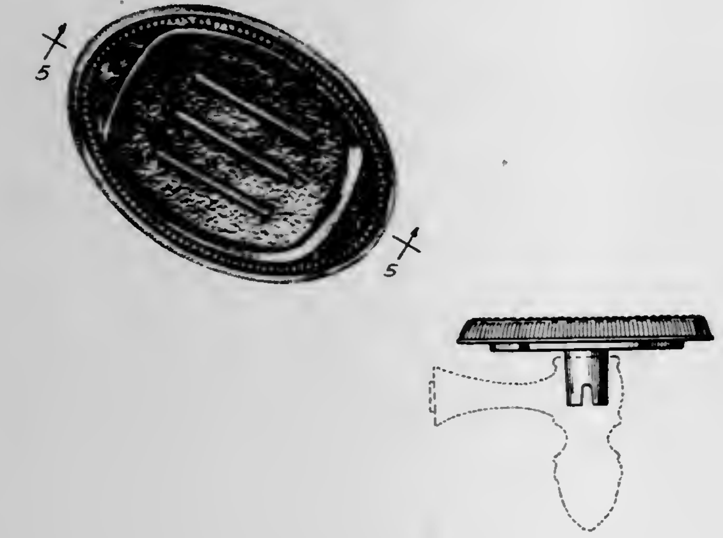
A chart recording machine has a chart supply roll, timing roll and idler roll, chart marking area, output roll, and chart collecting roll. The output roll has a pair of O-rings loosely stored thereon while chart is passed from the supply roll through the marking area and onto the collection roll. The O-rings are movable from storage position to driving position on the output roll to drive the chart out through a slot in the housing, if desired, as an alternative to collecting the chart on the collection roll.

DESIGNS

FEBRUARY 20, 1973

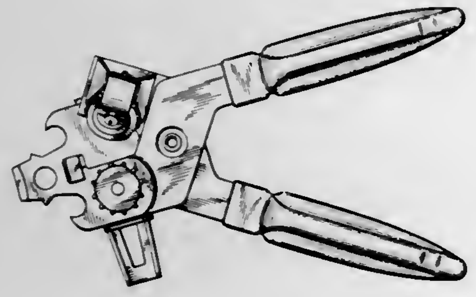
226,347
SOAP DISH

Sidney J. Shames, 57 Holly Place, Briarcliff Manor, N.Y. 10510, and Harold Shames, 5 Agnes Circle, Ardsley, N.Y. 10502
Filed Mar. 31, 1971, Ser. No. 130,059
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—90



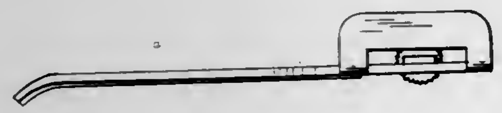
226,348
CAN OPENER

Theodorus Cornelis Marie van der Kroft, Valkenswaard, Netherlands, assignor to Van Eldersen's Metaalwarenfabriek "Brabantia," N.V., Aalst, Netherlands
Filed Feb. 22, 1971, Ser. No. 117,866
Term of patent 14 years
Int. Cl. D7—*04*
U.S. Cl. D8—39



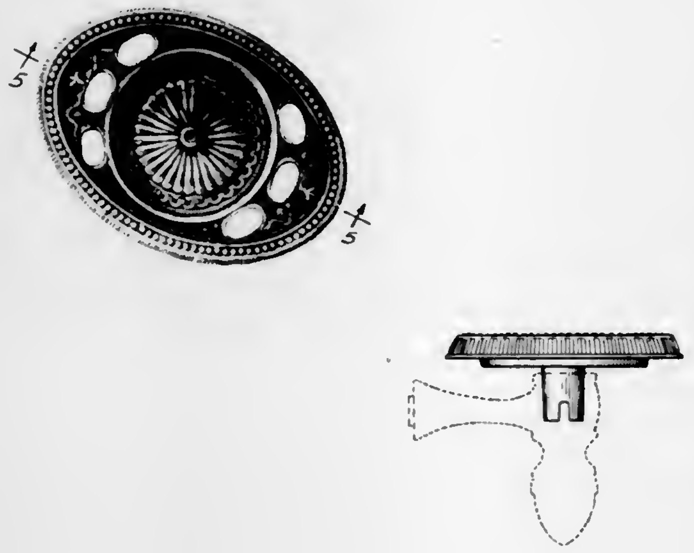
226,349
BUCKLE

Eldon C. Brophy, 2933 SE. Main St., Portland, Oreg. 97214
Filed July 9, 1971, Ser. No. 161,417
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—229



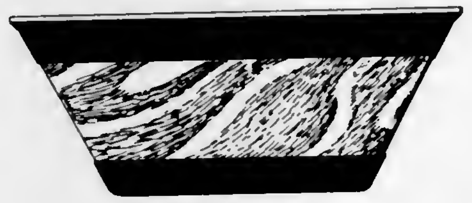
226,350
COMBINED TOOTHBRUSH AND TUMBLER HOLDER

Sidney J. Shames, 57 Holly Place, Briarcliff Manor, N.Y. 10510, and Harold Shames, 5 Agnes Circle, Ardsley, N.Y. 10502
Filed Mar. 31, 1971, Ser. No. 130,058
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—92



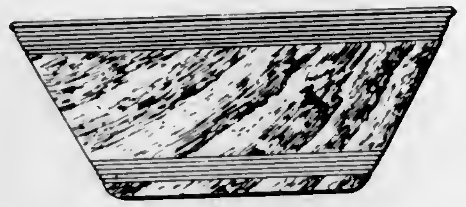
226,351
CONTAINER FOR DAIRY PRODUCTS OR THE LIKE

Herbert Arenson, 9999 W. 75th St., Overland Park, Kans. 66204
Filed June 14, 1971, Ser. No. 153,137
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—220



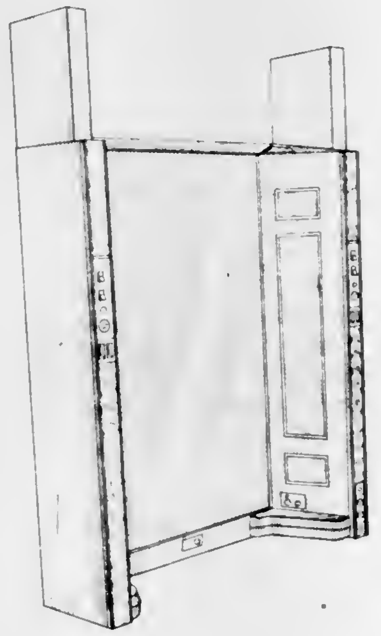
226,352
CONTAINER FOR DAIRY PRODUCTS OR THE LIKE

Herbert Arenson, 9999 W. 75th St., Overland Park, Kans. 66204
Filed June 14, 1971, Ser. No. 153,139
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—220



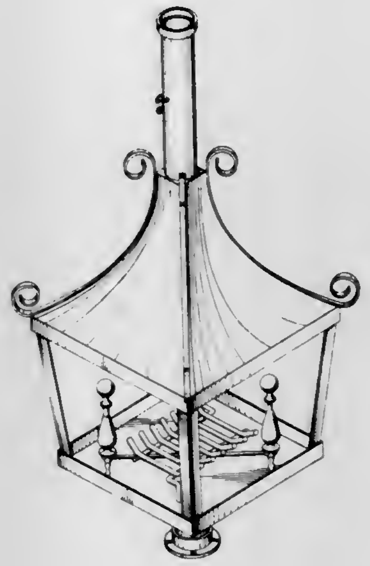
226,353
HOSPITAL IN-PATIENT SERVICE CORE MODULE

John R. Schultz, John M. Sharer, and John W. Heidacher, Batesville, Ind., and Frank M. Damico, Cincinnati, Ohio, assignors to Hill-Rom Company, Inc., Batesville, Ind.
Filed May 3, 1971, Ser. No. 140,013
Term of patent 14 years
Int. Cl. D24—*01*
U.S. Cl. D13—1 L



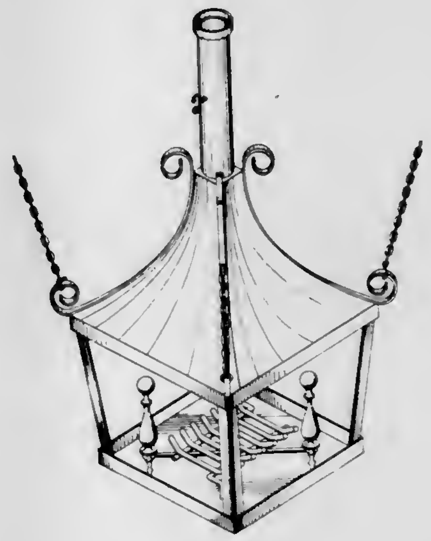
226,354
PEDESTAL FIREPLACE

Raynold A. Eld, 302 E. 39th St., Boise, Idaho 83703
Filed Mar. 8, 1971, Ser. No. 122,296
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—97



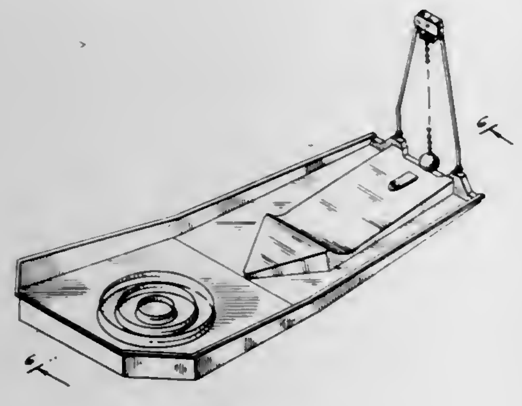
226,355
HANGING FIREPLACE

Raynold A. Eld, 302 E. 39th St., Boise, Idaho 83703
Filed Mar. 8, 1971, Ser. No. 122,297
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—97



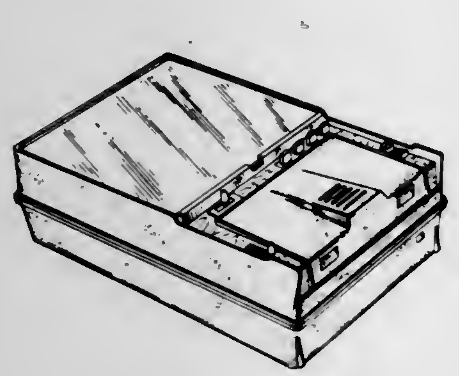
226,356
TETHER BALL GAME BOARD

Walter Moe, Huntington, N.Y., assignor to Aurora Products Corp., West Hempstead, N.Y.
Filed June 3, 1971, Ser. No. 149,869
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 BB



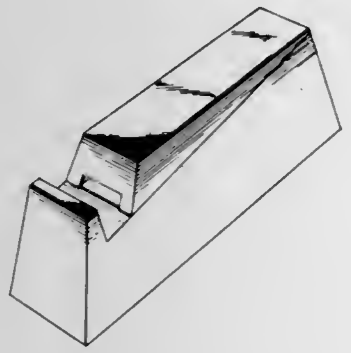
226,357
MICROFILM VIEWER

Arnis E. Peters, La Crosse, Wis., assignor to Micro 8 Company
Filed Aug. 3, 1971, Ser. No. 168,798
Term of patent 14 years
Int. Cl. D16—*02*
U.S. Cl. D61—1 N



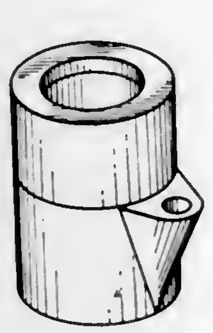
226,358
TAPE DISPENSER

William Macowski, Caldwell, N.J., assignor to Ketcham & McDougall, Inc., Roseland, N.J.
Filed May 14, 1971, Ser. No. 143,741
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D74—1



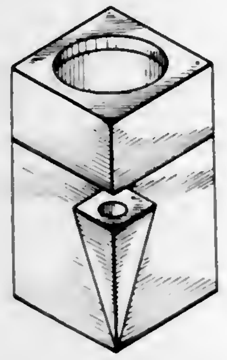
226,359
COMBINED CLIP DISPENSER AND PENCIL HOLDER

Robert M. Leedy, 7 Martindale Road, Short Hills, N.J. 07079
Filed July 7, 1971, Ser. No. 165,807
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D74—5 A



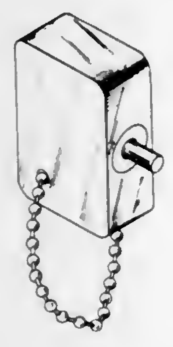
226,360
COMBINED CLIP DISPENSER AND PENCIL HOLDER

Robert M. Leedy, 7 Martindale Road, Short Hills, N.J. 07079
Filed July 7, 1971, Ser. No. 165,808
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D74—5 A



226,361
NOVELTY KEY CHAIN

Palmer P. Derby, Weston, Mass., assignor to Raytheon Company, Lexington, Mass.
Filed Apr. 6, 1971, Ser. No. 131,838
Term of patent 14 years
Int. Cl. D3—*99*
U.S. Cl. D87—8.2



LIST OF PATENTEES
TO WHOM
PATENTS WERE ISSUED ON THE 20TH DAY OF FEBRUARY, 1973

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

- : *See—*
  - Fabre, Aime, 3,717,181.
- A-T-O Inc.: *See—*
  - Carter, Sidney T., 3,717,239.
- AB Inventing: *See—*
  - Wallsten, Hans Ivar, 3,716,934.
- Abbas, Shakir A.; and Stern, Paul G., to International Business Machines Corporation. Electronically rewritable read-only memory using via connections. 3,717,852, Cl. 340-173.0sp.
- Abdale, John M.; Gartner, Robert J.; and Knudsen, Karl J., to Sperry Rand Corporation. Metal-glass laser window assembly. 3,717,823, Cl. 331-94.500.
- Abe, Takao: *See—*
  - Fukai, Akimasa; Fujiwara, Tuneaki; and Abe, Takao, 3,717,161.
- Abe, Toshio, to Tokyo Shibaura Electric Co., Ltd. Method of manufacturing semiconductor devices utilizing ion implantation and arsenic diffusion. 3,717,507, Cl. 148-1.500.
- Abendroth, John C. Ice-channel cutting attachment for ships. 3,717,115, Cl. 114-42.000.
- Abex Corporation: *See—*
  - Novotny, Raymond J., 3,717,105.
- Abilock, Solomon; Shottenfeld, Richard; and Brown, Thomas, to Lindly & Company, Inc. System for detecting defects in continuous traveling material. 3,717,771, Cl. 250-219.0df.
- A.C.I. Trust: *See—*
  - Fehr, Norbert, 3,716,875.
- Adams, Hal M.; Dunlap, Charles K., Jr.; and Harper, William M., to Sonoco Products Company. Textile yarn carrier with circumferential groove. 3,717,291, Cl. 225-6.000.
- Adams, Robert W.: *See—*
  - Holkesvick, Edgar E.; Hudnall, John; and Adams, Robert W., 3,717,339.
- Addressograph-Multigraph Corporation: *See—*
  - Tandy, William H., 3,717,464.
- Adenis, Daniel J., to Compagnie Pechiney. Process for the production of composite sheets. 3,717,513, Cl. 148-11.50a.
- Adler, Robert, to Zenith Radio Corporation. Acoustic wave amplification system. 3,717,819, Cl. 330-5.500.
- Advance Enterprises, Inc.: *See—*
  - Faltin, Hans G., 3,717,335.
- Aerpat A.G., mesne: *See—*
  - Prosser, Paul Edward; Sanders, John Stewart; Savage, Donald Stanley; and Summerlin, Frederick Arthur, 3,717,023.
- Agfa-Gevaert Aktiengesellschaft: *See—*
  - Heyl, Gerhard; Luttgens, Gunter; Behr, Rolf; Maus, Fritz; Frenken, Hans; Busch, Josef; Bruck, Herbert; and Schaffer, Helmut, 3,717,791.
- Air Products and Chemicals, Inc.: *See—*
  - Alexander, Warner; Gosselin, Kenneth F.; and McEvoy, James E., 3,717,588.
  - Bechara, Ibrahim S.; De Lamater, George B.; and Milligan, Barton, 3,717,676.
  - Huntzinger, Elwood E.; and Schwartz, Nelson N., 3,717,595.
  - Uffner, Melville W., 3,717,491.
- Air Products and Chemicals, Inc., mesne: *See—*
  - Luker, Ronald J.; and Jewell, George S., 3,717,332.
- Ajinomoto Co., Inc.: *See—*
  - Ninomiya, Tsunehiko; Ojima, Takashi; Yamaguchi, Shizuko; and Ito, Mieko, 3,717,477.
- Akashi, Goro: *See—*
  - Aonuma, Masashi; Fujiyama, Masaaki; and Akashi, Goro, 3,717,504.
- Aktiebolaget Bofors: *See—*
  - Hede, Nils Erik Allan; Hellner, Lars Ivar; and Johansson, Hans Elof, 3,717,455.
- Alagy, Jacob; Busson, Christian; Gadelle, Claude; and Seree de Roch, Irenee, to Institut Francais du Petrole des Carburants et Lubrifiants. Process for manufacturing epoxypropane and acetic acid. 3,717,662, Cl. 260-348.50v.
- Alburn, Harvey E.: *See—*
  - Grant, Norman H.; and Alburn, Harvey E., 3,717,669.
- Aldridge, Lionel Dennis, to AMP Incorporated. Threaded electrical connections. 3,717,839, Cl. 339-95.00r.
- Alexander, Carl J., to Wells Manufacturing Corporation. Reciprocating saw and blade therefor. 3,716,916, Cl. 143-68.00e.
- Alexander, Warner; Gosselin, Kenneth F.; and McEvoy, James E., to Air Products and Chemicals, Inc. Amorphous aluminodisilicate supported catalyst. 3,717,588, Cl. 252-455.00r.
- Alfes, John A., to General Motors Corporation. Energy absorber. 3,717,223, Cl. 188-1.00c.
- Alinari, Carlo. Depth gauge. 3,717,032, Cl. 73-300.000.
- Allard, Gilles; and Lansiart, Alain, to Commissariat a l'Energie Atomique. Spark chamber radiation-detecting device. 3,717,766, Cl. 250-83.60r.
- Allard, Pierre: *See—*
  - Rochina, Vincent; and Allard, Pierre, 3,717,696.
- Allen, Thomas E., to Caterpiller Tractor Co. Flow limiter and relief valve-belleville washer. 3,717,167, Cl. 137-117.000.
- Allen, Thomas E., to Caterpiller Tractor Co. Safety valve-Belleville. 3,717,178, Cl. 137-610.000.
- Allerbjer, Inger Margaretha, nee Nyberg: *See—*
  - Nyberg, Carl Erik Josef, 3,717,173.
- Allied Chemical Corporation: *See—*
  - Fohr, Thomas E., 3,716,895.
- Allied Control Company, Inc.: *See—*
  - Flaherty, Roger J., 3,717,829.
- Allis-Chalmers Manufacturing Company: *See—*
  - Reynolds, George E.; Mattison, Donald J.; and Gedemer, Fred J., 3,716,964.
- Alps Electric Co., Ltd.: *See—*
  - Shimojo, Takemi, 3,717,737.
- Altmann, Werner: *See—*
  - Enke, Kurt; and Altmann, Werner, 3,717,133.
- Altmeppen, Johannes, to Westinghouse Bremsen-und Apparatebau GmbH. Brake control apparatus. 3,717,383, Cl. 303-10.000.
- Aluminum Company of America: *See—*
  - Stokes, John J., Jr.; Cargnel, Robert A.; and Geiger, Robert C., 3,716,909.
  - Willis, Wilburn Coy, 3,717,275.
- Alyanov, Vladimir Fedorovich: *See—*
  - Zinkovsky, Viktor Petrovich; Sukoian, Nariman Alexandrovich; Alyanov, Vladimir Fedorovich; and Frolov, Jury Fedorovich, 3,717,712.
- Amana Refrigeration, Inc.: *See—*
  - Peterson, Donald E., 3,717,793.
- Amarin Plastics Inc.: *See—*
  - Honeycutt, Marshall L.; and Pye, William, 3,717,292.
- Amberg, Ralph Gilbert, to Owens-Illinois, Inc. Shrink-film capping machine. 3,716,963, Cl. 53-296.000.
- Ambrite Computer Rents, Inc.: *See—*
  - Emery, Douglas M., 3,717,250.
- Ambrose, John; and Shepherd, Edmund J., to Dunlop Company Limited, The. Flexible hose. 3,717,180, Cl. 138-153.000.
- Amemiya, Hiroshi; and Graf, Stefano Arturo, to RCA Corporation. Circuit for minimizing the signal currents drawn by the input stage of an amplifier. 3,717,821, Cl. 330-26.000.
- American Air Filter Company, Inc.: *See—*
  - Parrott, Orville C.; and Young, George W., 3,717,256.
- American Can Company: *See—*
  - Kohl, Lou; and Shea, Daniel Joseph, 3,717,693.
  - Langen, Jacobus Joseph; Lagen, Marinus Jacobus Maria; and Topler, Ernest, 3,716,962.
- American Chain & Cable Company, Inc.: *See—*
  - Peterson, Vincent Carl, 3,717,325.
- American cyanamid Company: *See—*
  - Buell, Bennett George, 3,717,652.
  - Werneke, Michael Francis, 3,717,574.
- American Flange & Manufacturing Co., Inc.: *See—*
  - Laurizio, Jeremiah, 3,717,289.
- American Home Products Corporation: *See—*
  - Grant, Norman H.; and Alburn, Harvey E., 3,717,669.
- American Lava Corporation: *See—*
  - Stradley, Norman H.; and Dunegan, Harry C., 3,717,497.
- American Optical Corporation: *See—*
  - Shaw, Robert R.; and Uhlmann, Donald R., 3,717,583.
  - Smith, Luther W., 3,717,531.
- American Precision Industries Inc.: *See—*
  - Oles, Herbert E.; and Thiesen, John W., Jr., 3,717,089.
- American Standard, Inc.: *See—*
  - Gerken, Carl F., 3,717,194.
- AMF Corporation: *See—*
  - Jacin, Harry; and Fiore, Joseph Vincent, 3,717,155.
- AMF Incorporated: *See—*
  - Hill, Loran R., 3,717,047.
  - Infantino, Joseph Rocco, 3,717,344.
  - Rattray, William L.; and Brown, Bruce G., 3,717,529.
- Ammino, Raymond; Jordan, William E.; and Earle, William E., to Foxboro Company, The. Chromatographic peak selector. 3,717,028, Cl. 73-23.100.
- Ammons, Walter D. Suspension fish box. 3,716,938, Cl. 43-55.000.
- Amori, Joseph A. Peach feeding and slicing means. 3,717,087, Cl. 146-99.000.

AMP Domestic Inc., mesne: *See—*
  Ziegler, George W., Jr., 3,716,904.
AMP Incorporated: *See—*
  Aldridge, Lionel Dennis, 3,717,839.
AMP Incorporated, mesne: *See—*
  Masino, Carlo; and Gilardine, Paolo, 3,716,913.
Amsted Industries Incorporated: *See—*
  Tack, Carl E., 3,716,903.
Anaconda Company, The: *See—*
  Grunig, James K.; Anderson, Rodney J.; and Vance, Bess L., 3,717,437.
Anderson, Charles Ernest, to Harris-Intertype Corporation. Method of fabrication of semiconductor device package. 3,716,907, Cl. 29-470.900.
Anderson, Edwin A. Seal and equalizing arrangement for a directional drilling apparatus. 3,717,208, Cl. 175-74.000.
Anderson, Gerald C.: *See—*
  Roe, Robert A.; and Anderson, Gerald C., 3,717,213.
Anderson, John W., to Sylvania Electric Products, Inc. Lamp having improved press seal. 3,716,898, Cl. 29-25.130.
Anderson, Paul L.; Houlihan, William J.; and Manning, Robert E., to Sandoz-Wander, Inc. Substituted-3-hydrazino pyridazines. 3,717,632, Cl. 260-250.00a.
Anderson, Paul L.; Houlihan, William J.; and Manning, Robert E., to Sandoz-Wander, Inc. Hydrazino and substituted hydrazino pyridazine-N-oxides. 3,717,635, Cl. 260-250.00a.
Anderson, Rodney J.: *See—*
  Grunig, James K.; Anderson, Rodney J.; and Vance, Bess L., 3,717,437.
Andras, John, to VSI Corporation. Mold base adapter. 3,717,428, Cl. 425-191.000.
Andrews, John E., Jr.: *See—*
  Wronka, Adolph A.; Banker, Bernard R.; Andrews, John E., Jr.; and Kliem, Bernd W. A., 3,717,097.
Angliker, Hans-Joerg: *See—*
  Peter, Richard; and Angliker, Hans-Joerg, 3,717,625.
Anthone, Leo E.: *See—*
  Miller, Donald F.; Anthone, Leo E.; and Kahabka, Richard D., 3,717,334.
Anti-Pollution Devices, Inc.: *See—*
  Doyle, Lawrence O., Jr.; and Meek, Harlen D., 3,716,967.
Aoki, Masaru: *See—*
  Shirato, Akira; Furuyama, Hidezo; and Aoki, Masaru, 3,717,522.
Aonuma, Masashi; Fujiyama, Masaaki; and Akashi, Goro, to Fuji Photo Film Co., Ltd. Magnetic recording medium. 3,717,504, Cl. 117-239.000.
Aotani, Hiroshi: *See—*
  Tanaka, Hiroyoshi; Aotani, Hiroshi; Shimamura, Masaharu; and Yuki, Ehime, 3,717,689.
Appel, Karl-Richard: *See—*
  Ost, Walter; Thomas, Klaus; Jerchel, Dietrich; and Appel, Karl-Richard, 3,717,709.
Applied Power Industries, Inc.: *See—*
  Roe, Robert A.; and Anderson, Gerald C., 3,717,213.
Arakawa, Yoshihide: *See—*
  Shiga, Takeo; Takagi, Toshihiko; Arakawa, Yoshihide; and Sato, Hisao, 3,717,218.
Arcari, Giuliana; Fregnan, Gian Carlo; Temperilli, Aldemio; and Ulivi, Pietro, to Societa Farmaceutici Italia. 8-Thioureidomethyl ergoline derivatives. 3,717,640, Cl. 260-285.500.
Archer, Sydney, to Sterling Drug Inc. N-Substituted-norapomopmorphines. 3,717,643, Cl. 260-289.00r.
Arciprete, Genio R.; Cairns, Walter J.; Hertz, Carl Hellmuth; Mansson, Kjell Ake Gosta; and Rothery, John L., to Little, Arthur D., Inc. Method and apparatus for directing the flow of liquid droplets in a stream and instruments incorporating the same. 3,77,875, Cl. 346-1.000.
Argus Engineering Company, Inc.: *See—*
  Costello, Bernard J., 3,717,743.
Arieh, Shimon. Reansporting apparatus. 3,717,241, Cl. 198-184.000.
Arkla Industries, Inc.: *See—*
  Kuhlenschmidt, Donald, 3,717,007.
Arleevskaya, Natalia Yalovlevna; Kalyaeva, Allanikolievna; and Pletnev, Dmitry Vasilievich. Multi-section electromechanical band pass filter with resonators and transducers mechanically connected together and to the filter baseplate. 3,717,828, Cl. 333-71.00.
Armstrong Cork Company: *See—*
  Culp, Charles Richard; and Lewicki, Walter John, Jr., 3,717,524.
  Moore, John H., 3,717,247.
Asai, Mitsuko: *See—*
  Kishi, Toyokazu; Asai, Mitsuko; Harada, Setsuo; Muroi, Masayuki; and Misuno, Komei, 3,717,707.
Asano, Kuniji: *See—*
  Kubo, Moritada; Asano, Kuniji; and Ohashi, Hiromichi, 3,717,413.
Ashar, Kanu G.; and Maheux, Leo W., to International Business Machines Corporation. Process for fabricating a pedestal transistor. 3,717,515, Cl. 148-175.000.
Asquith, William, Limited: *See—*
  Ennis, Brian, 3,717,392.
Asselin, Jean C.: *See—*
  Genest, Adrien P.; and Asselin, Jean C., 3,717,266.
Ateliers & Chantiers de la Manche: *See—*
  Regnier, Paul, 3,717,123.
Athena Controls, Inc.: *See—*
  Evalds, Egils, 3,717,300.
Athey, Stuart E., to Hobart Manufacturing Company, The. Magnetic switch control and interlock system. 3,717,830, Cl. 335-207.000.
Athletic Swing Measurement, Inc.: *See—*
  Evans, James W., 3,717,857.
Atkins, Carl E., to Wagner Electric Corporation. Code-responsive control circuit. 3,717,795, Cl. 317-134.000.
Atlantic Richfield Company: *See—*
  Larson, Allen E., 3,717,485.
Atomic Energy of Canada Limited: *See—*
  Wyatt, Brian Sidney, 3,717,454.
Aubrier, Paul Jacques, to Societe Anonyme dite: CNMP-Berthiez. Rotary tool-carrying heads for machine tools. 3,717,417, Cl. 408-35.000.
Auerbach, Richard, to Harman-Kordon, Incorporated. Tuning optimization circuit for F. M. tuner, including means for detecting maximum quieting. 3,717,817, Cl. 325-455.000.
Authie, Gerard: *See—*
  Falvert, Daniel; Raciazek, Andre; Authie, Gerard; Clot, Jean; and Giraud, Alain, 3,717,757.
Ayers, David T., Jr., to Kelsey-Hayes Company. Device for dual brake systems. 3,717,382, Cl. 303-6.00c.
Babayan, Eduard P., to Hitco. Curable epoxy resin composition containing a substituted diurea compound. 3,717,612, Cl. 260-47.0en.
Bach, Frederick O.; Chapin, Leo N.; Freed, Robert; and Cernoch, Thomas J., to Dick, A. B., Company, mesne. Electrophotographic multicolor copy developed receptor employing solubilizable dyes. 3,717,463, Cl. 96-1.500.
Badin, Elmer J., to Cities Service Oil Company. Fuel compositions containing nitrogen-heterocyclic substituted carbamates. 3,717,447, Cl. 44-63.000.
Badische Anilin- & Soda-Fabrik Aktiengesellschaft: *See—*
  Hauss, Alfred; Kieferle, Fritz; Kovacs, Jenoe; and Gulbins, Erich, 3,717,621.
  Rohr, Wolfgang; and Fischer, Adolf, 3,717,668.
Badische Maschinenfabrik GmbH: *See—*
  Graf, Max E., 3,716,946.
Bahr, Russel F.: *See—*
  Bragg, Gary O.; Bahr, Russel F.; and Williamson, Shellie O., 3,716,901.
Baird-Atomic, Inc.: *See—*
  Grenier, Raymond P.; and Welsh, William F., 3,717,762.
Balda Werke Photographische Gerate und Kunstaff R. Gruter Kommanditgesellschaft: *See—*
  Lange, Karl Heinze, 3,717,079.
Bandy, Charles Robert. Charging valve tool. 3,717,008, Cl. 62-292.000.
Banker, Bernard R.: *See—*
  Wronka, Adolph A.; Banker, Bernard R.; Andrews, John E., Jr.; and Kliem, Bernd W. A., 3,717,097.
Banville, Bertrand, to Prayfel Inc. Computerized race game. 3,717,345, Cl. 273-86.00r.
Barber-Colman Company: *See—*
  Sweger, Russell P., 3,717,803.
Bargman, Dale L., Jr., to Colorado Leisure Products, Inc. Vehicle tire carrier. 3,717,271, Cl. 214-451.000.
Barmag Barmer Maschinenfabrik Aktiengesellschaft: *See—*
  Rehn, Karl-Heinz; and Middelmann, Heinz, 3,716,980.
Barnes, Estil N.; and Collins, Harold T., to Phillips Petroleum Company. Process for preparing textured filled olefin polymer extrusions. 3,717,695, Cl. 264-90.000.
Baron, Frank A.; and Benner, Roland G., to Mallinckrodt Chemical Works. Purification of p-aminophenol. 3,717,680, Cl. 260-575.000.
Barrabas, Fritz, to Westfalische Bergewerkschaftskasse. Educational system for questioning a plurality of pupils simultaneously. 3,716,929, Cl. 35-48.00r.
Barret, Jean Pierre; Jourdan, Gerard; and Harbonn, Jacques, to Institut Francais du Petrole, des Carburants et Lubrifiants. Process of high reliability for communications between a master installation and secondary installations and device for carrying outthis process. 3,717,844, Cl. 340-5.00r.
Barriere, Georges Jean Joseph; and Dalbera, Michel Rene Joseph, to International Standard Electric Corporation. Surveillance doppler radars. 3,717,874, Cl. 343-7.0ed.
Barth, David E.: *See—*
  Petzon, Arthur R.; Conway, James M.; and Barth, David E., 3,716,876.
BASF Wyandotte Corporation: *See—*
  Kan, Peter T.; Cenker, Moses; and Patton, John T., Jr., 3,717,596.
Basler Electric Company: *See—*
  Gnaedinger, Donald J.; and Staley, Gerald E., 3,717,805.
Bassoff, Arthur B., to Lear Siegler, Inc. Index device. 3,717,044, Cl. 74-142.000.
Bateman, John H., to Ciba-Geigy Corporation. Bis (haloximino) acetone and method of preparation. 3,717,678, Cl. 260-566.00a.
Bates, Howard J., Jr.; and Hill, Jack O., to Oceanoics, Inc. Trenching apparatus. 3,717,003, Cl. 61-72.400.
Batz, JaMes E., to Northern Illinois Gas Company. Analog to digital converter having an electrostatic encoder. 3,717,869, Cl. 340-347.00p.
Bauer Bros. Co., The: *See—*
  Rowand, Ronald P.; and Michel, Donald P., 3,717,255.
Baumer, Wilhelm; Fruhstorfer, Wolfgang; Hesse, Reiner; Engelhardt, Manfred; and Dennler, Bernd, to Merck Patent Gesellschift mit Beschrankter Hagtung, mesne. Phenol ethers and phenol esters as stabilizers. 3,717,611, Cl. 260-45.95g.

Bazhaw, Willis O., to Hunt Oil Company. Surveying apparatus. 3,716,923, Cl. 33-264.000.
Beall, Francis C., to Research Corporation, mesne. Wood forming method. 3,717,187, Cl. 144-327.000.
Bechara, Ibrahim S.; De Lamater, George B.; and Milligan, Barton, to Air Products and Chemicals, Inc. Synthesis of oxycarboxylic acids salts. 3,717,676, Cl. 260-531.00c.
Bechtel International Corporation: *See—*
  Dikinis, Daumantas V.; and Yuen, Moon H., 3,717,804.
Beck, Erich. Method of preparing regrind. 3,717,307, Cl. 241-24.000.
Beckman Industries, Inc.: *See—*
  Penhasi, Harry A.; and Meir, Henry, 3,717,436.
Beggs, James E., to General Electric Company. Method of constructing a vapor deposited bi-potential cathode. 3,717,503, Cl. 117-212.000.
Behr, Rolf: *See—*
  Heyl, Gerhard; Luttgens, Gunter; Behr, Rolf; Maus, Fritz; Frenken, Hans; Busch, Josef; Bruck, Herbert; and Schaffer, Helmut, 3,717,791.
Bell & Howell Company: *See—*
  Bruck, Peter, 3,717,093.
  Duck, Sherman W.; and Jeffers, Frederick J., 3,717,460.
  McClure, Richard J., 3,717,459.
Bell Telephone Laboratories, Incorporated: *See—*
  Biskeborn, Merle C.; McCann, Joseph P.; and Sabia, Raffaele A., 3,717,716.
  Briley, Bruce Edwin, 3,717,755.
  Buzzard, Clair A.; Pasternack, Gerlad P.; and Saltzberg, Burton R., 3,717,754.
  Chu, Ta-Shing, 3,717,827.
  Dalton, John Vincent; Mac Rae, Alfred Urquhart; Mathews, James Robert; Moline, Robert Alan; Pickar, Kenneth Arnold; and Seidel, Harvey Donald, 3,717,790.
  Ehrlich, Nathan, 3,717,866.
  Gans, Michael James, 3,717,814.
  Ghiron, Hugo; and Ulrich, Werner, 3,717,850.
  Hirsch, Peter, 3,717,812.
  Hubbard, William Marshall; and Li, Tingye, 3,717,769.
  Schinke, David Paul; and Van Uitert, Le Grand Gerard, 3,717,562.
Bellmann, Manfred; and Pfeiffer, Gerd, to Mannesmann Aktiengesellschaft. Method and mill for skew rolling. 3,717,018, Cl. 72-97.000.
Bellware, James D., to General Motors Corporation. Windshield wiper system. 3,716,887, Cl. 15-250.170.
Belohoubek, Bohuslav: *See—*
  Linda, Josef; Belohoubek, Bohuslav; and Marsalek, Jaroslav, 3,717,393.
Bendix Corporation, The: *See—*
  Farrah, Harry Robert; Marom, Emanuel; and Mueller, Rolf K., 3,717,843.
  Wertheimer, Harry P.; and Sekella, Thomas Curran, 3,717,734.
Benecke, Norman L., to Westinghouse Electric Corporation. Mid-bed distrubutor. 3,717,254, Cl. 210-279.000.
Benner, Roland G.: *See—*
  Baron, Frank A.; and Benner, Roland G., 3,717,680.
Bennett, Ian Cameron: *See—*
  Hondermarck, Jean Claude; Bennett, Ian Cameron; and Guillo, Jacques, 3,717,552.
Benson, Henry E., to Warren Industries. Corner bracket and roller asembly for sliding doors. 3,716,890, Cl. 16-91.000.
Benteler, Helmut, to Benteler-Werke AG. Method of making an insulated tube. 3,717,527, Cl. 156-79.000.
Benteler-Werke AG: *See—*
  Benteler, Helmut, 3,717,527.
Bentley, William; and Kellar, John D., to PPG Industries, Inc. Manufacture of glass sheets having predetermined outline shapes. 3,717,290, Cl. 225-2.000.
Berends, Howard, to Holland Hitch Company. Convertible dolly-tandem axle. 3,717,363, Cl. 280-476.000.
Berends, Howard P., to Holland Hitch Company. Vehicular bag hoist. 3,717,273, Cl. 214-512.000.
Berezansky, Louis P. Centrifugal switch. 3,717,733, Cl. 200-80.000.
Berg Electronics, Inc.: *See—*
  Mancini, Lloyd, 3,717,841.
Bergische Achsenfabrik Fr. Kotz & Sohne: *See—*
  Brandt, Heinrich, 3,717,049.
Bernaerts, Henry J., to United States of America, Navy. Telescoping guard for Hazelton propellers. 3,717,114, Cl. 114-16.00r.
Bernard, Rene George, to Societe d'Etudes Verrieres Appliquees. Shutter valves for high-vacuum applications. 3,717,322, Cl. 251-61.000.
Bernardi, James T. Column flange and stiffener plate construction. 3,716,957, Cl. 52-633.000.
Bernardi, James T. Beam end construction for semi-rigid connection to a column. 3,716,959, Cl. 52-721.000.
Bernardi, Luigi; and Goffredo, Onfrio. Process for the preparaion of L-dopa. 3,717,673, Cl. 260-519.000.
Berndt, Wilbur C.; and Hardenbrook, Harry J. Cold pressure bandage. 3,717,145, Cl. 128-82.100.
Beroza, Morton: *See—*
  McGovern, Terrence P.; Beroza, Morton; Davis, Harry G.; and Eddy, Gaines W., 3,717,706.
Bethlehem Steel Corporation: *See—*
  Caldwell, Laurence B.; and Helman, Robert W., 3,717,501.
  Melloy, George F.; and Russ, John C., 3,717,508.
Bhatt, Harshad J., to Cogar Corporation. Fabrication method for making an aluminum alloy having a high resistance to electromigration. 3,717,564, Cl. 204-192.000.
Billett, Ronald J.: *See—*
  Short, Charles R.; and Billett, Ronald J., 3,717,336.
Bimler, Rudolf. Orthopedic leg support. 3,717,144, Cl. 128-80.00a.
Bio-Technical Resources, Inc.: *See—*
  Sfat, Michael R.; and Morton, Bruce J., 3,717,471.
Biscar, Jean P., to University of California, The Regents of the. Three electrode flow meter. 3,717,031, Cl. 73-194.0em.
Bischof, Kaspar; Hoskins, Robert D.; and Shepherd, John M., to Mid-cal Aluminum, Inc. Sealing compound applying machine and method. 3,717,184, Cl. 141-1.000.
Bishop, John W.: *See—*
  Robison, Ernest B.; Ehrlich, Shelton; and Bishop, John W., 3,717,700.
Biskeborn, Merle C.; McCann, Joseph P.; and Sabia, Raffaele A., to Bell Telephone Laboratories, Incorporated. Plastic insulated conductor communications cable water proofed with an internal void-pilling mixture of petroleum jelly and high molecular weight olyethulene or polypropylene. 3,717,716, Cl. 174-25.00r.
Bissett, Joseph L. Meat product. 3,717,473, Cl. 99-107.000.
Bitumarin N.V.: *See—*
  Rinkel, Gerardus; and Van Doorn, Gijsbert, 3,717,492.
Bizzini, Bernard; Chermann, Jean-Claude; Jasmin, Claude; and Raynaud, Marcel. Method of cell culture. 3,717,551, Cl. 195-1.700.
Black, Robert B. Autoclave. 3,717,434, Cl. 21-94.000.
Black, Sivalls & Bryson, Inc.: *See—*
  Pelczerski, Eugene A.; and Karnavas, James A., 3,717,703.
Black, Thomas J., to Westerman, Werner F. Coin counter cut-off and recycling apparatus. 3,717,158, Cl. 133-8.000.
Blair, Charles R. Attache case convertible to luggage dolly. 3,717,228, Cl. 190-1.000.
Blanton, Colectra E., Jr. Board game apparatus. 3,717,341, Cl. 273-1.00r.
Blay, Jorge A., to Celanese Corporation. Thermal purification of terephthalic acid using a carboxylic acidic aromatic solvent. 3,717,674, Cl. 260-525.000.
Bliss, Norman Stanley: *See—*
  Smith, Colin Francis Greening; and Bliss, Norman Stanley, 3,717,719.
Blum, Paul R., to Marine Swimming Pool Equipment Co. Swimming pool skimmer with demountable weir. 3,716,873, Cl. 4-172.170.
Bodine, Albert G. Sonic apparatus for working plastic material. 3,717,427, Cl. 425-174.000.
Bodine, Albert G. Use of sonic resonant energy in electrical machining. 3,717,567, Cl. 204-222.000.
Boehringer, C. H., & Sohn: *See—*
  Ost, Walter; Thomas, Klaus; Jerchel, Dietrich; and Appel, Karl-Richard, 3,717,709.
Boehringer Ingelheim G.m.b.H.: *See—*
  Maier, Roland; and Sauter, Robert, 3,717,629.
  Stahle, Helmut; Koppe, Herbert; Zeile, Karl; Wole, Martin; Hoefke, Wolfgang; and Samtleben, Hans-Wolfgang, 3,717,633.
Boggs, Roger L.: *See—*
  Cackley, George W.; Heitzman, Gary N.; Boggs, Roger L.; and Stedman, Robert N., 3,717,387.
Boggs, Roger L.; and Stedman, Robert N., to Caterpillar Tractor Co. Spacer means for cushioned track. 3,717,388, Cl. 305-19.000.
Boggs, Roger L.; and Stedman, Robert N., to Caterpillar Tractor Co. Pitch adjustment means for track assemblies. 3,717,389, Cl. 305-19.000.
Bohnen, David J. Pivot indicating golf practice mat. 3,717,349, Cl. 273-186.00r.
Boileau, Jacques, to Compagnie Generale des Etablissements Michelin, raison sociale Michelin & Cie. Radial tire having interposed plies at tread reinforcement edges. 3,717,190, Cl. 152-361.000.
Bok, Cornelis, to Nederlandse Organisatie voor Tolgepast Natuurwetenschappelijk Onderzoek Ten Behoeve Van Nijverheid. Method for manufacturing linen yarn, and linen yarn obtained by application of this method. 3,716,981, Cl. 57-139.000.
Boose, Cesar Adrianus; and Reidt, Maarten Johan, to Reactor Centrum Nederland. Method for the blackening of aluminum. 3,717,510, Cl. 148-6.240.
Booth, Gary E., to Procter & Gamble Company, The. Mono- and diphthalimidyl derivatives. 3,717,630, Cl. 260-240.0ca.
Borse, Anton G., to Borse Plastic Products Corporation. Disposable urinal. 3,716,871, Cl. 4-110.000.
Borse Plastic Products Corporation: *See—*
  Borse, Anton G., 3,716,871.
Bosch, Robert, Photokino GmbH: *See—*
  Riedel, Wolfgang, 3,717,405.
Bosley, Denis V.: *See—*
  Merino, Dennis H.; Bosley, Denis V.; Lucas, Daniel R., Jr.; and Schlau, Floyd E., 3,717,346.
Bosley, Denis V.; Crain, Philip W.; Douglas, Raymond J.; Loomis, Bernard; Schlau, Floyd E.; and Staats, William A., to Mattel, Inc. Toy flight simulator and control tower system. 3,716,940, Cl. 46-77.000.
Bouvet, Rene Jules: *See—*
  Daeninckx, Jean; and Bouvet, Rene Jules, 3,717,303.

- Bowers, David L., to General Electric Company. Standby external rate control and implanted standby heart pacer. 3,717,153, Cl. 128-419.00p.
- Bowers, Jeffrey L. Balance skill game. 3,717,340, Cl. 273-1.00r.
- Bowers, Jeffrey L. Catching post and projectile. 3,717,348, Cl. 273-96.00r.
- Bowling, Joseph E., Jr.: *See—*
  - Carpenter, James H.; and Bowling, Joseph E., Jr., 3,716,947.
- Boyajian, Alfred Z., to Boyan, Limited. Manually actutable tool. 3,716,879, Cl. 7-5.600.
- Boyan, Limited: *See—*
  - Boyajian, Alfred Z., 3,716,879.
- Boydell, Kenneth Raymond, to Dowty Technical Developments Limited. Selector valves. 3,717,175, Cl. 137-596.130.
- Boyle, William H., to Chainbelt, Rex, Inc. Peripheral feed and effluent system for sedimentation tanks. 3,717,257, Cl. 210-521.000.
- Boys, Donald R.; and White, Ernest W., to General Motors Corporation. Vacuum processing machine for aluminizing headlamp reflectors. 3,717,119, Cl. 118-49.000.
- Bradley, Ronnie A.: *See—*
  - Lindemer, Terrence B.; and Bradley, Ronnie A., 3,717,582.
- Bragg, Gary O.; Bahr, Russel F.; and Williamson, Shellie O., to Caterpillar Tractor Company. Method for making a porsional vibration damper. 3,716,901, Cl. 29-149.5nm.
- Brahm, Harry. Combination massaging, air-cushioning and ventilating insole. 3,716,930, Cl. 36-3.00b.
- Brander, George T.; and Lander, William M., to Westinghouse Electric Corporation. Pallet-package structure for cathode ray tubes. 3,717,245, Cl. 206-65.00r.
- Brandt, Heinrich, to Bergische Achsenfabrik Fr. Kotz & Sohne. Multistage wheel hub transmission. 3,717,049, Cl. 74-750.00r.
- Braverman, Theodore: *See—*
  - Klingler, Josef F.; Braverman, Theodore; and Klingler, Charles E., 3,717,035.
- Breitweiser, Gary C., to Sloan Technology Corporation. Thermally shrinkable devices. 3,717,746, Cl. 219-200.000.
- Brenneisen, Erich; Lindner, Helmut; and Schmidt, Heinz, to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning. Water-insoluble phenyl-azo-phenyl. 3,717,626, Cl. 260-207.100.
- Breslow, David S., to Hercules Incorporated. Modification of ethylenically unsaturated polymers with polyfunctional quaternary amidoximidinium salts. 3,717,560, Cl. 204-159.180.
- Brewer, Allen; and Joy, Michael, to Canadian Patents and Development Limited. Light collector for gamma ray cameras. 3,717,402, Cl. 350-286.000.
- Briley, Bruce Edwin, to Bell Telephone Laboratories, Incorporated. Parallel adder using a carry propagation bus. 3,717,755, Cl. 235-175.000.
- Brindisi, Frank A., Jr., to Enthone, Incorporated. Composition and method for selectively stripping nickel and/or copper. 3,717,520, Cl. 156-18.000.
- Bristol-Myers Company: *See—*
  - Juby, Peter Frederick; Goodwin, William Reuther; and Hudyma, Thomas William, 3,717,661.
- British Aircraft Corporation Limited: *See—*
  - Ward, Norman Reginald, 3,717,096.
- British Petroleum Company, Limited, The: *See—*
  - Hondermarck, Jean Claude; Bennett, Ian Cameron; and Guillo, Jacques, 3,717,552.
- Bro-Lee Incorporated: *See—*
  - Brown, Donald A.; and Leech, George W., 3,717,568.
- Brodnitz, Michael Hugo, to International Flavor & Fragrances, Inc. Alkenyl trisulfides. 3,717,681, Cl. 260-608.000.
- Brown, Bruce G.: *See—*
  - Rattray, William L.; and Brown, Bruce G., 3,717,529.
- Brown, Donald A.; and Leech, George W., to Bro-Lee Incorporated. Apparatus for removing minerals from ore. 3,717,568, Cl. 204-228.000.
- Brown, Robert Alan, to Inmont Corporation. Polyurethane production in the presence of boron trifluoride. 3,717,604, Cl. 260-32.60n.
- Brown, Thomas: *See—*
  - Abilock, Solomon; Shottenfeld, Richard; and Brown, Thomas, 3,717,771.
- Brown, William C.: *See—*
  - Massey, Ernst M.; and Brown, William C., 3,717,786.
- Brownbill, Thomas Duncan, to Dale, John, Limited. Tube dispenser. 3,717,281, Cl. 221-278.000.
- Bruck, Herbert: *See—*
  - Heyl, Gerhard; Luttgens, Gunter; Behr, Rolf; Maus, Fritz; Frenken, Hans; Busch, Josef; Bruck, Herbert; and Schaffer, Helmut, 3,717,791.
- Bruck, Peter, to Bell & Howell Company. Thermographic method of spirit duplication and transfer sheet for use therein. 3,717,093, Cl. 101-469.000.
- Bruckbauer, Gerald J.; and Corty, Michael E., to PPG Industries, Inc. Curtain coating head. 3,717,121, Cl. 118-324.000.
- Brugger, Emil. Slide rule for payroll use. 3,717,298, Cl. 235-70.00r.
- Buchel, Karl-Heinz; Regel, Erik K.; and Plempel, Manfred, to Farbenfabriken Bayer Aktiengesellschaft. N-Trityl-imidazoles. 3,717,657, Cl. 260-309.000.
- Buczek, Carl J.; Demaria, Anthony J.; Ferrar, Carl M.; and Wayne, Robert J., to United Aircraft Corporation. Apparatus and method for magnetically scanning an electric discharge gas laser. 3,717,824, Cl. 331-94.500.
- Buddecke, Charles L.: *See—*
  - Buddecke, Charles L., 3,717,037.
- Buddecke, Charles L., to Buddecke, Charles L., Flatten, Orris A., Hyman, Oscar E. and LeValley, John. Pressure measuring system. 3,717,037, Cl. 73-388.00r.
- Buehler, Arthur; and De Montmollin, Rene, to Ciba-Geigy AG. Reactive azo compounds acetoacetyl group containing an anthrquinonyl. 3,717,624, Cl. 260-153.000.
- Buell, Bennett George, to American cyanamid Company. 9-Carboxylic naphthoxazoles and plastics brightened therewith. 3,717,652, Cl. 260-307.00d.
- Bultemann, Hans-Joachim, to Varian Mat GmbH. Method for production of a diffusion membrane arrangement. 3,717,525, Cl. 156-77.000.
- Bunning, John G., to Esterline Corporation. Strip chart drive for recorder. 3,717,881, Cl. 346-136.000.
- Burenga, Thomas I., to TSC Industries Inc. Tractor power take-off for centrifugal pump. 3,717,045, Cl. 74-15.600.
- Burgess, Ronald R., to Motorola, Inc. Single crystal silicon contact for integrated circuits and method for making same. 3,717,514, Cl. 148-175.000.
- Burgett, David C.: *See—*
  - Dalhuisen, Albert J.; Deis, William H.; and Burgett, David C., 3,717,600.
- Burrow, Melvin N. Remote well plugging apparatus. 3,717,202, Cl. 166-55.000.
- Burtscher, Joachim; Emeis, Reimer; and Herlet, Adolf, to Siemens Aktiengesellschaft. Method of producing small area semiconductor components. 3,716,911, Cl. 29-578.000.
- Busch, Josef: *See—*
  - Heyl, Gerhard; Luttgens, Gunter; Behr, Rolf; Maus, Fritz; Frenken, Hans; Busch, Josef; Bruck, Herbert; and Schaffer, Helmut, 3,717,791.
- Busson, Christian: *See—*
  - Alagy, Jacob; Busson, Christian; Gadelle, Claude; and Seree de Roch, Irenee, 3,717,662.
- Butts, Mervin R., to General Motors Corporation. Refrigeration evaporator assembly. 3,717,009, Cl. 62-523.000.
- Buzzard, Clair A.; Pasternack, Gerlad P.; and Saltzberg, Burton R., to Bell Telephone Laboratories, Incorporated. Digital filter arrangement which alternatively filters two signals differing in frequency. 3,717,754, Cl. 235-152.000.
- Byler, William H.; and Mattis, James J., to U.S. Radium Corporation. Method for preparing rare earth oxide phosphors. 3,717,584, Cl. 252-301.40r.
- Cackley, George W.; Heitzman, Gary N.; Boggs, Roger L.; and Stedman, Robert N., to Caterpillar Tractor Co. Cushioned track with cross grousers. 3,717,387, Cl. 305-19.000.
- Cairns, Walter J.: *See—*
  - Arciprete, Genio R.; Cairns, Walter J.; Hertz, Carl Hellmuth; Mansson, Kjell Ake Gosta; and Rothery, John L., 3,717,875.
- Caldwell, Laurence B.; and Helman, Robert W., to Bethlehem Steel Corporation. Method of forming minimized spangle coated strip. 3,717,501, Cl. 117-102.00m.
- Calgon Corporation: *See—*
  - Thompson, Ralph N.; and Hoover, Merwin F., 3,717,679.
- Cameron Iron Works, Inc., mesne: *See—*
  - Thornton, Roland L., Jr., 3,717,849.
- Cammorata, Joseph J.: *See—*
  - Mainhardt, Robert; and Cammorata, Joseph J., 3,717,069.
- Campbell, James W., to Halton City State Bank, mesne. Method and apparatus for cutting panels. 3,717,265, Cl. 214-1.600.
- Canadian Patents and Development Limited: *See—*
  - Brewer, Allen; and Joy, Michael, 3,717,402.
- Cannon, Curtis W., to Climax Chemical Company. Solid-liquid contacting apparatus. 3,717,440, Cl. 23-284.000.
- Canon Kabushiki Kaisha: *See—*
  - Negishi, Hirokazu; Endo, Ichiro; Kinjo, Kikuo; and Yamanouchi, Teruo, 3,717,462.
- Caraccia, Joseph R.: *See—*
  - Germino, Felix J.; and Caraccia, Joseph R., 3,717,475.
- Carborundum Company, The: *See—*
  - Carpenter, James H.; and Bowling, Joseph E., Jr., 3,716,947.
  - Mt. Pleasant, Edison P., III, 3,717,694.
- Carder, Victor H.: *See—*
  - McCort, John I.; Notman, Robert J.; and Carder, Victor H., 3,717,365.
- Cargnel, Robert A.: *See—*
  - Stokes, John J., Jr.; Cargnel, Robert A.; and Geiger, Robert C., 3,716,909.
- Carlson, Ronald H., to Hooker Chemical Corporation. Process for sequestering metal ions by use of an amino carboxylic phosphine. 3,717,701, Cl. 423-272.000.
- Carpenter, James H.; and Bowling, Joseph E., Jr., to Carborundum Company, The. Abrasive blast cleaning system. 3,716,947, Cl. 51-9.000.
- Carpenter, Keith H., to General Motors Corporation. Depressed park wiper mechanism. 3,717,048, Cl. 74-600.000.
- Carr, George W., to Pullman Incorporated. Container hold-down locking means. 3,717,372, Cl. 296-35.00a.
- Carr, George W., to Pullman Incorporated. Variance compensator for chassis-to-container locking mechanism. 3,717,373, Cl. 296-35.00a.
- Carrier Corporation: *See—*
  - Pilarczyk, Karol, 3,717,418.

- Carter, Harry R., to Poloron Products, Inc. Spring mounting for snowmobile bogie wheels. 3,717,211, Cl. 180-5.00r.
- Carter, Kenneth R., to Litton Systems, Inc. Conductor grids for post and film memory systems. 3,717,854, Cl. 340-174.0va.
- Carter, Sidney T., to A-T-O Inc. Container handling apparatus. 3,717,239, Cl. 198-31.0aa.
- Carter, Warren E., to Perfect Equipment Corporation. Wheel weight demonstrating device. 3,716,927, Cl. 35-19.00r.
- Cartier, Roger J., to Controls Company of America. Timer stepping mechanism having stretched intervals. 3,717,043, Cl. 74-112.000.
- Case, Cecil L.; Elder, Robert L.; and Fell, Ferol S., to Hesston Corporation. Mowing, conditioning and windrowing machine and method. 3,716,972, Cl. 56-1.000.
- Case, Melvin C.; and Durney, George P., to ILC Industries, Inc. Method for forming crush resistant conduit. 3,717,530, Cl. 156-144.000.
- Castaigne, Albert R. J., to Centre d'Etudes Pour l'Industrie Pharmaceutique. 2-Dielhylamino-ethyl nicotinate, para-chloro- phenoxyisobutyiic acid salt. 3,717,649, Cl. 260-295.50r.
- Caterpillar Tractor Co.: *See—*
  - Boggs, Roger L.; and Stedman, Robert N., 3,717,388.
  - Boggs, Roger L.; and Stedman, Robert N., 3,717,389.
  - Cackley, George W.; Heitzman, Gary N.; Boggs, Roger L.; and Stedman, Robert N., 3,717,387.
  - Fuzzell, Joe E., 3,717,073.
  - Moser, Raymond L.; and Oldenburg, Dorrance, 3,717,185.
- Caterpillar Tractor Company: *See—*
  - Bragg, Gary O.; Bahr, Russel F.; and Williamson, Shellie O., 3,716,901.
  - Kronenberg, Francis E.; Olson, Alexius B.; Poirot, James M.; Rohweder, Gerald D.; and Winkler, Harold W., 3,717,025.
- Caterpiller Tractor Co.: *See—*
  - Allen, Thomas E., 3,717,167.
  - Allen, Thomas E., 3,717,178.
- Caviccioli, Mario. Pot washer and sterilizer. 3,717,159, Cl. 134-58.0dl.
- CCI Aerospace Corporation: *See—*
  - Herr, Frank M., 3,717,163.
- Cecil, James Barton, to Motorola, Inc. Digital to analog converter including improved reference current source. 3,717,777, Cl. 307-296.000.
- Celanese Corporation: *See—*
  - Blay, Jorge A., 3,717,674.
- Cenker, Moses: *See—*
  - Kan, Peter T.; Cenker, Moses; and Patton, John T., Jr., 3,717,596.
- Centre d'Etudes Pour l'Industrie Pharmaceutique: *See—*
  - Castaigne, Albert R. J., 3,717,649.
- Centre Technique de l'Industrie des Papiers Cartons et Celluloses: *See—*
  - Jacquelin, Guy, 3,717,546.
- Cernoch, Thomas J.: *See—*
  - Bach, Frederick O.; Chapin, Leo N.; Freed, Robert; and Cernoch, Thomas J., 3,717,463.
- Certain, Bernard Maurice, to Societe Nationale Idustrielle Aerospotiale. Method and devices for improving the longitudinal stability of helicopters. 3,717,317, Cl. 244-17.130.
- Chaffee, Robert C.: *See—*
  - Chartier, Richard G.; and Chaffee, Robert C., 3,717,272.
- Chainbelt, Rex, Inc.: *See—*
  - Boyle, William H., 3,717,257.
- Chakrabarti, Paritosh M.; Stange, Hugo; and Volpp, Gert Paul, to FMC Corporation. Polymers of 1-butene-2,3,4-tricarboxylic acid. 3,717,616, Cl. 260-78.50r.
- Chakravarti, Diptiman; Surendranath, Jack G.; and Orth, Richard Duncan, to Fentron Industries, Inc. Method of producing an electrolytic coating on aluminum and the product thereof. 3,717,555, Cl. 204-35.00n.
- Champlain Power Products Limited: *See—*
  - Rayfield, John Allen, 3,717,353.
- Chana, Howard E.; Rado, Joseph; and White, Harold D., to General Motors Corporation. Intake manifold for exhaust gas recirculation. 3,717,131, Cl. 123-52.0mv.
- Chapin, Leo N.: *See—*
  - Bach, Frederick O.; Chapin, Leo N.; Freed, Robert; and Cernoch, Thomas J., 3,717,463.
- Chapman, Clarke: *See—*
  - Woodall, Alan; and Honey, Chesleigh Brian, 3,717,295.
- Chapman, Paul W., to Honeywell Inc. KTA03 Ultraviolet detector. 3,717,799, Cl. 317-234.00r.
- Chartier, Richard G.; and Chaffee, Robert C., to Gilmore-Tatge Mfg. Co., Inc. Tailgate auger. 3,717,272, Cl. 214-503.000.
- Chaveneaud, Roger M.; and Janoska, Georges, to Societe a Responsabilite Limitee dite: Societe Lamy d'Etudes et de Recherches. Step-by-step driving device. 3,717,232, Cl. 192-142.00r.
- Chemerda, John M.: *See—*
  - Jones, William H.; and Chemerda, John M., 3,717,656.
- Chermann, Jean-Claude: *See—*
  - Bizzini, Bernard; Chermann, Jean-Claude; Jasmin, Claude; and Raynaud, Marcel, 3,717,551.
- Chicago Bridge & Iron Company: *See—*
  - Tam, William A., 3,717,001.
- Chu, Ta-Shing, to Bell Telephone Laboratories, Incorporated. Polarization transformation apparatus. 3,717,827, Cl. 333-21.00a.
- Ciba-Geigy AG: *See—*
  - Buehler, Arthur; and De Montmollin, Rene, 3,717,624.
  - Peter, Richard; and Angliker, Hans-Joerg, 3,717,625.
  - Zondler, Helmut; and Pfleiderer, Wolfgang, 3,717,593.
- Ciba-Geigy Corporation: *See—*
  - Bateman, John H., 3,717,678.
  - Howell, Frederick Harold; and Pickles, Wilfred, 3,717,691.
  - Kocsis, Karoly; Renner, Ulrich; and Jaeggi, Knut Alfred, 3,717,641.
  - Lyssy, Theodor; Keller, Ernst; Heller, Hansjorg; and Muller, Helmut, 3,717,614.
  - Marand, Jean, 3,717,287.
- Circa Tran. Inc.: *See—*
  - Fottler, Stanley A., 3,717,742.
- Citek, Francis J.: *See—*
  - McAllister, LeRoy; and Citek, Francis J., 3,717,569.
- Cities Service Oil Company: *See—*
  - Badin, Elmer J., 3,717,447.
  - Gulbrandsen, Arthur F., 3,717,283.
- Citizen Watch Company Limited: *See—*
  - Tanaka, Kazuo; Tsuzuki, Akira; and Matsumura, Tetsuo, 3,716,983.
- Clark, James William: *See—*
  - Law, Ernest Harry; and Clark, James William, 3,717,104.
- Clark, Richard J., to Rex Chainbelt Inc. Solenoid operated valve. 3,717,179, Cl. 137-625.650.
- Climax Chemical Company: *See—*
  - Cannon, Curtis W., 3,717,440.
- Clot, Jean: *See—*
  - Falvert, Daniel; Raciazek, Andre; Authie, Gerard; Clot, Jean; and Giraud, Alain, 3,717,757.
- Cochran, David L.; and Salter, Steven J., to MB Associates. Rocket launcher. 3,717,068, Cl. 89-1.806.
- Cochran Western Corporation: *See—*
  - McCort, John I.; Notman, Robert J.; and Carder, Victor H., 3,717,365.
- Cocke, John; Mommens, Jacques H.; and Raviv, Josef, to International Business Machines Corporation. Processing of compacted data. 3,717,851, Cl. 340-172.500.
- Cogar Corporation: *See—*
  - Bhatt, Harshad J., 3,717,564.
- Colchester, John Edward; and Entwisle, John Hubert, to Imperial Chemical Industries Limited. 4,4'-(Bis N,N' carbamyl methyl) dihydro-bipyridyls. 3,717,646, Cl. 260-295.0am.
- Cole, Edward L.: *See—*
  - Hess, Howard V.; and Cole, Edward L., 3,717,545.
- Cole, William R., Jr.: *See—*
  - Evans, Homer; and Cole, William R., Jr., 3,716,933.
- Collett, Robert M. Flesh penetrating apparatus. 3,717,151, Cl. 128-347.000.
- Collins, Harold T.: *See—*
  - Barnes, Estil N.; and Collins, Harold T., 3,717,695.
- Colorado Leisure Products, Inc.: *See—*
  - Bargman, Dale L., Jr., 3,717,271.
- Comalco Limited: *See—*
  - Scrivener, Ian, 3,716,958.
- Commissariat a l'Energie Atomique: *See—*
  - Allard, Gilles; and Lansiart, Alain, 3,717,766.
  - Godart, Michel, 3,717,267.
  - Guernet, Georges, 3,717,785.
  - Loupere, Andre, 3,716,955.
- Communications Satellite Corporation: *See—*
  - Horna, Otakar Antonin, 3,717,808.
- Compagnie Francaise de Raffinage: *See—*
  - De Gramont, Arnaud Marie-Jose; and Maurin, Jean, 3,717,572.
- Compagnie Generale d'Automatisme: *See—*
  - Falvert, Daniel; Raciazek, Andre; Authie, Gerard; Clot, Jean; and Giraud, Alain, 3,717,757.
- Compagnie Generale des Etablissements Michelin, raison sociale Michelin & Cie: *See—*
  - Boileau, Jacques, 3,717,190.
- Compagnie Pechiney: *See—*
  - Adenis, Daniel J., 3,717,513.
  - Percheron, Jean-Claude; and Septier, Louis, 3,717,456.
- Concast AG: *See—*
  - Marti, Heinrich; Zeller, Josef K.; and Fiala, Ferdinand, 3,717,198.
- Connick, Francis Glenn, to Swift & Company. Pickle manufacturing. 3,717,479, Cl. 99-222.000.
- Consiglio, Peter: *See—*
  - Rashbaum, Abraham; Humphrey, Robert; and Consiglio, Peter, 3,717,225.
- Controls Company of America: *See—*
  - Cartier, Roger J., 3,717,043.
- Conway, James M.: *See—*
  - Petzon, Arthur R.; Conway, James M.; and Barth, David E., 3,716,876.
- Cook, John C.; and Wilt, M. Duane, to Teledyne Industries, Inc. Periodic event detector system. 3,717,864, Cl. 340-261.000.
- Coombs, Robert V.; and Galantay, Eugene E., to Sandoz-Wander, Inc. 9 Alpha-methyl steroids. 3,717,663, Cl. 260-397.500.
- Cooper, Norman F.; Dozois, James H.; and Wanlass, Bert R., to General Motors Corporation. Closure operator. 3,716,945, Cl. 49-139.000.
- Cope, Paul E.; and Miles, Joe G., to Procter & Gamble Company, The. In-package sterilization. 3,716,961, Cl. 53-21.0fc.
- Copley, Russell Dean; and Schlueter, Francis Edward, to Deere & Company. Crop harvester. 3,716,976, Cl. 56-106.000.

Cordle, Paul E.: *See—*

Davis, Edward J.; Cordle, Paul E.; McCubbin, Melvin J.; Lockwood, Donald W.; and Higuera, Richard L., 3,717,098.

Cork, Gordon H.; and Tenniswood, David M., to Gemco Electric Company. Rolling conductor support. 3,716,986, Cl. 59-78.100.

Cornell, Richard D., to Johnson Products, Inc. Tappet push rod seat and meter means. 3,717,134, Cl. 123-90.350.

Corty, Michael E.: *See—*

Bruckbauer, Gerald J.; and Corty, Michael E., 3,717,121.

Cory Corporation: *See—*

Schlegel, Norman H., 3,717,288.

Cosgrove, James F.: *See—*

McCain, William B.; Cosgrove, James F.; and Zagorski, Edward J., 3,717,337.

Coss, Ronald G., to Standard Pneumatic Motor Company. Wire wrapping tool. 3,717,183, Cl. 140-124.000.

Costello, Bernard J., to Argus Engineering Company, Inc. Method and apparatus for heat-bonding in a local area using combined heating techniques. 3,717,743, Cl. 219-85.000.

Coston, Ronald Frances: *See—*

Rooke, Sydney William; and Coston, Ronald Frances, 3,717,270.

Costruzioni Meccaniche Industriali Genovesi C.M.I., S.p.A.: *See—*

Valdenazzi, Luigi Giovanni, 3,717,333.

Cote, Raymond A., to Rexham Corporation, mesne. Display carton. 3,717,243, Cl. 206-45.140.

Cotton, John F., to Westinghouse Electric Corporation. Distribution transformer. 3,717,832, Cl. 336-67.000.

Coussell, Ivan John; and Pattison, Roy, to Pye Limited. Intermittent carrier transmitter changeover system. 3,717,815, Cl. 325-158.000.

Cox, Edwin, Associates: *See—*

Davoud, John Gordon, 3,716,990.

CPC International Inc.: *See—*

Germino, Felix J.; and Caraccia, Joseph R., 3,717,475.

Craft, Roger L., to FMC Corporation, mesne. Tire mounting tool. 3,717,193, Cl. 157-1.300.

Crain, Philip W.: *See—*

Bosley, Denis V.; Crain, Philip W.; Douglas, Raymond J.; Loomis, Bernard; Schlau, Floyd E.; and Staats, William A., 3,716,940.

Crane Co.: *See—*

Geipel, Ernest W., 3,717,323.

Crane, Edward J.: *See—*

Miles, Wayne G.; and Crane, Edward J., 3,716,892.

Crawford, Robert H.; and Smith, Marvin W., to Texas Instruments, Incorporated. MOS memory decode. 3,717,868, Cl. 340-347.0dd.

Creative Posters, Inc.: *See—*

Perry, Charles H., 3,717,297.

Crider, Ernest L. Ice dispensing machine. 3,717,285, Cl. 222-143.000.

Crompton, Geoffrey: *See—*

Deane, William Harry; and Crompton, Geoffrey, 3,717,398.

Crum, James N., to Harris-Intertype Corporation. Registering mechanism for printing press. 3,717,092, Cl. 101-248.000.

Cryogenic Technology, Inc.: *See—*

Hosmer, Thomas P.; and Peterson, John F., 3,717,201.

O'Neil, James A., 3,717,004.

Cuddeback, Ruth M. Method and apparatus for manufacturing fabrics. 3,717,246, Cl. 206-47.00r.

Culp, Charles Richard; and Lewicki, Walter John, Jr., to Armstrong Cork Company. Method of adhering fibers in a tufted carpet. 3,717,524, Cl. 156-72.000.

Cummings, Gilbert A., to Peters & Co., Inc. Universal self-leveling dispenser. 3,717,397, Cl. 312-71.000.

Cunningham, Francis V.; and Wicks, John S., to Joslyn Mfg. and Supply Co. Shrinkable cable joint sleeve, cable joint employing the same, and method of forming a cable joint. 3,717,717, Cl. 174-73.00r.

Curty, Inc.: *See—*

Johnson, Curt H., 3,717,143.

Cutler-Hammer, Inc.: *See—*

Halbeck, Werner B., 3,717,838.

Wright, James C.; and Nemfth, Petfr, 3,716,960.

Cutter Laboratories Inc.: *See—*

Wada, Shohachi; and Mozen, Milton Michael, 3,717,708.

Czarnecki, Tadek; and Soderman, Bengt Rolf, to Fagersta Bruks Aktiebolag. Connection thread system for sets of extension drill rods. 3,717,368, Cl. 287-117.000.

Daeninckx, Jean; and Bouvet, Rene Jules, to L'Oreal. Method of vacuum-packaging insecticidal materials. 3,717,303, Cl. 239-55.000.

Daiga, Valdis R., to Owens-Illinois, Inc. Powders of metal silver and gold and processes for making same. 3,717,453, Cl. 75-.50a.

Dailey, Jack R.; Jensen, Donald F.; and Kuntzleman, Harry C., to International Business Machines Corporation. Fluidic information storage cell. 3,717,172, Cl. 137-564.000.

Daimler-Benz Aktiengesellschaft: *See—*

Enke, Kurt; and Altmann, Werner, 3,717,133.

Mischke, Arthur, 3,716,968.

Peter, Wolfgang; and Hanke, Hans, 3,716,995.

Dalbera, Michel Rene Joseph: *See—*

Barriere, Georges Jean Joseph; and Dalbera, Michel Rene Joseph, 3,717,874.

Dale, John, Limited: *See—*

Brownbill, Thomas Duncan, 3,717,281.

Dalhuisen, Albert J.; Deis, William H.; and Burgett, David C., to Merck & Co., Inc. Magnesium oxide dispersions. 3,717,600, Cl. 260-23.00h.

Dalton, John Vincent; Mac Rae, Alfred Urquhart; Mathews, James Robert; Moline, Robert Alan; Pickar, Kenneth Arnold; and Seidel, Harvey Donald, to Bell Telephone Laboratories, Incorporated. Ion implanted silicon diode array targets for electron beam camera ubes. 3,717,790, Cl. 317-1.500.

Dandliker, Rene, to U.S. Philips Corporation. Apparatus for determining the position of an object in an arbitrary cross-section of a beam of radiation. 3,717,404, Cl. 356-106.000.

Danfoss A/S: *See—*

Vind, Holger, 3,716,912.

Daniels, Brian K.; Preston, Jack; and Zaukelies, David A., to Monsanto Company. Flexible rubber articles reinforced with fiber of certain polyamide-hydrazide polymers. 3,717,542, Cl. 161-170.000.

Daniels, Dennis, to U.S. Amada, Ltd. Ironworker. 3,717,059, Cl. 83-401.000.

Daniels, Dennis, to U.S. Amada, Ltd. Punch press. 3,717,061, Cl. 83-409.000.

Davidse, Jan; and Saderson, Hendrik Johannes, to U.S. Phillips Corporation. Colour shifting circuit for a colour television display apparatus. 3,717,727, Cl. 178-5.4he.

Davies, Guy Edward; and Wilson, Christopher Guy Scott, to Plessey Handel und Investments A.G. Pure fluidic devices. 3,717,166, Cl. 137-818.000.

Davis, Burnice D., to Visador Company. Shaper apparatus for woodworking. 3,717,186, Cl. 144-145.00a.

Davis, Edward J.; Cordle, Paul E.; McCubbin, Melvin J.; Lockwood, Donald W.; and Higuera, Richard L., to United States of America, Navy. Warhead breakup sensor. 3,717,098, Cl. 102-70.20r.

Davis, Harry G.: *See—*

McGovern, Terrence P.; Beroza, Morton; Davis, Harry G.; and Eddy, Gaines W., 3,717,706.

Davison, Ernest, to Fluid Power Limited. Link-shaped structure for a press frame. 3,717,024, Cl. 72-455.000.

Davoud, John Gordon, to Cox, Edwin, Associates. Condensable vapor power producing system. 3,716,990, Cl. 60-94.000.

De Gramont, Arnaud Marie-Jose; and Maurin, Jean, to Compagnie Francaise de Raffinage. Process of fractionating hydrocarbon mixtures containing olefins and its application to the purification of isoolefins. 3,717,572, Cl. 208-310.000.

De Lamater, George B.: *See—*

Bechara, Ibrahim S.; De Lamater, George B.; and Milligan, Barton, 3,717,676.

De Mars, Alfred J. Hydraulic vehicle stabilizer. 3,717,355, Cl. 280-124.00f.

De Montmollin, Rene: *See—*

Buehler, Arthur; and De Montmollin, Rene, 3,717,624.

De Penti, Kenneth L., to Midland-Ross Corporation. Car coupler. 3,717,261, Cl. 213-110.000.

De Seversky, Alexander P., to Electronatom Corporation. Wet electrostatic precipitator. 3,716,966, Cl. 55-118.000.

De Wall, Richard A. Perfusion safety valve. 3,717,174, Cl. 137-565.000.

Deane, William Harry; and Crompton, Geoffrey, to Matburn (Holdings) Limited. Hospital lockers. 3,717,398, Cl. 312-283.000.

Decker, William R. Method and apparatus used for book binding. 3,717,366, Cl. 281-21.000.

Deere & Company: *See—*

Copley, Russell Dean; and Schlueter, Francis Edward, 3,716,976.

Deis, William H.: *See—*

Dalhuisen, Albert J.; Deis, William H.; and Burgett, David C., 3,717,600.

Delta Electronics, Inc.: *See—*

Kershner, Stephen W.; and Owen, Kenneth, 3,717,736.

Demarest, Douglas M., to Linker Machines, Inc. Frankfurter separator mechanism with cutter sensor device. 3,716,891, Cl. 17-1.00f.

Demaria, Anthony J.: *See—*

Buczek, Carl J.; Demaria, Anthony J.; Ferrar, Carl M.; and Wayne, Robert J., 3,717,824.

Demchock, Louis A., Jr.; and Greaney, Gerald F., to General Electric Company. Photoflash lamp. 3,717,432, Cl. 431-93.000.

Dennis, Paul A., to Ex-Cell-O Corporation. Tape transport control system. 3,717,316, Cl. 242-190.000.

Dennler, Bernd: *See—*

Baumer, Wilhelm; Fruhstorfer, Wolfgang; Hesse, Reiner; Engelhardt, Manfred; and Dennler, Bernd, 3,717,611.

Densow, Ulrich O., to Outboard Marine Corporation. Chain saw with oil pumping and signaling arrangement. 3,717,221, Cl. 184-6.400.

Design and Manufacturing Corporation: *See—*

Yake, William H., 3,717,168.

Deutsche Edelslahlwerke Aktiengesellschaft: *See—*

Kieffer, Richard; Mariacher, Hans; and Schoof, Hansotto, 3,717,496.

Deutsche Gold- und Silber-Scheideanstalt vormals Roessler: *See—*

Jager, Gerhard; and Kuhner, Gerhard, 3,717,494.

Diamond Shamrock Corporation: *See—*

Palm, Bert E.; and Harwell, Earnest W., 3,717,509.

Scherf, Gerhard W.; and Pfaff, Gary C., 3,717,433.

Diana, Guy D., to Sterling Drug Inc. 1-Phenyl-azacarbocyclic-2-imines. 3,717,648, Cl. 260-293.780.

Dick, A. B., Company: *See—*

Niesen, George P.; Dutko, Wolodymyr; and Garbarino, William L., 3,717,411.

Dick, A. B., Company, mesne: *See—*

Bach, Frederick O.; Chapin, Leo N.; Freed, Robert; and Cernoch, Thomas J., 3,717,463.

Didier-Werke A.G.: *See—*

Koch, Karl Heinz; Koch, Paul; Loorz, Walter; and Schoppa, Hans, 3,717,602.

Dienst, Stanely G., to Extracorporeal Medical Specialties, Inc. Organ enclosure mantle. 3,717,199, Cl. 165-46.000.

Dikinis, Daumantas V.; and Yuen, Moon H., to Bechtel International Corporation. In-line motor heater circuit. 3,717,804, Cl. 318-436.000.

Dimitracopoulos, Panayotis C. Audiovisual slides and data-record cards. 3,717,407, Cl. 353-120.000.

Dinh-Nguyen, Nguyen; and Raal, Aino, to Incentive Research & Development Aktiebolag. Method for the preparation of carboxylic acids by an oxidizing decomposition of organic compounds containing longer carbon chains. 3,717,664, Cl. 260-413.000.

Doggett, Roger H.: *See—*

Shanley, Edward S.; and Doggett, Roger H., 3,717,687.

Donker, Harvey D.; and Kuiper, Warren J. Construction conveying system and components therefor. 3,717,220, Cl. 182-129.000.

Donohue, James P.: *See—*

Gilberg, Robert C.; Donohue, James P.; and Patel, Ramesh S., 3,717,750.

Douglas, Raymond J.: *See—*

Bosley, Denis V.; Crain, Philip W.; Douglas, Raymond J.; Loomis, Bernard; Schlau, Floyd E.; and Staats, William A., 3,716,940.

Douglas, Richard, Jr., to Perfection Electrical Products, Inc. Method of connecting aluminum wire to electrical terminals. 3,717,842, Cl. 339-275.00t.

Douglas, Robert A. Saddle rig bar. 3,716,965, Cl. 54-46.000.

Dow Chemical Company, The: *See—*

Jankowiak, Erwin M.; and Niles, Earl Thomas, 3,717,517.

Dowden, Roy L.; and Russell, Lionel E. Apparatus for use by a rodeo performer for practicing tying the legs of a calf. 3,716,941, Cl. 46-123.000.

Dowty Technical Developments Limited: *See—*

Boydell, Kenneth Raymond, 3,717,175.

Lambeth, Dennis Ernest, 3,717,424.

Doyle, Lawrence O., Jr.; and Meek, Harlen D., to Anti-Pollution Devices, Inc. Filtering apparatus. 3,716,967, Cl. 55-217.000.

Doyle, Nicholas E., Jr., to Foxboro Company, The. Ion-responsive electrode construction. 3,717,565, Cl. 204-195.

Doyle, Thomas R., to Sperry Rand Corporation. Compact depressed electron beam collector. 3,717,787, Cl. 315-3.500.

Dozois, James H.: *See—*

Cooper, Norman F.; Dozois, James H.; and Wanlass, Bert R., 3,716,945.

Du Bois, Edward M. Press device. 3,717,022, Cl. 72-386.000.

Du Pont de Nemours, E. I., and Company: *See—*

Griswold, Paul H., Jr., 3,717,493.

Hartzler, Harris D., 3,717,619.

McClure, George R., 3,717,499.

Shields, John; and Mengason, James, 3,717,076.

Short, Oliver A., 3,717,481.

Smith, Robert D., 3,717,176.

Du Pont of Canada, Limited: *See—*

Pinney, Baden McDowall, 3,717,330.

Dubied, Edouard et Cie (Societe Anonyme): *See—*

Kohler, Fritz, 3,717,014.

Ducey, James A. Valve control mechanism. 3,716,870, Cl. 4-41.000.

Duck, Sherman W.; and Jeffers, Frederick J., to Bell & Howell Company. Method of imaging using interdigitated electrodes, a photoconductive layer and a magnetic imaging layer. 3,717,460, Cl. 96-1.00r.

Dukelow, Donald A.; Orehoski, Michael A.; and Veselinovich, Nick, to United States Steel Corporation. Apparatus for immersing and withdrawing bath examination means into and from a molten bath. 3,717,034, Cl. 73-343.00r.

Duling, Irl N.; and Merges, John C., Jr., to Sun Oil Company. Method for preparing laminated article of cellulosic and polymeric layers. 3,717,534, Cl. 156-309.000.

Dunegan, Harry C.: *See—*

Stradley, Norman H.; and Dunegan, Harry C., 3,717,497.

Dungemittelkombinat veb Sticksloffwerk Piesteritz: *See—*

Herzog, Gunther; Kahle, Gunter; Kolling, Wolfgang; Lamm, Christian; Munch, Ursula; Schumann, Horst; Wolfrom, Walter; Riesel, Werner; and Wagner, Roland, 3,717,489.

Dunlap, Charles K., Jr.: *See—*

Adams, Hal M.; Dunlap, Charles K., Jr.; and Harper, William M., 3,717,291.

Dunlop Company Limited, The: *See—*

Ambrose, John; and Shepherd, Edmund J., 3,717,180.

Harrington, Wilfred H.; and Grossett, Alfred Harry, 3,717,191.

Dunsche, Horst Georg, to Siemens Aktiengesellschaft. Method of gas-tight sealing of semiconductor components. 3,717,523, Cl. 156-69.000.

Duo-Flex Corporation: *See—*

Stanley, John E., 3,716,956.

Dupree, Hans-Werner. Modular shell cabinet structure. 3,717,396, Cl. 312-257.00r.

Durney, George P.: *See—*

Case, Melvin C.; and Durney, George P., 3,717,530.

Dutkewych, Oleh Borys: *See—*

Gulla, Michael; and Dutkewych, Oleh Borys, 3,717,482.

Dutko, Wolodymyr: *See—*

Niesen, George P.; Dutko, Wolodymyr; and Garbarino, William L., 3,717,411.

Dyck, Rudolph H.; and Kabell, Louis J., to Fairchild Camera and Instrument Corporation. High-density linear photosensor array. 3,717,770, Cl. 250-211.00j.

Dynamic Manufacturing Limited: *See—*

Way, Gordon Alexander, 3,717,120.

E-Systems, Inc., mesne: *See—*

Roberts, Harold D., 3,717,539.

Eagle Manufacturing Corporation: *See—*

McMinn, Donald E., 3,717,058.

Earle, William E.: *See—*

Ammino, Raymond; Jordan, William E.; and Earle, William E., 3,717,028.

Eastern Company, The, mesne: *See—*

Greene, Walter J.; and Perron, Robert R., 3,717,027.

Eastman Kodak Company: *See—*

Harvey, Donald Malcolm, 3,717,077.

Eastwood, Ralph W., II. Traction device for vehicles. 3,717,380, Cl. 301-41.00r.

Echols, William H.; Fielding, George H.; and Neihof, Rex A., to United States of America, Navy. Method of disinfecting and self-limiting solution therefor. 3,717,580, Cl. 252-106.000.

Ecodyne Corporation: *See—*

Rayn, Leo F., 3,717,594.

Eddy, Gaines W.: *See—*

McGovern, Terrence P.; Beroza, Morton; Davis, Harry G.; and Eddy, Gaines W., 3,717,706.

Edholm, Paul Ragnvald; and Jacobson, Nils Bertil, to Medinova AB. X-ray filter device in combination with a positioning light converging means. 3,717,768, Cl. 250-86.000.

Edmansson, Kurt Axel Henry; and Karlsson, Ake Gustav-Adolf, to Saab-Scania Aktiebolag. Brake device particularly for hydraulic hand brakes on railroad cars. 3,717,386, Cl. 303-89.000.

Edwards, Robert S.: *See—*

Rigdon, Orville W.; Edwards, Robert S.; and Holst, Edward H., 3,717,561.

Eggert, Noel B., to Owens-Illinois, Inc. Molded plastic container secondary operations machine. 3,716,910, Cl. 29-563.000.

Ehrlich, Nathan, to Bell Telephone Laboratories, Incorporated. Electronic lock. 3,717,866, Cl. 340-147.0md.

Ehrlich, Shelton: *See—*

Robison, Ernest B.; Ehrlich, Shelton; and Bishop, John W., 3,717,700.

Eickhoff, Henry Louis: *See—*

McVay, David Robert; Eickhoff, Henry Louis; and Thatcher, Harry William, 3,717,536.

Ekstam, Martin Rudolf, to Kontrollhuder Ek. For. Arrangement in an overhead track for controlled turning of suspended carcasses. 3,717,240, Cl. 198-33.0ab.

Elder, Robert L.: *See—*

Case, Cecil L.; Elder, Robert L.; and Fell, Ferol S., 3,716,972.

Electronatom Corporation: *See—*

De Seversky, Alexander P., 3,716,966.

Electronic Associates, Inc.: *See—*

Sickel, Gordon E.; and Tempel, George F., 3,717,776.

Electronic Communications, Inc.: *See—*

Stitt, James R., 3,717,756.

Ellis, Gordon Milburn, Jr.: *See—*

Sinclair, James R.; and Ellis, Gordon Milburn, Jr., 3,717,543.

Elox, Inc.: *See—*

Verner, Dalton R., 3,717,741.

Emeis, Reimer: *See—*

Burtscher, Joachim; Emeis, Reimer; and Herlet, Adolf, 3,716,911.

Emery, Douglas M., to Ambrite Computer Rents, Inc. Color coded computer system. 3,717,250, Cl. 209-111.600.

Enders, Dennis C.: *See—*

McGhee, Clarence L.; and Enders, Dennis C., 3,717,030.

Endo, Ichiro: *See—*

Negishi, Hirokazu; Endo, Ichiro; Kinjo, Kikuo; and Yamanouchi, Teruo, 3,717,462.

Endo, Masayuki: *See—*

Ichikawa, Mitsuo; Takeuchi, Yasumasa; Harita, Yoshiyuki; Endo, Masayuki; Yamaguchi, Nobuo; Tashiro, Matsuru; and Kogure, Akira, 3,717,613.

Engelhardt, Manfred: *See—*

Baumer, Wilhelm; Fruhstorfer, Wolfgang; Hesse, Reiner; Engelhardt, Manfred; and Dennler, Bernd, 3,717,611.

English Electric Company Limited: *See—*

Simpson, Michael Charles Stephen; and Felton, Barrie, 3,717,796.

Engman, George E., to Midland Capital Corporation. Linear bidirectional scanning system. 3,717,772, Cl. 250-235.000.

Enke, Kurt; and Altmann, Werner, to Daimler-Benz Aktiengesellschaft. Installation for producing a rotary movement of a valve in an internal combustion engine. 3,717,133, Cl. 123-90.300.

Ennis, Brian, to Asquith, William, Limited. Relating to hydrostatic bearings. 3,717,392, Cl. 308-5.00r.

Enthone, Incorporated: *See—*

Brindisi, Frank A., Jr., 3,717,520.

Entwisle, John Hubert: *See—*

Colchester, John Edward; and Entwisle, John Hubert, 3,717,646.

Erkfritz, Donald S., to Ingersoll Milling Machine Company, The. Indexable cutting insert and holder therefor. 3,716,900, Cl. 29-105.00a.

Ernest, Paul Emile; and Henricot, Alfred Andre, to Societe Anonyme Usines Emile Henricot. Dampened railway car truck bolster. 3,717,106, Cl. 105-197.00d.

- Ertl, Stefan; and Oehme, Friedrich, to Zellweger, Ltd. Process and apparatus for measuring and controlling the concentration of chemical compounds in solutions. 3,717,435, Cl. 23-230.00r.
- Esanu, Andre. Salts of pyridoxine mono-esters. 3,717,636, Cl. 260-268.00h.
- Esso Research and Engineering Company: *See—*
  - McGee, Robert V. J., 3,717,672.
  - Newman, Neil F., 3,717,690.
  - North, Howard C.; Sherman, Harry W.; and Kaplan, Edward B., 3,717,425.
  - Oswald, Alexis A., 3,717,618.
  - Schulman, Bernard L., 3,717,571.
- Esterline Corporation: *See—*
  - Bunning, John G., 3,717,881.
- Estes, John H.: *See—*
  - Suggitt, Robert M.; Estes, John H:; and Kravitz, Stanley, 3,717,586.
- Esveldt, Cornelis Jacobus: *See—*
  - Slijkerman, Nicolaas Petrus; and Esveldt, Cornelis Jacobus, 3,717,578.
- Ethyl Corporation: *See—*
  - Kobetz, Paul; Shapiro, Hymin; and Impastato, Fred J., 3,717,666.
  - Meltsner, Bernard R., 3,717,610.
  - Yang, Meiling T., 3,717,591.
- Etoh, Yukihiro: *See—*
  - Mayashi, Yoshimasa; and Etoh, Yukihiro, 3,717,135.
- Etzel, Leroy: *See—*
  - Tole, John W.; Stoiber, Paul J.; and Etzel, Leroy, 3,716,918.
- Evalds, Egils, to Athena Controls, Inc. Temperature control apparatus with a cyclical distributor. 3,717,300, Cl. 236-1.00e.
- Evans, Homer; and Cole, William R., Jr., to Kellwood Company. Flatiron with work cooling means. 3,716,933, Cl. 38-75.000.
- Evans, James W., to Athletic Swing Measurement, Inc. Athletic swing measurement system. 3,717,857, Cl. 340-177.00r.
- Evans, Wallace D., to Rolatape Corporation. Measuring wheel device. 3,716,919, Cl. 33-141.00e.
- Ex-Cell-O Corporation: *See—*
  - Dennis, Paul A., 3,717,316.
- Explosive Corporation of America: *See—*
  - Yates, Patrick A.; and Higgins, Robert P., 3,717,794.
- Extracorporeal Medical Specialties, Inc.: *See—*
  - Dienst, Stanely G., 3,717,199.
- Fabre, Aime, "Manta". Looms with a stationary weft supply and a weft carrier with gripper. 3,717,181, Cl. 139-125.000.
- Fagersta Bruks Aktiebolag: *See—*
  - Czarnecki, Tadek; and Soderman, Bengt Rolf, 3,717,368.
- Fahey, Darryl R., to Phillips Petroleum Company. Promoted trihydrocarbylphosphine modified carbonyl cobalt catalyst system. 3,717,585, Cl. 252-431.00p.
- Fairchild Camera and Instrument Corporation: *See—*
  - Dyck, Rudolph H.; and Kabell, Louis J., 3,717,770.
- Falcone, Anthony, Jr.: *See—*
  - Falcone, Joseph R.; and Falcone, Anthony, Jr., 3,717,126.
- Falcone, Joseph R.; and Falcone, Anthony, Jr. Feeder. 3,717,126, Cl. 119-52.00r.
- Faley, Arnold F., to Moore Dry Kiln Company of Oregon. Sorter and stacker for veneer sheet and strip material. 3,717,249, Cl. 209-75.000.
- Faltin, Hans G., to Advance Enterprises, Inc. Cross-web folder for sheet material. 3,717,335, Cl. 270-79.000.
- Falvert, Daniel; Raciazek, Andre; Authie, Gerard; Clot, Jean; and Giraud, Alain, to Compagnie Generale d'Automatisme. Traffic simulator. 3,717,757, Cl. 235-184.000.
- Farah Manufacturing Company, Inc.: *See—*
  - Schwartz, Samuel M., 3,717,150.
- Farbenfabriken Bayer Aktiengesellschaft: *See—*
  - Buchel, Karl-Heinz; Regel, Erik K.; and Plempel, Manfred, 3,717,657.
  - Lorenz, Walter; and Hammann, Ingeborg, 3,717,631.
- Farbwerke Hoechst Aktiengesellschaft vormals Meiste Lucius & Bruning: *See—*
  - Kampe, Klaus-Dieter, 3,717,556.
- Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning: *See—*
  - Brenneisen, Erich; Lindner, Helmut; and Schmidt, Heinz, 3,717,626.
  - Tucking, Werner; and Roder, Gerhard, 3,717,426.
- Farrah, Harry Robert; Marom, Emanuel; and Mueller, Rolf K., to Bendix Corporation, The. Holographic system for forming images of both stationary and moving objects. 3,717,843, Cl. 340-1.00r.
- Farrington, Frederick: *See—*
  - Nicklin, Thomas; and Farrington, Frederick, 3,717,699.
- Farrissey, William J., Jr.: *See—*
  - Von Doering, William E.; Farrissey, William J., Jr.; Frulla, Floro F.; and Sayigh, Adnan A. R., 3,717,683.
- Fawkes, Donald G., to Pratt, Henry, Company. Light operated valve position indicating system. 3,717,171, Cl. 137-552.000.
- Federal Products Corporation: *See—*
  - Worthen, John H., 3,716,920.
- Fehr, Norbert, to A.C.I. Trust. Three-dimensional upholstery element. 3,716,875, Cl. 5-345.000.
- Feierstein, Harold E.: *See—*
  - Feiler, William A.; Feierstein, Harold E.; Shen, Chung Yu; and Stahlheber, Norman Earl, 3,717,589.
- Feiler, William A.; Feierstein, Harold E.; Shen, Chung Yu; and Stahlheber, Norman Earl, to Monsanto Company. Sodium nitrilotriacetate and processes for producing same. 3,717,589, Cl. 252-523.000.
- Fell, Ferol S.: *See—*
  - Case, Cecil L.; Elder, Robert L.; and Fell, Ferol S., 3,716,972.
- Fellbrink, Karl Alf, to Gustafson, Hans Hjalmar. Container for transport, storage and handling. 3,717,296, Cl. 229-23.00a.
- Felton, Barrie: *See—*
  - Simpson, Michael Charles Stephen; and Felton, Barrie, 3,717,796.
- Fentron Industries, Inc.: *See—*
  - Chakravarti, Diptiman; Surendranath, Jack G.; and Orth, Richard Duncan, 3,717,555.
- Fernseh GmbH: *See—*
  - Legler, Ernst, 3,717,826.
- Ferrar, Carl M.: *See—*
  - Buczek, Carl J.; Demaria, Anthony J.; Ferrar, Carl M.; and Wayne, Robert J., 3,717,824.
- Fertin, Jacques: *See—*
  - Thillays, Jacques; and Fertin, Jacques, 3,717,800.
- Fetty, Robert L. Liquid water-soluble detergent compositions. 3,717,590, Cl. 252-540.000.
- Fiala, Ferdinand: *See—*
  - Marti, Heinrich; Zeller, Josef K.; and Fiala, Ferdinand, 3,717,198.
- Fiat Societa per Azioni: *See—*
  - Michellone, Giancarlo; and Palazzetti, Mario, 3,717,385.
- Fielding, George H.: *See—*
  - Echols, William H.; Fielding, George H.; and Neihof, Rex A., 3,717,580.
- Finch, William A.: *See—*
  - Loughridge, Frederick A.; and Finch, William A., 3,717,450.
- Fiore, Joseph Vincent: *See—*
  - Jacin, Harry; and Fiore, Joseph Vincent, 3,717,155.
- Fioriti, Joseph A.; Stahl, Howard D.; Sims, Rex J.; and Spotholz, Clifford H., to General Foods Corporation. Low cholesterol egg process. 3,717,474, Cl. 99-113.000.
- Fischer, Adolf: *See—*
  - Rohr, Wolfgang; and Fischer, Adolf, 3,717,668.
- Fischer, Paul W.: *See—*
  - Scheffel, John W.; and Fischer, Paul W., 3,717,204.
- Flaherty, Roger J., to Allied Control Company, Inc. Electromagnetic relay. 3,717,829, Cl. 335-187.000.
- Flatten, Orris A.: *See—*
  - Buddecke, Charles L., 3,717,037.
- Fletcher, H. E., Co.: *See—*
  - Fletcher, Ralph A.; and Oliver, Joseph R., 3,717,379.
- Fletcher, Ralph A.; and Oliver, Joseph R., to Fletcher, H. E., Co. Apparatus for cutting and splitting mineral bodies and other materials. 3,717,379, Cl. 299-22.000.
- Flextrac Nodwell Ltd.: *See—*
  - Muecke, Kurt H.; and Milnes, Marchall A., 3,717,217.
- Florens, Raymond Leopold; and Pollet, Robert Joseph, to Gevaert-Afga N.V. Fogged direct positive silver halide element containing a selenium compound sensitizer. 3,717,466, Cl. 96-107.000.
- Fluck, Rene, to Schweizerische Industrie-Gesellschaft. Counting device for regularly shaped, preferably flat articles, for example, biscuits (or cookies). 3,717,751, Cl. 235-92.0pk.
- Fluid Power Limited: *See—*
  - Davison, Ernest, 3,717,024.
- Fluor Drilling Services, Inc.: *See—*
  - Wilde, Arthur E., 3,717,113.
- Flynn, Stephen Donald. Resuscitator. 3,717,147, Cl. 128-145.800.
- FMC Corporation: *See—*
  - Chakrabarti, Paritosh M.; Stange, Hugo; and Volpp, Gert Paul, 3,717,616.
  - Robbins, Robert P.; and Thys, Thierry, 3,717,084.
  - Severns, Richard Ray; Sullivan, James Kirk; and Simmons, Lynn Coulson, 3,717,451.
  - Short, Charles R.; and Billett, Ronald J., 3,717,336.
- FMC Corporation, mesne: *See—*
  - Craft, Roger L., 3,717,193.
- Fohr, Thomas E., to Allied Chemical Corporation. Unitary seat belt buckle. 3,716,895, Cl. 24-230.0al.
- Fonken, Gunther S.: *See—*
  - Herr, Milton E.; Murray, Herbert C.; and Fonken, Gunther S., 3,717,650.
  - Herr, Milton E.; Murray, Herbert C.; and Fonken, Gunther S., 3,717,677.
- Formac International, Inc., mesne: *See—*
  - Schoonover, Richard H. A., 3,717,214.
- Fottler, Stanley A., to Circa Tran. Inc. Method and apparatus for forming printed circuit boards with infrared radiation. 3,717,742, Cl. 219-85.000.
- Foty, James V., to Lear Siegler, Inc. Damper drive for ventilator system. 3,717,080, Cl. 98-38.000.
- Fox, Homer M., to Phillips Petroleum Company. Method and apparatus for reducing engine exhaust pollutants. 3,717,129, Cl. 123-1.00a.
- Fox, John E. Ski boot traction device. 3,717,238, Cl. 36-61.000.
- Fox, Robert D.; Rains, William A.; and Lambert, Gerald G., to United States of America, Air Force. Rocket propellant and method. 3,717,518, Cl. 149-36.000.
- Foxboro Company, The: *See—*

  - Ammino, Raymond; Jordan, William E.; and Earle, William E., 3,717,028.
  - Doyle, Nicholas E., Jr., 3,717,565.
  - Prescott, Robert C., 3,717,162.
- Franklin Electric Co., Inc.: *See—*
  - Schaefer, Edward J., 3,717,421.
- Franz, Ilse; and Langheinrich, Werner, to Telefunken Patentverwertungsgesellschaft m.b.H. Method for treating the surface of a container and a container produced by the method. 3,717,498, Cl. 117-70.00a.
- Freed, Robert: *See—*
  - Bach, Frederick O.; Chapin, Leo N.; Freed, Robert; and Cernoch, Thomas J., 3,717,463.
- Fregnan, Gian Carlo: *See—*
  - Arcari, Giuliana; Fregnan, Gian Carlo; Temperilli, Aldemio; and Ulivi, Pietro, 3,717,640.
- Freije, Michell J. Wire cutter and stripper. 3,716,914, Cl. 30-90.100.
- Frenken, Hans: *See—*
  - Heyl, Gerhard; Luttgens, Gunter; Behr, Rolf; Maus, Fritz; Frenken, Hans; Busch, Josef; Bruck, Herbert; and Schaffer, Helmut, 3,717,791.
- Frenken, Klaus: *See—*
  - Strack, Friedhelm; Keuper, Erich; and Frenken, Klaus, 3,717,197.
- Fried, George; and Hirschman, Shalom Z., to Greiner Scientific Corporation. Tray rack. 3,717,259, Cl. 211-126.000.
- Friederichs, Haas, to Holtz, Hermann. Magnetic board with chart and markers. 3,716,935, Cl. 40-142.00a.
- Frill, Richard K.: *See—*
  - Jeffrey, William B.; and Frill, Richard K., 3,717,260.
- Frolov, Jury Fedorovich: *See—*
  - Zinkovsky, Viktor Petrovich; Sukoian, Nariman Alexandrovich; Alyanov, Vladimir Fedorovich; and Frolov, Jury Fedorovich, 3,717,712.
- Fromm, Howard V.: *See—*
  - Pedersen, Nicholas F.; Fromm, Howard V.; Kent, Melvin L.; and Olmstead, Don G., 3,717,423.
- Frshova, Vera Alexandrovna: *See—*
  - Slonimsky, Grigory Lvovich; Tolstoguzov, Vladimir Borisovich; Frshova, Vera Alexandrovna; and Izjumov, Dmitry Borisovich, 3,717,469.
- Fruhstorfer, Wolfgang: *See—*
  - Baumer, Wilhelm; Fruhstorfer, Wolfgang; Hesse, Reiner; Engelhardt, Manfred; and Dennler, Bernd, 3,717,611.
- Frulla, Floro F.: *See—*
  - Von Doering, William E.; Farrissey, William J., Jr.; Frulla, Floro F.; and Sayigh, Adnan A. R., 3,717,683.
- Fuehrer, Charles: *See—*
  - Stoffel, John F.; and Fuehrer, Charles, 3,717,369.
- Fuji Photo Film Co., Ltd.: *See—*
  - Aonuma, Masashi; Fujiyama, Masaaki; and Akashi, Goro, 3,717,504.
  - Honjo, Satoru, 3,717,461.
  - Ogura, Shuichi, 3,717,078.
  - Takimoto, Hisa'hi, 3,717,057.
- Fuji Shashin Film Kabushiki Kaisha: *See—*
  - Fujimura, Ikuo; and Takano, Masao, 3,717,764.
- Fujii, Mitsuharu: *See—*
  - Yokotsuka, Tamotsu; Iwaasa, Takashi; and Fujii, Mitsuharu, 3,717,470.
- Fujimura, Ikuo; and Takano, Masao, to Fuji Shashin Film Kabushiki Kaisha. Intensifying screen for radiograph use. 3,717,764, Cl. 250-80.000.
- Fujisawa, Yutaka: *See—*
  - Kishi, Ichiro; Matsui, Kazuyuki; and Fujisawa, Yutaka, 3,717,196.
- Fujitsu Limited: *See—*
  - Kanda, Kaoru; and Nagahori, Tetuo, 3,717,846.
- Fujiwara, Tuneaki: *See—*
  - Fukai, Akimasa; Fujiwara, Tuneaki; and Abe, Takao, 3,717,161.
- Fujiyama, Masaaki: *See—*
  - Aonuma, Masashi; Fujiyama, Masaaki; and Akashi, Goro, 3,717,504.
- Fukai, Akimasa; Fujiwara, Tuneaki; and Abe, Takao, to Kuraray Co. Ltd. Apparatus for liquid treatment of sheet material. 3,717,161, Cl. 134-64.000.
- Fukumoto, Kenichi; Nakamura, Tokunori; and Kadota, Kenji, to Shikoku Kaken Kogyo Kabushiki Kaisha. Foamed products of silica and manufacturing the same from silica gel. 3,717,486, Cl. 106-40.00v.
- Funkhouser, Richard L.: *See—*
  - Schutrum, Walter L.; and Funkhouser, Richard L., 3,717,400.
- Furuyama, Hidezo: *See—*
  - Shirato, Akira; Furuyama, Hidezo; and Aoki, Masaru, 3,717,522.
- Fushiki, Isamu: *See—*
  - Sakamoto, Kenro; Fushiki, Isamu; Shimizu, Fumio; and Sugita, Sadao, 3,717,465.
- Futaba Netsukagaku Kenkyujo Ltd., The: *See—*
  - Takase, Katsuyasu; Nakane, Yuzo; and Yomura, Masamichi, 3,716,924.
- Fuyuki, Minoru, to Konishiroku Photo Industry Co., Ltd. Drying means for electrophotographic copying machines. 3,717,747, Cl. 219-216.000.
- Fuzzell, Joe E., to Caterpillar Tractor Co. Proximity switch magnet control for bucket positioner. 3,717,073, Cl. 91-388.000.
- Gadelle, Claude: *See—*
  - Alagy, Jacob; Busson, Christian; Gadelle, Claude; and Seree de Roch, Irenee, 3,717,662.
- Gaeddert, Melvin V., to Hesston Corporation. Rotor for chopping residue from combines. 3,717,062, Cl. 146-107.000.
- GAF Corporation: *See—*
  - Radin, Edward J.; and Sames, Delbert W., 3,717,408.
  - Waring, James R., 3,717,484.
- Gag de France: *See—*
  - Pierre, Remi; Guillet, Leon Alain; and Glachant, Luc Clement Dominique, 3,717,139.
- Galantay, Eugene E.: *See—*
  - Coombs, Robert V.; and Galantay, Eugene E., 3,717,663.
- Gans, Michael James, to Bell Telephone Laboratories, Incorporated. Cophasing diversity communication system with pilot feedback. 3,717,814, Cl. 325-56.000.
- Ganssle, Eugene R., to Neotec Corporation. Collapsible reflector. 3,717,879, Cl. 343-915.000.
- Garbarino, William L.: *See—*
  - Niesen, George P.; Dutko, Wolodymyr; and Garbarino, William L., 3,717,411.
- Garcia, Armando J.; Gunther, Gregory M.; and Villanueva, Juanito O., to Mattel, Inc. Figure toy having a limb including a tensioned, detented connector. 3,716,942, Cl. 46-163.000.
- Garcia, Hernando Javier; Peek, Benjamin Roger; and Meza, Jose, to Integrated Systems Technology, Inc., mesne. Radio frequency power amplifier. 3,717,820, Cl. 330-21.000.
- Garrard, Bruce. Beverage dispensing valve. 3,717,284, Cl. 222-108.000.
- Gartner, Robert J.: *See—*
  - Abdale, John M.; Gartner, Robert J.; and Knudsen, Karl J., 3,717,823.
- Gas Council, The: *See—*
  - Nicklin, Thomas; and Farrington, Frederick, 3,717,699.
- Gatlin, Lonnie E.: *See—*
  - Seabourn, Ed. O.; and Gatlin, Lonnie E., 3,716,896.
- Gauch, Georg: *See—*
  - Schmalfeld, Paul; Mosberger, Erich; and Gauch, Georg, 3,717,438.
- Gay, Derek J.; Smedley, William H.; and Miller, Anthony D., to Mattel, Inc. Spring actuated projector having gravity fed magazine. 3,717,136, Cl. 124-21.000.
- Gedemer, Fred J.: *See—*
  - Reynolds, George E.; Mattison, Donald J.; and Gedemer, Fred J., 3,716,964.
- Geering, Emil J.; and Stratton, George B., to Hooker Chemical Corporation. Process of preparing mercaptophenols. 3,717,682, Cl. 260-609.00d.
- Gehrmann, Klaus: *See—*
  - Sennewald, Kurt; Hauser, Alfred; Gehrmann, Klaus; Steil, Karl-Heinz; and Lork, Winfried, 3,717,675.
- Geiger, Robert C.: *See—*
  - Stokes, John J., Jr.; Cargnel, Robert A.; and Geiger, Robert C., 3,716,909.
- Geipel, Ernest W., to Crane Co. Ball valves. 3,717,323, Cl. 251-315.000.
- Gemco Electric Company: *See—*
  - Cork, Gordon H.; and Tenniswood, David M., 3,716,986.
- General Electric Co.: *See—*
  - Schultz, William James; and Kernander, Warren Norman, 3,717,319.
- General Electric Company: *See—*
  - Beggs, James E., 3,717,503.
  - Bowers, David L., 3,717,153.
  - Demchock, Louis A., Jr.; and Greaney, Gerald F., 3,717,432.
  - Holub, Fred F.; and Pauze, Denis R., 3,717,615.
  - Plett, Don A.; Owen, Louis L.; and Tenkman, Robert H., 3,717,038.
  - Slattery, John P., 3,717,010.
  - Vanbennekom, Carl Frederick; and Schultz, William James, 3,717,118.
- General Foods Corporation: *See—*
  - Fioriti, Joseph A.; Stahl, Howard D.; Sims, Rex J.; and Spotholz, Clifford H., 3,717,474.
  - Lipfert, Donald E., 3,717,478.
- General Mills, Inc.: *See—*
  - Peerman, Dwight E.; and Van Demmeltraadt, Huibert, 3,717,528.
  - Rogier, Edgar R., 3,717,598.
- General Motors Corporation: *See—*
  - Alfes, John A., 3,717,223.
  - Bellware, James D., 3,716,887.
  - Boys, Donald R.; and White, Ernest W., 3,717,119.
  - Butts, Mervin R., 3,717,009.
  - Carpenter, Keith H., 3,717,048.
  - Chana, Howard E.; Rado, Joseph; and White, Harold D., 3,717,131.
  - Cooper, Norman F.; Dozois, James H.; and Wanlass, Bert R., 3,716,945.
  - Harned, John L., 3,717,384.
  - Hartmann, Dieter, 3,717,230.
  - Klomp, Edward D., 3,716,886.
  - Lundbom, Calvin F., 3,717,050.
  - McMurray, Nolan D.; and Tumey, Morris J., 3,717,443.
  - Perlick, Mark A., 3,717,229.
  - Porter, Glenn A.; and Roth, Norman J., 3,717,731.
  - Porter, Glenn A., 3,717,732.

  - Potter, Carl Richard, 3,717,212.
  - Ritter, Thomas E., 3,717,354.
  - Thornburgh, William F., 3,717,130.
  - Upp, Donald L., 3,717,138.
  - Van Slooten, Louis J., 3,717,132.
  - Vukovich, William J., 3,717,017.
- Genest, Adrien P.; and Asselin, Jean C. Automotive vehicle parking system. 3,717,266, Cl. 214-16.1ec.
- Gerken, Carl F., to American Standard, Inc. Coilable partition with passdoor. 3,717,194, Cl. 160-25.000.
- Gerlach, Helmut, to Zeiss-Strftung, Carl. Liquid laser. 3,717,825, Cl. 331-94.500.
- Germino, Felix J.; and Caraccia, Joseph R., to CPC International Inc. Starch products having unique gelling properties and process for preparing same. 3,717,475, Cl. 99-134.000.
- Gevaert-Afga N.V.: *See—*
  - Florens, Raymond Leopold; and Pollet, Robert Joseph, 3,717,466.
- Gevaert-Agfa N.V.: *See—*
  - Stievenart, Emile Frans, 3,716,926.
- Ghiron, Hugo; and Ulrich, Werner, to Bell Telephone Laboratories, Incorporated. Programmed data processing with facilitated transfers. 3,717,850, Cl. 340-172.500.
- Gibsen, Kenneth F.; and Saddington, Arthur W., to Kelco Company. Applying agricultural chemicals with xanthomonas hydrophillic colloids. 3,717,452, Cl. 71-117.000.
- Giebler, Fritz: *See—*
  - Jaskulke, Gerhard; Mayer, Max; Lampe, Bernst; Giebler, Fritz; and Steigenberger, Hasso, 3,717,723.
- Gilardine, Paolo: *See—*
  - Masino, Carlo; and Gilardine, Paolo, 3,716,913.
- Gilberg, Robert C.; Donohue, James P.; and Patel, Ramesh S., to National Cash Register Company, The. Input control logic for a code reading system. 3,717,750, Cl. 235-61.11e.
- Gillchriest, William Clarence, to International Development Labs. Process for purification of tungsten. 3,717,697, Cl. 423-58.000.
- Gille, John P.: *See—*
  - McGrew, Jay L.; Sharp, Richard A.; Mowrey, Eugene C.; Thomas, Donald A.; and Gille, John P., 3,717,005.
- Gilmore-Tatge Mfg. Co., Inc.: *See—*
  - Chartier, Richard G.; and Chaffee, Robert C., 3,717,272.
- Giraud, Alain: *See—*
  - Falvert, Daniel; Raciazek, Andre; Authie, Gerard; Clot, Jean; and Giraud, Alain, 3,717,757.
- Girling Limited: *See—*
  - Rath, Heinrich Bernhard, 3,717,227.
  - Rees, Jrhn Robert, 3,717,226.
- Glachant, Luc Clement Dominique: *See—*
  - Pierre, Remi; Guillet, Leon Alain; and Glachant, Luc Clement Dominique, 3,717,139.
- Glaxo Laboratories Limited: *See—*
  - Laing, Stuart Bruce; and Sykes, Peter Job, 3,717,627.
- Glesmann, Donald E., to Tescom Corporation. Proportional gas mixing apparatus. 3,717,177, Cl. 137-607.000.
- Glintz, Georgia E. Resilient hair dryer cushion. 3,716,877, Cl. 5-338.000.
- Gnaedinger, Donald J.; and Staley, Gerald E., to Basler Electric Company. Electrical power center for recreational vehicles. 3,717,805, Cl. 321-8.00r.
- Godart, Michel, to Commissariat a l'Energie Atomique. Device for leak-tight transfer of objects. 3,717,267, Cl. 214-17.00b.
- Godefroi, Erik Fred; and Heeres, Jan, to Janssen Pharmaceutica, N.V. 1-(β-Aryl)ethyl-imidazole derivatives. 3,717,655, Cl. 260-309.000.
- Goffredo, Onfrio: *See—*
  - Bernardi, Luigi; and Goffredo, Onfrio, 3,717,673.
- Gold, Raymond; and Porges, Karl G., to United States of America, Atomic Energy Commission. Detection system for heavy and superheavy cosmic ray nuclei. 3,717,767, Cl. 250-83.60r.
- Goldschmidt, Th., A.-G.: *See—*
  - Hofmann, Eberhard; and Holtschmidt, Ulrich, 3,717,579.
- Goldstein, Albert H., 50% to Leisure, Wallace, Products, Inc. Vacuum cleaner. 3,716,889, Cl. 15-366.000.
- Goodman, H., & Sons, Inc.: *See—*
  - Sidelman, Abraham, 3,717,157.
- Goodwin, William Reuther: *See—*
  - Juby, Peter Frederick; Goodwin, William Reuther; and Hudyma, Thomas William, 3,717,661.
- Gordon, Bernard M.; Neumann, Leopold; and Kirsch, Ivan H., to Gordon Engineering Company. Ultrasonic apparatus, particularly for thermometry. 3,717,033, Cl. 73-339.00a.
- Gordon Engineering Company: *See—*
  - Gordon, Bernard M.; Neumann, Leopold; and Kirsch, Ivan H., 3,717,033.
- Gordon, John Edward. Rope feed piston assembly. 3,717,071, Cl. 92-137.000.
- Gosselin, Kenneth F.: *See—*
  - Alexander, Warner; Gosselin, Kenneth F.; and McEvoy, James E., 3,717,588.
- Grace, W. R., & Co.: *See—*
  - Schirmer, Henry G., 3,717,541.
- Gracin, William J.; and Jones, Roy Lee, 33 1/3 interest to Stanford, Raymond L. Pipe cutting tool. 3,717,056, Cl. 82-82.000.
- Graeme-Noel, Basil: *See—*
  - Vaughan, William Lee; and Graeme-Noel, Basil, 3,717,840.
- Graf, Max E., to Badische Maschinenfabrik GmbH. Method and apparatus for cleaning and recuperating shot in the circulatory system of blasting apparatus. 3,716,946, Cl. 51-9.000.
- Graf, Stefano Arturo: *See—*
  - Amemiya, Hiroshi; and Graf, Stefano Arturo, 3,717,821.
- Grant, Norman H.; and Alburn, Harvey E., to American Home Products Corporation. 2-Phenoxyalkanoic acid esters. 3,717,669, Cl. 2500-473.00g.
- Greaney, Gerald F.: *See—*
  - Demchock, Louis A., Jr.; and Greaney, Gerald F., 3,717,432.
- Green, David T., to United States Surgical Corporation. Cartridge and powering instrument for stapling skin and fascia. 3,717,294, Cl. 227-19.000.
- Green, Morris L. Cassette caddy. 3,717,188, Cl. 150-1.000.
- Greene, Walter J.; and Perron, Robert R., to Eastern Company, The, mesne. Digital display distance log. 3,717,027, Cl. 73-181.000.
- Greenwood, Eugene C. Heart rate counter with digital storage and numerical readout. 3,717,140, Cl. 128-2.05t.
- Greiner Scientific Corporation: *See—*
  - Fried, George; and Hirschman, Shalom Z., 3,717,259.
- Grenier, Raymond P.; and Welsh, William F., to Baird-Atomic, Inc. Sensing matrix for a radioactivity-distribution detector. 3,717,762, Cl. 250-71.50r.
- Griffin, William S., to Northrop Corporation. Vent pressure control for multi-stage fluid jet amplifier. 3,717,164, Cl. 137-810.000.
- Griswold, Paul H., Jr., to Du Pont de Nemours, E. I., and Company. Production of phthalocyanine pigment. 3,717,493, Cl. 106-288.00q.
- Gross, Carl E. Condensor spring depressor pliers. 3,716,878, Cl. 7-5.000.
- Gross, Erich Wilhelm, to Moeller & Neumann GmbH. Roll stands for rolling mills. 3,717,021, Cl. 72-248.000.
- Grossett, Alfred Harry: *See—*
  - Harrington, Wilfred H.; and Grossett, Alfred Harry, 3,717,191.
- Grunig, James K.; Anderson, Rodney J.; and Vance, Bess L., to Anaconda Company, The. Crystallization of beryllium sulfate. 3,717,437, Cl. 23-24.00b.
- Gryctko, Carl E., to I-T-E Imperial corporation. Leakage current interrupter device. 3,717,792, Cl. 317-18.00d.
- GTE Sylvania Incorporated: *See—*
  - Lieberman, Daniel; and Neuber, Ralph E., 3,717,813.
- Guderjahn, Charles A., to North American Rockwell Corporation. Low drag magnetic suspension system. 3,717,103, Cl. 104-148.0ss.
- Guernet, Georges, to Commissariat a l'Energie Atomique. System of electrostatic quadrupole micro-lenses. 3,717,785, Cl. 313-231.000.
- Guichard, Geoffroy; and Le Bolloch, Rene, to Societe Milliat Freres. Treatment of grain. 3,717,480, Cl. 99-233.300.
- Guillet, Claude: *See—*
  - Peronnon, Christian; and Guillet, Claude, 3,717,359.
- Guillet, James Edwin, to University of Toronto, The Governors of the. Molecular probe apparatus. 3,717,040, Cl. 73-432.0ps.
- Guillet, Leon Alain: *See—*
  - Pierre, Remi; Guillet, Leon Alain; and Glachant, Luc Clement Dominique, 3,717,139.
- Guillo, Jacques: *See—*
  - Hondermarck, Jean Claude; Bennett, Ian Cameron; and Guillo, Jacques, 3,717,552.
- Gulbins, Erich: *See—*
  - Hauss, Alfred; Kieferle, Fritz; Kovacs, Jenoe; and Gulbins, Erich, 3,717,621.
- Gulbrandsen, Arthur F., to Cities Service Oil Company. Gasoline blending apparatus. 3,717,283, Cl. 222-76.000.
- Gulf Oil Corporation: *See—*
  - Peterson, Frank C.; and Theard, Leslie P., 3,717,557.
  - Unkle, Truman F., Jr.; and Loos, John F., 3,717,505.
- Gulf Research & Development Company: *See—*
  - Hay, Russell G.; Notaro, Vincent A.; and Selwitz, Charles M., 3,717,685.
  - Notaro, Vincent A.; and Selwitz, Charles M., 3,717,684.
  - Spanbauer, Francis L., 3,717,810.
- Gulla, Michael; and Dutkewych, Oleh Borys, to Shipley Company, Inc. Stabilized electroless plating solutions. 3,717,482, Cl. 106-1.000.
- Gullotti, Damian V.: *See—*
  - Sperry, Philip R.; and Gullotti, Damian V., 3,717,512.
- Gunther, Gregory M.: *See—*
  - Garcia, Armando J.; Gunther, Gregory M.; and Villanueva, Juanito O., 3,716,942.
- Gustafson, Hans Hjalmar: *See—*
  - Fellbrink, Karl Alf, 3,717,296.
- Gutshall, Charles E., to Textron, Inc. Method and apparatus for tire studs. 3,717,189, Cl. 152-210.000.
- Haan, Tammo: *See—*
  - Stupf, Ewald; and Haan, Tammo, 3,716,970.
- Haban, Joseph. Shear fingers for sickle bars. 3,716,978, Cl. 56-310.000.
- Haberthier, Wilbert L. Boat trailers. 3,717,356, Cl. 280-414.00r.
- Hadden, David M. Two conductor telemetering system. 3,717,858, Cl. 340-203.000.
- Hagino, Hiroshi: *See—*
  - Nakayama, Kiyoshi; and Hagino, Hiroshi, 3,717,547.
- Hagler, Robert G., to Texas Instruments, Incorporated. Transporting and positioning system. 3,717,381, Cl. 302-31.000.
- Haimovich, Joseph; and Sela, Michael. Protein-bacteriophage conjugates. 3,717,705, Cl. 424-12.000.

- Halbeck, Werner B., to Cutler-Hammer, Inc. Integrated wire termination system having integrally formed retainer. 3,717,838, Cl. 339-74.00r.
- Hall, Clifford; and Holdsworth, John E., to USM Corporation. Area measuring machines. 3,717,414, Cl. 356-158.000.
- Hallerback, Stig Lennart, to SKF Industrial Trading and Development Company NV. Bearing support. 3,717,779, Cl. 310-91.000.
- Halloran, William X. Threaded intramedullary compression and fixation device. 3,717,146, Cl. 128-92.0bc.
- Halone, William. Golf ball retriever. 3,717,371, Cl. 294-19.00a.
- Halton City State Bank, mesne: *See—*
  - Campbell, James W., 3,717,265.
- Hammann, Ingeborg: *See—*
  - Lorenz, Walter; and Hammann, Ingeborg, 3,717,631.
- Hampton, Quentin L. Method and apparatus for filtering solids. 3,717,251, Cl. 210-80.000.
- Handa, Itsuo. Measuring apparatus for eight millimeter film editing machine. 3,717,406, Cl. 352-172.000.
- Handschuch, Karl; and Schumann, Fritz, to Schubert & Salzer Maschinenfabrik Aktiengesellschaft. Method and arrangement for supplying sliver to fine spinning machine. 3,716,979, Cl. 57-34.00r.
- Haney, Jerome V.; and Hargis, John C., to Haney Recreational Equipment Company. Basketball training aid. 3,717,342, Cl. 273-1.50a.
- Haney Recreational Equipment Company: *See—*
  - Haney, Jerome V.; and Hargis, John C., 3,717,342.
- Hanke, Hans: *See—*
  - Peter, Wolfgang; and Hanke, Hans, 3,716,995.
- Hanninen, Albert E.; and Scanlon, Shaun M., to Sanders Associates, Inc. Cavity backed spiral antenna. 3,717,877, Cl. 343-872.000.
- Hansen, Gerhard. Apparatus for temporarily reducing the volume of a synthetic material container. 3,717,430, Cl. 425-392.000.
- Harada, Setsuo: *See—*
  - Kishi, Toyokazu; Asai, Mitsuko; Harada, Setsuo; Muroi, Masayuki; and Misuno, Komei, 3,717,707.
- Harbonn, Jacques: *See—*
  - Barret, Jean Pierre; Jourdan, Gerard; and Harbonn, Jacques, 3,717,844.
- Hardenbrook, Harry J.: *See—*
  - Berndt, Wilbur C.; and Hardenbrook, Harry J., 3,717,145.
- Hardtmann, Goetz E., to Sandoz-Wander, Inc. 3-Cyano-2-substituted-5-aryl-pyridine derivatives. 3,717,645, Cl. 260-294.900.
- Hargis, John C.: *See—*
  - Haney, Jerome V.; and Hargis, John C., 3,717,342.
- Harita, Yoshiyuki: *See—*
  - Ichikawa, Mitsuo; Takeuchi, Yasumasa; Harita, Yoshiyuki; Endo, Masayuki; Yamaguchi, Nobuo; Tashiro, Matsuru; and Kogure, Akira, 3,717,613.
- Harman-Kordon, Incorporated: *See—*
  - Auerbach, Richard, 3,717,817.
- Harned, John L., to General Motors Corporation. Anti-lock brake control system. 3,717,384, Cl. 303-21.0be.
- Harper, William Lyle; and Smith, Wesley Earl, to United States of America, Atomic Energy Commission. Truxene polymer and method for its preparation. 3,717,622, Cl. 260-93.50c.
- Harper, William M.: *See—*
  - Adams, Hal M.; Dunlap, Charles K., Jr.; and Harper, William M., 3,717,291.
- Harrington, Wilfred H.; and Grossett, Alfred Harry, to Dunlop Company Limited, The. Pneumatic tire with a breaker of variable stiffness. 3,717,191, Cl. 152-361.000.
- Harris-Intertype Corporation: *See—*
  - Anderson, Charles Ernest, 3,716,907.
  - Crum, James N., 3,717,092.
- Hartford, Huntington. Indoor-outdoor tennis game. 3,717,343, Cl. 273-30.000.
- Hartmann, Dieter, to General Motors Corporation. Friction clutch plate. 3,717,230, Cl. 192-107.00r.
- Hartung, Gerhard, to Joisten & Kettenbaum Elektro-Maschinenfabrik. Apparatus for forming articles of thermoplastic film. 3,717,538, Cl. 156-497.000.
- Hartung, Ray E. Humidifier attachment for clothes dryers. 3,716,925, Cl. 34-80.000.
- Hartzler, Harris D., to Du Pont de Nemours, E. I., and Company. Tetrathiooxalate polymers and their preparation. 3,717,619, Cl. 260-79.000.
- Harvey, Donald Malcolm, to Eastman Kodak Company. Exposure control apparatus. 3,717,077, Cl. 95-10.0ce.
- Harvey, Robert J., to Mirlin Corporation Wayland. Can-straw construction. 3,717,476, Cl. 99-138.00r.
- Harwell, Earnest W.: *See—*
  - Palm, Bert E.; and Harwell, Earnest W., 3,717,509.
- Hatano, Isao; Nagano, Akira; and Urasaki, Kazuaki, to Omron Tateisi Electronics Co. Keyboard input device. 3,717,871, Cl. 340-365.00e.
- Hatcher, Arthur L., Jr.; and Stonefelt, Ronald D., to Western Electric Company, Incorporated. Method of controlling the reverse breakdown characteristics of semiconductors. 3,717,516, Cl. 148-187.000.
- Hatton, John H., to Sta-Soil Corporation. Apparatus for spraying a slurry. 3,717,285, Cl. 222-136.000.
- Hauser, Alfred: *See—*
  - Sennewald, Kurt; Hauser, Alfred; Gehrmann, Klaus; Steil, Karl-Heinz; and Lork, Winfried, 3,717,675.
- Hauser, Karl V., to Levy, Edward Company. Method of treating slag. 3,717,490, Cl. 106-117.000.
- Hauss, Alfred; Kieferle, Fritz; Kovacs, Jenoe; and Gulbins, Erich, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Manufacture of vinyl chloride polymers. 3,717,621, Cl. 260-85.500.
- Hay, Russell G.; Notaro, Vincent A.; and Selwitz, Charles M., to Gulf Research & Development Company. Process for preparing chlorinated aromatics. 3,717,685, Cl. 260-650.00r.
- Hebeisen, Richard M.; and Voelkel, Samuel C., to Jasper Electronics Manufacturing Co. Key indicating device. 3,717,065, Cl. 84-478.000.
- Heberlein Patent Corporation: *See—*
  - Ritter, Helmut, 3,717,310.
- Hede, Nils Erik Allan; Hellner, Lars Ivar; and Johansson, Hans Elof, to Aktiebolaget Bofors. Stainless ferrite-austenitic steel. 3,717,455, Cl. 75-128.00n.
- Hedges, Harry O. Fuel injection nozzle assembly. 3,717,305, Cl. 239-288.500.
- Heeres, Jan: *See—*
  - Godefroi, Erik Fred; and Heeres, Jan, 3,717,655.
- Heitmann, William E., to Inland Steel Company. Chromized steel products. 3,717,444, Cl. 29-196.600.
- Heitzman, Gary N.: *See—*
  - Cackley, George W.; Heitzman, Gary N.; Boggs, Roger L.; and Stedman, Robert N., 3,717,387.
- Heller, Hansjorg: *See—*
  - Lyssy, Theodor; Keller, Ernst; Heller, Hansjorg; and Muller, Helmut, 3,717,614.
- Hellner, Lars Ivar: *See—*
  - Hede, Nils Erik Allan; Hellner, Lars Ivar; and Johansson, Hans Elof, 3,717,455.
- Helman, Robert W.: *See—*
  - Caldwell, Laurence B.; and Helman, Robert W., 3,717,501.
- Henc, Edward V. Tear tape applicator. 3,717,540, Cl. 156-577.000.
- Henricot, Alfred Andre: *See—*
  - Ernest, Paul Emile; and Henricot, Alfred Andre, 3,717,106.
- Hepner, Leonard S., to Mobil Oil Corporation. Catalyst and method of preparing the same. 3,717,587, Cl. 252-455.
- Herbst, John A. Instantaneous voltage detector. 3,717,818, Cl. 328-141.000.
- Hercules Incorporated: *See—*
  - Breslow, David S., 3,717,560.
  - Kutner, Abraham, 3,717,609.
  - Rave, Terence W., 3,717,592.
- Herlet, Adolf: *See—*
  - Burtscher, Joachim; Emeis, Reimer; and Herlet, Adolf, 3,716,911.
- Herr, Frank M., to CCI Aerospace Corporation. Precompression shroud for inlets. 3,717,163, Cl. 137-15.100.
- Herr, Milton E.; Murray, Herbert C.; and Fonken, Gunther S., to Upjohn Company, The. Oxygenated N,2,3,3-tetramethyl-exo-2-norbornanamines. 3,717,650, Cl. 260-295.50s.
- Herr, Milton E.; Murray, Herbert C.; and Fonken, Gunther S., to Upjohn Company, The. Oxygenated 1-amidoadamantanes. 3,717,677, Cl. 260-557.00r.
- Hertz, Carl Hellmuth: *See—*
  - Arciprete, Genio R.; Cairns, Walter J.; Hertz, Carl Hellmuth; Mansson, Kjell Ake Gosta; and Rothery, John L., 3,717,875.
- Herzog, Gunther; Kahle, Gunter; Kolling, Wolfgang; Lamm, Christian; Munch, Ursula; Schumann, Horst; Wolfrom, Walter; Riesel, Werner; and Wagner, Roland, to Dungemittelkombinat veb Sticksloffwerk Piesteritz. Process for increasing the strength of cement obtined from calcium sulfate. 3,717,489, Cl. 106-103.000.
- Hespenheide, Wilbur G., to Xerox Corporation. Cleaning of electrostatographic surfaces. 3,717,409, Cl. 355-15.000.
- Hess, Howard V.; and Cole, Edward L., to Texaco Inc. Process for treating waste liquors. 3,717,545, Cl. 162-31.000.
- Hesse, Reiner: *See—*
  - Baumer, Wilhelm; Fruhstorfer, Wolfgang; Hesse, Reiner; Engelhardt, Manfred; and Dennler, Bernd, 3,717,611.
- Hesskamp, Robert G.; Meyer, Kenneth P.; and Tornero, Rogelio, to MR Plastics and Coatings, Inc. Self-extinguishing polyurethane foam composite materials and method of preparing same. 3,717,597, Cl. 260-2.5aj.
- Hesston Corporation: *See—*
  - Case, Cecil L.; Elder, Robert L.; and Fell, Ferol S., 3,716,972.
  - Gaeddert, Melvin V., 3,717,062.
- Hester, Jackson B., Jr., to Upjohn Company, The. Triazolobenzodiazepines and their production. 3,717,653, Cl. 260-308.00d.
- Hester, Jackson B., Jr., to Upjohn Company, The. 2,5,6,7-Tetrahydro-3H-s-triazolo[4,3-d] [1,4]-benzodiazepin-3-one compounds and their production. 3,717,654, Cl. 260-308.00c.
- Heyl, Gerhard; Luttgens, Gunter; Behr, Rolf; Maus, Fritz; Frenken, Hans; Busch, Josef; Bruck, Herbert; and Schaffer, Helmut, to Agfa-Gevaert Aktiengesellschaft. Removal of electric charges. 3,717,791, Cl. 317-2.00r.
- Higgins, Robert P.: *See—*
  - Yates, Patrick A.; and Higgins, Robert P., 3,717,794.
- Higuera, Richard L.: *See—*
  - Davis, Edward J.; Cordle, Paul E.; McCubbin, Melvin J.; Lockwood, Donald W.; and Higuera, Richard L., 3,717,098.
- Hill, Jack O.: *See—*
  - Bates, Howard J., Jr.; and Hill, Jack O., 3,717,003.
- Hill, Loran R., to AMF Incorporated. Pedal attachment. 3,717,047, Cl. 74-594.400.
- Hill, William W. Sprinkler stand for cold deck log storage. 3,717,320, Cl. 248-83.000.

- Hiller, Sigwart, to Siemens Aktiengesellschaft. Device for non-destructive consumption testing of reactor fuel elements. 3,717,765, Cl. 250-83.30r.
- Himmelstein, S., and Company: *See—*
  - Tveter, Richard S., 3,717,029.
- Hindersinn, Raymond R., to Hooker Chemical Corporation. Polymer compositions containing perchlorofulvalene. 3,717,608, Cl. 260-45.7.
- Hiramoto, Toshiyuki: *See—*
  - Tanaka, Eiichi; Hiramoto, Toshiyuki; Nohara, Norimasa; and Kurihara, Shigeyasu, 3,717,763.
- Hiratsuka, Toshio; and Shimada, Toshio, to Nippon Carbon Co., Ltd. Graphite fluoride-synthetic resin composite material. 3,717,576, Cl. 252-12.000.
- Hirsch, Peter, to Bell Telephone Laboratories, Incorporated. Real time analysis of waves. 3,717,812, Cl. 324-77.00b.
- Hirschman, Shalom Z.: *See—*
  - Fried, George; and Hirschman, Shalom Z., 3,717,259.
- Hitachi, Ltd.: *See—*
  - Yamamoto, Manabu; and Suzuki, Yukio, 3,717,782.
- Hitco: *See—*
  - Babayan, Eduard P., 3,717,612.
- Hobart Manufacturing Company, The: *See—*
  - Athey, Stuart E., 3,717,830.
- Hochman, Jack M.; and Weinberg, Harold N. Simultaneous hydrofining of coker gas oil, vacuum gas oils and virgin kerosene. 3,717,570, Cl. 208-210.000.
- Hoefke, Wolfgang: *See—*
  - Stahle, Helmut; Koppe, Herbert; Zeile, Karl; Wole, Martin; Hoefke, Wolfgang; and Samtleben, Hans-Wolfgang, 3,717,633.
- Hoerner-Waldorf Corporation: *See—*
  - Rasmussen, Walter H., 3,717,074.
- Hoffman, Joseph J. Descent and ascent device for use on a rope. 3,717,219, Cl. 182-6.000.
- Hoffmann-La Roche Inc.: *See—*
  - Metlesics, Werner; and Sternbach, Leo Henryk, 3,717,658.
  - Miller, Oscar Neal, 3,717,711.
- Hofmann, Alexander, to Voith, J. M., GmbH., Firma. Apparatus for steering a ship. 3,717,116, Cl. 114-151.000.
- Hofmann, Eberhard; and Holtschmidt, Ulrich, to Goldschmidt, Th., A.-G. Biocidal preparation. 3,717,579, Cl. 252-106.000.
- Hohne, John C., Jr.; and Johnson, Carl J., to TRW Inc. Dual motor for cassette drive. 3,717,780, Cl. 310-112.000.
- Holdsworth, John E.: *See—*
  - Hall, Clifford; and Holdsworth, John E., 3,717,414.
- Holkesvick, Edgar E.; Hudnall, John; and Adams, Robert W., to Holkesvick, Edgar E., mesne. Method of unassisted friction-resistive exercising. 3,717,339, Cl. 272-79.00a.
- Holkesvick, Edgar E., mesne: *See—*
  - Holkesvick, Edgar E.; Hudnall, John; and Adams, Robert W., 3,717,339.
- Holland Hitch Company: *See—*
  - Berends, Howard, 3,717,363.
  - Berends, Howard P., 3,717,273.
- Holland Wire Products, Inc.: *See—*
  - Thomas, Herbert J., Jr., 3,716,874.
- Holst, Edward H.: *See—*
  - Rigdon, Orville W.; Edwards, Robert S.; and Holst, Edward H., 3,717,561.
- Holtschmidt, Ulrich: *See—*
  - Hofmann, Eberhard; and Holtschmidt, Ulrich, 3,717,579.
- Holtz, Hermann: *See—*
  - Friederichs, Haas, 3,716,935.
- Holub, Fred F.; and Pauze, Denis R., to General Electric Company. Polyimides. 3,717,615, Cl. 260-78.0va.
- Hondermarck, Jean Claude; Bennett, Ian Cameron; and Guillo, Jacques, to British Petroleum Company, Limited, The. Apparatus for the cultivation and recovery of microorganisms. 3,717,552, Cl. 195-142.000.
- Honey, Chesleigh Brian: *See—*
  - Woodall, Alan; and Honey, Chesleigh Brian, 3,717,295.
- Honeycutt, Marshall L.; and Pye, William, to Amarin Plastics Inc Degating plastic articles. 3,717,292, Cl. 225-99.000.
- Honeywell Inc.: *See—*
  - Chapman, Paul W., 3,717,799.
  - Walter, Jack C., 3,717,859.
- Honjo, Satoru, to Fuji Photo Film Co., Ltd. Removal of protective resin layer by liquid developer in electrophotographic imaging. 3,717,461, Cl. 96-1.0ly.
- Hooker Chemical Corporation: *See—*
  - Carlson, Ronald H., 3,717,701.
  - Geering, Emil J.; and Stratton, George B., 3,717,682.
  - Hindersinn, Raymond R., 3,717,608.
  - Hopkins, George C., 3,717,607.
- Hoover, Donald R.; and Kelly, Glenn P. Tire changing apparatus for small utility trailer wheels. 3,717,192, Cl. 157-1.100.
- Hoover, Merwin F.: *See—*
  - Thompson, Ralph N.; and Hoover, Merwin F., 3,717,679.
- Hopkins, George C., to Hooker Chemical Corporation. Stabilization of poly(vinyl halide). 3,717,607, Cl. 260-45.70r.
- Hopkins, Ralph E., to United States of America, Army. High voltage deposited fuel cell. 3,717,506, Cl. 136-86.00f.
- Hopt Electronic GmbH: *See—*
  - Stemke, Lothar, 3,717,041.
- Hori, Kyoichi: *See—*
  - Otsuki, Susumu; Hori, Kyoichi; and Miyanohara, Isao, 3,717,553.
- Horna, Otakar Antonin, to Communications Satellite Corporation. Shielded coaxial cable transformer. 3,717,808, Cl. 323-44.00r.
- Hoskins, Robert D.: *See—*
  - Bischof, Kaspar; Hoskins, Robert D.; and Shepherd, John M., 3,717,184.
- Hosmer, Thomas P.; and Peterson, John F., to Cryogenic Technology, Inc. Cryogenic thermal switch. 3,717,201, Cl. 165-96.000.
- Hottendorf & Company: *See—*
  - Hottendorf, William J., 3,717,347.
- Hottendorf, William J., to Hottendorf & Company. Apparatus for testing the reflexes or reaction time of a person. 3,717,347, Cl. 273-95.00r.
- Hough, Richard Murray. Liquid mist applicator. 3,717,086, Cl. 99-235.00r.
- Houlihan, William J.: *See—*
  - Anderson, Paul L.; Houlihan, William J.; and Manning, Robert E., 3,717,632.
  - Anderson, Paul L.; Houlihan, William J.; and Manning, Robert E., 3,717,635.
- Howe, Derek Henry, to Pye Limited. Noise immune colour killer circuit. 3,717,726, Cl. 178-5.4ck.
- Howell, Frederick Harold; and Pickles, Wilfred, to Ciba-Geigy Corporation. Tri-[p-(2-butenyl)-phenyl] phosphite. 3,717,691, Cl. 260-956.000.
- Howell, Richard S., to Xerox Corporation. Dual mode electrographic recorder. 3,717,880, Cl. 346-74.0es.
- Howland, Ward W.; and Mallett, William R., to Union Oil Company of California. Gasoline anti-icing additives (A). 3,717,446, Cl. 44-58.000.
- Huang, Ching Yun; Onizuka, Tomotaka; Maeno, Tamotsu; and Ninomiya, Teruyuki, to Japan Gas-Chemical Company, Inc. Xylylene dicarbamates and process for preparing the same. 3,717,671, Cl. 260-482.00b.
- Hubbard, William Marshall; and Li, Tingye, to Bell Telephone Laboratories, Incorporated. Optical fiber equalizer. 3,717,769, Cl. 250-199.000.
- Hudnall, John: *See—*
  - Holkesvick, Edgar E.; Hudnall, John; and Adams, Robert W., 3,717,339.
- Hudson, Frederick W., to Xerox Corporation. Magnetic gate. 3,717,f22, Cl. 118-636.000.
- Hudson, Willard G.: *See—*
  - Snellman, Donald L.; and Hudson, Willard G., 3,717,391.
- Hudyma, Thomas William: *See—*
  - Juby, Peter Frederick; Goodwin, William Reuther; and Hudyma, Thomas William, 3,717,661.
- Hughes Aircraft Company: *See—*
  - Snook, Melvin E.; Joujon-Roche, Phillip J.; and Yancey, Warren L., 3,717,872.
- Hughes, James S., Jr., to Omark Industries, Inc. Stud welding bad weld detection circuit. 3,717,865, Cl. 340-267.00w.
- Hughes, Paul G. Wrist exercising device. 3,717,338, Cl. 272-67.000.
- Humphrey, Robert: *See—*
  - Rashbaum, Abraham; Humphrey, Robert; and Consiglio, Peter, 3,717,225.
- Humphreys, Robert B., to Micro Devices Corporation. Electrical outlet means and fuse therefor. 3,717,836, Cl. 337-271.000.
- Hunt Oil Company: *See—*
  - Bazhaw, Willis O., 3,716,923.
- Huntzinger, Elwood E.; and Schwartz, Nelson N., to Air Products and Chemicals, Inc. Cell stabilizer for vinyl resin foams. 3,717,595, Cl. 260-2.50p.
- Hunziker, Fritz; Schmutz, Jean; and Kunzle, Franz Mattin, to Sandoz-Wander, Inc. Trifluoromethylthio substituted dibenz [b,f] [1,4] oxazepines. 3,717,637, Cl. 260-268.0tr.
- Hurley, Thomas P.; and McAdams, Arthur C., Jr., to Sprague Electric Company. Ceramic slip composition. 3,717,487, Cl. 106-48.000.
- Hushon, James R.: *See—*
  - Hushon, James R.; and Price, Sidney M. (said Price assor. to said), 3,717,306.
- Hushon, James R.; and Price, Sidney M., said Price assor. to said Hushon, James R. Nozzle for spraying foaming materials. 3,717,306, Cl. 239-404.000.
- Hyman, Oscar E.: *See—*
  - Buddecke, Charles L., 3,717,037.
- I-T-E Imperial corporation: *See—*
  - Gryctko, Carl E., 3,717,792.
- Ichikawa, Mitsuo; Takeuchi, Yasumasa; Harita, Yoshiyuki; Endo, Masayuki; Yamaguchi, Nobuo; Tashiro, Matsuru; and Kogure, Akira, to Japan Synthetic Rubber Co., Ltd. Process for preparing copolymers. 3,717,613, Cl. 260-63.00r.
- Ilardi, Joseph M.; and Rau, Eric, to Intermountain Research and Development Corporation. Manufacture of soda ash from Wyoming trona. 3,717,698, Cl. 423-206.000.
- ILC Industries, Inc.: *See—*
  - Case, Melvin C.; and Durney, George P., 3,717,530.
  - Middleton, William J., Jr.; and Snyder, Fred P., 3,716,882.
- Ilich, Slobodan. Adjustable stow-away table. 3,717,375, Cl. 297-162.000.
- Imai, Yohji: *See—*
  - Masuhara, Eiichi; and Imai, Yohji, 3,717,502.
- Imler, Carl E. Hot water circulator. 3,717,748, Cl. 219-306.000.
- Impastato, Fred J.: *See—*
  - Kobetz, Paul; Shapiro, Hymin; and Impastato, Fred J., 3,717,666.

- Imperial Chemical Industries Limited: *See—*
  - Colchester, John Edward; and Entwisle, John Hubert, 3,717,646.
  - Kingston, Derek; and Nattrass, Frank, 3,716,894.
  - Osmond, Desmond Wilfrid John; Waite, Frederick Andrew; and Walbridge, Derek John, 3,717,605.
  - Stuart, Ronald Sangster, 3,717,665.
- Incentive Research & Development Aktiebolag: *See—*
  - Dinh-Nguyen, Nguyen; and Raal, Aino, 3,717,664.
- Industrial Metal Products Corporation: *See—*
  - Judge, Edward E., Sr.; and Judge, Edward E., Jr., 3,717,020.
- Industrial Nucleonics Corporation, mesne: *See—*
  - Martin, Philip T., 3,717,760.
- Industrial Pneumatic Systems, Inc.: *See—*
  - Thompson, Earl B., Jr., 3,717,108.
- Infantino, Joseph Rocco, to AMF Incorporated. Bowling pin with plastic protective cladding. 3,717,344, Cl. 273-82.00r.
- Ingersoll Milling Machine Company, The: *See—*
  - Erkfritz, Donald S., 3,716,900.
- Inland Steel Company: *See—*
  - Heitmann, William E., 3,717,444.
- Inmont Corporation: *See—*
  - Brown, Robert Alan, 3,717,604.
- Institut Francais du Petrole des Carburants et Lubrifiants: *See—*
  - Alagy, Jacob; Busson, Christian; Gadelle, Claude; and Seree de Roch, Irenee, 3,717,662.
  - Barret, Jean Pierre; Jourdan, Gerard; and Harbonn, Jacques, 3,717,844.
- Institute of Gas Technology, The: *See—*
  - Wurm, Jaroslav, 3,716,988.
- Integrated Systems Technology, Inc., mesne: *See—*
  - Garcia, Hernando Javier; Peek, Benjamin Roger; and Meza, Jose, 3,717,820.
- Interatom, Internationale Atomreaktorbau GmbH: *See—*
  - Jansing, Walter; Rohrs, Hartwig; and Rothfuss, helmut, 3,717,352.
- Interlake, Inc.: *See—*
  - Williams, Walter Q., 3,717,313.
- Intermountain Research and Development Corporation: *See—*
  - Ilardi, Joseph M.; and Rau, Eric, 3,717,698.
- International Agri-Systems, Inc.: *See—*
  - Miles, Wayne G.; and Crane, Edward J., 3,716,892.
- International Business Machines Corporation: *See—*
  - Abbas, Shakir A.; and Stern, Paul G., 3,717,852.
  - Ashar, Kanu G.; and Maheux, Leo W., 3,717,515.
  - Cocke, John; Mommens, Jacques H.; and Raviv, Josef, 3,717,851.
  - Dailey, Jack R.; Jensen, Donald F.; and Kuntzleman, Harry C., 3,717,172.
  - Miller, Lewis F., 3,717,483.
  - Revitz, Martin; and Turene, Francis E., 3,717,563.
- International Development Labs.: *See—*
  - Gillchriest, William Clarence, 3,717,697.
- International Flavor & Fragrances, Inc.: *See—*
  - Brodnitz, Michael Hugo, 3,717,681.
- International Harvester Company: *See—*
  - Vander Burgh, Lloyd A., 3,717,321.
- International Standard Electric Corporation: *See—*
  - Barriere, Georges Jean Joseph; and Dalbera, Michel Rene Joseph, 3,717,874.
  - Smith, Colin Francis Greening; and Bliss, Norman Stanley, 3,717,719.
- International Technical Industries: *See—*
  - Zinker, Norman, 3,717,039.
- Intertechnique S.A., mesne: *See—*
  - Thomas, Edward Wherry, 3,717,753.
- Irvin, Donald L.; and Rider, Alan J., to Recognition Equipment Incorporated, mesne. Stored reference code character reader method and system. 3,717,848, Cl. 340-146.30q.
- Ito, Koshiro, to Kobushikikaisha Tokyo Keiki. Viscosimeter. 3,717,026, Cl. 73-57.000.
- Ito, Mieko: *See—*
  - Ninomiya, Tsunehiko; Ojima, Takashi; Yamaguchi, Shizuko; and Ito, Mieko, 3,717,477.
- Iwaasa, Takashi: *See—*
  - Yokotsuka, Tamotsu; Iwaasa, Takashi; and Fujii, Mitsuharu, 3,717,470.
- Iwatsu Electric Company, Ltd.: *See—*
  - Kakuta, Kazuhiko, 3,717,847.
- Izjumov, Dmitry Borisovich: *See—*
  - Slonimsky, Grigory Lvovich; Tolstoguzov, Vladimir Borisovich; Frshova, Vera Alexandrovna; and Izjumov, Dmitry Borisovich, 3,717,469.
- Jacin, Harry; and Fiore, Joseph Vincent, to AMF Corporation. Reconstituted tobacco product. 3,717,155, Cl. 131-17.00a.
- Jackson, Clarence E. Reclining chair. 3,717,378, Cl. 297-446.000.
- Jackson, Harold P., to McDonough Power Equipment, Inc. Grass catcher assembly. 3,716,977, Cl. 56-202.000.
- Jacobs, Karl F. Fish culture cage assembly. 3,717,124, Cl. 119-3.000.
- Jacobson, Nils Bertil: *See—*
  - Edholm, Paul Ragnvald; and Jacobson, Nils Bertil, 3,717,768.
- Jacquelin, Guy, to Centre Technique de l'Industrie des Papiers Cartons et Celluloses. Method and apparatus of producing a sheet with orientated fibres by overflow. 3,717,546, Cl. 162-215.000.
- Jaeggi, Knut Alfred: *See—*
  - Kocsis, Karoly; Renner, Ulrich; and Jaeggi, Knut Alfred, 3,717,641.
- Jager, Gerhard; and Kuhner, Gerhard, to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. Process for the production of color black by the furnace process. 3,717,494, Cl. 106-307.000.
- Jakimas, John A. Air conditioner diffuser. 3,717,081, Cl. 98-40.00b.
- Jankowiak, Erwin M.; and Niles, Earl Thomas, to Dow Chemical Company, The. Composition for colored smoke dissemination. 3,717,517, Cl. 149-19.000.
- Janoska, Georges: *See—*
  - Chaveneaud, Roger M.; and Janoska, Georges, 3,717,232.
- Jansing, Walter; Rohrs, Hartwig; and Rothfuss, helmut, to Interatom, Internationale Atomreaktorbau GmbH. Seal for rotatable covers of nuclear reactors. 3,717,352, Cl. 277-34.300.
- Janssen, Eduard Jozef Philomena: *See—*
  - Notelteirs, Victor Rosallie; and Janssen, Eduard Jozef Philomena, 3,717,783.
- Janssen Pharmaceutica, N.V.: *See—*
  - Godefroi, Erik Fred; and Heeres, Jan, 3,717,655.
- Japan Exlan Company Limited: *See—*
  - Matsumura, Yasuo; and Maruyama, Kunio, 3,717,603.
- Japan Gas-Chemical Company, Inc.: *See—*
  - Huang, Ching Yun; Onizuka, Tomotaka; Maeno, Tamotsu; and Ninomiya, Teruyuki, 3,717,671.
- Japan Synthetic Rubber Co., Ltd.: *See—*
  - Ichikawa, Mitsuo; Takeuchi, Yasumasa; Harita, Yoshiyuki; Endo, Masayuki; Yamaguchi, Nobuo; Tashiro, Matsuru; and Kogure, Akira, 3,717,613.
- Japanese Geon Company, Ltd., The, and: *See—*
  - Takase, Katsuyasu; Nakane, Yuzo; and Yomura, Masamichi, 3,716,924.
- Jarysta, Henri, to Pont-A-Mousson S.A. Composite means for treating cast iron. 3,717,457, Cl. 75-130.00a.
- Jaskulke, Gerhard; Mayer, Max; Lampe, Bernst; Giebler, Fritz; and Steigenberger, Hasso, to Siemens Aktiengesellschaft. Process and apparatus for the selection and interrogation of connections in dial exchange data systems with central programable control. ,717,723, Cl. 178-3.000.
- Jasmin, Claude: *See—*
  - Bizzini, Bernard; Chermann, Jean-Claude; Jasmin, Claude; and Raynaud, Marcel, 3,717,551.
- Jasper Electronics Manufacturing Co.: *See—*
  - Hebeisen, Richard M.; and Voelkel, Samuel C., 3,717,065.
- Jeffers, Frederick J.: *See—*
  - Duck, Sherman W.; and Jeffers, Frederick J., 3,717,460.
- Jeffrey, William B.; and Frill, Richard K., to Westinghouse Air Brake Company. Draft gear and coupler positioning apparatus for a vehicle. 3,717,260, Cl. 213-14.000.
- Jensen, Donald F.: *See—*
  - Dailey, Jack R.; Jensen, Donald F.; and Kuntzleman, Harry C., 3,717,172.
- Jerchel, Dietrich: *See—*
  - Ost, Walter; Thomas, Klaus; Jerchel, Dietrich; and Appel, Karl-Richard, 3,717,709.
- Jewell, George S.: *See—*
  - Luker, Ronald J.; and Jewell, George S., 3,717,332.
- Johansson, Hans Elof: *See—*
  - Hede, Nils Erik Allan; Hellner, Lars Ivar; and Johansson, Hans Elof, 3,717,455.
- Johnson, A., & Co., Inc.: *See—*
  - Knopp, Walter V., 3,717,442.
- Johnson, Carl J.: *See—*
  - Hohne, John C., Jr.; and Johnson, Carl J., 3,717,780.
- Johnson, Curt H., to Curty, Inc. Lumbo-sacral support. 3,717,143, Cl. 128-78.000.
- Johnson Products, Inc.: *See—*
  - Cornell, Richard D., 3,717,134.
- Johnson, Thomas C. Adjsutable and retractable trailer hitch. 3,717,362, Cl. 280-415.00a.
- Johnson, Walter A.: *See—*
  - Sadoski, Tadius T.; and Johnson, Walter A., 3,717,781.
- Johnson, William J. Paperboard chair. 3,717,377, Cl. 297-440.000.
- Joisten & Kettenbaum Elektro-Maschinenfabrik: *See—*
  - Hartung, Gerhard, 3,717,538.
- Jones, Roy Lee: *See—*
  - Gracin, William J.; and Jones, Roy Lee, 3,717,056.
- Jones, William H.; and Chemerda, John M., to Merck & Co., Inc. Selective catalytic hydrogenation of 2-(4-nitrophenyl)-4 (5)-nitroimidazole. 3,717,656, Cl. 260-309.000.
- Jordan, William E.: *See—*
  - Ammino, Raymond; Jordan, William E.; and Earle, William E., 3,717,028.
- Jordy, Peter, to U.S. Philips Corporation. Electronic musical instrument provided with variable coupling of the keyboards. 3,717,715, Cl. 84-11.170.
- Jorgensen, Leif G. Splicing device. 3,717,535, Cl. 156-443.000.
- Joslyn Mfg. and Supply Co.: *See—*
  - Cunningham, Francis V.; and Wicks, John S., 3,717,717.
- Joujon-Roche, Phillip J.: *See—*
  - Snook, Melvin E.; Joujon-Roche, Phillip J.; and Yancey, Warren L., 3,717,872.
- Jourdan, Gerard: *See—*
  - Barret, Jean Pierre; Jourdan, Gerard; and Harbonn, Jacques, 3,717,844.
- Joy, Michael: *See—*
  - Brewer, Allen; and Joy, Michael, 3,717,402.

Juby, Peter Frederick; Goodwin, William Reuther; and Hudyma, Thomas William, to Bristol-Myers Company. Process for the preparation of 1-indancarboxylic acids and intermediate therefor. 3,717,661, Cl. 260-327.00m.

Judge, Edward E., Jr.: *See*—
Judge, Edward E., Sr.; and Judge, Edward E., Jr., 3,717,020.

Judge, Edward E., Sr.; and Judge, Edward E., Jr., to Industrial Metal Products Corporation. Process for straightening elongate members. 3,717,020, Cl. 72-389.000.

Jung, Otto Josef. Convector hood. 3,717,082, Cl. 98-114.000.

Jurrens, Lawrence D., to Phillips Petroleum Company. Amorphous polypropylene stabilized hot melt adhesive. 3,717,601, Cl. 260-27.0ev.

Kabel- und Metallwerke Gubehoffnungnutte Aktiengesellschaft: *See*—
Wallbaum, Hans-Joachim, 3,717,511.

Kabel- und Metallwerke Gutehoffnungshutte Aktiengesellschaft: *See*—
Schmidtchen, Hans-Martin, 3,717,718.

Kabell, Louis J.: *See*—
Dyck, Rudolph H.; and Kabell, Louis J., 3,717,770.

Kabushiki Kaisha Suwa Seikosha: *See*—
Saito, Toshiaki; and Miyasaka, Mamoru, 3,716,984.

Kadota, Kenji: *See*—
Fukumoto, Kenichi; Nakamura, Tokunori; and Kadota, Kenji, 3,717,486.

Kaelin, George R.: *See*—
Mathews, Jimmy C.; and Kaelin, George R., 3,717,870.

Kahabka, Richard D.: *See*—
Miller, Donald F.; Anthone, Leo E.; and Kahabka, Richard D., 3,717,334.

Kahle, Gunter: *See*—
Herzog, Gunther; Kahle, Gunter; Kolling, Wolfgang; Lamm, Christian; Munch, Ursula; Schumann, Horst; Wolfrom, Walter; Riesel, Werner; and Wagner, Roland, 3,717,489.

Kahn, Manfred, to Sprague Electric Company. Overlay for ohmic contact electrodes. 3,717,798, Cl. 317-234.00r.

Kakuta, Kazuhiko, to Iwatsu Electric Company, Ltd. Method and apparatus for tracing the contour of a pattern. 3,717,847, Cl. 340-146.3ae.

Kaltenthaler, Wolfgang; and Mylius, Horst, to Westinghouse Bremsen- und Apparatebau, GmbH. Brake cylinder for vehicles. 3,717,072, Cl. 92-152.000.

Kalyaeva, Allanikolievna: *See*—
Arleevskaya, Natalia Yalovlevna; Kalyaeva, Allanikolievna; and Pletnev, Dmitry Vasilievich, 3,717,828.

Kamp, Ewald A. Method and apparatus for producing controllably oriented fibrous product. 3,717,532, Cl. 156-199.000.

Kampe, Klaus-Dieter, to Farbwerke Hoechst Aktiengesellschaft vormals Meiste Lucius & Bruning. Process for the preparation of β-halogenoalkyl-isocyanates. 3,717,556, Cl. 204-158.00r.

Kan, Peter T.; Cenker, Moses; and Patton, John T., Jr., to BASF Wyandotte Corporation. Carbodiimide foams and process for preparing carbodimmide foams from co-catalyst systems. 3,717,596, Cl. 260-2.5bf.

Kanda, Kaoru; and Nagahori, Tetuo, to Fujitsu Limited. System for the detection of faults in a magneti recording medium. 3,717,846, Cl. 340-146.10f.

Kaplan, Edward B.: *See*—
North, Howard C.; Sherman, Harry W.; and Kaplan, Edward B., 3,717,425.

Karapetian, Carl. Secondary barbeque grill. 3,717,083, Cl. 99-450.000.

Karlsson, Ake Gustav-Adolf: *See*—
Edmansson, Kurt Axel Henry; and Karlsson, Ake Gustav-Adolf, 3,717,386.

Karnavas, James A.: *See*—
Pelczerski, Eugene A.; and Karnavas, James A., 3,717,703.

Kashigi, Kazuo: *See*—
Makara, Satoshi; Kashigi, Kazuo; and Taniguchi, Yasuhiro, 3,717,721.

Kasperkovitz, Wolfdietrich, to U.S. Philips Corporation. Coupling of bistable elements by conductivity modulation. 3,717,775, Cl. 307-221.00b.

Katcha, Frank F.; and Moericke, Dieter, to Rex Chainbelt Inc. Rail gang spiker. 3,717,101, Cl. 104-17.00r.

Kaufeldt, Roland T. A. Positively cushioned stop device for robot system. 3,717,231, Cl. 192-139.000.

Kelbish, Edward D. Modular building system. 3,716,954, Cl. 52-79.000.

Kelco Company: *See*—
Gibsen, Kenneth F.; and Saddington, Arthur W., 3,717,452.

Kellar, John D.: *See*—
Bentley, William; and Kellar, John D., 3,717,290.

Keller, Ernst: *See*—
Lyssy, Theodor; Keller, Ernst; Heller, Hansjorg; and Muller, Helmut, 3,717,614.

Kellwood Company: *See*—
Evans, Homer; and Cole, William R., Jr., 3,716,933.

Kelly, Glenn P.: *See*—
Hoover, Donald R.; and Kelly, Glenn P., 3,717,192.

Kelsey-Hayes Company: *See*—
Ayers, David T., Jr., 3,717,382.

Kennedy, Damon M. Plural occupant propelled velocipede. 3,717,360, Cl. 280-231.000.

Kent, Melvin L.: *See*—
Pedersen, Nicholas F.; Fromm, Howard V.; Kent, Melvin L.; and Olmstead, Don G., 3,717,423.

Kenting Drilling Limited: *See*—
Wilderman, Giles H., 3,717,205.

Kernander, Warren Norman: *See*—
Schultz, William James; and Kernander, Warren Norman, 3,717,319.

Kershner, Stephen W.; and Owen, Kenneth, to Delta Electronics, Inc. Balanced line switch system with U-shaped crossed conductive channels arranged back to back. 3,717,736, Cl. 200-153.00s.

Kerstetter, Donald R.; and Losey, Harold D., to Sylvania Electric Products, Inc. Vacuum tube readout device having ruggedized internal electrode structure and method of making same. 3,716,899, Cl. 29-25.140.

Keuper, Erich: *See*—
Strack, Friedhelm; Keuper, Erich; and Frenken, Klaus, 3,717,197.

Kidd, Archibald W., to Kidd, Archie (Designs) Limited. Machines for cutting crops. 3,716,973, Cl. 56-6.000.

Kidd, Archie (Designs) Limited: *See*—
Kidd, Archibald W., 3,716,973.

Kieferle, Fritz: *See*—
Hauss, Alfred; Kieferle, Fritz; Kovacs, Jenoe; and Gulbins, Erich, 3,717,621.

Kieffer, Richard; Mariacher, Hans; and Schoof, Hansotto, to Deutsche Edelslahlwerke Aktiengesellschaft. Machine parts having a wear-and abrasion-resistant surface. 3,717,496, Cl. 117-49.000.

Kikkoman Shoyu Co., Ltd.: *See*—
Yokotsuka, Tamotsu; Iwaasa, Takashi; and Fujii, Mitsuharu, 3,717,470.

Kimberling, Rex F.: *See*—
Sheldon, Gary L.; and Kimberling, Rex F., 3,717,209.

Kimmel, Cleve C.; and Moll, John H., to Parker-Hannifin Corporation. Transit handling system for volatile fluids. 3,717,006, Cl. 62-48.000.

King Instrument Corporation: *See*—
King, James L., 3,717,314.

King, James L., to King Instrument Corporation. Air turbine drive system for tape winding and splicing machine. 3,717,314, Cl. 242-75.530.

Kingston, Derek; and Nattrass, Frank, to Imperial Chemical Industries Limited. Rope fittings. 3,716,894, Cl. 24-126.001.

Kinjo, Kikuo: *See*—
Negishi, Hirokazu; Endo, Ichiro; Kinjo, Kikuo; and Yamanouchi, Teruo, 3,717,462.

Kirkpatrick, Maurice; and Waggener, Donnell E. Automatic well shutoff apparatus. 3,717,203, Cl. 166-224.000.

Kirsch, Ivan H.: *See*—
Gordon, Bernard M.; Neumann, Leopold; and Kirsch, Ivan H., 3,717,033.

Kishi, Ichiro; Matsui, Kazuyuki; and Fujisawa, Yutaka. Continuous ingot casting system for the ingot mill. 3,717,196, Cl. 164-270.000.

Kishi, Toyokazu; Asai, Mitsuko; Harada, Setsuo; Muroi, Masayuki; and Misuno, Komei, to Takeda Chemical Industries, Ltd. Antibiotic b-2847rb and production thereof. 3,717,707, Cl. 424-122.000.

Kitamura, Hajime: *See*—
Koyanagi, Shunichi; Kitamura, Hajime; and Sonegawa, Shigehisa, 3,717,688.

Klein's, S., Department Stores, Inc.: *See*—
Spielvogel, Paul; Sagal, William R.; and Miller, Jay H., 3,717,395.

Kliem, Bernd W. A.: *See*—
Wronka, Adolph A.; Banker, Bernard R.; Andrews, John E., Jr.; and Kliem, Bernd W. A., 3,717,097.

Klingler, Charles E.: *See*—
Klingler, Josef F.; Braverman, Theodore; and Klingler, Charles E., 3,717,035.

Klingler, Josef F.; Braverman, Theodore; and Klingler, Charles E., to Thermex Inc. Thermometer with means for selectively closing the capilliary bore. 3,717,035, Cl. 73-371.000.

Klomp, Edward D., to General Motors Corporation. Windshield cleaner system. 3,716,886, Cl. 15-250.00y.

Klug, Leonhard: *See*—
Kuhl, Wilfried; and Klug, Leonhard, 3,717,739.

Knapsack Aktiengesellschaft: *See*—
Roszinski, Hilmar; and Schmadel, Hermann, 3,717,692.
Sennewald, Kurt; Hauser, Alfred; Gehrmann, Klaus; Steil, Karl-Heinz; and Lork, Winfried, 3,717,675.

Knoos, Stellan P., to Northrop Corporation. Free-piston gas heater system. 3,717,422, Cl. 417-392.000.

Knopp, Walter V., to Johnson, A., & Co., Inc. Brazing alloy composition. 3,717,442, Cl. 29-182.200.

Knudsen, Karl J.: *See*—
Abdale, John M.; Gartner, Robert J.; and Knudsen, Karl J., 3,717,823.

Kobetz, Paul; Shapiro, Hymin; and Impastato, Fred J., to Ethyl Corporation. Process for producing aluminum alkoxides. 3,717,666, Cl. 260-448.0ad.

Kobushikikaisha Tokyo Keiki: *See*—
Ito, Koshiro, 3,717,026.

Koch, Karl Heinz; Koch, Paul; Loorz, Walter; and Schoppa, Hans, to Didier-Werke A.G. Stamping mass for metallurgical furnaces. 3,717,602, Cl. 260-28.000.

Koch, Paul: *See*—
Koch, Karl Heinz; Koch, Paul; Loorz, Walter; and Schoppa, Hans, 3,717,602.

Kocsis, Karoly; Renner, Ulrich; and Jaeggi, Knut Alfred, to Ciba-Geigy Corporation. Derivatives of dibenzo cycloocten-5,11-imine. 3,717,641, Cl. 260-286.00r.

Koenig, Robert H., to Tapeswitch Corporation of America. Flex sensitive normally closed ribbon switch. 3,717,735, Cl. 200-85.00r.

Kogure, Akira: *See*—
Ichikawa, Mitsuo; Takeuchi, Yasumasa; Harita, Yoshiyuki; Endo, Masayuki; Yamaguchi, Nobuo; Tashiro, Matsuru; and Kogure, Akira, 3,717,613.

Kohl, Lou; and Shea, Daniel Joseph, to American Can Company. Dry pressing ceramic dish in mold having a multi-part female die. 3,717,693, Cl. 264-56.000.

Kohler, Fritz, to Dubied, Edouard et Cie (Societe Anonyme). Jacquard rectilinear knitting machines. 3,717,014, Cl. 66-75.000.

Koike, Hirotami; and Ueno, Katuyoshi, to Nihon Denshi Kabushiki Kaisha. Scanning electron microscope. 3,717,761, Cl. 250-49.5pe.

Koller, Rudolf, to Siemens Aktiengesellschaft. Carrier for type carriers for high speed printing device. 3,717,234, Cl. 197-53.000.

Kolling, Wolfgang: *See*—
Herzog, Gunther; Kahle, Gunter; Kolling, Wolfgang; Lamm, Christian; Munch, Ursula; Schumann, Horst; Wolfrom, Walter; Riesel, Werner; and Wagner, Roland, 3,717,489.

Konishiroku Photo Industry Co., Ltd.: *See*—
Fuyuki, Minoru, 3,717,747.
Sakamoto, Kenro; Fushiki, Isamu; Shimizu, Fumio; and Sugita, Sadao, 3,717,465.
Sakazume, Kaiichiro; and Sato, Shui, 3,717,468.

Kontrollhuder Ek. For.: *See*—
Ekstam, Martin Rudolf, 3,717,240.

Koppe, Herbert: *See*—
Stahle, Helmut; Koppe, Herbert; Zeile, Karl; Wole, Martin; Hoefke, Wolfgang; and Samtleben, Hans-Wolfgang, 3,717,633.

Kopper Company, Inc.: *See*—
Lopez, John, 3,717,075.

Kosonen, Ahti A.; and Nieminen, Seppo A., to Outokumpu Oy. Continuous resistance annealing method for wires. 3,717,745, Cl. 219-155.000.

Kovacs, Jenoe: *See*—
Hauss, Alfred; Kieferle, Fritz; Kovacs, Jenoe; and Gulbins, Erich, 3,717,621.

Kovaleski, Joseph J., to Wyrepak Industries, Inc. Take-apart spool for wire and the like. 3,717,315, Cl. 242-115.000.

Koyanagi, Shunichi; Kitamura, Hajime; and Sonegawa, Shigehisa, to Shinetsu Chemical Company. Methods for preparing graft polymers and resin compositions. 3,717,688, Cl. 260-876.00r.

Kravitz, Stanley: *See*—
Suggitt, Robert M.; Estes, John H.; and Kravitz, Stanley, 3,717,586.

Krohn, Lawrence H.: *See*—
Krohn, Lawrence H.; and Merlo, Angelo L. (said Merlo assor. to said), 3,717,141.

Krohn, Lawrence H.; and Merlo, Angelo L., said Merlo assor. to said Krohn, Lawrence H. System for providing a multi-level current density diagram of a human body organ. 3,717,141, Cl. 128-2.06r.

Kronenberg, Francis E.; Olson, Alexius B.; Poirot, James M.; Rohweder, Gerald D.; and Winkler, Harold W., to Caterpillar Tractor Company. Apparatus and method for determining coefficient of friction. 3,717,025, Cl. 73-9.000.

Kropp, Karl, to Reichert, C., Optische Werke A.G. Photomicrographic apparatus. 3,717,410, Cl. 355-46.000.

Kubo, Moritada; Asano, Kuniji; and Ohashi, Hiromichi, to Tokyo Shibaura Electric Co., Ltd. Sun sensing system for a flying body. 3,717,413, Cl. 356-152.000.

Kubo, Moritada; and Shinomiya, Yasuo, to Tokyo Shibaura Electric Co., Ltd. Dual heads with selective data dependent energization. 3,717,856, Cl. 340-174.10g.

Kubota, Yasuharu; and Tagawa, Susumu, to Sony Corporation. Transformer. 3,717,833, Cl. 336-69.000.

Kuhl, Wilfried; and Klug, Leonhard, to Siemens Aktiengesellschaft. Contact arrangement for vacuum switches. 3,717,739, Cl. 200-166.00c.

Kuhlenschmidt, Donald, to Arkla Industries, Inc. Absorption refrigeration system with multiple generator stages. 3,717,007, Cl. 62-101.000.

Kuhner, Gerhard: *See*—
Jager, Gerhard; and Kuhner, Gerhard, 3,717,494.

Kuiper, Warren J.: *See*—
Donker, Harvey D.; and Kuiper, Warren J., 3,717,220.

Kuntzleman, Harry C.: *See*—
Dailey, Jack R.; Jensen, Donald F.; and Kuntzleman, Harry C., 3,717,172.

Kunzle, Franz Mattin: *See*—
Hunziker, Fritz; Schmutz, Jean; and Kunzle, Franz Mattin, 3,717,637.

Kuraray Co. Ltd.: *See*—
Fukai, Akimasa; Fujiwara, Tuneaki; and Abe, Takao, 3,717,161.

Kurihara, Shigeyasu: *See*—
Tanaka, Eiichi; Hiramoto, Toshiyuki; Nohara, Norimasa; and Kurihara, Shigeyasu, 3,717,763.

Kurita Water Industries, Ltd.: *See*—
Miyata, Kazuo, 3,717,599.

Kutner, Abraham, to Hercules Incorporated. Flame retardant polymers. 3,717,609, Cl. 260-45.75k.

Kyowa Hakko Kogyo Co., Ltd.: *See*—
Nakayama, Kiyoshi; and Hagino, Hiroshi, 3,717,547.
Nara, Takashi; and Okachi, Ryo, 3,717,548.

La Coste and Romberg, Inc.: *See*—
La Coste, Lucien J. B., 3,717,036.

La Coste, Lucien J. B., to La Coste and Romberg, Inc. Force measuring device. 3,717,036, Cl. 73-382.000.

Lagen, Marinus Jacobus Maria: *See*—
Langen, Jacobus Joseph; Lagen, Marinus Jacobus Maria; and Topler, Ernest, 3,716,962.

Laing, Stuart Bruce; and Sykes, Peter Job, to Glaxo Laboratories Limited. Process for the production of estrogenic steroids having a formyl group in the 1 or 4-position. 3,717,627, Cl. 260-239.550.

Lambert, Gerald G.: *See*—
Fox, Robert D.; Rains, William A.; and Lambert, Gerald G., 3,717,518.

Lambeth, Dennis Ernest, to Dowty Technical Developments Limited. Hydraulic apparatus. 3,717,424, Cl. 418-126.000.

Lamm, Christian: *See*—
Herzog, Gunther; Kahle, Gunter; Kolling, Wolfgang; Lamm, Christian; Munch, Ursula; Schumann, Horst; Wolfrom, Walter; Riesel, Werner; and Wagner, Roland, 3,717,489.

Lampe, Bernst: *See*—
Jaskulke, Gerhard; Mayer, Max; Lampe, Bernst; Giebler, Fritz; and Steigenberger, Hasso, 3,717,723.

Landau, Adela: *See*—
Slominski, Leo J.; Landau, Adela; and Siegmund, Arthur J., 3,717,521.

Lander, William M.: *See*—
Brander, George T.; and Lander, William M., 3,717,245.

Landis Tool Company, mesne: *See*—
Price, Ralph E.; and Schoonover, Stanley C., 3,716,949.

Langan, Joseph E.: *See*—
Tipton, William C.; and Langan, Joseph E., 3,717,860.

Lange, Karl Heinze, to Balda Werke Photographische Gerate und Kunstaff R. Gruter Kommanditgesellschaft. Arrangements for filtransport, exposure locking and releasing, with flashlight-cube transport means and shutter locking means. 3,717,079, Cl. 95-31.0ac.

Langen, Jacobus Joseph; Lagen, Marinus Jacobus Maria; and Topler, Ernest, to American Can Company. Carton flap folding mechanism. 3,716,962, Cl. 53-209.000.

Langer, Erik, to Siemens Aktiengesellschaft. Impulse-scanned N-path filter for several frequency ranges. 3,717,816, Cl. 325-430.000.

Langheinrich, Werner: *See*—
Franz, Ilse; and Langheinrich, Werner, 3,717,498.

Lansiart, Alain: *See*—
Allard, Gilles; and Lansiart, Alain, 3,717,766.

Larranaga, Gaston A. Automatic metal louvered safety blind. 3,717,195, Cl. 160-169.000.

Larson, Allen E., to Atlantic Richfield Company. Pattern wax compositions. 3,717,485, Cl. 106-38.800.

Laukien, Gunther Rudi. Device for automatic recording of spectra. 3,717,809, Cl. 324-.50r.

Laurizio, Jeremiah, to American Flange & Manufacturing Co., Inc. Vented pouring spout. 3,717,289, Cl. 222-481.000.

Lavins, Ramon E. Gun bore cleaning implement. 3,716,884, Cl. 15-104.160.

Law, Ernest Harry; and Clark, James William, to United Aircraft Corporation. Active roll controlling truck stabilizing mechanism. 3,717,104, Cl. 105-164.000.

Le Bolloch, Rene: *See*—
Guichard, Geoffroy; and Le Bolloch, Rene, 3,717,480.

Leach, Austin F.; and Sandberg, Gary Karl, to Omark Industries, Inc. Two stage energy absorber. 3,717,224, Cl. 188-1.00c.

Leach, Austin F.; Sandberg, Gary Karl; and Pierson, William F., to Omark Industries, Inc. Energy absorbing highway barrier. 3,717,326, Cl. 256-13.100.

Lear Siegler, Inc.: *See*—
Bassoff, Arthur B., 3,717,044.
Foty, James V., 3,717,080.

Leech, George W.: *See*—
Brown, Donald A.; and Leech, George W., 3,717,568.

Legler, Ernst, to Fernseh GmbH. Variable reactance circuit. 3,717,826, Cl. 331-117.00r.

Leisure, Wallace, Products, Inc.: *See*—
Goldstein, Albert H., 3,716,889.

Lerche-Svendsen, Flemming; and Nielsen, Erik. Means for neutralizing submarine erosion. 3,716,998, Cl. 61-38.000.

Lesko, Frank J., to Reynolds Metals Company. Method of and apparatus for forming a tubular metal blank into a tapered tube on a tapered mandrel and stripping the tube from the mandrel. 3,717,458, Cl. 72-276.000.

LeValley, John: *See*—
Buddecke, Charles L., 3,717,037.

Levy, Edward Company: *See*—
Hauser, Karl V., 3,717,490.

Lewicki, Walter John, Jr.: *See*—
Culp, Charles Richard; and Lewicki, Walter John, Jr., 3,717,524.

Lewis, Keith, to Lucas, Joseph, (Industries) Limited. Electric switch contacts. 3,717,738, Cl. 200-166.0bh.

Li, Tingye: *See*—
Hubbard, William Marshall; and Li, Tingye, 3,717,769.

Lieberman, Daniel; and Neuber, Ralph E., to GTE Sylvania Incorporated. Amplifier station. 3,717,813, Cl. 325-3.000.

Liebig, Joseph M., to Microdt Inc. Seal. 3,717,351, Cl. 277-185.000.

- Linda, Josef; Belohoubek, Bohuslav; and Marsalek, Jaroslav, to TOS Hostivar, narodni podnik Proha-Hostivar. Radial fluid-film bearing. 3,717,393, Cl. 308-122.000.
- Lindemer, Terrence B.; and Bradley, Ronnie A., to United States of America, Atomic Energy Commission. Method for reducing the oxygen in certain actinide oxides to less than stoichiometric levels. 3,717,582, Cl. 252-301.10r.
- Lindly & Company, Inc.: *See—*
  - Abilock, Solomon; Shottenfeld, Richard; and Brown, Thomas, 3,717,771.
- Lindner, Helmut: *See—*
  - Brenneisen, Erich; Lindner, Helmut; and Schmidt, Heinz, 3,717,626.
- Lingl, Hans, Jr., to Lingl-Bell Corporation. Machine for unloading and blending layered stacks of bricks of similar articles. 3,717,264, Cl. 214-8.50c.
- Lingl-Bell Corporation: *See—*
  - Lingl, Hans, Jr., 3,717,264.
- Linker Machines, Inc.: *See—*
  - Demarest, Douglas M., 3,716,891.
- Lipfert, Donald E., to General Foods Corporation. Disposable cook-in package for frozen food products. 3,717,478, Cl. 99-192.00r.
- Little, Arthur D., Inc.: *See—*
  - Arciprete, Genio R.; Cairns, Walter J.; Hertz, Carl Hellmuth; Mansson, Kjell Ake Gosta; and Rothery, John L., 3,717,875.
- Little, Arthur D., Inc., mesne: *See—*
  - Neumeyer, John L., 3,717,639.
- Little, Francis H.: *See—*
  - Lott, Gesrge T.; and Little, Francis H., 3,717,102.
- Litton Systems, Inc.: *See—*
  - Carter, Kenneth R., 3,717,854.
  - Mathews, Jimmy C.; and Kaelin, George R., 3,717,870.
- Locher, Robert J.: *See—*
  - Moline, John H.; and Locher, Robert J., 3,717,137.
- Lockwood, Donald W.: *See—*
  - Davis, Edward J.; Cordle, Paul E.; McCubbin, Melvin J.; Lockwood, Donald W.; and Higuera, Richard L., 3,717,098.
- Lomasney, Henry L.; and Lomasney, William J. Solventless coal tar extended antifouling coating. 3,717,606, Cl. 260-40.00r.
- Lomasney, William J.: *See—*
  - Lomasney, Henry L.; and Lomasney, William J., 3,717,606.
- Lonnemo, Kurt R., to Sperry Rand Corporation. Power transmission. 3,716,987, Cl. 60-19.000.
- Loomis, Bernard: *See—*
  - Bosley, Denis V.; Crain, Philip W.; Douglas, Raymond J.; Loomis, Bernard; Schlau, Floyd E.; and Staats, William A., 3,716,940.
- Loorz, Walter: *See—*
  - Koch, Karl Heinz; Koch, Paul; Loorz, Walter; and Schoppa, Hans, 3,717,602.
- Loos, John F.: *See—*
  - Unkle, Truman F., Jr.; and Loos, John F., 3,717,505.
- Lopez, John, to Kopper Company, Inc. Stacker apparatus for multiple corrugated sheet. 3,717,075, Cl. 93-93.00m.
- L'Oreal: *See—*
  - Daeninckx, Jean; and Bouvet, Rene Jules, 3,717,303.
  - Morane, Bruno P., 3,717,149.
  - Paoletti, Charles; and Terrasse, Gilles, 3,717,495.
- Lorenz, Walter; and Hammann, Ingeborg, to Farbenfabriken Bayer Aktiengesellschaft. 2,4'Dioxo-1,3-benzoxazinothionophosphonic acid esters. 3,717,631, Cl. 260-244.00r.
- Lork, Winfried: *See—*
  - Sennewald, Kurt; Hauser, Alfred; Gehrmann, Klaus; Steil, Karl-Heinz; and Lork, Winfried, 3,717,675.
- Losey, Harold D.: *See—*
  - Kerstetter, Donald R.; and Losey, Harold D., 3,716,899.
- Lott, Gesrge T.; and Little, Francis H., to Lott Tool Corporation. Parts conveyor pallet and means for supporting same on an initial piir of rails and switching same to pair of rails. 3,717,102, Cl. 104-130.000.
- Lott Tool Corporation: *See—*
  - Lott, Gesrge T.; and Little, Francis H., 3,717,102.
- Loudermilk, Michael R. Retractable spike for golf shoe. 3,716,931, Cl. 36-61.000.
- Loughridge, Frederick A.; and Finch, William A., to Sylvania Electric Products Inc. Furnace for manufacture of striation-free quart tubing. 3,717,450, Cl. 65-145.000.
- Loupere, Andre, to Commissariat a l'Energie Atomique. Light-weight cellular structure. 3,716,955, Cl. 52-227.000.
- Lovitz, David D., to Sternco Industries, Inc. Adjustable bracket and filter for various sizes of home aquariums. 3,717,253, Cl. 210-169.000.
- Lubrizol Corporation, The: *See—*
  - Shanley, Edward S.; and Doggett, Roger H., 3,717,687.
- Lucas, Daniel R., Jr.: *See—*
  - Merino, Dennis H.; Bosley, Denis V.; Lucas, Daniel R., Jr.; and Schlau, Floyd E., 3,717,346.
- Lucas, Joseph, (Industries) Limited: *See—*
  - Lewis, Keith, 3,717,738.
- Luczak, Terrence L.; Pudlick, Leonard K.; and Richie, Carlton A., to Owens-Illinois, Inc. Vented closure. 3,717,276, Cl. 215-40.000.
- Luker, Harold E.; and Skeem, Gary L. Grinding mill. 3,717,309, Cl. 241-247.000.
- Luker, Ronald J.; and Jewell, George S., to Air Products and Chemicals, Inc., mesne. Contour cutting device. 3,717,332, Cl. 266-23.00b.
- Lundbom, Calvin F., to General Motors Corporation. Engine governor bypass system. 3,717,050, Cl. 74-859.000.
- Lutchansky, Milton. Furniture with body contour accommodating support system. 3,717,376, Cl. 297-284.000.
- Luttgens, Gunter: *See—*
  - Heyl, Gerhard; Luttgens, Gunter; Behr, Rolf; Maus, Fritz; Frenken, Hans; Busch, Josef; Bruck, Herbert; and Schaffer, Helmut, 3,717,791.
- Luwa AG: *See—*
  - Stupf, Ewald; and Haan, Tammo, 3,716,970.
- Lyssy, Theodor; Keller, Ernst; Heller, Hansjorg; and Muller, Helmut, to Ciba-Geigy Corporation. Linear elastic polymers. 3,717,614, Cl. 260-77.500.
- Maalschappij van Berkel's Patent N.V.: *See—*
  - Vogelsang, Francis H., 3,716,893.
- Mac Dermid Incorporated: *See—*
  - Slominski, Leo J.; Landau, Adela; and Siegmund, Arthur J., 3,717,521.
- Mac Rae, Alfred Urquhart: *See—*
  - Dalton, John Vincent; Mac Rae, Alfred Urquhart; Mathews, James Robert; Moline, Robert Alan; Pickar, Kenneth Arnold; and Seidel, Harvey Donald, 3,717,790.
- MacLachlan, Donald Fulton Alexander, to Micro-Electric AG. Potentiometer. 3,717,837, Cl. 338-160.000.
- Maeda, Isamu, to Sumiotmo Jukikai Kogyo Kabushiki Kaisha. Continuous moving layer type adsorption device. 3,716,969, Cl. 55-390.000.
- Maeno, Tamotsu: *See—*
  - Huang, Ching Yun; Onizuka, Tomotaka; Maeno, Tamotsu; and Ninomiya, Teruyuki, 3,717,671.
- Magnan, Regis Marie Albert, to Societe Anonyme Ciments la Farge. Hydration of silicates. 3,717,488, Cl. 106-97.000.
- Maheux, Leo W.: *See—*
  - Ashar, Kanu G.; and Maheux, Leo W., 3,717,515.
- Maidenform, Inc.: *See—*
  - Spetalnik, Mack, 3,717,154.
- Maier, Roland; and Sauter, Robert, to Boehringer Ingelheim G.m.b.H. Nitrofuran derivatives. 3,717,629, Cl. 260-244.00r.
- Mainhardt, Robert; and Cammorata, Joseph J., to MB Associates. Rocket launcher. 3,717,069, Cl. 89-1.806.
- Makara, Satoshi; Kashigi, Kazuo; and Taniguchi, Yasuhiro, to Nippon Electric Company, Limited. Automatic chroma compensating system. 3,717,721, Cl. 178-5.4ac.
- Mallett, William R.: *See—*
  - Howland, Ward W.; and Mallett, William R., 3,717,446.
- Mallinckrodt Chemical Works: *See—*
  - Baron, Frank A.; and Benner, Roland G., 3,717,680.
- Mancini, Lloyd, to Berg Electronics, Inc. Socket terminal. 3,717,841, Cl. 339-258.000.
- Mandas, Kenneth C. Guide and cutter. 3,716,915, Cl. 30-293.000.
- Mannesmann Aktiengesellschaft: *See—*
  - Bellmann, Manfred; and Pfeiffer, Gerd, 3,717,018.
  - Strack, Friedhelm; Keuper, Erich; and Frenken, Klaus, 3,717,197.
- Manning, Robert E.: *See—*
  - Anderson, Paul L.; Houlihan, William J.; and Manning, Robert E., 3,717,632.
  - Anderson, Paul L.; Houlihan, William J.; and Manning, Robert E., 3,717,635.
- Mansson, Kjell Ake Gosta: *See—*
  - Arciprete, Genio R.; Cairns, Walter J.; Hertz, Carl Hellmuth; Mansson, Kjell Ake Gosta; and Rothery, John L., 3,717,875.
- Manuel Lainz S.A.: *See—*
  - Vicent, Fernando Suarez, 3,716,921.
- Marand, Jean, to Ciba-Geigy Corporation. Self-sealing and locking collar and container. 3,717,287, Cl. 222-153.000.
- Margittai, Thomas. Stand supported vessel and mixer. 3,717,329, Cl. 259-43.000.
- Mari, Enzo. Hinged box. 3,717,278, Cl. 220-31.00r.
- Mariacher, Hans: *See—*
  - Kieffer, Richard; Mariacher, Hans; and Schoof, Hansotto, 3,717,496.
- Marine Swimming Pool Equipment Co.: *See—*
  - Blum, Paul R., 3,716,873.
- Marks, Larry D.: *See—*
  - Oakley, Charles F.; and Marks, Larry D., 3,717,350.
- Marom, Emanuel: *See—*
  - Farrah, Harry Robert; Marom, Emanuel; and Mueller, Rolf K., 3,717,843.
- Marrs, Oren L.; and Thomas, Moses L., to Phillips Petroleum Company. High peel strength polysulfide based sealants. 3,717,617, Cl. 260-75.00s.
- Marsalek, Jaroslav: *See—*
  - Linda, Josef; Belohoubek, Bohuslav; and Marsalek, Jaroslav, 3,717,393.
- Marti, Heinrich; Zeller, Josef K.; and Fiala, Ferdinand, to Concast AG. Adjustable dummy bar head continuous casting. 3,717,198, Cl. 164-274.000.
- Martin, Philip T., to Industrial Nucleonics Corporation, mesne. Radiation fill gauge. 3,717,760, Cl. 250-43.5fl.
- Martin-Marietta Corporation: *See—*
  - McGrew, Jay L.; Sharp, Richard A.; Mowrey, Eugene C.; Thomas, Donald A.; and Gille, John P., 3,717,005.
- Maruoka, Hiroyuki, to Nissan Motor Company, Limited. Afterburner for internal combustion engine. 3,716,996, Cl. 60-286.000.
- Maruyama, Kunio: *See—*
  - Matsumura, Yasuo; and Maruyama, Kunio, 3,717,603.

- Masino, Carlo; and Gilardine, Paolo, to AMP Incorporated, mesne. Method of and apparatus for preparing cold crimp sleeves. 3,716,913, Cl. 29-629.000.
- Massachusetts Institute of Technology: *See—*
  - Seyferth, Dietmar; and Tronich, Wolfgang, 3,717,660.
- Massey, Ernst M.; and Brown, William C., to Tektronix, Inc. Post-deflection acceleration storage tube. 3,717,786, Cl. 315-12.000.
- Mastrianni, Vincenzo, to Owens-Corning Fiberglas Corporation. Fabric finishing method and fabric. 3,717,500, Cl. 117-76.000.
- Masuhara, Eiichi; and Imai, Yohji, to Tokyo Medical and Dental University, President of the. Method for providing anticoagulant surfaces onto articles. 3,717,502, Cl. 117-124.00d.
- Masutani, Koji: *See—*
  - Takuma, Hiroshi; Mori, Hajimi; Masutani, Koji; and Umezu, Kazuko, 3,717,412.
- Matburn (Holdings) Limited: *See—*
  - Deane, William Harry; and Crompton, Geoffrey, 3,717,398.
- Matheson, Wilfrid G., to Sylvania Electric Products Inc. Tungsten halogen lamp with tungsten mesh deflector. 3,717,784, Cl. 313-222.000.
- Mathews, James Robert: *See—*
  - Dalton, John Vincent; Mac Rae, Alfred Urquhart; Mathews, James Robert; Moline, Robert Alan; Pickar, Kenneth Arnold; and Seidel, Harvey Donald, 3,717,790.
- Mathews, Jimmy C.; and Kaelin, George R., to Litton Systems, Inc. Card directory. 3,717,870, Cl. 340-365.00r.
- Matsuda, Hari. Snow bricker. 3,717,431, Cl. 425-318.000.
- Matsui, Kazuyuki: *See—*
  - Kishi, Ichiro; Matsui, Kazuyuki; and Fujisawa, Yutaka, 3,717,196.
- Matsumura, Tetsuo: *See—*
  - Tanaka, Kazuo; Tsuzuki, Akira; and Matsumura, Tetsuo, 3,716,983.
- Matsumura, Yasuo; and Maruyama, Kunio, to Japan Exlan Company Limited. Process for preparing lactonized acrylic polymer solution. 3,717,603, Cl. 260-29.6ab.
- Matsushita Electric Industrial Co., Ltd.: *See—*
  - Nagata, Takashi; and Nakajima, Yasuo, 3,717,778.
- Mattel, Inc.: *See—*
  - Bosley, Denis V.; Crain, Philip W.; Douglas, Raymond J.; Loomis, Bernard; Schlau, Floyd E.; and Staats, William A., 3,716,940.
  - Garcia, Armando J.; Gunther, Gregory M.; and Villanueva, Juanito O., 3,716,942.
  - Gay, Derek J.; Smedley, William H.; and Miller, Anthony D., 3,717,136.
  - Maurer, Donald J., 3,717,066.
  - Merino, Dennis H.; Bosley, Denis V.; Lucas, Daniel R., Jr.; and Schlau, Floyd E., 3,717,346.
- Mattis, James J.: *See—*
  - Byler, William H.; and Mattis, James J., 3,717,584.
- Mattison, Donald J.: *See—*
  - Reynolds, George E.; Mattison, Donald J.; and Gedemer, Fred J., 3,716,964.
- Maurer, Donald J., to Mattel, Inc. Connector for connecting toy parts together. 3,717,066, Cl. 85-5.00r.
- Maurin, Jean: *See—*
  - De Gramont, Arnaud Marie-Jose; and Maurin, Jean, 3,717,572.
- Maus, Fritz: *See—*
  - Heyl, Gerhard; Luttgens, Gunter; Behr, Rolf; Maus, Fritz; Frenken, Hans; Busch, Josef; Bruck, Herbert; and Schaffer, Helmut, 3,717,791.
- Mayashi, Yoshimasa; and Etoh, Yukihiro, to Nissan Motor Company, Limited. Ignition timing change-over device. 3,717,135, Cl. 123-117.00r.
- Mayer, Max: *See—*
  - Jaskulke, Gerhard; Mayer, Max; Lampe, Bernst; Giebler, Fritz; and Steigenberger, Hasso, 3,717,723.
- Mayworm, Daniel E.; and Rohde, William A., to Tower Products, Inc. Method for producing plastic flexible container having peelable seals. 3,717,533, Cl. 156-244.000.
- MB Associates: *See—*
  - Cochran, David L.; and Salter, Steven J., 3,717,068.
  - Mainhardt, Robert; and Cammorata, Joseph J., 3,717,069.
- Mc Clure, Charles A. Reinforced abrasive wheels. 3,716,950, Cl. 51-206.0nf.
- Mc Kee, Arthur G., & Company: *See—*
  - Pavilon, Stanley J., 3,717,200.
- McAdams, Arthur C., Jr.: *See—*
  - Hurley, Thomas P.; and McAdams, Arthur C., Jr., 3,717,487.
- McAllister, LeRoy; and Citek, Francis J., to Standard Oil Company. Method for increasing a refinery's capacity for processing metals-containing residual-type hydrocarbons. 3,717,569, Cl. 208-92.000.
- McBride, Tom J.: *See—*
  - Rao, Koppaka V.; and McBride, Tom J., 3,717,710.
- McCain Manufacturing Corporation: *See—*
  - McCain, William B.; Cosgrove, James F.; and Zagorski, Edward J., 3,717,337.
- McCain, William B.; Cosgrove, James F.; and Zagorski, Edward J., to McCain Manufacturing Corporation. Sheet or signature feeding machines. 3,717,337, Cl. 271-13.000.
- McCann, Joseph P.: *See—*
  - Biskeborn, Merle C.; McCann, Joseph P.; and Sabia, Raffaele A., 3,717,716.
- McClive, William J. Trailer hitch. 3,717,364, Cl. 280-489.000.
- McClure, George R., to Du Pont de Nemours, E. I., and Company. Article with filled cavity. 3,717,499, Cl. 117-72.000.
- McClure, Richard J., to Bell & Howell Company. Method of imaging involving preheating using interdigitated electrodes, a photoconductive layer and a magnetic imaging layer. 3,717,459, Cl. 96-1.00r.
- McCort, John I.; Notman, Robert J.; and Carder, Victor H., to Cochran Western Corporation. Automatic vehicle hitch assembly. 3,717,365, Cl. 280-508.000.
- McCubbin, Melvin J.: *See—*
  - Davis, Edward J.; Cordle, Paul E.; McCubbin, Melvin J.; Lockwood, Donald W.; and Higuera, Richard L., 3,717,098.
- McDonough Power Equipment, Inc.: *See—*
  - Jackson, Harold P., 3,716,977.
- McEvoy, James E.: *See—*
  - Alexander, Warner; Gosselin, Kenneth F.; and McEvoy, James E., 3,717,588.
- McGee, Robert V. J., to Esso Research and Engineering Company. Neutralization process for ester materials. 3,717,672, Cl. 260-485.00s.
- McGhee, Clarence L.; and Enders, Dennis C. Tire pressure indicating apparatus. 3,717,030, Cl. 73-146.300.
- McGill, Charles H., to Monsanto Company. Rotor tube for a beria-type cutter. 3,717,060, Cl. 83-403.000.
- McGinniss, Vincent D., to SCM Corporation. Photopolymerization catalyst comprising a metallocene and an active halogen-containing compound. 3,717,558, Cl. 204-159.150.
- McGovern, Terrence P.; Beroza, Morton; Davis, Harry G.; and Eddy, Gaines W., to United States of America, Agriculture. Attractants for the yellow jacket wasp (vespula spp: vespidae). 3,717,706, Cl. 424-84.000.
- McGraw-Edison Company: *See—*
  - Spencer, Donald B., 3,717,015.
- McGrew, Jay L.; Sharp, Richard A.; Mowrey, Eugene C.; Thomas, Donald A.; and Gille, John P., to Martin-Marietta Corporation. Capillary insulation. 3,717,005, Cl. 62-45.000.
- McIntosh, Harold A., to Robertshaw Controls Company. Valve construction with modulating diaphragm construction and method. 3,717,301, Cl. 236-12.00a.
- McKeown, Arthur J. Lock-on hair curler assembly. 3,717,156, Cl. 132-40.000.
- McKinney, Jonathan R. Automatic grinding machine. 3,717,052, Cl. 76-48.000.
- McKinnon, James Willard. Assembly for the display and storage of science demonstration units or the like. 3,717,258, Cl. 211-87.000.
- McMinn, Donald E., to Eagle Manufacturing Corporation. Flying cut-off press. 3,717,058, Cl. 83-157.000.
- McMullen, John J., Associates, Inc.: *See—*
  - Pangalila, Frans V. A, 3,717,107.
- McMurray, Nolan D.; and Tumey, Morris J., to General Motors Corporation. Zirconium diffusion barrier in titanium-silicon carbide composite materials. 3,717,443, Cl. 29-191.400.
- McRae, Edwin C. Ball cock valve. 3,717,170, Cl. 137-413.000.
- McVay, David Robert; Eickhoff, Henry Louis; and Thatcher, Harry William, to Standard Oil Company. Tube-making apparatus. 3,717,536, Cl. 156-463.000.
- McWilliams, Joseph E. Apparatus for loading bagged mail from a loading dock into a highway vehicle. 3,717,263, Cl. 214-6.00g.
- Mead Johnson & Comapny: *See—*
  - Wu, Yao Hua; and Rayburn, James W., 3,717,634.
- Medicor Muvek: *See—*
  - Svab, Ferenc, 3,717,148.
- Medinova AB: *See—*
  - Edholm, Paul Ragnvald; and Jacobson, Nils Bertil, 3,717,768.
- Meek, Harlen D.: *See—*
  - Doyle, Lawrence O., Jr.; and Meek, Harlen D., 3,716,967.
- Meir, Henry: *See—*
  - Penhasi, Harry A.; and Meir, Henry, 3,717,436.
- Meister, Clarence P. Line tightening lever. 3,716,985, Cl. 24-68.00f.
- Melloy, George F.; and Russ, John C., to Bethlehem Steel Corporation. Method of improving stability of boron hardenability effect in alloy steels. 3,717,508, Cl. 148-2.000.
- Meltsner, Bernard R., to Ethyl Corporation. Stabilization polyolefins and rubbers with a phenolic phosphate. 3,717,610, Cl. 260-45.950.
- Mengason, James: *See—*
  - Shields, John; and Mengason, James, 3,717,076.
- Merck & Co.: *See—*
  - Sarett, Lewis H.; and Ruyle, William V., 3,717,659.
- Merck & Co., Inc.: *See—*
  - Dalhuisen, Albert J.; Deis, William H.; and Burgett, David C., 3,717,600.
  - Jones, William H.; and Chemerda, John M., 3,717,656.
  - Ruyle, William V., 3,717,623.
- Merck Patent Gesellschift mit Beschrankter Hagtung, mesne: *See—*
  - Baumer, Wilhelm; Fruhstorfer, Wolfgang; Hesse, Reiner; Engelhardt, Manfred; and Dennler, Bernd, 3,717,611.
- Merges, John C., Jr.: *See—*
  - Duling, Irl N.; and Merges, John C., Jr., 3,717,534.
- Merino, Dennis H.; Bosley, Denis V.; Lucas, Daniel R., Jr.; and Schlau, Floyd E., to Mattel, Inc. Toy vehicle starting mechanism. 3,717,346, Cl. 273-86.00r.
- Merlo, Angelo L.: *See—*
  - Krohn, Lawrence H.; and Merlo, Angelo L., 3,717,141.
- Messier, Fernand A. Mitt mirror. 3,717,403, Cl. 350-298.000.
- Messner, Jakob. Apparatus for printing continuous runs of material. 3,717,722, Cl. 178-5.20r.
- Messrs. Mitsubishi Jukogyo Kabushiki Kaisha: *See—*
  - Narumi, Natsuo, 3,717,280.

Metallgesellschaft AG: *See—*

Schmalfeld, Paul; Mosberger, Erich; and Gauch, Georg, 3,717,438.

Metlesics, Werner; and Sternbach, Leo Henryk, to Hoffmann-La Roche Inc. 3'-arylspiro [imidazolidine-2,1-phthalan] and 2-[2'-(- hydroxy-arylmethyl)-aryl] -2-imidazoline derivatives. 3,717,658, Cl. 260-309.600.

Meyer, Kenneth P.: *See—*

Hesskamp, Robert G.; Meyer, Kenneth P.; and Tornero, Rogelio, 3,717,597.

Meyer, Robert S. Vocational guidance aids. 3,716,928, Cl. 35-22.00r.

Meza, Jose: *See—*

Garcia, Hernando Javier; Peek, Benjamin Roger; and Meza, Jose, 3,717,820.

Michel, Donald P.: *See—*

Rowand, Ronald P.; and Michel, Donald P., 3,717,255.

Michellone, Giancarlo; and Palazzetti, Mario, to Fiat Societa per Azioni. Anti-skid braking systems. 3,717,385, Cl. 303-21.00f.

Mickelson, Thomas V. Hydrotherapeutic apparatus. 3,717,142, Cl. 128-66.000.

Micro Devices Corporation: *See—*

Humphreys, Robert B., 3,717,836.

Micro-Electric AG: *See—*

MacLachlan, Donald Fulton Alexander, 3,717,837.

Microdt Inc.: *See—*

Liebig, Joseph M., 3,717,351.

Midcal Aluminum, Inc: *See—*

Bischof, Kaspar; Hoskins, Robert D.; and Shepherd, John M., 3,717,184.

Middelbeek, Cornelis G. Mechanical buffer or resilient material such as rubber, in particular fender for ships. 3,716,999, Cl. 61-48.000.

Middelmann, Heinz: *See—*

Rehn, Karl-Heinz; and Middelmann, Heinz, 3,716,980.

Middleton, William J., Jr.; and Snyder, Fred P., to ILC Industries, Inc. Automatic inflator device for expandable structures. 3,716,882, Cl. 9-314.000.

Midland Capital Corporation: *See—*

Engman, George E., 3,717,772.

Midland-Ross Corporation: *See—*

De Penti, Kenneth L., 3,717,261.

Milde, Wilhelm, to Volkswagenwerk Aktiengesellschaft. Closure valve. 3,717,324, Cl. 251-331.000.

Miles, Joe G.: *See—*

Cope, Paul E.; and Miles, Joe G., 3,716,961.

Miles, Wayne G.; and Crane, Edward J., to International Agri-Systems, Inc. Method and apparatus for processing poultry. 3,716,892, Cl. 17-11.000.

Miller, Anthony D.: *See—*

Gay, Derek J.; Smedley, William H.; and Miller, Anthony D., 3,717,136.

Miller, Donald F.; Anthone, Leo E.; and Kahabka, Richard D., to Minnesota Mining and Manufacturing Company. Mounting for wire splice modules. 3,717,334, Cl. 269-37.000.

Miller, Frank E.; Smith, Erwin G.; and Sulcek, Charles E., to Whirlpool Corporation. Refuse compactor with cooperating exposed and hidden control means. 3,717,090, Cl. 100-53.000.

Miller, Jay H.: *See—*

Spielvogel, Paul; Sagal, William R.; and Miller, Jay H., 3,717,395.

Miller, Jaydee W. Gas-fog alkylation process. 3,717,686, Cl. 260-683.590.

Miller, Lewis F., to International Business Machines Corporation. Metallizing composition. 3,717,483, Cl. 106-100.000.

Miller, Oscar. Display device. 3,716,936, Cl. 40-152.000.

Miller, Oscar Neal, to Hoffmann-La Roche Inc. Reducing fatty acid synthesis with a diet containing xylitol. 3,717,711, Cl. 424-343.000.

Miller, Roy W., to Pullman Incorporated. Motor actuated hopper door. 3,717,109, Cl. 105-284.000.

Miller, Roy W., to Pullman Incorporated. Motor actuated hopper doors. 3,717,110, Cl. 105-284.000.

Milligan, Barton: *See—*

Bechara, Ibrahim S.; De Lamater, George B.; and Milligan, Barton, 3,717,676.

Mills, Frank, Jr., to Tote-Cart Company. Shopping cart construction. 3,717,358, Cl. 280-33.99r.

Milnes, Marchall A.: *See—*

Muecke, Kurt H.; and Milnes, Marchall A., 3,717,217.

Minnesota Mining and Manufacturing Company: *See—*

Miller, Donald F.; Anthone, Leo E.; and Kahabka, Richard D., 3,717,334.

Mirlin Corporation Wayland: *See—*

Harvey, Robert J., 3,717,476.

Mischke, Arthur, to Daimler-Benz Aktiengesellschaft. Installation for filtering and cleaning filters. 3,716,968, Cl. 55-294.000.

Misner, Evelyn K.: *See—*

Misner, James P.; and Misner, Evelyn K., 3,717,012.

Misner, James P.; and Misner, Evelyn K. Hairpin lace loom. 3,717,012, Cl. 66-1.00a.

Misuno, Komei: *See—*

Kishi, Toyokazu; Asai, Mitsuko; Harada, Setsuo; Muroi, Masayuki; and Misuno, Komei, 3,717,707.

Mitsubishi Seiko Kabushiki Kaisha: *See—*

Yoshimura, Tsuneo; Suzuki, Kunio; and Shikano, Gohei, 3,717,445.

Mitsubishi Seishi Kabushiki Kaisha: *See—*

Ohyama, Yasushi; and Miyazawa, Sadayuki, 3,717,467.

Miyanohara, Isao: *See—*

Otsuki, Susumu; Hori, Kyoichi; and Miyanohara, Isao, 3,717,553.

Miyasaka, Mamoru: *See—*

Saito, Toshiaki; and Miyasaka, Mamoru, 3,716,984.

Miyata, Kazuo, to Kurita Water Industries, Ltd. Composition for forming strippable and anti-corrosive film. 3,717,599, Cl. 260-23.00r.

Miyazawa, Sadayuki: *See—*

Ohyama, Yasushi; and Miyazawa, Sadayuki, 3,717,467.

Mizrahi, Albert H. Noise maker. 3,716,944, Cl. 46-175.000.

Mobil Oil Corporation: *See—*

Hepner, Leonard S., 3,717,587.

Moeller & Neumann GmbH: *See—*

Gross, Erich Wilhelm, 3,717,021.

Moericke, Dieter: *See—*

Katcha, Frank F.; and Moericke, Dieter, 3,717,101.

Moline, John H.; and Locher, Robert J. Charcoal-type cooker assembly with pivotally mounted fire box. 3,717,137, Cl. 126-25.00b.

Moline, John H. Dispensing apparatus for packing grease in friction bearings and the like. 3,717,222, Cl. 184-1.00d.

Moline, Robert Alan: *See—*

Dalton, John Vincent; Mac Rae, Alfred Urquhart; Mathews, James Robert; Moline, Robert Alan; Pickar, Kenneth Arnold; and Seidel, Harvey Donald, 3,717,790.

Molins, Desmond Walter; and Rowlands, Tom, to Molins Machine Company Limited. Continuous webs. 3,717,537, Cl. 156-466.000.

Molins Limited: *See—*

New, John Elliott, 3,717,236.

Molins Machine Company Limited: *See—*

Molins, Desmond Walter; and Rowlands, Tom, 3,717,537.

Moll, John H.: *See—*

Kimmel, Cleve C.; and Moll, John H., 3,717,006.

Mommens, Jacques H.: *See—*

Cocke, John; Mommens, Jacques H.; and Raviv, Josef, 3,717,851.

Monroe, Maurice. Fluid driven cleaning implement for swimming pools. 3,716,883, Cl. 15-1.700.

Monsanto Company: *See—*

Daniels, Brian K.; Preston, Jack; and Zaukelies, David A., 3,717,542.

Feiler, William A.; Feierstein, Harold E.; Shen, Chung Yu; and Stahlheber, Norman Earl, 3,717,589.

McGill, Charles H., 3,717,060.

Schultz, Robert G., 3,717,670.

Monsanto Europe S.A.: *See—*

Visnovsky, Lubomir; and Stordeur, Pierre, 3,717,526.

Montgomery, William E., III, to Westinghouse Electric Corporation. Solid state multi-color sensor. 3,717,724, Cl. 178-5.4st.

Moon, Clive D., to Phillips Petroleum Company. Stabilized olefin polymers. 3,717,577, Cl. 260-45.780.

Moon, Jerry W. Refuse compactor. 3,717,091, Cl. 100-53.000.

Moore, Alvin Edward. Light-weight, crashproof, tubular structure. 3,716,953, Cl. 52-2.000.

Moore Dry Kiln Company of Oregon: *See—*

Faley, Arnold F., 3,717,249.

Moore, John H., to Armstrong Cork Company. Prefabricated flooring. 3,717,247, Cl. 206-59.00f.

Morane, Bruno P., to L'Oreal. Injector package for catamenial tampon. 3,717,149, Cl. 128-263.000.

Moreira, Renan. Rotary jet twin propulsion engine. 3,716,989, Cl. 60-39.340.

Mori, Hajimi: *See—*

Takuma, Hiroshi; Mori, Hajimi; Masutani, Koji; and Umezu, Kazuko, 3,717,412.

Morohashi, Takashi; and Morohashi, Yuji. Extra coarse-laid wire rope for reinforced concrete. 3,716,982, Cl. 57-145.000.

Morohashi, Yuji: *See—*

Morohashi, Takashi; and Morohashi, Yuji, 3,716,982.

Morrow, Warren P., to United States of America, Army. Mine fuze. 3,717,094, Cl. 102-19.200.

Morton, Bruce J.: *See—*

Sfat, Michael R.; and Morton, Bruce J., 3,717,471.

Mosberger, Erich: *See—*

Schmalfeld, Paul; Mosberger, Erich; and Gauch, Georg, 3,717,438.

Moser, Raymond L.; and Oldenburg, Dorrance, to Caterpillar Tractor Co. Delimbing assembly for tree harvesters. 3,717,185, Cl. 144-2.00z.

Mosko, Joseph A., to United States of America, Navy. Spiral antenna. 3,717,878, Cl. 343-895.000.

Motorola, Inc.: *See—*

Burgess, Ronald R., 3,717,514.

Cecil, James Barton, 3,717,777.

Motz, Carl H., to Siegler, Lear, Inc. Rolling of gear locks. 3,717,019, Cl. 72-102.000.

Mowrey, Eugene C.: *See—*

McGrew, Jay L.; Sharp, Richard A.; Mowrey, Eugene C.; Thomas, Donald A.; and Gille, John P., 3,717,005.

Mozen, Milton Michael: *See—*

Wada, Shohachi; and Mozen, Milton Michael, 3,717,708.

MR Plastics and Coatings, Inc.: *See—*

Hesskamp, Robert G.; Meyer, Kenneth P.; and Tornero, Rogelio, 3,717,597.

Mt. Pleasant, Edison P., III, to Carborundum Company, The. Hot pressing a refractory article of complex shape in a mold of simple shape. 3,717,694, Cl. 264-67.000.

Muecke, Kurt H.; and Milnes, Marchall A., to Flextrac Nodwell Ltd. Mechanisms for mounting and stowing seismic vibrators on a vehicle. 3,717,217, Cl. 181-.5vm.

Mueller, Rolf K.: *See—*

Farrah, Harry Robert; Marom, Emanuel; and Mueller, Rolf K., 3,717,843.

Muller, Helmut: *See—*

Lyssy, Theodor; Keller, Ernst; Heller, Hansjorg; and Muller, Helmut, 3,717,614.

Munch, Ursula: *See—*

Herzog, Gunther; Kahle, Gunter; Kolling, Wolfgang; Lamm, Christian; Munch, Ursula; Schumann, Horst; Wolfrom, Walter; Riesel, Werner; and Wagner, Roland, 3,717,489.

Muroi, Masayuki: *See—*

Kishi, Toyokazu; Asai, Mitsuko; Harada, Setsuo; Muroi, Masayuki; and Misuno, Komei, 3,717,707.

Murray, Charles R.; and Plaster, Robert L., to Westinghouse Electric Corporation. Transformer having series-multiple windings. 3,717,831, Cl. 336-5.000.

Murray, Herbert C.: *See—*

Herr, Milton E.; Murray, Herbert C.; and Fonken, Gunther S., 3,717,650.

Herr, Milton E.; Murray, Herbert C.; and Fonken, Gunther S., 3,717,677.

Mylius, Horst: *See—*

Kaltenthaler, Wolfgang; and Mylius, Horst, 3,717,072.

Nadella: *See—*

Pitner, Alfred, 3,717,394.

Nagahori, Tetuo: *See—*

Kanda, Kaoru; and Nagahori, Tetuo, 3,717,846.

Nagano, Akira: *See—*

Hatano, Isao; Nagano, Akira; and Urasaki, Kazuaki, 3,717,871.

Nagase, Minoru, to Nippon Air Brake Co., Ltd., The. Control system for fluid pressure brake apparatus. 3,717,165, Cl. 137-814.000.

Nagata, Takashi; and Nakajima, Yasuo, to Matsushita Electric Industrial Co., Ltd. Piezoelectric ceramic resonator with asymmetrically rough edge. 3,717,778, Cl. 310-9.500.

Nakajima, Yasuo: *See—*

Nagata, Takashi; and Nakajima, Yasuo, 3,717,778.

Nakamura, Tokunori: *See—*

Fukumoto, Kenichi; Nakamura, Tokunori; and Kadota, Kenji, 3,717,486.

Nakane, Yuzo: *See—*

Takase, Katsuyasu; Nakane, Yuzo; and Yomura, Masamichi, 3,716,924.

Nakayama, Kiyoshi; and Hagino, Hiroshi, to Kyowa Hakko Kogyo Co., Ltd. Process for producing uridine-5'-diphosphoglucose. 3,717,547, Cl. 195-28.00n.

Nara, Takashi; and Okachi, Ryo, to Kyowa Hakko Kogyo Co., Ltd. Method for preparing aminocyclohexylpenicillin. 3,717,548, Cl. 195-36.00p.

Narumi, Natsuo, to Messrs. Mitsubishi Jukogyo Kabushiki Kaisha. Tank support and bracing structure. 3,717,280, Cl. 220-69.000.

National Bank Book Company, Inc.: *See—*

Schade, Frank Stanley, 3,717,416.

National Can Corporation: *See—*

Patarini, Leon M.; and Zundel, Arthur P., 3,717,279.

National Cash Register Company, The: *See—*

Gilberg, Robert C.; Donohue, James P.; and Patel, Ramesh S., 3,717,750.

Schutrum, Walter L.; and Funkhouser, Richard L., 3,717,400.

Soderstrom, Melvin A., 3,716,905.

National Institute of Radiological Sciences: *See—*

Tanaka, Eiichi; Hiramoto, Toshiyuki; Nohara, Norimasa; and Kurihara, Shigeyasu, 3,717,763.

Nattrass, Frank: *See—*

Kingston, Derek; and Nattrass, Frank, 3,716,894.

Nederlandse Organisatie voor Tolgepast Natuur-wetenschappelijk Onderzoek Ten Behoeve Van Nijverheid: *See—*

Bok, Cornelis, 3,716,981.

Negishi, Hirokazu; Endo, Ichiro; Kinjo, Kikuo; and Yamanouchi, Teruo, to Canon Kabushiki Kaisha. Heat-treatment of an electrophotographic photosensitive member. 3,717,462, Cl. 96-1.500.

Neihof, Rex A.: *See—*

Echols, William H.; Fielding, George H.; and Neihof, Rex A., 3,717,580.

Nemfth, Petfr: *See—*

Wright, James C.; and Nemfth, Petfr, 3,716,960.

Nemis, Coniston James: *See—*

Parisotto, Antonio; and Nemis, Coniston James, 3,717,390.

Neotec Corporation: *See—*

Ganssle, Eugene R., 3,717,879.

Neuber, Ralph E.: *See—*

Lieberman, Daniel; and Neuber, Ralph E., 3,717,813.

Neumann, Gunter, to Neumann, Gunter, Terrasan-Erzeugnisse. Supporting plates. 3,717,302, Cl. 238-287.000.

Neumann, Gunter, Terrasan-Erzeugnisse: *See—*

Neumann, Gunter, 3,717,302.

Neumann, Leopold: *See—*

Gordon, Bernard M.; Neumann, Leopold; and Kirsch, Ivan H., 3,717,033.

Neumeyer, John L., to Little, Arthur D., Inc., mesne. Process for the preparation of 1-(2-nitro-3,4-di- lower-alkoxybenzyl)isoquinolines. 3,717,639, Cl. 260-283.0cn.

New, John Elliott, to Molins Limited. Conveying apparatus. 3,717,236, Cl. 198-25.000.

Newman, Neil F., to Esso Research and Engineering Company. N,N-dialkylamidoxime phosphates. 3,717,690, Cl. 260-945.000.

Nicklin, Thomas; and Farrington, Frederick, to Gas Council, The. Treatment of gases. 3,717,699, Cl. 423-222.000.

Nielsen, Erik: *See—*

Lerche-Svendsen, Flemming; and Nielsen, Erik, 3,716,998.

Nieminen, Seppo A.: *See—*

Kosonen, Ahti A.; and Nieminen, Seppo A., 3,717,745.

Niesen, George P.; Dutko, Wolodymyr; and Garbarino, William L., to Dick, A. B., Company. Reversible copyboard for electrostatic copying machine. 3,717,411, Cl. 355-75.000.

Nigg, Russell L.; and Olinger, Guy R., to United States of America, Army, mesne. Cross-country vehicle. 3,717,215, Cl. 180-14.00r.

Nihan Denshi Kabushiki Kaisha: *See—*

Takuma, Hiroshi; Mori, Hajimi; Masutani, Koji; and Umezu, Kazuko, 3,717,412.

Nihon Denshi Kabushiki Kaisha: *See—*

Koike, Hirotami; and Ueno, Katuyoshi, 3,717,761.

Niles, Earl Thomas: *See—*

Jankowiak, Erwin M.; and Niles, Earl Thomas, 3,717,517.

Ninomiya, Teruyuki: *See—*

Huang, Ching Yun; Onizuka, Tomotaka; Maeno, Tamotsu; and Ninomiya, Teruyuki, 3,717,671.

Ninomiya, Tsunehiko; Ojima, Takashi; Yamaguchi, Shizuko; and Ito, Mieko, to Ajinomoto Co., Inc. Sweetening. 3,717,477, Cl. 99-141.00a.

Nippon Air Brake Co., Ltd., The: *See—*

Nagase, Minoru, 3,717,165.

Nippon Carbon Co., Ltd.: *See—*

Hiratsuka, Toshio; and Shimada, Toshio, 3,717,576.

Nippon Columbia Co., Ltd., mesne: *See—*

Shiga, Takeo; Takagi, Toshihiko; Arakawa, Yoshihide; and Sato, Hisao, 3,717,218.

Nippon Electric Company, Limited: *See—*

Makara, Satoshi; Kashigi, Kazuo; and Taniguchi, Yasuhiro, 3,717,721.

Nissan Motor Company, Limited: *See—*

Maruoka, Hiroyuki, 3,716,996.

Mayashi, Yoshimasa; and Etoh, Yukihiro, 3,717,135.

Takao, Hiroshi; and Seino, Hiroshi, 3,717,046.

Nittan Company, Limited: *See—*

Sasaki, Koju, 3,717,862.

Nohara, Norimasa: *See—*

Tanaka, Eiichi; Hiramoto, Toshiyuki; Nohara, Norimasa; and Kurihara, Shigeyasu, 3,717,763.

Noothout, Arend J., to Reactor Centrum Nederland. Method for the preparation of grains. 3,717,581, Cl. 252-301.10r.

Nordskog Company, Inc.: *See—*

Nordskog, Robert A., 3,717,282.

Nordskog, Robert A., to Nordskog Company, Inc. Container dispenser. 3,717,282, Cl. 221-279.000.

Norfin, Inc.: *See—*

Snellman, Donald L.; and Hudson, Willard G., 3,717,391.

Snellman, Donald L., 3,717,720.

North American Rockwell Corporation: *See—*

Guderjahn, Charles A., 3,717,103.

O'Donnell, Cedric F.; and Pulliam, George R., 3,717,853.

North, Howard C.; Sherman, Harry W.; and Kaplan, Edward B., to Esso Research and Engineering Company. Apparatus for production of thermoplastic sheet. 3,717,425, Cl. 425-71.000.

Northern Illinois Gas Company: *See—*

Batz, JaMes E., 3,717,869.

Northrop Corporation: *See—*

Griffin, William S., 3,717,164.

Knoos, Stellan P., 3,717,422.

Northwest Dental Laboratories, Inc.: *See—*

Tole, John W.; Stoiber, Paul J.; and Etzel, Leroy, 3,716,918.

Notaro, Vincent A.: *See—*

Hay, Russell G.; Notaro, Vincent A.; and Selwitz, Charles M., 3,717,685.

Notaro, Vincent A.; and Selwitz, Charles M., to Gulf Research & Development Company. Process for preparing chlorinated aromatics. 3,717,684, Cl. 260-650.00r.

Notelteirs, Victor Rosallie; and Janssen, Eduard Jozef Philomena, to U.S. Philips Corporation. Electric incandescent lamp comprising an internal fuse. 3,717,783, Cl. 312-217.000.

Notman, Robert J.: *See—*

McCort, John I.; Notman, Robert J.; and Carder, Victor H., 3,717,365.

Novotny, Raymond J., to Abex Corporation. Fluid bolster spring. 3,717,105, Cl. 105-197.00b.

Numakura, Toshihiko, to Sony Corporation. Television signal recording system with color information recorded on a low frequency carrier at reduced amplitude with respect to the luminance. 3,717,725, Cl. 178-54.0cd.

N.V. Bekaert S.A.: *See—*

Schmidt, Fernand; and Vanoverberghe, Cyrille, 3,717,327.

N.V. Inc.: *See—*

Vaughan, William Lee; and Graeme-Noel, Basil, 3,717,840.

Nyberg, Anna Ingegerd: *See—*

Nyberg, Carl Erik Josef, 3,717,173.

Nyberg, Bo Erik: *See—*

Nyberg, Carl Erik Josef, 3,717,173.

Nyberg, Carl Erik Josef; deceased (by Nyberg, Anna Ingegerd; Nyberg, Karl Ove; Nyberg, Bo Erik; Nyberg, Kent Olof; and Allerbjer, Inger Margaretha, nee Nyberg; heirs), to Nyberg, Karl Ove. Connecting assembly for dish-or clothes washing machines. 3,717,173 Cl. 137-562.000.
Nyberg, Karl Ove: *See—*
Nyberg, Carl Erik Josef, 3,717,173.
Nyberg, Kent Olof: *See—*
Nyberg, Carl Erik Josef, 3,717,173.
Oakley, Charles F.; and Marks, Larry D., to V-M Corporation. Cueing means for record player. 3,717,350, Cl. 274-23.00r.
O'Brien, Billy L.; and O'Brien, Heber P. Method and apparatus for constructing and connecting underwater risers. 3,717,002, Cl. 61-72.300.
O'Brien, Heber P.: *See—*
O'Brien, Billy L.; and O'Brien, Heber P., 3,717,002.
Oceanoics, Inc.: *See—*
Bates, Howard J., Jr.; and Hill, Jack O., 3,717,003.
O'Donnell, Cedric F.; and Pulliam, George R., to North American Rockwell Corporation. Magnetic bubble domain system. 3,717,853, Cl. 340-174.0tf.
Oehme, Friedrich: *See—*
Ertl, Stefan; and Oehme, Friedrich, 3,717,435.
Ogura, Shuichi, to Fuji Photo Film Co., Ltd. Pressure resistant underwater casing. 3,717,078, Cl. 95-11.000.
Ohashi, Hiromichi: *See—*
Kubo, Moritada; Asano, Kuniji; and Ohashi, Hiromichi, 3,717,413.
Ohkubo, Shunji: *See—*
Oyama, Minoru; Yamada, Masaaki; Ohkubo, Shunji; and Osakada, Atsushi, 3,717,559.
Ohyama, Yasushi; and Miyazawa, Sadayuki, to Mitsubishi Seishi Kabushiki Kaisha. Hardening gelation silver halide emulsions with reaction products of halogenated triazines and hydrophilic organic colloids. 3,717,467, Cl. 96-111.000.
Ojima, Takashi: *See—*
Ninomiya, Tsunehiko; Ojima, Takashi; Yamaguchi, Shizuko; and Ito, Mieko, 3,717,477.
Okachi, Ryo: *See—*
Nara, Takashi; and Okachi, Ryo, 3,717,548.
Olcott, Eugene L., to Susquehanna Corporation, The. Turbine blade. 3,717,419, Cl. 416-230.000.
Oldenburg, Dorrance: *See—*
Moser, Raymond L.; and Oldenburg, Dorrance, 3,717,185.
Oles, Herbert E.; and Thiesen, John W., Jr., to American Precision Industries Inc. Household refuse compactor. 3,717,089, Cl. 100-52.000.
Olin Corporation: *See—*
Sperry, Philip R.; and Gullotti, Damian V., 3,717,512.
Olinger, Guy R.: *See—*
Nigg, Russell L.; and Olinger, Guy R., 3,717,215.
Oliver, Joseph R.: *See—*
Fletcher, Ralph A.; and Oliver, Joseph R., 3,717,379.
Olmstead, Don G.: *See—*
Pedersen, Nicholas F.; Fromm, Howard V.; Kent, Melvin L.; and Olmstead, Don G., 3,717,423.
Olson, Alexius B.: *See—*
Kronenberg, Francis E.; Olson, Alexius B.; Poirot, James M.; Rohweder, Gerald D.; and Winkler, Harold W., 3,717,025.
Omark Industries, Inc.: *See—*
Hughes, James S., Jr., 3,717,865.
Leach, Austin F.; and Sandberg, Gary Karl, 3,717,224.
Leach, Austin F.; Sandberg, Gary Karl; and Pierson, William F., 3,717,326.
Omron Tateisi Electronics Co.: *See—*
Hatano, Isao; Nagano, Akira; and Urasaki, Kazuaki, 3,717,871.
O'Neil, James A., to Cryogenic Technology, Inc. Method and apparatus for minimizing motional heat leak in cryogenic apparatus. 3,717,004, Cl. 62-6.000.
Onizuka, Tomotaka: *See—*
Huang, Ching Yun; Onizuka, Tomotaka; Maeno, Tamotsu; and Ninomiya, Teruyuki, 3,717,671.
Ordena Lenina Institut Elementoorganicheskikh Soedineny: *See—*
Slonimsky, Grigory Lvovich; Tolstoguzov, Vladimir Borisovich; Frshova, Vera Alexandrovna; and Izjumov, Dmitry Borisovich, 3,717,469.
Orehoski, Michael A.: *See—*
Dukelow, Donald A.; Orehoski, Michael A.; and Veselinovich, Nick, 3,717,034.
Oriard, Marcel H.: *See—*
Sheeran, Harold W.; and Oriard, Marcel H., 3,717,519.
Original Equipment Manufacturing Limited: *See—*
Parisotto, Antonio; and Nemis, Coniston James, 3,717,390.
Orth, Richard Duncan: *See—*
Chakravarti, Diptiman; Surendranath, Jack G.; and Orth, Richard Duncan, 3,717,555.
Orzetti, Francis J. Hunting call. 3,716,943, Cl. 46-189.000.
Osakada, Atsushi: *See—*
Oyama, Minoru; Yamada, Masaaki; Ohkubo, Shunji; and Osakada, Atsushi, 3,717,559.
Osmond, Desmond Wilfrid John; Waite, Frederick Andrew; and Walbridge, Derek John, to Imperial Chemical Industries Limited. Process for the preparation of polymer dispersions of uniform particle size. 3,717,605, Cl. 260-34.200.
Ost, Walter; Thomas, Klaus; Jerchel, Dietrich; and Appel, Karl-Richard, to Boehringer, C. H., & Sohn. Fungicidal and acaricidal composition and method of use. 3,717,709, Cl. 424-250.000.
Oswald, Alexis A., to Esso Research and Engineering Company. Terminally difunctional polythioethers derived via dithiol-acetylene polyadditions. 3,717,618, Cl. 260-887.000.
Otsuki, Susumu; Hori, Kyoichi; and Miyanohara, Isao, to Rohm and Haas Company. Process and apparatus for the distillation of a vinyl monomer. 3,717,553, Cl. 202-158.000.
Outboard Marine Corporation: *See—*
Densow, Ulrich O., 3,717,221.
Outokumpu Oy: *See—*
Kosonen, Ahti A.; and Nieminen, Seppo A., 3,717,745.
Ovsienko, Walter C. Magnetic spring and coin rejector. 3,717,233, Cl. 194-101.000.
Owen, Kenneth: *See—*
Kershner, Stephen W.; and Owen, Kenneth, 3,717,736.
Owen, Louis L.: *See—*
Plett, Don A.; Owen, Louis L.; and Tenkman, Robert H., 3,717,038.
Owens-Corning Fiberglas Corporation: *See—*
Mastrianni, Vincenzo, 3,717,500.
Smith, Roy E., 3,717,311.
Smith, Roy E., 3,717,448.
Owens-Illinois, Inc.: *See—*
Amberg, Ralph Gilbert, 3,716,963.
Daiga, Valdis R., 3,717,453.
Eggert, Noel B., 3,716,910.
Luczak, Terrence L.; Pudlick, Leonard K.; and Richie, Carlton A., 3,717,276.
Rapp, Charles F., 3,717,441.
Stengle, Edward J., Jr., 3,717,277.
Oyama, Minoru; Yamada, Masaaki; Ohkubo, Shunji; and Osakada, Atsushi, to Toray Industries, Inc. Process for the preparation of polypropylene resin foams. 3,717,559, Cl. 204-159.170.
Pabst Brewing Company: *See—*
Ziffer, Jack, 3,717,550.
Pacific Tooling and Engineering Company: *See—*
Sheldon, Gary L.; and Kimberling, Rex F., 3,717,209.
Pakulak, Steve. Slip on steel foot guard. 3,716,932, Cl. 36-72.00r.
Palazzetti, Mario: *See—*
Michellone, Giancarlo; and Palazzetti, Mario, 3,717,385.
Palm, Bert E.; and Harwell, Earnest W., to Diamond Shamrock Corporation. Coated metal and method. 3,717,509, Cl. 148-6.200.
Pangalila, Frans V. A, to McMullen, John J., Associates, Inc. Railway car roll stabilization. 3,717,107, Cl. 105-199.0cb.
Paoletti, Charles; and Terrasse, Gilles, to L'Oreal. Glass containers for aerosols and method and apparatus for making same. 3,717,495, Cl. 117-18.000.
Parisotto, Antonio; and Nemis, Coniston James, to Original Equipment Manufacturing Limited. Snow-mobile track assembly. 3,717,390, Cl. 305-25.000.
Park-Ohio Industries, Inc.: *See—*
Vickers, Robert V., 3,717,740.
Parker-Hannifin Corporation: *See—*
Kimmel, Cleve C.; and Moll, John H., 3,717,006.
Parmentier, Robert D.; and Scott, Alwyn C., to Wisconsin Alumni Research Foundation. Neuristor transmission line for actively propagating pulses. 3,717,773, Cl. 307-201.000.
Parrott, Orville C.; and Young, George W., to American Air Filter Company, Inc. Filter frame construction. 3,717,256, Cl. 210-495.000.
Pasternack, Gerlad P.: *See—*
Buzzard, Clair A.; Pasternack, Gerlad P.; and Saltzberg, Burton R., 3,717,754.
Patarini, Leon M.; and Zundel, Arthur P., to National Can Corporation. Non-detachable tear strip with wing tab. 3,717,279, Cl. 220-54.000.
Patel, Ramesh S.: *See—*
Gilberg, Robert C.; Donohue, James P.; and Patel, Ramesh S., 3,717,750.
Pattison, Roy: *See—*
Coussell, Ivan John; and Pattison, Roy, 3,717,815.
Patton, John T., Jr.: *See—*
Kan, Peter T.; Cenker, Moses; and Patton, John T., Jr., 3,717,596.
Paul, Werner; and Schumann, Dierk, to Vereinigte Flugtechnische Werke-Fokker GmbH. Hydraulic drive and actuator. 3,717,070, Cl. 92-128.000.
Pauze, Denis R.: *See—*
Holub, Fred F.; and Pauze, Denis R., 3,717,615.
Pavilon, Stanley J., to Mc Kee, Arthur G., & Company. Tube structure repair. 3,717,200, Cl. 165-75.000.
Pearce, Harry T., to Small Tube Products, Inc. Method of making a composite welding torch tip. 3,716,902, Cl. 29-157.00c.
Pearce, Hugh J. Hood coupling for baby carrier. 3,717,374, Cl. 296-111.000.
Pearman, Grady E.; and Pearman, Marvin S. Animal holder. 3,717,128, Cl. 119-103.000.
Pearman, Marvin S.: *See—*
Pearman, Grady E.; and Pearman, Marvin S., 3,717,128.
Pearson, Ian John, to Sovex Limited. Elevating and lowering conveyors. 3,717,237, Cl. 198-27.000.
Peddinghaus, Carl Ullrich. Bending machine. 3,717,016, Cl. 72-21.000.

Pedersen, Nicholas F.; Fromm, Howard V.; Kent, Melvin L.; and Olmstead, Don G., to Sperry Rand Corporation. Power transmission. 3,717,423, Cl. 418-16.000.
Peek, Benjamin Roger: *See—*
Garcia, Hernando Javier; Peek, Benjamin Roger; and Meza, Jose, 3,717,820.
Peerman, Dwight E.; and Van Demmeltraadt, Huibert, to General Mills, Inc. Fabric bonding with thermoplastic fibrous mats. 3,717,528, Cl. 156-179.000.
Pelczerski, Eugene A.; and Karnavas, James A., to Black, Sivalls & Bryson, Inc. Purification of mine water and the like. 3,717,703, Cl. 423-571.000.
Pendleton, Earl M. Portable tool for refacing drill pipe. 3,717,055, Cl. 82-4.00c.
Penhasi, Harry A.; and Meir, Henry, to Beckman Industries, Inc. Process for the sequential degradation of peptide chains. 3,717,436, Cl. 23-230.00r.
Penn, William O. Calendar and date computer. 3,717,299, Cl. 235-88.000.
Percheron, Jean-Claude; and Septier, Louis, to Compagnie Pechiney. Alloy and method for treatment to produce spheroidal-graphite cast irons. 3,717,456, Cl. 75-130.00b.
Perfect Equipment Corporation: *See—*
Carter, Warren E., 3,716,927.
Perfection Electrical Products, Inc.: *See—*
Douglas, Richard, Jr., 3,717,842.
Perlick, Mark A., to General Motors Corporation. Fluid clutch with one way torque limiting engager. 3,717,229, Cl. 192-85.0aa.
Peronnon, Christian; and Guillet, Claude. Ski-bobs and similar sliding apparatus of the single-track type. 3,717,359, Cl. 280-16.000.
Perron, Robert R.: *See—*
Greene, Walter J.; and Perron, Robert R., 3,717,027.
Perry, Charles H., to Creative Posters, Inc. Disc record carrier. 3,717,297, Cl. 229-72.000.
Peter, Lothar: *See—*
Peter, Oskar E.; and Peter, Lothar, 3,717,367.
Peter, Oskar E.: *See—*
Peter, Oskar E.; and Peter, Lothar (said Peter, Lothar, assor. to said), 3,717,367.
Peter, Oskar E.; and Peter, Lothar, said Peter, Lothar, assor. to said Peter, Oskar E. Unitary hub-shaft interconnection assembly. 3,717,367, Cl. 289-52.006.
Peter, Richard; and Angliker, Hans-Joerg, to Ciba-Geigy AG. Azo dyestuffs containing a complete radical of a styryl dyestuff. 3,717,625, Cl. 260-207.100.
Peter, Wolfgang; and Hanke, Hans, to Daimler-Benz Aktiengesellschaft. Hydrodynamic transmission. 3,716,995, Cl. 60-54.000.
Peters & Co., Inc.: *See—*
Cummings, Gilbert A., 3,717,397.
Peters, Donald L.; and Wilson, Newton R., to Phillips Petroleum Company. Apparatus for cooling the blow pin and plastic molding material during blow molding operation. 3,717,429, Cl. 425-387.000.
Petersen, Alfred W., to Stauffer Chemical Company. Process for treating phosphate ore. 3,717,702, Cl. 423-320.000.
Peterson, Donald E., to Amana Refrigeration, Inc. Circuit protector. 3,717,793, Cl. 317-40.00a.
Peterson, Frank C.; and Theard, Leslie P., to Gulf Oil Corporation. Polymerizable intermediates containing olefin anhydride copolymer and copolymer of unsaturated oxirane and unsaturated anhydride. 3,717,557, Cl. 204-159.150.
Peterson, John F.: *See—*
Hosmer, Thomas P.; and Peterson, John F., 3,717,201.
Peterson, Vincent Carl, to American Chain & Cable Company, Inc. Cable system. 3,717,325, Cl. 254-175.700.
Petrolite Corporation: *See—*
Wilson, Homer M., 3,717,566.
Petzon, Arthur R.; Conway, James M.; and Barth, David E., to Sybron Corporation. Actuation means for an adjustable bed. 3,716,876, Cl. 5-68.000.
Pfaff, Gary C.: *See—*
Scherf, Gerhard W.; and Pfaff, Gary C., 3,717,433.
Pfeiffer, Gerd: *See—*
Bellmann, Manfred; and Pfeiffer, Gerd, 3,717,018.
Pfizer Inc.: *See—*
Rao, Koppaka V.; and McBride, Tom J., 3,717,710.
Roberts, Foy F., 3,717,549.
Warren, Joel, 3,717,573.
Pfleiderer, Wolfgang: *See—*
Zondler, Helmut; and Pfleiderer, Wolfgang, 3,717,593.
Phillips Petroleum Company: *See—*
Barnes, Estil N.; and Collins, Harold T., 3,717,695.
Fahey, Darryl R., 3,717,585.
Fox, Homer M., 3,717,129.
Jurrens, Lawrence D., 3,717,601.
Marrs, Oren L.; and Thomas, Moses L., 3,717,617.
Moon, Clive D., 3,717,577.
Peters, Donald L.; and Wilson, Newton R., 3,717,429.
Rohlfing, Raymond G., 3,717,620.
Seabourn, Ed. O.; and Gatlin, Lonnie E., 3,716,896.
Pibet, Jose Maria Arnau. Toy construction systems. 3,716,939, Cl. 46-25.000.
Picard, Marcel. Self-cleaning filter. 3,717,252, Cl. 210-108.000.
Pickar, Kenneth Arnold: *See—*
Dalton, John Vincent; Mac Rae, Alfred Urquhart; Mathews, James Robert; Moline, Robert Alan; Pickar, Kenneth Arnold; and Seidel, Harvey Donald, 3,717,790.
Pickles, Wilfred: *See—*
Howell, Frederick Harold; and Pickles, Wilfred, 3,717,691.
Pierre, Remi; Guillet, Leon Alain; and Glachant, Luc Clement Dominique, to Gag de France. Submerged combustion heat-generator. 3,717,139, Cl. 126-360.00a.
Pierson, William F.: *See—*
Leach, Austin F.; Sandberg, Gary Karl; and Pierson, William F., 3,717,326.
Pilarczyk, Karol, to Carrier Corporation. Compressor barrel assembly. 3,717,418, Cl. 415-104.000.
Pilgram, Kurt H.; and Skiles, Richard D., to Shell Oil Company. Thiazoles. 3,717,651, Cl. 260-306.80r.
Pilkington Perkin-Elmer Limited: *See—*
Taylor, Hylton; and Tuck, Michael John, 3,717,399.
Pinney, Baden McDowall, to Du Pont of Canada, Limited. High viscosity finisher. 3,717,330, Cl. 259-6.000.
Pippin, Wallace H., to Rohm and Haas Company. 2-n-Alkyl-amino-2-deoxy-alditonitriles as biocidals. 3,717,667, Cl. 260-464.000.
Pishioneri, Philip J. Electrode holder. 3,717,744, Cl. 219-138.000.
Pitner, Alfred, 1/2 to Nadella. Sealing device for a bearing mounted on a shaft. 3,717,394, Cl. 308-187.100.
Plaster, Robert L.: *See—*
Murray, Charles R.; and Plaster, Robert L., 3,717,831.
Plempel, Manfred: *See—*
Buchel, Karl-Heinz; Regel, Erik K.; and Plempel, Manfred, 3,717,657.
Plessey Handel und Investments A.G.: *See—*
Davies, Guy Edward; and Wilson, Christopher Guy Scott, 3,717,166.
Pletnev, Dmitry Vasilievich: *See—*
Arleevskaya, Natalia Yalovlevna; Kalyaeva, Allanikolievna; and Pletnev, Dmitry Vasilievich, 3,717,828.
Plett, Don A.; Owen, Louis L.; and Tenkman, Robert H., to General Electric Company. Direct current pressure ratio circuit. 3,717,038, Cl. 73-398.0ar.
Plevy, Arthur L.; and Wepprecht, Vincent, to Serex, Inc. Solid state electronic bird repellent system. 3,717,802, Cl. 317-262.00s.
Pogonoski, Ivo C., to Texaco Inc. Assembly system for a detachably connected offshore marine structure. 3,716,994, Cl. 61-46.500.
Poirot, James M.: *See—*
Kronenberg, Francis E.; Olson, Alexius B.; Poirot, James M.; Rohweder, Gerald D.; and Winkler, Harold W., 3,717,025.
Pollet, Robert Joseph: *See—*
Florens, Raymond Leopold; and Pollet, Robert Joseph, 3,717,466.
Poloron Products, Inc.: *See—*
Carter, Harry R., 3,717,211.
Pont-A-Mousson S.A.: *See—*
Jarysta, Henri, 3,717,457.
Porges, Karl G.: *See—*
Gold, Raymond; and Porges, Karl G., 3,717,767.
Porter, Glenn A.; and Roth, Norman J., to General Motors Corporation. Acceleration responsive sensor. 3,717,731, Cl. 200-61.45m.
Porter, Glenn A., to General Motors Corporation. Acceleration responsive sensor. 3,717,732, Cl. 200-61.45m.
Porterfield, D. G. Animal feeding device. 3,717,127, Cl. 119-52.00b.
Potter, Carl Richard, to General Motors Corporation. Steer control for hydrostatic system. 3,717,212, Cl. 180-6.440.
Powell, Royal Edward, to United Kingdom Atomic Energy Authority. Adjustable width-slit mechanism. 3,717,401, Cl. 350-271.000.
PPG Industries, Inc.: *See—*
Bentley, William; and Kellar, John D., 3,717,290.
Bruckbauer, Gerald J.; and Corty, Michael E., 3,717,121.
Seymour, Samuel L., 3,717,449.
Pratt, Henry, Company: *See—*
Fawkes, Donald G., 3,717,171.
Pratt Manufacturing Corporation: *See—*
Smith, Richard W., 3,717,244.
Prayfel Inc.: *See—*
Banville, Bertrand, 3,717,345.
Precision Fukuhara Works, Ltd.: *See—*
Sumitomo, Norishige, 3,717,013.
Prescott, Robert C., to Foxboro Company, The. Cascade control system. 3,717,162, Cl. 137-14.000.
Preston, Jack: *See—*
Daniels, Brian K.; Preston, Jack; and Zaukelies, David A., 3,717,542.
Price, Ralph E.; and Schoonover, Stanley C., to Landis Tool Company, mesne. Feed rate and positioning control system for a machine tool. 3,716,949, Cl. 51-165.800.
Price, Sidney M.: *See—*
Hushon, James R.; and Price, Sidney M., 3,717,306.
Procter & Gamble Company, The: *See—*
Booth, Gary E., 3,717,630.
Cope, Paul E.; and Miles, Joe G., 3,716,961.
Strobel, Rudolf G. K., 3,717,472.
Prosser, Paul Edward; Sanders, John Stewart; Savage, Donald Stanley; and Summerlin, Frederick Arthur, to Aerpat A.G., mesne. Blind riveting apparatus. 3,717,023, Cl. 72-391.000.
Pudlick, Leonard K.: *See—*
Luczak, Terrence L.; Pudlick, Leonard K.; and Richie, Carlton A., 3,717,276.

Pulliam, George R.: *See—*
O'Donnell, Cedric F.; and Pulliam, George R., 3,717,853.

Pullman Incorporated: *See—*
Carr, George W., 3,717,372.
Carr, George W., 3,717,373.
Miller, Roy W., 3,717,109.
Miller, Roy W., 3,717,110.

Pye Limited: *See—*
Coussell, Ivan John; and Pattison, Roy, 3,717,815.
Howe, Derek Henry, 3,717,726.

Pye, William: *See—*
Honeycutt, Marshall L.; and Pye, William, 3,717,292.

Raal, Aino: *See—*
Dinh-Nguyen, Nguyen; and Raal, Aino, 3,717,664.

Rachocki, Eugene, to Zurn Industries, Inc. Bilge pump. 3,717,420, Cl. 417-12.000.

Raciazek, Andre: *See—*
Falvert, Daniel; Raciazek, Andre; Authie, Gerard; Clot, Jean; and Giraud, Alain, 3,717,757.

Radin, Edward J.; and Sames, Delbert W., to GAF Corporation. Flash flat-bed wet copier. 3,717,408, Cl. 355-3.000.

Rado, Joseph: *See—*
Chana, Howard E.; Rado, Joseph; and White, Harold D., 3,717,131.

Rains, William A.: *See—*
Fox, Robert D.; Rains, William A.; and Lambert, Gerald G., 3,717,518.

Rank Organisation, Limited, The: *See—*
Rogers, Bernhard J., 3,717,788.

Rankin, William Wirt, to Union Carbide Corporation. Spandex lubricant. 3,717,575, Cl. 252-8.800.

Rao, Koppaka V.; and McBride, Tom J., to Pfizer Inc. Indicine-N-oxide as an antitumor and antileukemic agent for mice and rats. 3,717,710, Cl. 424-274.000.

Rapp, Charles F., to Owens-Illinois, Inc. Low expansion aluminosilicate glass compositions comprising a pentavalent metal oxide. 3,717,441, Cl. 23-292.000.

Rashbaum, Abraham: *See—*
Rashbaum, Abraham; Humphrey, Robert; and Consiglio, Peter (said Humphrey and said Consigli assor. to said), 3,717,225.

Rashbaum, Abraham; Humphrey, Robert; and Consiglio, Peter, said Humphrey and said Consigli assor. to said Rashbaum, Abraham. Anti-theft device for a shopping cart. 3,717,225, Cl. 188-29.000.

Rasmussen, Walter H., to Hoerner-Waldorf Corporation. Deadened crease. 3,717,074, Cl. 93-1.00g.

Rath, Heinrich Bernhard, to Girling Limited. Mechanical couplings. 3,717,227, Cl. 188-79.50p.

Rattray, William L.; and Brown, Bruce G., to AMF Incorporated. Application assembly for tread building apparatus. 3,717,529, Cl. 156-130.000.

Rau, Eric: *See—*
Ilardi, Joseph M.; and Rau, Eric, 3,717,698.

Rave, Terence W., to Hercules Incorporated. Cross-linking epihalohydrin polymers. 3,717,592, Cl. 260-2.00a.

Raviv, Josef: *See—*
Cocke, John; Mommens, Jacques H.; and Raviv, Josef, 3,717,851.

Rayburn, James W.: *See—*
Wu, Yao Hua; and Rayburn, James W., 3,717,634.

Rayfield, John Allen, to Champlain Power Products Limited. Stator ring for face-type fluid seals. 3,717,353, Cl. 277-96.000.

Rayn, Leo F., to Ecodyne Corporation. Stabilizing cation resins. 3,717,594, Cl. 260-2.20r.

Raynaud, Marcel: *See—*
Bizzini, Bernard; Chermann, Jean-Claude; Jasmin, Claude; and Raynaud, Marcel, 3,717,551.

RCA Corporation: *See—*
Amemiya, Hiroshi; and Graf, Stefano Arturo, 3,717,821.

Reactor Centrum Nederland: *See—*
Boose, Cesar Adrianus; and Reidt, Maarten Johan, 3,717,510.
Noothout, Arend J., 3,717,581.

Recognition Equipment Incorporated, mesne: *See—*
Irvin, Donald L.; and Rider, Alan J., 3,717,848.

Redmer Sons Co.: *See—*
Redmer, Wilbert William, 3,717,262.

Redmer, Wilbert William, to Redmer Sons Co. Apparatus for orienting a rod or tube having a beveled end. 3,717,262, Cl. 214-1.00q.

Rees, Donald Frank; and Richardson, Michael Alexander, to Rees, William F., Limited. Tunnel boring equipment. 3,716,997, Cl. 61-85.000.

Rees, Jrhn Robert, to Girling Limited. Disc brake actuator, and resilient retaining means. 3,717,226, Cl. 188-71.400.

Rees, William F., Limited: *See—*
Rees, Donald Frank; and Richardson, Michael Alexander, 3,716,997.

Regel, Erik K.: *See—*
Buchel, Karl-Heinz; Regel, Erik K.; and Plempel, Manfred, 3,717,657.

Regnier, Paul, to Ateliers & Chantiers de la Manche. Installation for the preservation of fish especially on board fishing boats. 3,717,123, Cl. 119-3.000.

Rehn, Karl-Heinz; and Middelmann, Heinz, to Barmag Barmer Maschinenfabrik Aktiengesellschaft. Rapid mounting for spindle in yarn twisting machines. 3,716,980, Cl. 57-130.000.

Reichert, C., Optische Werke A.G.: *See—*
Kropp, Karl, 3,717,410.

Reidt, Maarten Johan: *See—*
Boose, Cesar Adrianus; and Reidt, Maarten Johan, 3,717,510.

Reinauer, Thomas V. Method of filtering. 3,716,971, Cl. 55-96.000.

Reinhall, Rolf Bertil. Grinding apparatus for fibrous material. 3,717,308, Cl. 241-244.000.

Renaud, Georges, to Weydert, Louis Claude. Tightening collar. 3,716,897, Cl. 24-283.000.

Renner, Ulrich: *See—*
Kocsis, Karoly; Renner, Ulrich; and Jaeggi, Knut Alfred, 3,717,641.

Research Corporation, mesne: *See—*
Beall, Francis C., 3,717,187.

Revitz, Martin; and Turene, Francis E., to International Business Machines Corporation. Method of adhering gold to an insulating layer on a semiconductor substrate. 3,717,563, Cl. 204-192.000.

Rex Chainbelt Inc.: *See—*
Clark, Richard J., 3,717,179.
Katcha, Frank F.; and Moericke, Dieter, 3,717,101.

Rexham Corporation, mesne: *See—*
Cote, Raymond A., 3,717,243.
Sinclair, James R.; and Ellis, Gordon Milburn, Jr., 3,717,543.

Reynolds, George E.; Mattison, Donald J.; and Gedemer, Fred J., to Allis-Chalmers Manufacturing Company. Wrapping sheet dispenser for roll wrapping machine. 3,716,964, Cl. 53-389.000.

Reynolds Metals Company: *See—*
Lesko, Frank J., 3,717,458.

Rheem Manufacturing Company: *See—*
Troughton, Thomas D., 3,716,906.

Richardson, Michael Alexander: *See—*
Rees, Donald Frank; and Richardson, Michael Alexander, 3,716,997.

Richie, Carlton A.: *See—*
Luczak, Terrence L.; Pudlick, Leonard K.; and Richie, Carlton A., 3,717,276.

Rider, Alan J.: *See—*
Irvin, Donald L.; and Rider, Alan J., 3,717,848.

Riedel, Wolfgang, to Bosch, Robert, Photokino GmbH. Cinematographic apparatus with coupling means for detachable film-containing cassettes. 3,717,405, Cl. 352-72.000.

Riesel, Werner: *See—*
Herzog, Gunther; Kahle, Gunter; Kolling, Wolfgang; Lamm, Christian; Munch, Ursula; Schumann, Horst; Wolfrom, Walter; Riesel, Werner; and Wagner, Roland, 3,717,489.

Riester, William C., to Trico Products Corporation. Windshield wiper arm. 3,716,888, Cl. 15-250.30y.

Rigdon, Orville W.; Edwards, Robert S.; and Holst, Edward H., to Texaco Inc. Photonitrosation of normal paraffins. 3,717,561, Cl. 204-162.0xn.

Riggs, Robert F., to Sperry Rand Corporation. Ship's maneuver assessment system. 3,717,873, Cl. 343-5.0em.

Rinkel, Gerardus; and Van Doorn, Gijsbert, to Bitumarin N.V. Water-permeable bituminous compositions for hydraulic engineering. 3,717,492, Cl. 106-280.00r.

Ritter, Helmut, to Heberlein Patent Corporation. Transfer tail traction mechanism. 3,717,310, Cl. 242-18.00a.

Ritter, Thomas E., to General Motors Corporation. Vehicle suspension system. 3,717,354, Cl. 280-124.00a.

Roadstrum, William H. Electrical coil. 3,717,835, Cl. 336-84.000.

Robbins, Robert P.; and Thys, Thierry, to FMC Corporation. Water spray ring for citrus fruit processing apparatus. 3,717,084, Cl. 146-3.00r.

Roberts, Conrad L. Saw guide for cutting wedges. 3,717,063, Cl. 83-477.200.

Roberts, Foy F., to Pfizer Inc. Fermentation process for the production of citric acid. 3,717,549, Cl. 195-37.000.

Roberts, Harold D., to E-Systems, Inc., mesne. Ultrasonic welding apparatus. 3,717,539, Cl. 156-498.000.

Robertshaw Controls Company: *See—*
McIntosh, Harold A., 3,717,301.

Robison, Ernest B.; Ehrlich, Shelton; and Bishop, John W., to United States of America, Interior. Process and apparatus for burning sulfur-containing fuels. 3,717,700, Cl. 423-244.000.

Rochina, Vincent; and Allard, Pierre, to Societe Rhodiaceta. Process for the preparation of polyamide-imide filaments. 3,717,696, Cl. 264-205.000.

Roder, Gerhard: *See—*
Tucking, Werner; and Roder, Gerhard, 3,717,426.

Roe, Robert A.; and Anderson, Gerald C., to Applied Power Industries, Inc. Vehicle drive system and control means therefor. 3,717,213, Cl. 180-6.480.

Rogers, Bernhard J., to Rank Organisation, Limited, The. Cathode ray tube arrangement utilizing magnetic shunts for controlling color registration. 3,717,788, Cl. 315-13.00c.

Rogers, Waldo I., to Rusco Industries, Inc. Electromagnet sensor structure for magnetic cards. 3,717,749, Cl. 235-61.11d.

Rogier, Edgar R., to General Mills, Inc. Polyamide compositions. 3,717,598, Cl. 260-18.00n.

Rohde, William A.: *See—*
Mayworm, Daniel E.; and Rohde, William A., 3,717,533.

Rohlfing, Raymond G., to Phillips Petroleum Company. Arylene sulfide resin oxidative curing process. 3,717,620, Cl. 260-79.000.

Rohm and Haas Company: *See—*
Otsuki, Susumu; Hori, Kyoichi; and Miyanohara, Isao, 3,717,553.
Pippin, Wallace H., 3,717,667.

Rohr, Wolfgang; and Fischer, Adolf, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Substituted biscarbamates. 3,717,668, Cl. 260-472.000.

Rohrs, Hartwig: *See—*
Jansing, Walter; Rohrs, Hartwig; and Rothfuss, helmut, 3,717,352.

Rohweder, Gerald D.: *See—*
Kronenberg, Francis E.; Olson, Alexius B.; Poirot, James M.; Rohweder, Gerald D.; and Winkler, Harold W., 3,717,025.

Rolatape Corporation: *See—*
Evans, Wallace D., 3,716,919.

Rolls-Royce Limited: *See—*
Sutton, Julian MacDonald Davison, 3,717,304.

Rooke, Sydney William; and Coston, Ronald Frances, to Sovex Limited. Container unloading. 3,717,270, Cl. 214-307.000.

Rosen, Karl Isac Joel. Thread storage and delivery device. 3,717,312, Cl. 242-47.120.

Rosenzweig, Walter. Display device. 3,717,867, Cl. 340-336.000.

Roszinski, Hilmar; and Schmadel, Hermann, to Knapsack Aktiengesellschaft. Process for the manufacture of salt mixtures of alkali metal salts of O,O-dialkyldithio-phosphoric acids. 3,717,692, Cl. 260-987.000.

Rotek Instruments Corporated: *See—*
West, James L., 3,717,822.

Roth, Norman J.: *See—*
Porter, Glenn A.; and Roth, Norman J., 3,717,731.

Rothery, John L.: *See—*
Arciprete, Genio R.; Cairns, Walter J.; Hertz, Carl Hellmuth; Mansson, Kjell Ake Gosta; and Rothery, John L., 3,717,875.

Rothfuss, helmut: *See—*
Jansing, Walter; Rohrs, Hartwig; and Rothfuss, helmut, 3,717,352.

Rothschild, Barbara G. Vehicle restraint assembly. 3,717,216, Cl. 180-82.000.

Rothwell, Guy N., Jr., to Telecheck International, Inc., mesne. Jig for performing work in a weightless medium. 3,717,000, Cl. 61-69.00r.

Rousseau, Jean-Pierre. Flashlight. 3,717,759, Cl. 240-10.660.

Rowand, Ronald P.; and Michel, Donald P., to Bauer Bros. Co., The. Liquid clarification unit. 3,717,255, Cl. 210-512.000.

Rowe, Charles A., jr.; and Stogryn, Eugene L., to United States of America, Air Force. Method for the preparation of 2,3-dimethyl aziridine. 3,717,628, Cl. 260-239.00e.

Rowell, Douglas W. Method for welding. 3,716,908, Cl. 29-477.700.

Rowlands, Tom: *See—*
Molins, Desmond Walter; and Rowlands, Tom, 3,717,537.

Ruben, Zorro D. Portable electric saw, grinder, sander or the like. 3,716,917, Cl. 30-391.000.

Rusco Industries, Inc.: *See—*
Rogers, Waldo I., 3,717,749.

Russ, John C.: *See—*
Melloy, George F.; and Russ, John C., 3,717,508.

Russell, Lionel E.: *See—*
Dowden, Roy L.; and Russell, Lionel E., 3,716,941.

Ruthrof, Klaus, to Siemens Aktiengesellschaft. Device for reclaiming sweet water from sea water or brackish water. 3,717,554, Cl. 202-238.000.

Ruyle, William V.: *See—*
Sarett, Lewis H.; and Ruyle, William V., 3,717,659.

Ruyle, William V., to Merck & Co., Inc. Sulfanilyl phenyl urea complexes useful against Marek's disease. 3,717,623, Cl. 260-96.50c.

Rydeski, Julian A., to Westinghouse Electric Corporation. One piece aluminum electrical contact member for semiconductor devices. 3,717,797, Cl. 317-234.00r.

Saab-Scania Aktiebolag: *See—*
Edmansson, Kurt Axel Henry; and Karlsson, Ake Gustav-Adolf, 3,717,386.

Sabia, Raffaele A.: *See—*
Biskeborn, Merle C.; McCann, Joseph P.; and Sabia, Raffaele A., 3,717,716.

Saddington, Arthur W.: *See—*
Gibsen, Kenneth F.; and Saddington, Arthur W., 3,717,452.

Saderson, Hendrik Johannes: *See—*
Davidse, Jan; and Saderson, Hendrik Johannes, 3,717,727.

Sadoski, Tadius T.; and Johnson, Walter A., to Sylvania Electric Products Inc. Aperture fluorescent lamp having uniform surface brightness. 3,717,781, Cl. 313-109.000.

Sagal, William R.: *See—*
Spielvogel, Paul; Sagal, William R.; and Miller, Jay H., 3,717,395.

Saito, Toshiaki; and Miyasaka, Mamoru, to Kabushiki Kaisha Suwa Seikosha. Watch structure having plastic and metal components. 3,716,984, Cl. 58-58.000.

Sakai, Ryoichi, to Tokyo Shibaura Electric Co., Ltd. Vapour phase reaction apparatus. 3,717,439, Cl. 23-277.00r.

Sakamoto, Kenro; Fushiki, Isamu; Shimizu, Fumio; and Sugita, Sadao, to Konishiroku Photo Industry Co., Ltd. Light-sensitive silver halide color photographic material having improved graininess upon color development. 3,717,465, Cl. 96-100.000.

Sakazume, Kaiichiro; and Sato, Shui, to Konishiroku Photo Industry Co., Ltd. Light-sensitive supersensitized silver halide emulsions. 3,717,468, Cl. 96-124.000.

Salter, Steven J.: *See—*
Cochran, David L.; and Salter, Steven J., 3,717,068.

Saltzberg, Burton R.: *See—*
Buzzard, Clair A.; Pasternack, Gerlad P.; and Saltzberg, Burton R., 3,717,754.

Sames, Delbert W.: *See—*
Radin, Edward J.; and Samea, Delbert W., 3,717,408.

Samtleben, Hans-Wolfgang: *See—*
Stahle, Helmut; Koppe, Herbert; Zeile, Karl; Wole, Martin; Hoefke, Wolfgang; and Samtleben, Hans-Wolfgang, 3,717,633.

San Ritsu Company Limited: *See—*
Sato, Taketoshi, 3,717,085.

Sandberg, Gary Karl: *See—*
Leach, Austin F.; and Sandberg, Gary Karl, 3,717,224.
Leach, Austin F.; Sandberg, Gary Karl; and Pierson, William F., 3,717,326.

Sanders Associates, Inc.: *See—*
Hanninen, Albert E.; and Scanlon, Shaun M., 3,717,877.

Sanders, Howard E. Automatic feeder for fish aquarium. 3,717,125, Cl. 119-51.110.

Sanders, John Stewart: *See—*
Prosser, Paul Edward; Sanders, John Stewart; Savage, Donald Stanley; and Summerlin, Frederick Arthur, 3,717,023.

Sandoz-Wander, Inc.: *See—*
Anderson, Paul L.; Houlihan, William J.; and Manning, Robert E., 3,717,632.
Anderson, Paul L.; Houlihan, William J.; and Manning, Robert E., 3,717,635.
Coombs, Robert V.; and Galantay, Eugene E., 3,717,663.
Hardtmann, Goetz E., 3,717,645.
Hunziker, Fritz; Schmutz, Jean; and Kunzle, Franz Mattin, 3,717,637.

Santosuosso, Robert C. Fishing lure. 3,716,937, Cl. 43-42.470.

Sarett, Lewis H.; and Ruyle, William V., to Merck & Co. Heterocyclic salicylic acid derivatives. 3,717,659, Cl. 260-326.300.

Sasaki, Koju, to Nittan Company, Limited. Fire detecting system and testing means therefor. 3,717,862, Cl. 340-237.00s.

Sato, Hisao: *See—*
Shiga, Takeo; Takagi, Toshihiko; Arakawa, Yoshihide; and Sato, Hisao, 3,717,218.

Sato, Shui: *See—*
Sakazume, Kaiichiro; and Sato, Shui, 3,717,468.

Sato, Taketoshi, to San Ritsu Company Limited. Installation for bean sprout production. 3,717,085, Cl. 99-516.000.

Sauter, Robert: *See—*
Maier, Roland; and Sauter, Robert, 3,717,629.

Savage, Donald Stanley: *See—*
Prosser, Paul Edward; Sanders, John Stewart; Savage, Donald Stanley; and Summerlin, Frederick Arthur, 3,717,023.

Sayigh, Adnan A. R.: *See—*
Von Doering, William E.; Farrissey, William J., Jr.; Frulla, Floro F.; and Sayigh, Adnan A. R., 3;717,683.

Scanlon, Shaun M.: *See—*
Hanninen, Albert E.; and Scanlon, Shaun M., 3,717,877.

Schade, Frank Stanley, to National Bank Book Company, Inc. Arched ring-wire post binder. 3,717,416, Cl. 402-31.000.

Schaefer, Edward J., to Franklin Electric Co., Inc. Apparatus ind method for a liquid level sensor. 3,717,421, Cl. 417-38.000.

Schaefer, Theodore S. Adjustable dolly construction. 3,717,357, Cl. 280-35.000.

Schaeff, Hans, to Schaeff, Karl, Maschinenfabrik, KG. Mobile shovel excavator. 3,717,269, Cl. 214-138.00r.

Schaeff, Karl, Maschinenfabrik, KG: *See—*
Schaeff, Hans, 3,717,269.

Schaffer, Helmut: *See—*
Heyl, Gerhard; Luttgens, Gunter; Behr, Rolf; Maus, Fritz; Frenken, Hans; Busch, Josef; Bruck, Herbert; and Schaffer, Helmut, 3,717,791.

Scheffel, John W.; and Fischer, Paul W., to Union Oil Company of California. Method and composition for treating high-temperature subterranean formations. 3,717,204, Cl. 166-283.000.

Scherf, Gerhard W.; and Pfaff, Gary C., to Diamond Shamrock Corporation. Corrosion inhibition method. 3,717,433, Cl. 21-2.700.

Schering Corporation: *See—*
Villani, Frank J., 3,717,647.

Schinke, David Paul; and Van Uitert, Le Grand Gerard, to Bell Telephone Laboratories, Incorporated. Ferroelastic $Tb_2(MoO_4)_3$ and devices incorporating. 3,717,562, Cl. 204-180.00r.

Schirmer, Henry G., to Grace, W. R., & Co. Non-woven fabric-like member. 3,717,541, Cl. 161-169.000.

Schlau, Floyd E.: *See—*
Bosley, Denis V.; Crain, Philip W.; Douglas, Raymond J.; Loomis, Bernard; Schlau, Floyd E.; and Staats, William A., 3,716,940.
Merino, Dennis H.; Bosley, Denis V.; Lucas, Daniel R., Jr.; and Schlau, Floyd E., 3,717,346.

Schlegel, Norman H., to Cory Corporation. Decanter handle structure. 3,717,288, Cl. 222-465.000.

Schlienger, Max P. Arc furnace crucible. 3,717,713, Cl. 13-9.000.

Schloemann Aktiengesellschaft: *See—*
Simons, Willi, 3,717,331.

Schlueter, Francis Edward: *See—*
Copley, Russell Dean; and Schlueter, Francis Edward, 3,716,976.

Schlumberger Technology Corporation: *See—*
Shore, James B., 3,717,207.

Schmadel, Hermann: *See—*
Roszinski, Hilmar; and Schmadel, Hermann, 3,717,692.

Schmalfeld, Paul; Mosberger, Erich; and Gauch, Georg, to Metallgesellschaft AG. Hydrocarbon cracking apparatus. 3,717,438, Cl. 23-262.000.

Schmidt, Fernand; and Vanoverberghe, Cyrille, to N.V. Bekaert S.A. Fence post with fence wire tensioning mechanism. 3,717,327, Cl. 256-41.900.
Schmidt, Heinz: *See—*
Brenneisen, Erich; Lindner, Helmut; and Schmidt, Heinz, 3,717,626.
Schmidtchen, Hans-Martin, to Kabel- und Metallwerke Gutehoffnungshutte Aktiengesellschaft. High pressure cable. 3,717,718, Cl. 174-106.00d.
Schmutz, Jean: *See—*
Hunziker, Fritz; Schmutz, Jean; and Kunzle, Franz Mattin, 3,717,637.
Schoger, H. L., & Associates, Inc.: *See—*
Schoger, Henry L., 3,717,169.
Schoger, Henry L., to Schoger, H. L., & Associates, Inc. Gas supply system apparatus. 3,717,169, Cl. 137-412.000.
Schoof, Hansotto: *See—*
Kieffer, Richard; Mariacher, Hans; and Schoof, Hansotto, 3,717,496.
Schoonover, Richard H. A., to Formac International, Inc., mesne. Tracked vehicle walking beam assembly with equalizing means for ground pressure and track length. 3,717,214, Cl. 180-9.500.
Schoonover, Stanley C.: *See—*
Price, Ralph E.; and Schoonover, Stanley C., 3,716,949.
Schoppa, Hans: *See—*
Koch, Karl Heinz; Koch, Paul; Loorz, Walter; and Schoppa, Hans, 3,717,602.
Schubert & Salzer Maschinenfabrik Aktiengesellschaft: *See—*
Handschuch, Karl; and Schumann, Fritz, 3,716,979.
Schulenberg, John W., to Sterling Drugs, Inc. 1,2,3,4,6,7 12,12a-Octahydro-2-phenylpyrazino [2',1':6,1] pyrido [3,4-b] indoles and intermediates therefor. 3,717,638, Cl. 260-268.0pc.
Schulman, Bernard L., to Esso Research and Engineering Company. Hydrogen purification and recycle in hydrogenating heavy mineral oils. 3,717,571, Cl. 208-254.00h.
Schultz, Robert G., to Monsanto Company. Production of carboxylic acids and esters. 3,717,670, Cl. 260-476.00r.
Schultz, William James: *See—*
Vanbennekom, Carl Frederick; and Schultz, William James, 3,717,118.
Schultz, William James; and Kernander, Warren Norman, to General Electric Co. Wire-form cable guide for shelf-mounted electronic equipment modules. 3,717,319, Cl. 248-49.000.
Schumann, Dierk: *See—*
Paul, Werner; and Schumann, Dierk, 3,717,070.
Schumann, Fritz: *See—*
Handschuch, Karl; and Schumann, Fritz, 3,716,979.
Schumann, Horst: *See—*
Herzog, Gunther; Kahle, Gunter; Kolling, Wolfgang; Lamm, Christian; Munch, Ursula; Schumann, Horst; Wolfrom, Walter; Riesel, Werner; and Wagner, Roland, 3,717,489.
Schutrum, Walter L.; and Funkhouser, Richard L., to National Cash Register Company, The. Microform viewer lens focusing mechanism. 3,717,400, Cl. 350-255.000.
Schwartz, Nelson N.: *See—*
Huntzinger, Elwood E.; and Schwartz, Nelson N., 3,717,595.
Schwartz, Samuel M., to Farah Manufacturing Company, Inc. Absorbent stretchable fabric. 3,717,150, Cl. 128-284.000.
Schweizerische Industrie-Gesellschaft: *See—*
Fluck, Rene, 3,717,751.
Science and Technology Agency, Director of the: *See—*
Tanaka, Eiichi; Hiramoto, Toshiyuki; Nohara, Norimasa; and Kurihara, Shigeyasu, 3,717,763.
SCM Corporation: *See—*
McGinniss, Vincent D., 3,717,558.
Scott, Alwyn C.: *See—*
Parmentier, Robert D.; and Scott, Alwyn C., 3,717,773.
Scribner, Harry E. Differential pressure bottle crown inspector employing fluidic control system. 3,717,248, Cl. 209-73.000.
Scrivener, Ian, to Comalco Limited. Hidden sheet securing assembly. 3,716,958, Cl. 52-713.000.
Seabourn, Ed. O.; and Gatlin, Lonnie E., to Phillips Petroleum Company. Eccentrically locking apparatus holder. 3,716,896, Cl. 24-257.000.
Sebring, Rex G. AC-to-DC converter. 3,717,806, Cl. 321-18.000.
Seidel, Harvey Donald: *See—*
Dalton, John Vincent; Mac Rae, Alfred Urquhart; Mathews, James Robert; Moline, Robert Alan; Pickar, Kenneth Arnold; and Seidel, Harvey Donald, 3,717,790.
Seino, Hiroshi: *See—*
Takao, Hiroshi; and Seino, Hiroshi, 3,717,046.
Sekella, Thomas Curran: *See—*
Wertheimer, Harry P.; and Sekella, Thomas Curran, 3,717,734.
Seki, Nagataka, to Tokyo Shibaura Electric Co., Ltd. Inverter device. 3,717,807, Cl. 321-27.00r.
Sela, Michael: *See—*
Haimovich, Joseph; and Sela, Michael, 3,717,705.
Selwitz, Charles M.: *See—*
Hay, Russell G.; Notaro, Vincent A.; and Selwitz, Charles M., 3,717,685.
Notaro, Vincent A.; and Selwitz, Charles M., 3,717,684.
Sennewald, Kurt; Hauser, Alfred; Gehrmann, Klaus; Steil, Karl-Heinz; and Lork, Winfried, to Knapsack Aktiengesellschaft. Process for isolating acrylic acid from the reaction gases obtained by the oxidation of propylene or a acrolein. 3,717,675, Cl. 260-530000.
Septier, Louis: *See—*
Percheron, Jean-Claude; and Septier, Louis, 3,717,456.
Seree de Roch, Irenee: *See—*
Alagy, Jacob; Busson, Christian; Gadelle, Claude; and Seree de Roch, Irenee, 3,717,662.
Serex, Inc.: *See—*
Plevy, Arthur L.; and Wepprecht, Vincent, 3,717,802.
Severns, Richard Ray; Sullivan, James Kirk; and Simmons, Lynn Coulson, to FMC Corporation. Fluidized bed treatment of phosphorus-containing precipitator dust. 3,717,451, Cl. 71-33.000.
Seyferth, Dietmar; and Tronich, Wolfgang, to Massachusetts Institute of Technology. Reaction of phenyl (bromodichloromethyl) mercury and the preparation of perchlorothiirane. 3,717,660, Cl. 260-327.00e.
Seymour, Samuel L., to PPG Industries, Inc. Treating glass sheets during shaping and cooling. 3,717,449, Cl. 65-104.000.
Sfat, Michael R.; and Morton, Bruce J., to Bio-Technical Resources, Inc. Preparation of low carbohydrate beer. 3,717,471, Cl. 99-31.000.
Shamban, W. S., & Co.: *See—*
Traub, Henry A; and Woodson, Leslie A., 3,717,293.
Shanahan, William J.: *See—*
Zopf, Vincent R.; and Shanahan, William J., 3,717,206.
Shanley, Edward S.; and Doggett, Roger H., to Lubrizol Corporation, The. Composition and method of imparting permanent press and soil release properties to fabrics. 3,717,687, Cl. 260-851.000.
Shapiro, Hymin: *See—*
Kobetz, Paul; Shapiro, Hymin; and Impastato, Fred J., 3,717,666.
Sharp, Denis, to U.S. Philips Corporation. Transistor amplifier and limiter circuits. 3,717,774, Cl. 307-237.000.
Sharp, Richard A.: *See—*
McGrew, Jay L.; Sharp, Richard A.; Mowrey, Eugene C.; Thomas, Donald A.; and Gille, John P., 3,717,005.
Shaver, Everett E. Gauging method and apparatus for diesel injector nozzles. 3,716,922, Cl. 33-181.00r.
Shaw, Robert R.; and Uhlmann, Donald R., to American Optical Corporation. Neodymium glass laser having room temperature output at wavelengths shorter than 1060 NM. 3,717,583, Cl. 252-301.40f.
Shea, Daniel Joseph: *See—*
Kohl, Lou; and Shea, Daniel Joseph, 3,717,693.
Sheeran, Harold W.; and Oriard, Marcel H. Polyacrylamide thickened slurry explosive with particular cross-linking combination. 3,717,519, Cl. 149-60.000.
Sheldon, Gary L.; and Kimberling, Rex F., to Pacific Tooling and Engineering Company. Replaceable wear-resistant element and method for replacing same. 3,717,209, Cl. 175-413.000.
Shell Oil Company: *See—*
Pilgram, Kurt H.; and Skiles, Richard D., 3,717,651.
Shelton, Naaman. Guides for hand power saws. 3,717,064, Cl. 83-761.000.
Shen, Chung Yu: *See—*
Feiler, William A.; Feierstein, Harold E.; Shen, Chung Yu; and Stahlheber, Norman Earl, 3,717,589.
Shepherd, Edmund J.: *See—*
Ambrose, John; and Shepherd, Edmund J., 3,717,180.
Shepherd, John M.: *See—*
Bischof, Kaspar; Hoskins, Robert D.; and Shepherd, John M., 3,717,184.
Sheppard, Geoffrey: *See—*
Turner, John Christopher; and Sheppard, Geoffrey, 3,717,704.
Sherman, Harry W.: *See—*
North, Howard C.; Sherman, Harry W.; and Kaplan, Edward B., 3,717,425.
Shields, John; and Mengason, James, to Du Pont de Nemours, E. I., and Company. Traffic lane indicator. 3,717,076, Cl. 404-11.000.
Shiga, Takeo; Takagi, Toshihiko; Arakawa, Yoshihide; and Sato, Hisao, 1/2 to Sato, Hisao and 1/2 to Nippon Columbia Co., Ltd., mesne. Loudspeaker. 3,717,218, Cl. 181-32.00r.
Shikano, Gohei: *See—*
Yoshimura, Tsuneo; Suzuki, Kunio; and Shikano, Gohei, 3,717,445.
Shikcku Kaken Kogyo Kabushiki Kaisha: *See—*
Fukumoto, Kenichi; Nakamura, Tokunori; and Kadota, Kenji, 3,717,486.
Shimada, Toshio: *See—*
Hiratsuka, Toshio; and Shimada, Toshio, 3,717,576.
Shimamura, Masaharu: *See—*
Tanaka, Hiroyoshi; Aotani, Hiroshi; Shimamura, Masaharu; and Yuki, Ehime, 3,717,689.
Shimizu, Fumio: *See—*
Sakamoto, Kenro; Fushiki, Isamu; Shimizu, Fumio; and Sugita, Sadao, 3,717,465.
Shimizu, Hiroshi: *See—*
Tatsutomi, Yasuo; and Shimizu, Hiroshi, 3,716,991.
Shimojo, Takemi, to Alps Electric Co., Ltd. Resilient ominidirectional push-button for an electrical switch. 3,717,737, Cl. 200-159.00b.
Shinetsu Chemical Company: *See—*
Koyanagi, Shunichi; Kitamura, Hajime; and Sonegawa, Shigehisa, 3,717,688.
Shinomiya, Yasuo: *See—*
Kubo, Moritada; and Shinomiya, Yasuo, 3,717,856.
Shipley Company, Inc.: *See—*

Gulla, Michael; and Dutkewych, Oleh Borys, 3,717,482.
Shirato, Akira; Furuyama, Hidezo; and Aoki, Masaru, to Showa Electric Wire and Cable Co., Ltd. Method for forming a cross-linked polyethylene insulator. 3,717,522, Cl. 156-53.000.
Shoob, Stuart J.: *See—*
Thompson, Robert J., 3,717,054.
Shore, James B., to Schlumberger Technology Corporation. Perforating apparatus. 3,717,207, Cl. 175-4.600.
Short, Charles R.; and Billett, Ronald J., to FMC Corporation. Sheet feeding and aligning apparatus. 3,717,336, Cl. 271-9.000.
Short, Oliver A., to Du Pont de Nemours, E. I., and Company. Gold metallizing compositions. 3,717,481, Cl. 106-1.000.
Shottenfeld, Richard: *See—*
Abilock, Solomon; Shottenfeld, Richard; and Brown, Thomas, 3,717,771.
Showa Electric Wire and Cable Co., Ltd.: *See—*
Shirato, Akira; Furuyama, Hidezo; and Aoki, Masaru, 3,717,522.
Sickel, Gordon E.; and Tempel, George F., to Electronic Associates, Inc. Analog summer/integrator mode control circuit having digital/analog switched inputs. 3,717,776, Cl. 307-229.000.
Sidelman, Abraham, to Goodman, H., & Sons, Inc. Self-secured foundation. 3,717,157, Cl. 122-54.000.
Siegler, Lear, Inc.: *See—*
Motz, Carl H., 3,717,019.
Siegmund, Arthur J.: *See—*
Slominski, Leo J.; Landau, Adela; and Siegmund, Arthur J., 3,717,521.
Sieke, Helmut; and Sieke, Rainer. Movable tamping machines for railroads. 3,717,100, Cl. 104-12.000.
Sieke, Rainer: *See—*
Sieke, Helmut; and Sieke, Rainer, 3,717,100.
Siemens Aktiengesellschaft: *See—*
Burtscher, Joachim; Emeis, Reimer; and Herlet, Adolf, 3,716,911.
Dunsche, Horst Georg, 3,717,523.
Hiller, Sigwart, 3,717,765.
Jaskulke, Gerhard; Mayer, Max; Lampe, Bernst; Giebler, Fritz; and Steigenberger, Hasso, 3,717,723.
Koller, Rudolf, 3,717,234.
Kuhl, Wilfried; and Klug, Leonhard, 3,717,739.
Langer, Erik, 3,717,816.
Ruthrof, Klaus, 3,717,554.
Wittich, Holger; and Spanek, Wolfgang, 3,717,834.
Sieswerda, Bauke S., to Stamicarbon N.V. Balance. 3,717,210, Cl. 177-196.000.
Silverberg, Morton, to Xerox Corporation. Method and apparatus for electrostatically performing a tacking operation. 3,717,801, Cl. 317-262.00e.
Silvey, Elmer R. Saw chain depth gauge grinder. 3,717,051, Cl. 76-37.000.
Simmons, Lynn Coulson: *See—*
Severns, Richard Ray; Sullivan, James Kirk; and Simmons, Lynn Coulson, 3,717,451.
Simons, Willi, to Schloemann Aktiengesellschaft. Turret for casting ladles. 3,717,331, Cl. 266-13.000.
Simplex Time Recorder Company: *See—*
Stanley, Lawrence G., 3,717,117.
Simpson, Michael Charles Stephen; and Felton, Barrie, to English Electric Company Limited. Relay power supply. 3,717,796, Cl. 317-148.50r.
Sims, Rex J.: *See—*
Fioriti, Joseph A.; Stahl, Howard D.; Sims, Rex J.; and Spotholz, Clifford H., 3,717,474.
Sinclair, James R.; and Ellis, Gordon Milburn, Jr., to Rexham Corporation, mesne. Laminations of polyimide films to like films and/or to metal foils. 3,717,543, Cl. 161-186.000.
Singer Company, The: *See—*
St. Dannatt, Hugh L., 3,717,235.
Skeem, Gary L.: *See—*
Luker, Harold E.; and Skeem, Gary L., 3,717,309.
SKF Industrial Trading and Development Company NV: *See—*
Hallerback, Stig Lennart, 3,717,779.
Skiatron Electronics & Television Corporation: *See—*
Zopf, Vincent R.; and Shanahan, William J., 3,717,206.
Skiles, Richard D.: *See—*
Pilgram, Kurt H.; and Skiles, Richard D., 3,717,651.
Slattery, John P., to General Electric Company. Air conditioner. 3,717,010, Cl. 62-184.000.
Slijkerman, Nicolaas Petrus; and Esveldt, Cornelis Jacobus, to U.S. Philips Corporation. Annular magnet core built up from a soft magnetic ferrite material and method of manufacturing the same. 3,717,578, Cl. 252-62.610.
Sloan Technology Corporation: *See—*
Breitweiser, Gary C., 3,717,746.
Slominski, Leo J.; Landau, Adela; and Siegmund, Arthur J., to Mac Dermid Incorporated. Solution and method for dissolving copper. 3,717,521, Cl. 156-19.000.
Slonimsky, Grigory Lvovich; Tolstoguzov, Vladimir Borisovich; Frshova, Vera Alexandrovna; and Izjumov, Dmitry Borisovich, to Ordena Lenina Institut Elementoorganicheskikh Soedineny. Granular protein containing food product resembling the natural caviar of sturgeon, salmon and other fish, and a method of preparing same. 3,717,469, Cl. 99-14.000.
Small Tube Products, Inc.: *See—*
Pearce, Harry T., 3,716,902.
Smedley, William H.: *See—*
Gay, Derek J.; Smedley, William H.; and Miller, Anthony D., 3,717,136.
Smeulers, Wouter, to U.S. Philips Corporation. Adjusting circuit for a chrominance signal amplifier in a colour television receiver using a differential amplifier suitable for an integrated circuit. 3,717,728, Cl. 178-5.4ac.
Smith, Alfred E. Safety shield for powered lawn equipment. 3,716,975, Cl. 56-17.400.
Smith, Colin Francis Greening; and Bliss, Norman Stanley, to International Standard Electric Corporation. Coaxial cable inner conductor. 3,717,719, Cl. 174-107.000.
Smith, Erwin G.: *See—*
Miller, Frank E.; Smith, Erwin G.; and Sulcek, Charles E., 3,717,090.
Smith, Luther W., to American Optical Corporation. Method and apparatus for making fused bundles of energy-conducting fibers. 3,717,531, Cl. 156-180.000.
Smith, Marvin W.: *See—*
Crawford, Robert H.; and Smith, Marvin W., 3,717,868.
Smith, Richard W., to Pratt Manufacturing Corporation. Package with easy opening dust flap and method of manufacturing the same. 3,717,244, Cl. 206-56.0aa.
Smith, Robert D., to Du Pont de Nemours, E. I., and Company. Hydraulic valve. 3,717,176, Cl. 137-599.000.
Smith, Roy E., to Owens-Corning Fiberglas Corporation. Apparatus for packaging linear material. 3,717,311, Cl. 242-18.00r.
Smith, Roy E., to Owens-Corning Fiberglas Corporation. Apparatus for and method of processing wet strand-like material. 3,717,448, Cl. 65-3.000.
Smith, Wesley Earl: *See—*
Harper, William Lyle; and Smith, Wesley Earl, 3,717,622.
Snellman, Donald L.; and Hudson, Willard G., to Norfin, Inc. Glass fiber cable, method of making, and its use in the manufacture of track vehicles. 3,717,391, Cl. 305-40.000.
Snellman, Donald L., to Norfin, Inc. Electrical transmission cable system. 3,717,720, Cl. 174-131.00a.
Snodgrass, Harold F. Boat trailer structure. 3,717,268, Cl. 214-83.240.
Snook, Melvin E.; Joujon-Roche, Phillip J.; and Yancey, Warren L., to Hughes Aircraft Company. High fidelity symbol display through limited bandwidth system. 3,717,872, Cl. 343-5.0em.
Snyder, Fred P.: *See—*
Middleton, William J., Jr.; and Snyder, Fred P., 3,716,882.
Societa Farmaceutici Italia: *See—*
Arcari, Giuliana; Fregnan, Gian Carlo; Temperilli, Aldemio; and Ulivi, Pietro, 3,717,640.
Societe a Responsabilite Limitee dite: Societe Lamy d'Etudes et de Recherches: *See—*
Chaveneaud, Roger M.; and Janoska, Georges, 3,717,232.
Societe Anonyme Ciments la Farge: *See—*
Magnan, Regis Marie Albert, 3,717,488.
Societe Anonyme dite: CNMP-Berthiez: *See—*
Aubrier, Paul Jacques, 3,717,417.
Societe Anonyme Usines Emile Henricot: *See—*
Ernest, Paul Emile; and Henricot, Alfred Andre, 3,717,106.
Societe d'Etudes Verrieres Appliquees: *See—*
Bernard, Rene George, 3,717,322.
Societe Milliat Freres: *See—*
Guichard, Geoffroy; and Le Bolloch, Rene, 3,717,480.
Societe Nationale Idustrielle Aerospotiale: *See—*
Certain, Bernard Maurice, 3,717,317.
Societe Rhodiaceta: *See—*
Rochina, Vincent; and Allard, Pierre, 3,717,696.
Soderman, Bengt Rolf: *See—*
Czarnecki, Tadek; and Soderman, Bengt Rolf, 3,717,368.
Soderstrom, Melvin A., to National Cash Register Company, The. Method of making connection between a printing drum and torsion shaft. 3,716,905, Cl. 29-447.000.
Sohns, Johann. Manure removal system. 3,717,242, Cl. 198-224.000.
Sonegawa, Shigehisa: *See—*
Koyanagi, Shunichi; Kitamura, Hajime; and Sonegawa, Shigehisa, 3,717,688.
Sonoco Products Company: *See—*
Adams, Hal M.; Dunlap, Charles K., Jr.; and Harper, William M., 3,717,291.
Sony Corporation: *See—*
Kubota, Yasuharu; and Tagawa, Susumu, 3,717,833.
Numakura, Toshihiko, 3,717,725.
Sorenson, Hugh E. Circular water skis or surfboard. 3,716,880, Cl. 9-310.00g.
Sovex Limited: *See—*
Pearson, Ian John, 3,717,237.
Rooke, Sydney William; and Coston, Ronald Frances, 3,717,270.
Spaargaren, Hans: *See—*
Van Kempen, Dick; and Spaargaren, Hans, 3,717,863.
Spanbauer, Francis L., to Gulf Research & Development Company. Abnormal impedance test for a string of geophones. 3,717,810, Cl. 324-57.00r.
Spanek, Wolfgang: *See—*
Wittich, Holger; and Spanek, Wolfgang, 3,717,834.
Sparling, Robert O. Rapier loom. 3,717,182, Cl. 139-127.00r.
Spencer, Donald B., to McGraw-Edison Company. Jet spray treating machine. 3,717,015, Cl. 68-18.00f.
Sperry, Philip R.; and Gullotti, Damian V., to Olin Corporation. Aluminum base alloys. 3,717,512, Cl. 148-32.500.
Sperry Rand Corporation: *See—*

Abdale, John M.; Gartner, Robert J.; and Knudsen, Karl J., 3,717,823.
Doyle, Thomas R., 3,717,787.
Lonnemo, Kurt R., 3,716,987.
Pedersen, Nicholas F.; Fromm, Howard V.; Kent, Melvin L.; and Olmstead, Don G., 3,717,423.
Riggs, Robert F., 3,717,873.
Spetalnik, Mack, to Maidenform, Inc. Brassiere. 3,717,154, Cl. 128-494.000.
Spielvogel, Paul; Sagal, William R.; and Miller, Jay H., to Klein's, S., Department Stores, Inc. Display fixture. 3,717,395, Cl. 312-114.000.
Spotholz, Clifford H.: *See—*
Fioriti, Joseph A.; Stahl, Howard D.; Sims, Rex J.; and Spotholz, Clifford H., 3,717,474.
S.P.Q.R. Engineering Limited: *See—*
Sturges, Frederick William, 3,717,053.
Sprague Electric Company: *See—*
Hurley, Thomas P.; and McAdams, Arthur C., Jr., 3,717,487.
Kahn, Manfred, 3,717,798.
Sprinter Pack AB: *See—*
Wingardh, Uno, 3,717,274.
St. Dannatt, Hugh L., to Singer Company, The. Impact contact keyboard. 3,717,235, Cl. 197-98.000.
Sta-Soil Corporation: *See—*
Hatton, John H., 3,717,285.
Staats, William A.: *See—*
Bosley, Denis V.; Crain, Philip W.; Douglas, Raymond J.; Loomis, Bernard; Schlau, Floyd E.; and Staats, William A., 3,716,940.
Stahl, Howard D.: *See—*
Fioriti, Joseph A.; Stahl, Howard D.; Sims, Rex J.; and Spotholz, Clifford H., 3,717,474.
Stahl, Jere F. Adapter for exhaust manifold. 3,716,992, Cl. 60-323.000.
Stahle, Helmut; Koppe, Herbert; Zeile, Karl; Wole, Martin; Hoefke, Wolfgang; and Samtleben, Hans-Wolfgang, to Boehringer Ingelheim G.m.b.H. 2-Anilino-1,3-diazacyclopentene-(2) derivative. 3,717,633, Cl. 260-253.000.
Stahlheber, Norman Earl: *See—*
Feiler, William A.; Feierstein, Harold E.; Shen, Chung Yu; and Stahlheber, Norman Earl, 3,717,589.
Staley, Gerald E.: *See—*
Gnaedinger, Donald J.; and Staley, Gerald E., 3,717,805.
Stamicarbon N.V.: *See—*
Sieswerda, Bauke S., 3,717,210.
Stanaback, Kenneth P. Tapered end mill machine. 3,716,948, Cl. 51-95.01h.
Standard Oil Company: *See—*
McAllister, LeRoy; and Citek, Francis J., 3,717,569.
McVay, David Robert; Eickhoff, Henry Louis; and Thatcher, Harry William, 3,717,536.
Standard Pneumatic Motor Company: *See—*
Coss, Ronald G., 3,717,183.
Stanford, Raymond L.: *See—*
Gracin, William J.; and Jones, Roy Lee, 3,717,056.
Stange, Hugo: *See—*
Chakrabarti, Paritosh M.; Stange, Hugo; and Volpp, Gert Paul, 3,717,616.
Stanley, John E., to Duo-Flex Corporation. Downward access spline for demountable suspended ceiling system. 3,716,956, Cl. 52-484.000.
Stanley, Lawrence G., to Simplex Time Recorder Company. Annunciator. 3,717,117, Cl. 116-128.000.
Stauffer Chemical Company: *See—*
Petersen, Alfred W., 3,717,702.
Stedman, Robert N.: *See—*
Boggs, Roger L.; and Stedman, Robert N., 3,717,388.
Boggs, Roger L.; and Stedman, Robert N., 3,717,389.
Cackley, George W.; Heitzman, Gary N.; Boggs, Roger L.; and Stedman, Robert N., 3,717,387.
Steigenberger, Hasso: *See—*
Jaskulke, Gerhard; Mayer, Max; Lampe, Bernst; Giebler, Fritz; and Steigenberger, Hasso, 3,717,723.
Steil, Karl-Heinz: *See—*
Sennewald, Kurt; Hauser, Alfred; Gehrmann, Klaus; Steil, Karl-Heinz; and Lork, Winfried, 3,717,675.
Stemke, Lothar, to Hopt Electronic GmbH. Adjusting device for tuner units. 3,717,041, Cl. 24-10.600.
Stengle, Edward J., Jr., to Owens-Illinois, Inc. Handle for suspending intravenous solution bottles. 3,717,277, Cl. 215-100.00a.
Sterling Drug Inc.: *See—*
Archer, Sydney, 3,717,643.
Diana, Guy D., 3,717,648.
Sterling Drugs, Inc.: *See—*
Schulenberg, John W., 3,717,638.
Stern, Paul G.: *See—*
Abbas, Shakir A.; and Stern, Paul G., 3,717,852.
Sternbach, Leo Henryk: *See—*
Metlesics, Werner; and Sternbach, Leo Henryk, 3,717,658.
Sternco Industries, Inc.: *See—*
Lovitz, David D., 3,717,253.
Stevenson, Karl F. Method for repairing craters in the surface of a concrete runway. 3,717,328, Cl. 259-148.000.
Stievenart, Emile Frans, to Gevaert-Agfa N.V. Photographic dryer. 3,716,926, Cl. 34-160.000.
Stitt, James R., to Electronic Communications, Inc. High precision circulating digital correlator. 3,717,756, Cl. 235-181.000.
Stoffel, John F.; and Fuehrer, Charles, to Stoffel Seals Corporation. Plastic seal with hinge. 3,717,369, Cl. 292-321.000.
Stoffel Seals Corporation: *See—*
Stoffel, John F.; and Fuehrer, Charles, 3,717,369.
Stogryn, Eugene L.: *See—*
Rowe, Charles A., jr.; and Stogryn, Eugene L., 3,717,628.
Stoiber, Paul J.: *See—*
Tole, John W.; Stoiber, Paul J.; and Etzel, Leroy, 3,716,918.
Stokes, John J., Jr.; Cargnel, Robert A.; and Geiger, Robert C., to Aluminum Company of America. Method of soldering. 3,716,909, Cl. 29-504.000.
Stonefelt, Ronald D.: *See—*
Hatcher, Arthur L., Jr.; and Stonefelt, Ronald D., 3,717,516.
Stordeur, Pierre: *See—*
Visnovsky, Lubomir; and Stordeur, Pierre, 3,717,526.
Strack, Friedhelm; Keuper, Erich; and Frenken, Klaus, to Mannesmann Aktiengesellschaft. Mold for continuous casting of slab ingots. 3,717,197, Cl. 164-273.000.
Stradley, Norman H.; and Dunegan, Harry C., to American Lava Corporation. Refractory articles and method of manufacture. 3,717,497, Cl. 117-169.00r.
Stratton, George B.: *See—*
Geering, Emil J.; and Stratton, George B., 3,717,682.
Strobel, Rudolf G. K., to Procter & Gamble Company, The. Separating aroma-and flavor-bearing substrates into aroma and flavor concentrates. 3,717,472, Cl. 99-65.000.
Stuart, Ronald Sangster, to Imperial Chemical Industries Limited. Siloxane-oxyalkylene co-polymers containing si-si bonds. 3,717,665, Cl. 260-448.20d.
Stupf, Ewald; and Haan, Tammo, to Luwa AG. Filter device and method for the manufacturing thereof. 3,716,970, Cl. 55-521.000.
Sturges, Frederick William, to S.P.Q.R. Engineering Limited. Hand tool. 3,717,053, Cl. 81-3.00f.
Suggitt, Robert M.; Estes, John H.; and Kravitz, Stanley, to Texaco Inc. Fluorided composite alumina catalysts. 3,717,586, Cl. 252-439.000.
Sugita, Sadao: *See—*
Sakamoto, Kenro; Fushiki, Isamu; Shimizu, Fumio; and Sugita, Sadao, 3,717,465.
Sukoian, Nariman Alexandrovich: *See—*
Zinkovsky, Viktor Petrovich; Sukoian, Nariman Alexandrovich; Alyanov, Vladimir Fedorovich; and Frolov, Jury Fedorovich, 3,717,712.
Sulcek, Charles E.: *See—*
Miller, Frank E.; Smith, Erwin G.; and Sulcek, Charles E., 3,717,090.
Sullivan, James Kirk: *See—*
Severns, Richard Ray; Sullivan, James Kirk; and Simmons, Lynn Coulson, 3,717,451.
Sumiotmo Jukikai Kogyo Kabushiki Kaisha: *See—*
Maeda, Isamu, 3,716,969.
Sumitomo, Norishige, to Precision Fukuhara Works, Ltd. Cams for knitting machines. 3,717,013, Cl. 66-57.000.
Summerlin, Frederick Arthur: *See—*
Prosser, Paul Edward; Sanders, John Stewart; Savage, Donald Stanley; and Summerlin, Frederick Arthur, 3,717,023.
Sumner, Maurice N. Modular offshore structures system. 3,716,993, Cl. 61-46.500.
Sun Oil Company: *See—*
Duling, Irl N.; and Merges, John C., Jr., 3,717,534.
Surendranath, Jack G.: *See—*
Chakravarti, Diptiman; Surendranath, Jack G.; and Orth, Richard Duncan, 3,717,555.
Susquehanna Corporation, The: *See—*
Olcott, Eugene L., 3,717,419.
Sutton, Julian MacDonald Davison, to Rolls-Royce Limited. Thrust reverser for fluid flow engine. 3,717,304, Cl. 239-265.190.
Suzuki, Kunio: *See—*
Yoshimura, Tsuneo; Suzuki, Kunio; and Shikano, Gohei, 3,717,445.
Suzuki, Yukio: *See—*
Yamamoto, Manabu; and Suzuki, Yukio, 3,717,782.
Svab, Ferenc, to Medicor Muvek. Aeroiomizer. 3,717,148, Cl. 128-190.000.
Sweger, Russell P., to Barber-Colman Company. Servo control. 3,717,803, Cl. 318-471.000.
Swift & Company: *See—*
Connick, Francis Glenn, 3,717,479.
Sybron Corporation: *See—*
Petzon, Arthur R.; Conway, James M.; and Barth, David E., 3,716,876.
Sykes, Peter Job: *See—*
Laing, Stuart Bruce; and Sykes, Peter Job, 3,717,627.
Sylvania Electric Products, Inc.: *See—*
Anderson, John W., 3,716,898.
Kerstetter, Donald R.; and Losey, Harold D., 3,716,899.
Loughridge, Frederick A.; and Finch, William A., 3,717,450.
Matheson, Wilfrid G., 3,717,784.
Sadoski, Tadius T.; and Johnson, Walter A., 3,717,781.
Tack, Carl E., to Amsted Industries Incorporated. Process for assembling a snubbing arrangement in a railway truck. 3,716,903, Cl. 29-173.000.
Tagawa, Susumu: *See—*

Kubota, Yasuharu; and Tagawa, Susumu, 3,717,833.
Takagi, Toshihiko: *See—*
Shiga, Takeo; Takagi, Toshihiko; Arakawa, Yoshihide; and Sato, Hisao, 3,717,218.
Takano, Masao: *See—*
Fujimura, Ikuo; and Takano, Masao, 3,717,764.
Takao, Hiroshi; and Seino, Hiroshi, to Nissan Motor Company Limited. Automotive steering column. 3,717,046, Cl. 74-492.000.
Takase, Katsuyasu; Nakane, Yuzo; and Yomura, Masamichi, to Japanese Geon Company, Ltd., The, and and Futaba Netsukagaku Kenkyujo Ltd., The. Method of drying synthetic rubber material. 3,716,924, Cl. 34-36.000.
Takeda Chemical Industries, Ltd.: *See—*
Kishi, Toyokazu; Asai, Mitsuko; Harada, Setsuo; Muroi, Masayuki; and Misuno, Komei, 3,717,707.
Takeuchi, Yasumasa: *See—*
Ichikawa, Mitsuo; Takeuchi, Yasumasa; Harita, Yoshiyuki; Endo, Masayuki; Yamaguchi, Nobuo; Tashiro, Matsuru; and Kogure, Akira, 3,717,613.
Takimoto, Hisa'hi, to Fuji Photo Film Co., Ltd. Web cutting device in an apparatus for splicing an old web and a new web. 3,717,057, Cl. 83-98.000.
Takuma, Hiroshi; Mori, Hajimi; Masutani, Koji; and Umezu, Kazuko, to Nihan Denshi Kabushiki Kaisha. Method for analyzing spectral data using halograms. 3,717,412, Cl. 356-77.000.
Tam, William A., to Chicago Bridge & Iron Company. Offshore storage structure. 3,717,001, Cl. 61-46.500.
Tanabe Kakoki Co., Ltd.: *See—*
Tisaki, Tatu, 3,717,714.
Tanaka, Eiichi; Hiramoto, Toshiyuki; Nohara, Norimasa; and Kurihara, Shigeyasu, to National Institute of Radiological Sciences, Science and Technology Agency, Director of the and Tokyo Shibaura Electric Co., Ltd. Scintillation camera device. 3,717,763, Cl.250-71.50s.
Tanaka, Hiroyoshi; Aotani, Hiroshi; Shimamura, Masaharu; and Yuki, Ehime, to Toray Industries, Inc. Process for improving the antistatic properties of hydrophobic synthetic fibers. 3,717,689, Cl. 260-898.000.
Tanaka, Kazuo; Tsuzuki, Akira; and Matsumura, Tetsuo, to Citizen Watch Company Limited. Calendar watch. 3,716,983, Cl. 58-58.000.
Tandy, William H., to Addressograph-Multigraph Corporation. Photosensitization of printing masters. 3,717,464, Cl. 96-33.000.
Taniguchi, Yasuhiro: *See—*
Makara, Satoshi; Kashigi, Kazuo; and Taniguchi, Yasuhiro, 3,717,721.
Tapeswitch Corporation of America: *See—*
Koenig, Robert H., 3,717,735.
Tashiro, Matsuru: *See—*
Ichikawa, Mitsuo; Takeuchi, Yasumasa; Harita, Yoshiyuki; Endo, Masayuki; Yamaguchi, Nobuo; Tashiro, Matsuru; and Kogure, Akira, 3,717,613.
Tatsutomi, Yasuo; and Shimizu, Hiroshi, to Toyo Kogyo Co., Ltd. Exhaust gas purifying device. 3,716,991, Cl. 60-289.000.
Taylor, Hylton; and Tuck, Michael John, to Pilkington Perkin-Elmer Limited. Optical interference filter for shifting color temperature. 3,717,399, Cl. 350-166.000.
Tektronix, Inc.: *See—*
Massey, Ernst M.; and Brown, William C., 3,717,786.
Telecheck International, Inc., mesne: *See—*
Rothwell, Guy N., Jr., 3,717,000.
Teledyne Industries, Inc.: *See—*
Cook, John C.; and Wilt, M. Duane, 3,717,864.
Telefunken Patentverwertungsgesellschaft m.b.H.: *See—*
Franz, Ilse; and Langheinrich, Werner, 3,717,498.
Tempel, George F.: *See—*
Sickel, Gordon E.; and Tempel, George F., 3,717,776.
Temperilli, Aldemio: *See—*
Arcari, Giuliana; Fregnan, Gian Carlo; Temperilli, Aldemio; and Ulivi, Pietro, 3,717,640.
Tenkman, Robert H.: *See—*
Plett, Don A.; Owen, Louis L.; and Tenkman, Robert H., 3,717,038.
Tenniswood, David M.: *See—*
Cork, Gordon H.; and Tenniswood, David M., 3,716,986.
Terahara, Goro, to Toyoda Koki Kabushiki Kaisha. Loading device. 3,716,952, Cl. 51-215.0hm.
Terrasse, Gilles: *See—*
Paoletti, Charles; and Terrasse, Gilles, 3,717,495.
Tescom Corporation: *See—*
Glesmann, Donald E., 3,717,177.
Texaco Inc.: *See—*
Hess, Howard V.; and Cole, Edward L., 3,717,545.
Pogonoski, Ivo C., 3,716,994.
Rigdon, Orville W.; Edwards, Robert S.; and Holst, Edward H., 3,717,561.
Suggitt, Robert M.; Estes, John H.; and Kravitz, Stanley, 3,717,586.
Texas Instruments, Incorporated: *See—*
Crawford, Robert H.; and Smith, Marvin W., 3,717,868.
Hagler, Robert G., 3,717,381.
Textol Systems, Inc.: *See—*
Zaruba, Wenzel, 3,717,042.
Textron, Inc.: *See—*
Gutshall, Charles E., 3,717,189.
Thatcher, Harry William: *See—*
McVay, David Robert; Eickhoff, Henry Louis; and Thatcher, Harry William, 3,717,536.
Theard, Leslie P.: *See—*
Peterson, Frank C.; and Theard, Leslie P., 3,717,557.
Thermex Inc.: *See—*
Klingler, Josef F.; Braverman, Theodore; and Klingler, Charles E., 3,717,035.
Thiesen, John W., Jr.: *See—*
Oles, Herbert E.; and Thiesen, John W., Jr., 3,717,089.
Thillays, Jacques; and Fertin, Jacques, to U.S. Philips Corporation. Device and base plate for a mosaic of semiconductor elements. 3,717,800, Cl. 317-234.00r.
Thomas, Donald A.: *See—*
McGrew, Jay L.; Sharp, Richard A.; Mowrey, Eugene C.; Thomas, Donald A.; and Gille, John P., 3,717,005.
Thomas, Edward Wherry, to Intertechnique S.A., mesne. Liquid scintillation spectrometer with automatic setting of channel limits. 3,717,753, Cl. 235-151.300.
Thomas, Herbert J., Jr., to Holland Wire Products, Inc. Differentially resilient spring assembly. 3,716,874, Cl. 5-260.000.
Thomas, Klaus: *See—*
Ost, Walter; Thomas, Klaus; Jerchel, Dietrich; and Appel, Karl-Richard, 3,717,709.
Thomas, Moses L.: *See—*
Marrs, Oren L.; and Thomas, Moses L., 3,717,617.
Thompson, Albert N. Curling brooms. 3,716,885, Cl. 15-210.00r.
Thompson, Earl B., Jr., to Industrial Pneumatic Systems, Inc. Convertible rail-highway mine car. 3,717,108, Cl. 105-215.00c.
Thompson, John, Limited: *See—*
Woodall, Alan; and Honey, Chesleigh Brian, 3,717,295.
Thompson, Ralph N.; and Hoover, Merwin F., to Calgon Corporation. Fluorocarbon containing diallyl ammonium compounds. 3,717,679, Cl. 260-567.60m.
Thompson, Robert J., 25% to Shoob, Stuart J. Open-end wrench with integral ratcheting means. 3,717,054, Cl. 81-179.000.
Thor Power Tool Company: *See—*
Vana, Vladimir J., 3,717,011.
Thornburgh, William F., to General Motors Corporation. Intake manifold for exhaust gas recirculation and method of manufacture. 3,717,130, Cl. 123-52.5mv.
Thornton, Roland L., Jr., to Cameron Iron Works, Inc., mesne. Communication and control system. 3,717,849, Cl. 340-163.000.
Thunder Projects, Incorporated: *See—*
Utter, Wallace, 3,717,730.
Thys, Thierry: *See—*
Robbins, Robert P.; and Thys, Thierry, 3,717,084.
Tilings, Paul. Buoyant maneuverable ski. 3,716,881, Cl. 9-310.00d.
Tipton, William C.; and Langan, Joseph E. Rate of rise thermal detector. 3,717,860, Cl. 340-229.000.
Tisaki, Tatu, to Tanabe Kakoki Co., Ltd. Combined equipment of electrode holder segments and fastening means for use with closed electric smelting furnace. 3,717,714, Cl. 13-15.000.
Tobias, Philip E. Automatic sheet material transport machine. 3,717,160, Cl. 134-122.000.
Tokai Rubber Industries, Ltd.: *See—*
Yamashita, Kazuo, 3,717,318.
Tokyo Medical and Dental University, President of the: *See—*
Masuhara, Eiichi; and Imai, Yohji, 3,717,502.
Tokyo Shibaura Electric Co., Ltd.: *See—*
Abe, Toshio, 3,717,507.
Kubo, Moritada; Asano, Kuniji; and Ohashi, Hiromichi, 3,717,413.
Kubo, Moritada; and Shinomiya, Yasuo, 3,717,856.
Sakai, Ryoichi, 3,717,439.
Seki, Nagataka, 3,717,807.
Tanaka, Eiichi; Hiramoto, Toshiyuki; Nohara, Norimasa; and Kurihara, Shigeyasu, 3,717,763.
Tole, John W.; Stoiber, Paul J.; and Etzel, Leroy, to Northwest Dental Laboratories, Inc. Denture coupling and method of forming coupling. 3,716,918, Cl. 32-5.000.
Tolstoguzov, Vladimir Borisovich: *See—*
Slonimsky, Grigory Lvovich; Tolstoguzov, Vladimir Borisovich; Frshova, Vera Alexandrovna; and Izjumov, Dmitry Borisovich, 3,717,469.
Topler, Ernest: *See—*
Langen, Jacobus Joseph; Lagen, Marinus Jacobus Maria; and Topler, Ernest, 3,716,962.
Toray Industries, Inc.: *See—*
Oyama, Minoru; Yamada, Masaaki; Ohkubo, Shunji; and Osakada, Atsushi, 3,717,559.
Tanaka, Hiroyoshi; Aotani, Hiroshi; Shimamura, Masaharu; and Yuki, Ehime, 3,717,689.
Tornero, Rogelio: *See—*
Hesskamp, Robert G.; Meyer, Kenneth P.; and Tornero, Rogelio, 3,717,597.
TOS Hostivar, narodni podnik Proha-Hostivar: *See—*
Linda, Josef; Belohoubek, Bohuslav; and Marsalek, Jaroslav, 3,717,393.
Tote-Cart Company: *See—*
Mills, Frank, Jr., 3,717,358.
Tower Products, Inc.: *See—*
Mayworm, Daniel E.; and Rohde, William A., 3,717,533.
Toyo Carbon Kabushiki Kaisha: *See—*

  - Yoshimura, Tsuneo; Suzuki, Kunio; and Shikano, Gohei, 3,717,445.
- Toyo Kogyo Co., Ltd.: *See—*
  - Tatsutomi, Yasuo; and Shimizu, Hiroshi, 3,716,991.
- Toyoda Koki Kabushiki Kaisha: *See—*
  - Terahara, Goro, 3,716,952.
- Traub, Henry A; and Woodson, Leslie A., to Shamban, W. S., & Co. Seal assembly. 3,717,293, Cl. 277-144.000.
- Trico Products Corporation: *See—*
  - Riester, William C., 3,716,888.
- Tronich, Wolfgang: *See—*
  - Seyferth, Dietmar; and Tronich, Wolfgang, 3,717,660.
- Troughton, Thomas D., to Rheem Manufacturing Company. Method of making food containers. 3,716,906, Cl. 29-460.000.
- TRW Inc.: *See—*
  - Hohne, John C., Jr.; and Johnson, Carl J., 3,717,780.
- TSC Industries Inc.: *See—*
  - Burenga, Thomas I., 3,717,045.
- Tsuzuki, Akira: *See—*
  - Tanaka, Kazuo; Tsuzuki, Akira; and Matsumura, Tetsuo, 3,716,983.
- Tuck, Michael John: *See—*
  - Taylor, Hylton; and Tuck, Michael John, 3,717,399.
- Tucking, Werner; and Roder, Gerhard, to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning. Overpressure external sizing tool. 3,717,426, Cl. 425-71.000.
- Tumey, Morris J.: *See—*
  - McMurray, Nolan D.; and Tumey, Morris J., 3,717,443.
- Turene, Francis E.: *See—*
  - Revitz, Martin; and Turene, Francis E., 3,717,563.
- Turner, John Christopher; and Sheppard, Geoffrey, to United Kingdom Atomic Energy Authority. Inulin type radioactive diagnostic materials. 3,717,704, Cl. 424-1.000.
- Tveter, Richard S., to Himmelstein, S., and Company. Torquemeter. 3,717,029, Cl. 74-136.00a.
- Ueno, Katuyoshi: *See—*
  - Koike, Hirotami; and Ueno, Katuyoshi, 3,717,761.
- Uffner, Melville W., to Air Products and Chemicals, Inc. Dye compositions. 3,717,491, Cl. 106-209.000.
- Uhlmann, Donald R.: *See—*
  - Shaw, Robert R.; and Uhlmann, Donald R., 3,717,583.
- Ulivi, Pietro: *See—*
  - Arcari, Giuliana; Fregnan, Gian Carlo; Temperilli, Aldemio; and Ulivi, Pietro, 3,717,640.
- Ulrich, Werner: *See—*
  - Ghiron, Hugo; and Ulrich, Werner, 3,717,850.
- Umezu, Kazuko: *See—*
  - Takuma, Hiroshi; Mori, Hajimi; Masutani, Koji; and Umezu, Kazuko, 3,717,412.
- Union Carbide Corporation: *See—*
  - Rankin, William Wirt, 3,717,575.
- Union Oil Company of California: *See—*
  - Howland, Ward W.; and Mallett, William R., 3,717,446.
  - Scheffel, John W.; and Fischer, Paul W., 3,717,204.
- United Aircraft Corporation: *See—*
  - Buczek, Carl J.; Demaria, Anthony J.; Ferrar, Carl M.; and Wayne, Robert J., 3,717,824.
  - Law, Ernest Harry; and Clark, James William, 3,717,104.
- United Kingdom Atomic Energy Authority: *See—*
  - Powell, Royal Edward, 3,717,401.
  - Turner, John Christopher; and Sheppard, Geoffrey, 3,717,704.
- United States of America
  - Agriculture: *See—*
    - McGovern, Terrence P.; Beroza, Morton; Davis, Harry G.; and Eddy, Gaines W., 3,717,706.
    - Vick, Charles B.; and Walker, Roy M., 3,717,067.
  - Air Force: *See—*
    - Fox, Robert D.; Rains, William A.; and Lambert, Gerald G., 3,717,518.
    - Rowe, Charles A., jr.; and Stogryn, Eugene L., 3,717,628.
  - Army: *See—*
    - Hopkins, Ralph E., 3,717,506.
    - Morrow, Warren P., 3,717,094.
    - Wronka, Adolph A.; Banker, Bernard R.; Andrews, John E., Jr.; and Kliem, Bernd W. A., 3,717,097.
  - Army, mesne: *See—*
    - Nigg, Russell L.; and Olinger, Guy R., 3,717,215.
  - Atomic Energy Commission: *See—*
    - Gold, Raymond; and Porges, Karl G., 3,717,767.
    - Harper, William Lyle; and Smith, Wesley Earl, 3,717,622.
    - Lindemer, Terrence B.; and Bradley, Ronnie A., 3,717,582.
  - Interior: *See—*
    - Robison, Ernest B.; Ehrlich, Shelton; and Bishop, John W., 3,717,700.
  - Navy: *See—*
    - Bernaerts, Henry J., 3,717,114.
    - Davis, Edward J.; Cordle, Paul E.; McCubbin, Melvin J.; Lockwood, Donald W.; and Higuera, Richard L., 3,717,098.
    - Echols, William H.; Fielding, George H.; and Neihof, Rex A., 3,717,580.
    - Mosko, Joseph A., 3,717,878.
- United States Steel Corporation: *See—*
  - Dukelow, Donald A.; Orehoski, Michael A.; and Veselinovich, Nick, 3,717,034.
- United States Surgical Corporation: *See—*
  - Green, David T., 3,717,294.
- University of California, The Regents of the: *See—*
  - Biscar, Jean P., 3,717,031.
- University of Toronto, The Governors of the: *See—*
  - Guillet, James Edwin, 3,717,040.
- Unkle, Truman F., Jr.; and Loos, John F., to Gulf Oil Corporation. Electrochemical cell stack. 3,717,505, Cl. 136-86.00a.
- Upjohn Company, The: *See—*
  - Herr, Milton E.; Murray, Herbert C.; and Fonken, Gunther S., 3,717,650.
  - Herr, Milton E.; Murray, Herbert C.; and Fonken, Gunther S., 3,717,677.
  - Hester, Jackson B., Jr., 3,717,653.
  - Hester, Jackson B., Jr., 3,717,654.
  - Von Doering, William E.; Farrissey, William J., Jr.; Frulla, Floro F.; and Sayigh, Adnan A. R., 3,717,683.
- Upp, Donald L., to General Motors Corporation. Shielded window arrangement for a heat cleaning oven door. 3,717,138, Cl. 126-200.000.
- Urasaki, Kazuaki: *See—*
  - Hatano, Isao; Nagano, Akira; and Urasaki, Kazuaki, 3,717,871.
- Urbonas, Algie J. Appliances for cutting an egg shell. 3,717,088, Cl. 99-568.000.
- U.S. Amada, Ltd.: *See—*
  - Daniels, Dennis, 3,717,059.
  - Daniels, Dennis, 3,717,061.
- U.S. Philips Corporation: *See—*
  - Dandliker, Rene, 3,717,404.
  - Jordy, Peter, 3,717,715.
  - Kasperkovitz, Wolfdietrich, 3,717,775.
  - Notelteirs, Victor Rosallie; and Janssen, Eduard Jozef Philomena, 3,717,783.
  - Sharp, Denis, 3,717,774.
  - Slijkerman, Nicolaas Petrus; and Esveldt, Cornelis Jacobus, 3,717,578.
  - Smeulers, Wouter, 3,717,728.
  - Thillays, Jacques; and Fertin, Jacques, 3,717,800.
  - Van Acker, Paul Antonius Ferdinand, 3,717,855.
  - Van de Polder, Johan Leendert, 3,717,729.
  - Van Kempen, Dick; and Spaargaren, Hans, 3,717,863.
  - Woerdman, Johannes Petrus, 3,717,415.
  - Wolber, Jorg, 3,717,789.
- U.S. Phillips Corporation: *See—*
  - Davidse, Jan; and Saderson, Hendrik Johannes, 3,717,727.
- U.S. Radium Corporation: *See—*
  - Byler, William H.; and Mattis, James J., 3,717,584.
- USM Corporation: *See—*
  - Hall, Clifford; and Holdsworth, John E., 3,717,414.
- Utter, Wallace, to Thunder Projects, Incorporated. Memory timing disc structure with adjustable pins which are set and resettable by automatic means during continuous cyclic operation. 3,717,730, Cl. 200-38.0ch.
- V-M Corporation: *See—*
  - Oakley, Charles F.; and Marks, Larry D., 3,717,350.
- Valdenazzi, Luigi Giovanni, to Costruzioni Meccaniche Industriali Genovesi C.M.I., S.p.A. Device for the connection between a crucible and a supporting ring. 3,717,333, Cl. 266-36.00p.
- Valyl, Emery I. Lined plastic articles. 3,717,544, Cl. 161-252.000.
- Van Acker, Paul Antonius Ferdinand, to U.S. Philips Corporation. Magnetic head unit. 3,717,855, Cl. 340-174.10e.
- Van de Polder, Johan Leendert, to U.S. Philips Corporation. Colour television receiver for displaying a received television signal on a picture tube of the indexing type. 3,717,729, Cl. 178-5.40f.
- Van Demmeltraadt, Huibert: *See—*
  - Peerman, Dwight E.; and Van Demmeltraadt, Huibert, 3,717,528.
- Van Den Berg, Janwillem, to Vitatron N.V. Cardiac pacemaker. 3,717,152, Cl. 128-419.00p.
- Van Doorn, Gijsbert: *See—*
  - Rinkel, Gerardus; and Van Doorn, Gijsbert, 3,717,492.
- Van Kempen, Dick; and Spaargaren, Hans, to U.S. Philips Corporation. Switch position supervising device. 3,717,863, Cl. 340-253.00r.
- Van Slooten, Louis J., to General Motors Corporation. Valve rotator. 3,717,132, Cl. 123-90.300.
- Van Uitert, Le Grand Gerard: *See—*
  - Schinke, David Paul; and Van Uitert, Le Grand Gerard, 3,717,562.
- Vana, Vladimir J., to Thor Power Tool Company. Impulse unit. 3,717,011, Cl. 64-26.000.
- Vanbennekom, Carl Frederick; and Schultz, William James, to General Electric Company. Indicating instrument with interchangeable face assembly. 3,717,118, Cl. 116-129.000.
- Vance, Bess L.: *See—*
  - Grunig, James K.; Anderson, Rodney J.; and Vance, Bess L., 3,717,437.
- Vander Burgh, Lloyd A., to International Harvester Company. Hydraulically actuated seat assembly. 3,717,321, Cl. 248-404.000.
- Vanderpool, Charles C. Selectively operable eccentric wheel mount. 3,717,361, Cl. 280-229.000.
- Vann, Clyde R.: *See—*
  - Vann, Roy R.; and Vann, Clyde R., 3,717,099.
- Vann, Roy R. Select fire jet perforating apparatus. 3,717,095, Cl. 102-21.600.
- Vann, Roy R.; and Vann, Clyde R. Electrical power package for subsurface detonation of explosives. 3,717,099, Cl. 102-70.20r.

- Vanoverberghe, Cyrille: *See—*
  - Schmidt, Fernand; and Vanoverberghe, Cyrille, 3,717,327.
- Varian Mat GmbH: *See—*
  - Bultemann, Hans-Joachim, 3,717,525.
- Vaughan, William Lee; and Graeme-Noel, Basil, to N.V. Inc. Electrical circuit connector. 3,717,840, Cl. 339-198.00r.
- Vereinigte Flugtechnische Werke-Fokker GmbH: *See—*
  - Paul, Werner; and Schumann, Dierk, 3,717,070.
- Verner, Dalton R., to Elox, Inc. Short circuit protection system for electrical discharge machining apparatus. 3,717,741, Cl. 219-69.00c.
- Veselinovich, Nick: *See—*
  - Dukelow, Donald A.; Orehoski, Michael A.; and Veselinovich, Nick, 3,717,034.
- Vicent, Fernando Suarez, to Manuel Lainz S.A. Template for tracing small and capital letters and numbers. 3,716,921, Cl. 33-174.00b.
- Vick, Charles B.; and Walker, Roy M., to United States of America, Agriculture. Underlayment fastening device. 3,717,067, Cl. 85-21.000.
- Vickers, Robert V., to Park-Ohio Industries, Inc. Slab heating device. 3,717,740, Cl. 219-10.570.
- Villani, Frank J., to Schering Corporation. Alpha-nicotinoyl phenylacetonitriles. 3,717,647, Cl. 260-294.900.
- Villanueva, Juanito O.: *See—*
  - Garcia, Armando J.; Gunther, Gregory M.; and Villanueva, Juanito O., 3,716,942.
- Vind, Holger, to Danfoss A/S. Method of for centering the stator and rotor of an electric motor. 3,716,912, Cl. 29-596.000.
- Visador Company: *See—*
  - Davis, Burnice D., 3,717,186.
- Visnovsky, Lubomir; and Stordeur, Pierre, to Monsanto Europe S.A. Production of textile articles. 3,717,526, Cl. 156-78.000.
- Vitatron N.V.: *See—*
  - Van Den Berg, Janwillem, 3,717,152.
- Voelkel, Samuel C.: *See—*
  - Hebeisen, Richard M.; and Voelkel, Samuel C., 3,717,065.
- Vogelsang, Francis H., to Maalschappij van Berkel's Patent N.V. Meat tenderizer. 3,716,893, Cl. 17-26.000.
- Voith, J. M., GmbH., Firma: *See—*
  - Hofmann, Alexander, 3,717,116.
- Volberding, William L. Adjsutable snack tray. 3,717,111, Cl. 108-45.000.
- Volkers, Daphne: *See—*
  - Volkers, Walter K.; and Willie, Edward N., 3,717,876.
- Volkers Research Corporation: *See—*
  - Volkers, Walter K.; and Willie, Edward N. (said Willie assor. to), 3,717,876.
- Volkers, Walter K.; deceased (by Volkers, Daphne; executrix); and Willie, Edward N., said Willie assor. to Volkers Research Corporation. Ferrite antenna coupled to radio frequency currents in vehicle body. 3,717,876, Cl. 343-712.000.
- Volkswagenwerk Aktiengesellschaft: *See—*
  - Milde, Wilhelm, 3,717,324.
- Volpp, Gert Paul: *See—*
  - Chakrabarti, Paritosh M.; Stange, Hugo; and Volpp, Gert Paul, 3,717,616.
- Von Doering, William E.; Farrissey, William J., Jr.; Frulla, Floro F.; and Sayigh, Adnan A. R., to Upjohn Company, The. Process for preparing hydroquinone from P-nitrosophenol. 3,717,683, Cl. 260-621.00r.
- Von Strandtmann, Maximilian, to Warner-Lambert Company. N-quinoline-5-aminooxazoles. 3,717,642, Cl. 260-287.00r.
- VSI Corporation: *See—*
  - Andras, John, 3,717,428.
- Vukovich, William J., to General Motors Corporation. Gear forming. 3,717,017, Cl. 72-68.000.
- Wada, Shohachi; and Mozen, Milton Michael, to Cutter Laboratories Inc. Blood coagulation complex. 3,717,708, Cl. 424-177.000.
- Waggener, Donnell E.: *See—*
  - Kirkpatrick, Maurice; and Waggener, Donnell E., 3,717,203.
- Wagner Electric Corporation: *See—*
  - Atkins, Carl E., 3,717,795.
- Wagner, Roland: *See—*
  - Herzog, Gunther; Kahle, Gunter; Kolling, Wolfgang; Lamm, Christian; Munch, Ursula; Schumann, Horst; Wolfrom, Walter; Riesel, Werner; and Wagner, Roland, 3,717,489.
- Waite, Frederick Andrew: *See—*
  - Osmond, Desmond Wilfrid John; Waite, Frederick Andrew; and Walbridge, Derek John, 3,717,605.
- Walbridge, Derek John: *See—*
  - Osmond, Desmond Wilfrid John; Waite, Frederick Andrew; and Walbridge, Derek John, 3,717,605.
- Walker, Brooks. Tire water bumper. 3,717,370, Cl. 293-1,000.
- Walker, Roy M.: *See—*
  - Vick, Charles B.; and Walker, Roy M., 3,717,067.
- Wallbaum, Hans-Joachim, to Kabel- und Metallwerke Gubehoffnungnutte Aktiengesellschaft. Process for making hardenable copper alloy products. 3,717,511, Cl. 148-11.50r.
- Wallsten, Hans Ivar, to AB Inventing. Press or flatiron surface. 3,716,934, Cl. 38-93.000.
- Walter, Jack C., to Honeywell Inc. Supervisory or monitoring apparatus. 3,717,859, Cl. 340-213.00r.
- Walter, Lewis A. 1-(Di-lower alkyl amino lower alkyl)-2- phenyl-5,6,7,8-tetrahydroindolizines. 3,717,644, Cl. 260-293.530.
- Walters, Klemenes C. Cup grinding wheels. 3,716,951, Cl. 51-209.00r.
- Wanlass, Bert R.: *See—*
  - Cooper, Norman F.; Dozois, James H.; and Wanlass, Bert R., 3,716,945.
- Ward, Norman Reginald, to British Aircraft Corporation Limited. Fuseheads. 3,717,096, Cl. 102-28.00m.
- Waring, James R., to GAF Corporation. Reducing corrosivity of solvent casting compositions. 3,717,484, Cl. 106-14.000.
- Warner-Lambert Company: *See—*
  - Von Strandtmann, Maximilian, 3,717,642.
- Warning, Walter B. Particle spraying device. 3,717,752, Cl. 239-654.000.
- Warren Industries: *See—*
  - Benson, Henry E., 3,716,890.
- Warren, Joel, to Pfizer Inc. Removal of petroleum hydrocarbons from water surfaces. 3,717,573, Cl. 210-40.000.
- Way, Gordon Alexander, to Dynamic Manufacturing Limited. Apparatus particularly adapted for marking products. 3,717,120, Cl. 118-263.000.
- Wayne, Robert J.: *See—*
  - Buczek, Carl J.; Demaria, Anthony J.; Ferrar, Carl M.; and Wayne, Robert J., 3,717,824.
- Wehde, James F. Harvesting attachment for combines. 3,716,974, Cl. 56-14.300.
- Weinberg, Harold N.: *See—*
  - Hochman, Jack M.; and Weinberg, Harold N., 3,717,570.
- Wells Manufacturing Corporation: *See—*
  - Alexander, Carl J., 3,716,916.
- Welsh, William F.: *See—*
  - Grenier, Raymond P.; and Welsh, William F., 3,717,762.
- Welty, Wibert N. Hinge safe. 3,717,112, Cl. 109-23.000.
- Wepprecht, Vincent: *See—*
  - Plevy, Arthur L.; and Wepprecht, Vincent, 3,717,802.
- Werneke, Michael Francis, to American Cyanamid Company. Flocculation of coal slimes. 3,717,574, Cl. 210-53.000.
- Wertheimer, Harry P.; and Sekella, Thomas Curran, to Bendix Corporation, The. Pressure rate change responsive diaphragm switch with relatively hard rebound prevention members on diaphragm. 3,717,734, Cl. 200-83.00r.
- West, James L., to Rotek Instruments Corporated. Phase shift oscillator. 3,717,822, Cl. 331-11.000.
- Westerman, Werner F.: *See—*
  - Black, Thomas J., 3,717,158.
- Western Electric Company, Incorporated: *See—*
  - Hatcher, Arthur L., Jr.; and Stonefelt, Ronald D., 3,717,516.
- Westfalische Bergewerkschaftskasse: *See—*
  - Barrabas, Fritz, 3,716,929.
- Westinghouse Air Brake Company: *See—*
  - Jeffrey, William B.; and Frill, Richard K., 3,717,260.
- Westinghouse Bremsen-und Apparatebau GmbH: *See—*
  - Altmeppen, Johannes, 3,717,383.
  - Kaltenthaler, Wolfgang; and Mylius, Horst, 3,717,072.
- Westinghouse Electric Corporation: *See—*
  - Benecke, Norman L., 3,717,254.
  - Brander, George T.; and Lander, William M., 3,717,245.
  - Cotton, John F., 3,717,832.
  - Montgomery, William E., III, 3,717,724.
  - Murray, Charles R.; and Plaster, Robert L., 3,717,831.
  - Rydeski, Julian A., 3,717,797.
- Weydert, Louis Claude: *See—*
  - Renaud, Georges, 3,716,897.
- Wheeler, Daniel E., to Wiltron Company. Coupling apparatus. 3,717,811, Cl. 324-57.00r.
- Whirlpool Corporation: *See—*
  - Miller, Frank E.; Smith, Erwin G.; and Sulcek, Charles E., 3,717,090.
- White, Ernest W.: *See—*
  - Boys, Donald R.; and White, Ernest W., 3,717,119.
- White, Harold D.: *See—*
  - Chana, Howard E.; Rado, Joseph; and White, Harold D., 3,717,131.
- Wicks, John S.: *See—*
  - Cunningham, Francis V.; and Wicks, John S., 3,717,717.
- Wilde, Arthur E., to Fluor Drilling Services, Inc. Flotation and access apparatus for sub-sea drilling structures. 3,717,113, Cl. 114-.50d.
- Wilderman, Giles H., to Kenting Drilling Limited. Draw works for drilling rig. 3,717,205, Cl. 173-147.000.
- Williams, Walter Q., to Interlake, Inc. Coil unreeler. 3,717,313, Cl. 242-54.00r.
- Williamson, Shellie O.: *See—*
  - Bragg, Gary O.; Bahr, Russel F.; and Williamson, Shellie O., 3,716,901.
- Willie, Edward N.: *See—*
  - Volkers, Walter K.; and Willie, Edward N., 3,717,876.
- Willis, Alvin B. Tail light adapter assembly. 3,717,758, Cl. 240-8.300.
- Willis, Wilburn Coy, to Aluminum Company of America. Knurled closure. 3,717,275, Cl. 215-43.00r.
- Wilson, Christopher Guy Scott: *See—*
  - Davies, Guy Edward; and Wilson, Christopher Guy Scott, 3,717,166.
- Wilson, Homer M., to Petrolite Corporation. Corrosion ratemeter. 3,717,566, Cl. 204-195.00c.
- Wilson, Newton R.: *See—*
  - Peters, Donald L.; and Wilson, Newton R., 3,717,429.
- Wilt, M. Duane: *See—*
  - Cook, John C.; and Wilt, M. Duane, 3,717,864.

Wiltron Company: *See—*
Wheeler, Daniel E., 3,717,811.
Wingardh, Uno, to Sprinter Pack AB. Container with lid for liquids. 3,717,274, Cl. 215-1.00c.
Winkler, Harold W.: *See—*
Kronenberg, Francis E.; Olson, Alexius B.; Poirot, James M.; Rohweder, Gerald D.; and Winkler, Harold W., 3,717,025.
Winther, Charles R.: *See—*
Winther, Harry C., 3,717,845.
Winther, Harry C.: *See—*
Winther, Harry C., 3,717,845.
Winther, Harry C., 46% to Winther, Harry C., 38% to Winther, Walter J., 10% to Winther, Charles R., 5% to Winther, William J. and 1% to Winther, Shirley M. Vehicle tire deflation signalling system. 3,717,845, Cl. 340-58.000.
Winther, Shirley M.: *See—*
Winther, Harry C., 3,717,845.
Winther, Walter J.: *See—*
Winther, Harry C., 3,717,845.
Winther, William J.: *See—*
Winther, Harry C., 3,717,845.
Wisconsin Alumni Research Foundation: *See—*
Parmentier, Robert D.; and Scott, Alwyn C., 3,717,773.
Wittich, Holger; and Spanek, Wolfgang, to Siemens Aktiengesellschaft. Voltage transformer with means connected to the primary winding for equalizing the winding ratio. 3,717,834, Cl. 336-70.000.
Woerdman, Johannes Petrus, to U.S. Philips Corporation. Short interval holographic comparison. 3,717,415, Cl. 356-168.000.
Wolber, Jorg, to U.S. Philips Corporation. Circuit arrangement for correcting the deflection of an electron beam. 3,717,789, Cl. 315-26.000.
Wole, Martin: *See—*
Stahle, Helmut; Koppe, Herbert; Zeile, Karl; Wole, Martin; Hoefke, Wolfgang; and Samtleben, Hans-Wolfgang, 3,717,633.
Wolfrom, Walter: *See—*
Herzog, Gunther; Kahle, Gunter; Kolling, Wolfgang; Lamm, Christian; Munch, Ursula; Schumann, Horst; Wolfrom, Walter; Riesel, Werner; and Wagner, Roland, 3,717,489.
Woodall, Alan; and Honey, Chesleigh Brian, to Chapman, Clarke and Thompson, John, Limited. Friction welding or like machines. 3,717,295, Cl. 228-2.000.
Woodson, Leslie A.: *See—*
Traub, Henry A; and Woodson, Leslie A., 3,717,293.
Worthen, John H., to Federal Products Corporation. Precision square. 3,716,920, Cl. 33-174.00m.
Wright, James C.; and Nemfth, Petfr, to Cutler-Hammer, Inc. Method and apparatus for inserting a three-sided wrap. 3,716,960, Cl. 53-3.000.
Wright, Robert C., Jr. Tornado alarm. 3,717,861, Cl. 340-236.000.
Wronka, Adolph A.; Banker, Bernard R.; Andrews, John E., Jr.; and Kliem, Bernd W. A., to United States of America, Army. Implosion colored marker. 3,717,097, Cl. 102-56.000.
Wu, Yao Hua; and Rayburn, James W., to Mead Johnson & Comapny. N-(Heteroarcyclic) piperazinylalkyl-azaspiroalkanediones. 3,717,634, Cl. 260-256.40n.
Wurm, Jaroslav, to Institute of Gas Technology, The. Pressure translating apparatus and process. 3,716,988, Cl. 60-24.000.
Wyatt, Brian Sidney; deceased (by Wyatt, Margaret I.; administratrix), to Atomic Energy of Canada Limited. Uranium-base alloys. 3,717,454, Cl. 75-122.700.
Wyatt, Margaret I.: *See—*
Wyatt, Brian Sidney, 3,717,454.
Wyrepak Industries, Inc.: *See—*
Kovaleski, Joseph J., 3,717,315.
Xerox Corporation: *See—*
Hespenheide, Wilbur G., 3,717,409.
Howell, Richard S., 3,717,880.
Hudson, Frederick W., 3,717,122.
Silverberg, Morton, 3,717,801.
Yake, William H., to Design and Manufacturing Corporation. Water inlet unit for appliances. 3,717,168, Cl. 137-216.100.
Yamada, Masaaki: *See—*
Oyama, Minoru; Yamada, Masaaki; Ohkubo, Shunji; and Osakada, Atsushi, 3,717,559.
Yamaguchi, Nobuo: *See—*
Ichikawa, Mitsuo; Takeuchi, Yasumasa; Harita, Yoshiyuki; Endo, Masayuki; Yamaguchi, Nobuo; Tashiro, Matsuru; and Kogure, Akira, 3,717,613.
Yamaguchi, Shizuko: *See—*
Ninomiya, Tsunehiko; Ojima, Takashi; Yamaguchi, Shizuko; and Ito, Mieko, 3,717,477.
Yamamoto, Manabu; and Suzuki, Yukio, to Hitachi, Ltd. Induction-coupled ring discharge device. 3,717,782, Cl. 313-161.000.
Yamanouchi, Teruo: *See—*
Negishi, Hirokazu; Endo, Ichiro; Kinjo, Kikuo; and Yamanouchi, Teruo, 3,717,462.
Yamashita, Kazuo, to Tokai Rubber Industries, Ltd. Anti-vibratory. 3,717,318, Cl. 248-24.000.
Yancey, Warren L.: *See—*
Snook, Melvin E.; Joujon-Roche, Phillip J.; and Yancey, Warren L., 3,717,872.
Yang, Meiling T., to Ethyl Corporation. Detergent formulations. 3,717,591, Cl. 252-545.000.
Yates, Patrick A.; and Higgins, Robert P., to Explosive Corporation of America. Blasting device. 3,717,794, Cl. 317-80.000.
Yokotsuka, Tamotsu; Iwaasa, Takashi; and Fujii, Mitsuharu, to Kikkoman Shoyu Co., Ltd. Hydrolysis of glutamine within foods and beverages to glutamic acid. 3,717,470, Cl. 99-16.000.
Yomura, Masamichi: *See—*
Takase, Katsuyasu; Nakane, Yuzo; and Yomura, Masamichi, 3,716,924.
Yoshimura, Tsuneo; Suzuki, Kunio; and Shikano, Gohei, to Mitsubishi Seiko Kabushiki Kaisha and Toyo Carbon Kabushiki Kaisha. Electrode holder for electric arc furnace and make the same. 3,717,445, Cl. 29-182.300.
Young, George W.: *See—*
Parrott, Orville C.; and Young, George W., 3,717,256.
Yuen, Moon H.: *See—*
Dikinis, Daumantas V.; and Yuen, Moon H., 3,717,804.
Yuki, Ehime: *See—*
Tanaka, Hiroyoshi; Aotani, Hiroshi; Shimamura, Masaharu; and Yuki, Ehime, 3,717,689.
Zagorski, Edward J.: *See—*
McCain, William B.; Cosgrove, James F.; and Zagorski, Edward J., 3,717,337.
Zaruba, Wenzel, to Textol Systems, Inc. Linear actuator with yoke actuated pitch control. 3,717,042, Cl. 74-25.000.
Zaukelies, David A.: *See—*
Daniels, Brian K.; Preston, Jack; and Zaukelies, David A., 3,717,542.
Zeile, Karl: *See—*
Stahle, Helmut; Koppe, Herbert; Zeile, Karl; Wole, Martin; Hoefke, Wolfgang; and Samtleben, Hans-Wolfgang, 3,717,633.
Zeiss-Strftung, Carl: *See—*
Gerlach, Helmut, 3,717,825.
Zeller, Josef K.: *See—*
Marti, Heinrich; Zeller, Josef K.; and Fiala, Ferdinand, 3,717,198.
Zellweger, Ltd.: *See—*
Ertl, Stefan; and Oehme, Friedrich, 3,717,435.
Zenith Radio Corporation: *See—*
Adler, Robert, 3,717,819.
Ziegler, George W., Jr., to AMP Domestic Inc., mesne. Coaxial stake for high frequency cable termination. 3,716,904, Cl. 29-203.00h.
Zieman, Simone. Toilet cover chair. 3,716,872, Cl. 4-1.000.
Ziffer, Jack, to Pabst Brewing Company. Liquid compositions of bacterial protease and/or amylase and preparation thereof. 3,717,550, Cl. 195-63.000.
Zinker, Norman, to International Technical Industries. Method and means for amplifying the stress and strain in a stress-sensitive component. 3,717,039, Cl. 73-398.00r.
Zinkovsky, Viktor Petrovich; Sukoian, Nariman Alexandrovich; Alyanov, Vladimir Fedorovich; and Frolov, Jury Fedorovich. Device for holding and longitudinal displacing of electrode. 3,717,712, Cl. 13-15.000.
Zondler, Helmut; and Pfleiderer, Wolfgang, to Ciba-Geigy AG. Composition comprising Al, 2-polyepoxide and piperidine derivative as curing agent. 3,717,593, Cl. 260-2.00n.
Zopf, Vincent R.; and Shanahan, William J., to Skiatron Electronics & Television Corporation. Scrambled television. 3,717,206, Cl. 175-5.100.
Zundel, Arthur P.: *See—*
Patarini, Leon M.; and Zundel, Arthur P., 3,717,279.
Zurn Industries, Inc.: *See—*
Rachocki, Eugene, 3,717,420.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 20TH DAY OF FEBRUARY, 1973

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Charier-Vadrot, Pierre. Process for preparation of gelatinous material from animal collagen. Re. 27,583, 2–20–73, Cl. 424—360.
Cousino, Ralph E., to Orrtronico Inc. Tape cartridge. Re. 27,584, 2–20–73, Cl. 242—15.19.
Orrtronico Inc.: *See—*
Cousino, Ralph E. Re. 27,584.

LIST OF PLANT PATENTEES

Cobia, Barnell L. Milkweed plant. 3,306, 2–20–73, Cl. 88.
Cobia, Barnell L. Milkweed plant. 3,307, 2–20–73, Cl. 88.
Pan-American Plant Co.: *See—*
Shoesmith, Leonard H. 3,009.
Runkel, Walter E. Apple tree. 3,308, 2–20–73, Cl. 34.
Shoesmith, Leonard H., to Pan-American Plant Co. Chrysanthemum plant. 3,009, 2–20–73, Cl. 77.

LIST OF DESIGN PATENTEES

Arenson, Herbert. Container for dairy products or the like. 226,351, 2–20–73, Cl. D9—220.
Brophy, Eldon C. Buckle. 226,349, 2–20–73, Cl. D8—229.
Eld, Raynold A. Pedestal fireplace. 226,354, 2–20–73, Cl. 23—97.
Eld, Raynold A. Hanging fireplace. 226,355, 2–20–73, Cl. D23—97.
Heidacher, John W.: *See—*
Schultz, John R., Sharer, and Heidacher. 226,353.
Hill-Rom Co., Inc.: *See—*
Schultz, John R., Sharer, and Heidacher. 226,353.
Schultz, John R., J. M. Sharer, and J. W. Heidacher, to Hill-Rom Co., Inc. A hospital in-patient service core module. 226,353, 2–20–73, Cl. D13—1.
Shames, Harold: *See—*
Shames, Sidney J. and H. 226,347.
Shames, Sidney J. and H. 226,350.
Shames, Sidney J. and H. Soap dish. 226,347, 2–20–73, Cl. D6—90.
Shames, Sidney J. and H. Combined toothbrush and tumbler holder. 226,350, 2–20–73, Cl. D6—92.
Sharer, John M.: *See—*
Schultz, John R., Sharer, and Heidacher. 226,353.
Van der Kroft, Theodorus C. M., to Van Elderen's Metaalwarenfabriek "Brabantia." Can opener. 226,348, 2–20–73, Cl. D8—39.
Van Elderen's Metaalwarenfabriek "Brabantia": *See—*
Van der Kroft, Theodorus C. M. 226,348.

CLASSIFICATION OF PATENTS

ISSUED FEBRUARY 20, 1973

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 4	
1	3,716,872
41	3,716,870
110	3,716,871
172.17	3,716,873
CLASS 5	
68	3,716,876
260	3,716,874
338	3,716,877
345	3,716,875
CLASS 7	
5	3,716,878
5.6	3,716,879
CLASS 9	
310D	3,716,881
310G	3,716,880
314	3,716,882
CLASS 13	
9	3,717,713
15	3,717,712
	3,717,714
CLASS 15	
1.7	3,716,883
104.16	3,716,884
210R	3,716,885
250.004	3,716,886
250.17	3,716,887
250.3Y	3,716,888
366	3,716,889
CLASS 16	
91	3,716,890
CLASS 17	
1F	3,716,891
11	3,716,892
26	3,716,893
CLASS 21	
2.7	3,717,433
94	3,717,434
CLASS 23	
24B	3,717,437
230R	3,717,435
	3,717,436
262	3,717,438
277R	3,717,439
284	3,717,440
292	3,717,441
CLASS 24	
10.6	3,717,041
68F	3,716,985
126L	3,716,894
230SL	3,716,895
257	3,716,896
283	3,716,897
CLASS 29	
25.13	3,716,898
25.14	3,716,899
105A	3,716,900
149.5NM	3,716,901
157C	3,716,902
173	3,716,903
182.2	3,717,442
182.3	3,717,445
191.4	3,717,443
196.6	3,717,444
203H	3,716,904
447	3,716,905
460	3,716,906
470.9	3,716,907
477.7	3,716,908
504	3,716,909
563	3,716,910
578	3,716,911
596	3,716,912
629	3,716,913
CLASS 30	
90.1	3,716,914
293	3,716,915
369	3,716,916
391	3,716,917
CLASS 32	
5	3,716,918
CLASS 33	
141E	3,716,919
174B	3,716,921
174M	3,716,920
181R	3,716,922
264	3,716,923
CLASS 34	
36	3,716,924
80	3,716,925
160	3,716,926
CLASS 35	
19R	3,716,927
22R	3,716,928
48R	3,716,929
CLASS 36	
3B	3,716,930
61	3,716,931
	3,717,238
72R	3,716,932
CLASS 38	
75	3,716,933
93	3,716,934
CLASS 40	
142A	3,716,935
152	3,716,936
CLASS 43	
42.47	3,716,937
55	3,716,938
CLASS 44	
58	3,717,446
63	3,717,447
CLASS 46	
25	3,716,939
77	3,716,940
123	3,716,941
163	3,716,942
175	3,716,944
189	3,716,943
CLASS 49	
139	3,716,945
CLASS 51	
9	3,716,946
	3,716,947
95LH	3,716,948
165.8	3,716,949
206NF	3,716,950
209R	3,716,951
215HM	3,716,952
CLASS 52	
2	3,716,953
79	3,716,954
227	3,716,955
484	3,716,956
633	3,716,957
713	3,716,958
721	3,716,959
CLASS 53	
3	3,716,960
21FC	3,716,961
209	3,716,962
296	3,716,963
389	3,716,964
CLASS 54	
46	3,716,965
CLASS 55	
96	3,716,971
118	3,716,966
217	3,716,967
294	3,716,968
390	3,716,969
521	3,716,970
CLASS 56	
1	3,716,972
6	3,716,973
14.3	3,716,974
17.4	3,716,975
106	3,716,976
202	3,716,977
310	3,716,978
CLASS 57	
34R	3,716,979
130	3,716,980
139	3,716,981
145	3,716,982
CLASS 58	
58	3,716,983
	3,716,984
CLASS 59	
78.1	3,716,986
CLASS 60	
19	3,716,987
24	3,716,988
39.34	3,716,989
54	3,716,995
94	3,716,990
286	3,716,996
289	3,716,991
323	3,716,992
CLASS 61	
38	3,716,998
46.5	3,716,993
	3,716,994
	3,717,001
48	3,716,999
69R	3,717,000
72.3	3,717,002
72.4	3,717,003
85	3,716,997
CLASS 62	
6	3,717,004
45	3,717,005
48	3,717,006
101	3,717,007
184	3,717,010
292	3,717,008
523	3,717,009
CLASS 64	
26	3,717,011
CLASS 65	
3	3,717,448
104	3,717,449
145	3,717,450
CLASS 66	
1A	3,717,012
57	3,717,013
75	3,717,014
CLASS 68	
18F	3,717,015
CLASS 71	
33	3,717,451
117	3,717,452
CLASS 72	
21	3,717,016
68	3,717,017
97	3,717,018
102	3,717,019
248	3,717,021
276	3,717,458
386	3,717,022
389	3,717,020
391	3,717,023
455	3,717,024
CLASS 73	
9	3,717,025
23.1	3,717,028
57	3,717,026
146.3	3,717,030
181	3,717,027
194EM	3,717,031
300	3,717,032
339A	3,717,033
343R	3,717,034
371	3,717,035
382	3,717,036
388R	3,717,037
398AR	3,717,038
398R	3,717,039
432PS	3,717,040
CLASS 74	
15.6	3,717,045
25	3,717,042
112	3,717,043
136A	3,717,029
142	3,717,044
492	3,717,046
594.4	3,717,047
600	3,717,048
750R	3,717,049
859	[illegible],050
CLASS 75	
.5A	3,717,453
122.7	3,717,454
128N	3,717,455
130A	3,717,457
130B	3,717,456
CLASS 76	
37	3,717,051
48	3,717,052
CLASS 81	
3F	3,717,053
179	3,717,054
CLASS 82	
4C	3,717,055
82	3,717,056
CLASS 83	
98	3,717,057
157	3,717,058
401	3,717,059
403	3,717,060
409	3,717,061
471	3,717,062
477.2	3,717,063
761	3,717,064
CLASS 84	
1.17	3,717,715
478	3,717,065
CLASS 85	
5R	3,717,066
21	3,717,067
CLASS 89	
1.86	3,717,068
	3,717,069
CLASS 91	
388	3,717,073
CLASS 92	
128	3,717,070
137	3,717,071
152	3,717,072
CLASS 93	
1G	3,717,074
93M	3,717,075
CLASS 95	
10CE	3,717,077
11UW	3,717,078
31AC	3,717,079
CLASS 96	
1LY	3,717,461
1R	3,717,459
	3,717,460
1.5	3,717,462
	3,717,463
33	3,717,464
100	3,717,465
107	3,717,466
111	3,717,467
124	3,717,468
CLASS 98	
38	3,717,080
40B	3,717,081
114	3,717,082
CLASS 99	
14	3,717,469
16	3,717,470
31	3,717,471
65	3,717,472
107	3,717,473
113	3,717,474
134	3,717,475
138R	3,717,476
141A	3,717,477
192R	3,717,478
222	3,717,479
233.3	3,717,480
450	3,717,083
496	3,717,084
516	3,717,085
	3,717,086
538	3,717,087
568	3,717,088
CLASS 100	
52	3,717,089
53	3,717,090
	3,717,091
CLASS 101	
248	3,717,092
469	3,717,093
CLASS 102	
19.2	3,717,094
21.6	3,717,095
28M	3,717,096
66	3,717,097
70.2R	3,717,098
	3,717,099
CLASS 104	
12	3,717,100
17R	3,717,101
130	3,717,102
148SS	3,717,103
CLASS 105	
164	3,717,104
197B	3,717,105
197D	3,717,106
199CB	3,717,107
215C	3,717,108
284	3,717,109
	3,717,110
CLASS 106	
1	3,717,481
	3,717,482
	3,717,483
14	3,717,484
38.8	3,717,485
40V	3,717,486
48	3,717,487
97	3,717,488
103	3,717,489
117	3,717,490
209	3,717,491
280R	3,717,492
288Q	3,717,493
307	3,717,494
CLASS 108	
45	3,717,111
CLASS 109	
23	3,717,112
CLASS 114	
.5D	3,717,113
16R	3,717,114
42	3,717,115
151	3,717,116
CLASS 116	
128	3,717,117
129	3,717,118
CLASS 117	
18	3,717,495
49	3,717,496
70A	3,717,498
72	3,717,499
76	3,717,500
102M	3,717,501
124D	3,717,502
169R	3,717,497
212	3,717,503
239	3,717,504
CLASS 118	
49	3,717,119
263	3,717,120
324	3,717,121
636	3,717,122
CLASS 119	
3	3,717,123
	3,717,124
51.11	3,717,125
52B	3,717,127
52R	3,717,126
103	3,717,128
CLASS 122	
54	3,717,157
CLASS 123	
1A	3,717,129
52MV	3,717,131
52.5MV	3,717,130
90.3	3,717,132
	3,717,133
90.35	3,717,134
117R	3,717,135
CLASS 124	
21	3,717,136
CLASS 126	
25B	3,717,137
200	3,717,138
360A	3,717,139
CLASS 128	
2.05T	3,717,140
2.06R	3,717,141
66	3,717,142
78	3,717,143
80A	3,717,144
82.1	3,717,145
92BC	3,717,146
145.8	3,717,147
190	3,717,148
263	3,717,149
284	3,717,150
347	3,717,151
419P	3,717,152
	3,717,153
494	3,717,154
CLASS 131	
17A	3,717,155
CLASS 132	
40	3,717,156
CLASS 133	
8	3,717,158
CLASS 134	
58DL	3,717,159
64	3,717,161
122	3,717,160
CLASS 136	
86A	3,717,505
86F	3,717,506
CLASS 137	
14	3,717,162
15.1	3,717,163
117	3,717,167
216.1	3,717,168
412	3,717,169
413	3,717,170
552	3,717,171
561	3,717,172
562	3,717,173
565	3,717,174
596.13	3,717,175
599	3,717,176
607	3,717,177
610	3,717,178
625.65	3,717,179
810	3,717,164
814	3,717,166
818	3,717,165
CLASS 138	
153	3,717,180
CLASS 139	
125	3,717,181
127R	3,717,182
CLASS 140	
124	3,717,183
CLASS 141	
1	3,717,184
CLASS 144	
2Z	3,717,185
145A	3,717,186
327	3,717,187
CLASS 148	
1.5	3,717,507
2	3,717,508
6.2	3,717,509
6.24	3,717,510
11.5A	3,717,513
11.5R	3,717,511
32.5	3,717,512
175	3,717,514
	3,717,515
187	3,717,516
CLASS 149	
19	3,717,517
36	3,717,518
60	3,717,519
CLASS 150	
1	3,717,188
CLASS 152	
210	3,717,189
361	3,717,190
	3,717,191

CLASS 156	
18	3,717,520
19	3,717,521
53	3,717,522
69	3,717,523
72	3,717,524
77	3,717,525
78	3,717,526
79	3,717,527
130	3,717,529
144	3,717,530
179	3,717,528
180	3,717,531
199	3,717,532
244	3,717,533
309	3,717,534
443	3,717,535
463	3,717,536
466	3,717,537
497	3,717,538
498	3,717,539
577	3,717,540
CLASS 157	
1.1	3,717,192
1.3	3,717,193
CLASS 160	
25	3,717,194
169	3,717,195
CLASS 161	
	3,717,541
170	3,717,542
186	3,717,543
252	3,717,544
CLASS 162	
31	3,717,545
215	3,717,546
CLASS 164	
270	3,717,196
273	3,717,197
274	3,717,198
CLASS 165	
46	3,717,199
75	3,717,200
96	3,717,201
CLASS 166	
55	3,717,202
224	3,717,203
283	3,717,204
CLASS 173	
147	3,717,205
CLASS 174	
25R	3,717,716
73R	3,717,717
106D	3,717,718
107	3,717,719
131A	3,717,720
CLASS 175	
4.6	3,717,207
74	3,717,208
413	3,717,209
CLASS 177	
196	3,717,210
CLASS 178	
3	3,717,723
5.1	3,717,206
5.2R	3,717,722
5.4AC	3,717,721
	3,717,728
5.4CK	3,717,726
5.4HE	3,717,727
5.4F	3,717,729
5.4R	3,717,724
54CD	3,717,725
CLASS 180	
5R	3,717,211
6.44	3,717,212
6.48	3,717,213
9.5	3,717,214
14R	3,717,215
82C	3,717,216
CLASS 181	
.5VM	3,717,217
32R	3,717,218
CLASS 182	
6	3,717,219
129	3,717,220
CLASS 184	
1D	3,717,222
6.4	3,717,221
CLASS 188	
1C	3,717,223
	3,717,224
29	3,717,225
71.4	3,717,226
79.5P	3,717,227
CLASS 190	
1	3,717,228
CLASS 192	
85AA	3,717,229
107R	3,717,230
139	3,717,231
142R	3,717,232
CLASS 194	
101	3,717,233
CLASS 195	
1.7	3,717,551
28N	3,717,547
36P	3,717,548
37	3,717,549
63	3,717,550
142	3,717,552
CLASS 197	
53	3,717,234
98	3,717,235
CLASS 198	
25	3,717,236
27	3,717,237
31AA	3,717,239
33AB	3,717,240
184	3,717,241
224	3,717,242
CLASS 200	
38CA	3,717,730
61.45M	3,717,731
	3,717,732
80	3,717,733
83R	3,717,734
85R	3,717,735
153S	3,717,736
159B	3,717,737
166BH	3,717,738
166C	3,717,739
CLASS 202	
158	3,717,553
238	3,717,554
CLASS 204	
35N	3,717,555
158R	3,717,556
159.15	3,717,557
	3,717,558
159.17	3,717,559
159.18	3,717,560
162XN	3,717,561
180R	3,717,562
192	3,717,563
	3,717,564
195C	3,717,566
195G	3,717,565
222	3,717,567
228	3,717,568
CLASS 206	
45.14	3,717,243
47R	3,717,246
56AA	3,717,244
59F	3,717,247
65R	3,717,245
CLASS 208	
92	3,717,569
210	3,717,570
254H	3,717,571
310	3,717,572
CLASS 209	
73	3,717,248
75	3,717,249
111.6	3,717,250
CLASS 210	
40	3,717,573
53	3,717,574
80	3,717,251
108	3,717,252
169	3,717,253
279	3,717,254
495	3,717,256
512	3,717,255
521	3,717,257
CLASS 211	
87	3,717,258
126	3,717,259
CLASS 213	
14	3,717,260
110	3,717,261
CLASS 214	
1Q	3,717,262
1.6	3,717,265
6G	3,717,263
8.5C	3,717,264
16.1EC	3,717,266
17B	3,717,267
83.24	3,717,268
138R	3,717,269
307	3,717,270
451	3,717,271
503	3,717,272
512	3,717,273
CLASS 215	
1C	3,717,274
40	3,717,276
43R	3,717,275
100A	3,717,277
CLASS 219	
10.57	3,717,740
69C	3,717,741
85	3,717,742
	3,717,743
138	3,717,744
155	3,717,745
200	3,717,746
216	3,717,747
306	3,717,748
CLASS 220	
31R	3,717,278
54	3,717,279
69	3,717,280
CLASS 221	
278	3,717,281
279	3,717,282
CLASS 222	
	3,717,288
76	3,717,283
108	3,717,284
136	3,717,285
143	3,717,286
153	3,717,287
481	3,717,289
CLASS 225	
2	3,717,290
6	3,717,291
99	3,717,292
CLASS 227	
19	3,717,294
CLASS 228	
2	3,717,295
CLASS 229	
23A	3,717,296
72	3,717,297
CLASS 235	
61.11D	3,717,749
61.11E	3,717,750
70R	3,717,298
88	3,717,299
92PK	3,717,751
151.3	3,717,753
152	3,717,754
175	3,717,755
181	3,717,756
184	3,717,757
CLASS 236	
1E	3,717,300
12A	3,717,301
CLASS 238	
287	3,717,302
CLASS 239	
55	3,717,303
265.19	3,717,304
288.5	3,717,305
404	3,717,306
654	3,717,752
CLASS 240	
8.3	3,717,758
10.66	3,717,759
CLASS 241	
24	3,717,307
244	3,717,308
247	3,717,309
CLASS 242	
18A	3,717,310
18R	3,717,311
47.12	3,717,312
54R	3,717,313
55.19A	Re.27,584
75.53	3,717,314
115	3,717,315
190	3,717,316
CLASS 244	
17.13	3,717,317
CLASS 248	
24	3,717,318
49	3,717,319
83	3,717,320
404	3,717,321
CLASS 250	
43.5FL	3,717,760
47.3	3,717,669
49.5PE	3,717,761
71.5R	3,717,762
71.5S	3,717,763
80	3,717,764
83.3R	3,717,765
83.6R	3,717,766
	3,717,767
86	3,717,768
199	3,717,769
211J	3,717,770
219DF	3,717,771
235	3,717,772
CLASS 251	
61	3,717,322
315	3,717,323
331	3,717,324
CLASS 252	
8.8	3,717,575
12	3,717,576
62.61	3,717,578
106	3,717,579
	3,717,580
301.1R	3,717,581
	3,717,582
301.4F	3,717,583
301.4R	3,717,584
431P	3,717,585
439	3,717,586
455R	3,717,588
455Z	3,717,587
523	3,717,589
540	3,717,590
545	3,717,591
CLASS 254	
175.7	3,717,325
CLASS 256	
13.1	3,717,326
41.9	3,717,327
CLASS 259	
6	3,717,330
43	3,717,329
148	3,717,328
CLASS 260	
2A	3,717,592
2N	3,717,593
2.2R	3,717,594
2.5AJ	3,717,597
2.5BF	3,717,596
2.5P	3,717,595
18N	3,717,598
23H	3,717,600
23R	3,717,599
27EV	3,717,601
28	3,717,602
29.6AB	3,717,603
32.6N	3,717,604
34.2	3,717,605
40R	3,717,606
45.7R	3,717,607
	3,717,608
45.7S	3,717,577
45.75K	3,717,609
45.95G	3,717,611
45.95	3,717,610
47EN	3,717,612
63R	3,717,613
75S	3,717,617
77.5	3,717,614
78UA	3,717,615
78.5R	3,717,616
79	3,717,619
	3,717,620
85.5	3,717,621
93.5C	3,717,622
96.5C	3,717,623
153	3,717,624
207.1	3,717,625
	3,717,626
239E	3,717,628
239.55	3,717,627
240CA	3,717,630
244R	3,717,629
	3,717,631
250A	3,717,632
	3,717,635
253	3,717,633
256.4N	3,717,634
268PC	3,717,638
268TR	3,717,637
268H	3,717,636
283CN	3,717,639
285.5	3,717,640
286R	3,717,641
287R	3,717,642
289R	3,717,643
293.53	3,717,644
293.78	3,717,648
294.9	3,717,645
	3,717,647
295AM	3,717,646
295.5R	3,717,649
295.5S	3,717,650
306.8R	3,717,651
307D	3,717,652
308C	3,717,654
308D	3,717,653
309	3,717,655
	3,717,656
	3,717,657
309.6	3,717,658
326.3	3,717,659
327E	3,717,660
327M	3,717,661
348.5V	3,717,662
397.5	3,717,663
413	3,717,664
448AD	3,717,666
448.2D	3,717,665
464	3,717,667
472	3,717,668
476R	3,717,670
482B	3,717,671
485R	3,717,672
519	3,717,673
525	3,717,674
530N	3,717,675
531C	3,717,676
557R	3,717,677
566A	3,717,678
567.6M	3,717,679
575	3,717,680
608	3,717,681
609D	3,717,682
621R	3,717,683
650R	3,717,684
	3,717,685
683.59	3,717,686
851	3,717,687
876R	3,717,688
887	3,717,618
898	3,717,689
945	3,717,690
956	3,717,691
987	3,717,692
CLASS 264	
56	3,717,693
67	3,717,694
90	3,717,695
205	3,717,696
CLASS 266	
13	3,717,331
23B	3,717,332
36P	3,717,333
CLASS 269	
37	3,717,334
CLASS 270	
79	3,717,335
CLASS 271	
9	3,717,336
13	3,717,337
CLASS 272	
67	3,717,338
79A	3,717,339
CLASS 273	
1R	3,717,340
	3,717,341
1.5A	3,717,342
30	3,717,343
82R	3,717,344
86R	3,717,345
	3,717,346
95R	3,717,347
96R	3,717,348
186R	3,717,349
CLASS 274	
23R	3,717,350
CLASS 277	
34.3	3,717,352
96	3,717,353
144	3,717,293
185	3,717,351
CLASS 280	
16	3,717,359
33.99R	3,717,358
35	3,717,357
124A	3,717,354
124F	3,717,355
229	3,717,361
231	3,717,360
414R	3,717,356
415A	3,717,362
476	3,717,363
489	3,717,364
508	3,717,365
CLASS 281	
21	3,717,366
CLASS 287	
52.006	3,717,367
117	3,717,368
CLASS 292	
321	3,717,369
CLASS 293	
1	3,717,370
CLASS 294	
19A	3,717,371
CLASS 296	
35A	3,717,372
	3,717,373
111	3,717,374
CLASS 297	
162	3,717,375
284	3,717,376
440	3,717,377
446	3,717,378
CLASS 299	
22	3,717,379
CLASS 301	
41R	3,717,380
CLASS 302	
31	3,717,381
CLASS 303	
6C	3,717,382
10	3,717,383
21BE	3,717,384
21F	3,717,385
89	3,717,386
CLASS 305	
19	3,717,387
	3,717,388
	3,717,389
25	3,717,390
40	3,717,391
CLASS 307	
201	3,717,773
221B	3,717,775
229	3,717,776
237	3,717,774
296	3,717,777
CLASS 308	
5R	3,717,392
122	3,717,393
187.1	3,717,394
CLASS 310	
9.5	3,717,778
91	3,717,779
112	3,717,780
CLASS 312	
71	3,717,397
114	3,717,395
257R	3,717,396
283	3,717,398
CLASS 313	
109	3,717,781
161	3,717,782
217	3,717,783
222	3,717,784
231	3,717,785
CLASS 315	
3.5	3,717,787
12	3,717,786
13C	3,717,788
26	3,717,789
CLASS 317	
1.5	3,717,790
2R	3,717,791
18D	3,717,792
40A	3,717,793
80	3,717,794
134	3,717,795
148.5R	3,717,796
234R	3,717,797
	3,717,798
	3,717,799
	3,717,800
262E	3,717,801
262S	3,717,802
CLASS 318	
436	3,717,804
471	3,717,803
CLASS 321	
8R	3,717,805
18	3,717,806
27R	3,717,807
CLASS 323	
44R	3,717,808
CLASS 324	
.5R	3,717,809
57R	3,717,810
	3,717,811
77B	3,717,812
CLASS 325	
3	3,717,813
56	3,717,814
158	3,717,815
430	3,717,816
455	3,717,817
CLASS 328	
141	3,717,818
CLASS 330	
5.5	3,717,819
21	3,717,820
26	3,717,821
CLASS 331	
11	3,717,822
94.5	3,717,823
	3,717,824
	3,717,825
117R	3,717,826
CLASS 333	
21A	3,717,827
71	3,717,828
CLASS 335	
187	3,717,829
207	3,717,830
CLASS 336	
5	3,717,831
67	3,717,832
69	3,717,833
70	3,717,834
84	3,717,835

CLASS 337	
271	3,717,836
CLASS 338	
160	3,717,837
CLASS 339	
74R	3,717,838
95R	3,717,839
198R	3,717,840
258	3,717,841
275T	3,717,842
CLASS 340	
1R	3,717,843
5R	3,717,844
58	3,717,845
146.1F	3,717,846
146.3AE	3,717,847
146.3Q	3,717,848
147MD	3,717,866
163	3,717,849
172.5	3,717,850
	3,717,851
173SP	3,717,852
174TF	3,717,853
174VA	3,717,854
174.1E	3,717,855
174.1G	3,717,856
177R	3,717,857
203	3,717,858
213R	3,717,859
229	3,717,860
236	3,717,861
237S	3,717,862
253R	3,717,863
261	3,717,864
267W	3,717,865
336	3,717,867
347DD	3,717,868
347P	3,717,869
365E	3,717,871
365R	3,717,870
CLASS 343	
5EM	3,717,872
	3,717,873
7ED	3,717,874
712	3,717,876
872	3,717,877
895	3,717,878
915	3,717,879
CLASS 346	
1	3,717,875
74ES	3,717,880
136	3,717,881
CLASS 350	
166	3,717,399
255	3,717,400
271	3,717,401
286	3,717,402
298	3,717,403
CLASS 352	
72	3,717,405
172	3,717,406
CLASS 353	
120	3,717,407
CLASS 355	
3	3,717,408
15	3,717,409
46	3,717,410
75	3,717,411
CLASS 356	
77	3,717,412
106	3,717,404
152	3,717,413
158	3,717,414
168	3,717,415
CLASS 402	
31	3,717,416
CLASS 404	
11	3,717,076
CLASS 408	
35	3,717,417
CLASS 415	
104	3,717,418
CLASS 416	
230	3,717,419
CLASS 417	
12	3,717,420
38	3,717,421
392	3,717,422
CLASS 418	
16	3,717,423
126	3,717,424
CLASS 423	
58	3,717,697
206	3,717,698
222	3,717,699
244	3,717,700
272	3,717,701
320	3,717,702
571	3,717,703
CLASS 424	
1	3,717,704
12	3,717,705
84	3,717,706
122	3,717,707
177	3,717,708
250	3,717,709
274	3,717,710
343	3,717,711
360	Re.27,583
CLASS 425	
71	3,717,425
	3,717,426
174	3,717,427
191	3,717,428
318	3,717,431
387	3,717,429
392	3,717,430
CLASS 431	
93	3,717,432

CLASSIFICATION OF DESIGNS

D 6—	90	226,347
	92	226,350
D 8—	39	226,348
D 9—	229	226,349
	220	226,351
		226,352
D13—	1	226,353
D23—	97	226,354
		226,355
D34—	5	226,356
D61—	1	226,357
D74—		226,358
	5	226,359
		226,360
D87—	8	226,361

CLASSIFICATION OF PLANTS

P. —	34	3,308
P. —	77	3,309
P. —	88	3,306
P. —		3,307

GEOGRAPHICAL INDEX OF RESIDENCE OF INVENTORS

(U.S. States, Territories and Armed Forces, the Commonwealth of Puerto Rico, and the Canal Zone)

Alabama	1	Kentucky	21	Oregon	41
Alaska	2	Louisiana	22	Pennsylvania	42
American Samoa	3	Maine	23	Puerto Rico	43
Arizona	4	Maryland	24	Rhode Island	44
Arkansas	5	Massachusetts	25	South Carolina	45
California	6	Michigan	26	South Dakota	46
Canal Zone	7	Minnesota	27	Tennessee	47
Colorado	8	Mississippi	28	Texas	48
Connecticut	9	Missouri	29	Utah	49
Delaware	10	Montana	30	Vermont	50
District of Columbia	11	Nebraska	31	Virginia	51
Florida	12	Nevada	32	Virgin Islands	52
Georgia	13	New Hampshire	33	Washington	53
Guam	14	New Jersey	34	West Virginia	54
Hawaii	15	New Mexico	35	Wisconsin	55
Idaho	16	New York	36	Wyoming	56
Illinois	17	North Carolina	37	U.S. Air Force	57
Indiana	18	North Dakota	38	U.S. Army	58
Iowa	19	Ohio	39	U.S. Navy	59
Kansas	20	Oklahoma	40		

(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

PATENTS

1 : 3,717,060
3,717,170
4 : 3,717,054
3,717,437
3,717,458
3,717,514
3,717,568
3,717,777
6 : 3,716,873
3,716,879
3,716,883
3,716,906
3,716,919
3,716,922
3,716,940
3,716,942
3,716,956
3,716,975
3,717,006
3,717,037
3,717,039
3,717,056
3,717,063
3,717,066
3,717,068
3,717,084
3,717,087
3,717,093
3,717,098
3,717,103
3,717,111
3,717,113
3,717,136
3,717,140
3,717,142
3,717,146
3,717,151
3,717,163
3,717,164
3,717,169
3,717,183
3,717,184
3,717,204
3,717,228
3,717,250
3,717,282
3,717,285
3,717,293
3,717,301
3,717,316
3,717,336

3,717,338
3,717,339
3,717,342
3,717,346
3,717,347
3,717,349
3,717,364
3,717,365
3,717,366
3,717,370
3,717,371
3,717,374
3,717,375
3,717,409
3,717,422
3,717,427
3,717,436
3,717,446
3,717,452
3,717,459
3,717,460
3,717,505
3,717,529
3,717,556
3,717,557
3,717,567
3,717,600
3,717,612
3,717,651
3,717,697
3,717,708
3,717,713
3,717,746
3,717,749
3,717,758
3,717,770
3,717,804
3,717,811
3,717,820
3,717,853
3,717,854
3,717,858
3,717,870
3,717,872
3,717,878
7 : 3,717,069
3,717,341
8 : 3,716,960
3,717,005
3,717,222
3,717,271

3,717,356
3,717,440
9 : 3,716,908
3,717,092
3,717,104
3,717,137
3,717,155
3,717,259
3,717,287
3,717,294
3,717,315
3,717,512
3,717,520
3,717,521
3,717,549
3,717,574
3,717,683
3,717,824
3,717,829
10 : 3,716,882
3,717,076
3,717,176
3,717,481
3,717,493
3,717,499
3,717,530
3,717,560
3,717,592
3,717,609
3,717,619
11 : 3,717,297
12 : 3,716,889
3,716,890
3,716,907
3,716,930
3,716,938
3,716,989
3,717,008
3,717,052
3,717,143
3,717,179
3,717,251
3,717,262
3,717,299
3,717,360
3,717,542
3,717,573
3,717,710
3,717,756
3,717,787
3,717,839

3,717,857
13 : 3,716,977
3,717,067
3,717,128
3,717,157
3,717,216
3,717,284
3,717,380
3,717,536
3,717,832
15 : 3,717,000
16 : 3,717,209
3,717,309
3,717,451
17 : 3,716,870
3,716,871
3,716,878
3,716,900
3,716,901
3,716,903
3,716,917
3,716,988
3,717,001
3,717,011
3,717,025
3,717,029
3,717,035
3,717,045
3,717,047
3,717,073
3,717,121
3,717,145
3,717,171
3,717,185
3,717,263
3,717,279
3,717,288
3,717,298
3,717,313
3,717,321
3,717,323
3,717,337
3,717,351
3,717,357
3,717,358
3,717,387
3,717,388
3,717,389
3,717,411
3,717,431
3,717,444

3,717,463
3,717,475
3,717,479
3,717,532
3,717,533
3,717,535
3,717,693
3,717,717
3,717,742
3,717,752
3,717,755
3,717,767
3,717,803
3,717,805
3,717,819
3,717,869
18 : 3,716,893
3,716,914
3,716,963
3,717,007
3,717,043
3,717,065
3,717,109
3,717,110
3,717,119
3,717,168
3,717,194
3,717,212
3,717,275
3,717,421
3,717,443
3,717,569
3,717,634
3,717,881
19 : 3,716,877
3,716,892
3,716,976
3,717,793
20 : 3,716,972
3,717,062
3,717,268
3,717,272
3,717,748
21 : 3,717,010
3,717,064
3,717,090
3,717,256
22 : 3,717,606
3,717,666
23 : 3,717,478
24 : 3,716,947

3,717,094
3,717,195
3,717,386
3,717,580
3,717,700
3,717,706
3,717,724
3,717,848
3,717,849
3,717,879
25 : 3,716,898
3,716,936
3,716,937
3,716,944
3,717,004
3,717,027
3,717,028
3,717,033
3,717,088
3,717,117
3,717,118
3,717,162
3,717,201
3,717,239
3,717,246
3,717,292
3,717,314
3,717,319
3,717,397
3,717,416
3,717,450
3,717,476
3,717,482
3,717,531
3,717,565
3,717,583
3,717,639
3,717,687
3,717,762
3,717,772
3,717,781
3,717,784
3,717,798
3,717,808
3,717,822
3,717,835
3,717,840
3,717,861
3,717,875
26 : 3,716,874
3,716,886

3,716,895
3,716,916
3,716,945
3,716,948
3,716,953
3,716,957
3,716,959
3,716,985
3,716,986
3,716,987
3,717,017
3,717,019
3,717,020
3,717,044
3,717,050
3,717,058
3,717,083
3,717,086
3,717,091
3,717,130
3,717,131
3,717,132
3,717,134
3,717,141
3,717,199
3,717,215
3,717,220
3,717,223
3,717,229
3,717,273
3,717,350
3,717,354
3,717,363
3,717,377
3,717,382
3,717,384
3,717,423
3,717,428
3,717,490
3,717,517
3,717,518
3,717,596
3,717,610
3,717,650
3,717,653
3,717,654
3,717,677
3,717,741
3,717,799
3,717,843
27 : 3,716,925
3,716,967
3,717,074
3,717,080
3,717,177
3,717,334
3,717,528
3,717,598
3,717,859
28 : 3,716,933
29 : 3,717,193
3,717,485
3,717,589
3,717,597
3,717,670
30 : 3,717,238

31 : 3,717,590
32 : 3,716,931
33 : 3,717,379
3,717,877
34 : 3,716,915
3,716,971
3,717,042
3,717,075
3,717,081
3,717,097
3,717,105
3,717,107
3,717,114
3,717,154
3,717,253
3,717,254
3,717,283
3,717,289
3,717,305
3,717,376
3,717,442
3,717,447
3,717,562
3,717,570
3,717,571
3,717,584
3,717,587
3,717,594
3,717,604
3,717,616
3,717,618
3,717,623
3,717,628
3,717,632
3,717,635
3,717,642
3,717,644
3,717,645
3,717,647
3,717,652
3,717,656
3,717,658
3,717,659
3,717,663
3,717,672
3,717,680
3,717,681
3,717,690
3,717,698
3,717,711
3,717,716
3,717,743
3,717,753
3,717,754
3,717,769
3,717,776
3,717,792
3,717,795
3,717,802
3,717,812
3,717,814
3,717,821
3,717,823
3,717,827
3,717,850
3,717,860

3,717,865
3,717,866
3,717,867
36 : 3,716,876
3,716,888
3,716,891
3,716,954
3,716,966
3,717,012
3,717,059
3,717,061
3,717,077
3,717,089
3,717,122
3,717,126
3,717,156
3,717,159
3,717,172
3,717,206
3,717,225
3,717,235
3,717,343
3,717,344
3,717,361
3,717,369
3,717,395
3,717,408
3,717,418
3,717,474
3,717,483
3,717,484
3,717,503
3,717,515
3,717,544
3,717,545
3,717,563
3,717,564
3,717,586
3,717,607
3,717,608
3,717,615
3,717,638
3,717,643
3,717,648
3,717,661
3,717,678
3,717,682
3,717,694
3,717,701
3,717,730
3,717,734
3,717,735
3,717,801
3,717,813
3,717,817
3,717,818
3,717,851
3,717,852
3,717,876
3,717,880
37 : 3,717,192
3,717,243
3,717,543
3,717,630
39 : Re.27,584
3,716,884

3,716,887
3,716,905
3,716,910
3,716,961
3,717,009
3,717,015
3,717,022
3,717,038
3,717,048
3,717,102
3,717,112
3,717,138
3,717,174
3,717,200
3,717,261
3,717,276
3,717,277
3,717,311
3,717,328
3,717,340
3,717,348
3,717,372
3,717,373
3,717,400
3,717,432
3,717,441
3,717,448
3,717,453
3,717,464
3,717,472
3,717,473
3,717,509
3,717,558
3,717,740
3,717,750
3,717,760
3,717,780
3,717,830
3,717,836
40 : 3,716,941
3,717,002
3,717,124
3,717,129
3,717,167
3,717,178
3,717,202
3,717,429
3,717,577
3,717,585
3,717,601
3,717,617
3,717,620
3,717,695
41 : 3,716,932
3,717,051
3,717,214
3,717,224
3,717,255
3,717,320
3,717,326
3,717,355
3,717,786
3,717,806
42 : 3,716,899
3,716,902
3,716,904

3,716,909
3,716,943
3,716,949
3,716,950
3,716,951
3,716,992
3,717,034
3,717,160
3,717,187
3,717,189
3,717,211
3,717,245
3,717,247
3,717,260
3,717,300
3,717,306
3,717,325
3,717,329
3,717,335
3,717,420
3,717,449
3,717,491
3,717,501
3,717,508
3,717,513
3,717,516
3,717,524
3,717,534
3,717,540
3,717,588
3,717,595
3,717,667
3,717,669
3,717,676
3,717,679
3,717,684
3,717,685
3,717,686
3,717,703
3,717,733
3,717,744
3,717,790
3,717,797
3,717,810
3,717,841
3,717,845
44 : 3,716,920
3,717,182
3,717,500
45 : 3,717,291
3,717,541
3,717,771
46 : 3,716,974
47 : 3,716,927
3,717,264
3,717,286
3,717,497
3,717,582
3,717,622
3,717,842
48 : 3,716,923
3,716,993
3,716,994
3,717,003
3,717,030
3,717,036

3,717,055
3,717,095
3,717,099
3,717,127
3,717,150
3,717,186
3,717,203
3,717,207
3,717,208
3,717,219
3,717,265
3,717,362
3,717,378
3,717,381
3,717,425
3,717,434
3,717,539
3,717,561
3,717,566
3,717,591
3,717,674
3,717,864
3,717,868
49 : 3,717,188
3,717,702
50 : 3,717,487
51 : 3,716,990
3,717,125
3,717,158
3,717,419
3,717,506
3,717,736
3,717,831
3,717,873
53 : 3,717,391
3,717,519
3,717,555
3,717,720
3,717,794
54 : 3,717,108
3,717,249
3,717,575
55 : 3,716,880
3,716,918
3,716,928
3,716,964
3,716,978
3,717,101
3,717,115
3,717,153
3,717,213
3,717,233
3,717,244
3,717,248
3,717,257
3,717,471
3,717,550
3,717,731
3,717,732
3,717,773
3,717,838
56 : 3,716,965

DESIGN PATENTS

16 : 226,354
226,355
18 : 226,353

20 : 226,351
226,352
25 : 226,361

34 : 226,358
226,359

226,360
36 : 226,347

226,350
226,356

41 : 226,349
55 : 226,357

PLANT PATENTS

12 : 3,306

3,307

26 : 3,308

U. S. GOVERNMENT PRINTING OFFICE : O - 1973

OFFICIAL GAZETTE of the UNITED STATES PATENT OFFICE
February 27, 1973 Volume 907 Number 4

CONTENTS

Page

Patents and Trademark Notices

Board of Appeals Decisions Rendered in the Month of January 1973 . . . 856
Patent Suits 856
Recommended International Nonproprietary Names 857

Patent Notices

Errata 861
Condition of Patent Applications 862
Reissue Patents Granted 863
Plant Patents Granted 865

Patents Granted

General and Mechanical 866
Chemical 1011
Electrical 1069
Design Patents Granted 1122
Index of Patentees . . . . PI 1
Indices of Reissues, Plants, and Designs . . . . PI 32

Classification of

Patents (Including Reissues) . . . . PI 35
Designs and Plants . . . . PI 37

Geographical Index of Residence of Inventors

Patents (Including Reissues) . . . . PI 38
Designs and Plants . . . . PI 39

The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

THE OFFICIAL GAZETTE (PATENTS SECTION), issued weekly, subscription $89.00 per annum, foreign mailing $22.25 additional; single copies $2.00 each.

THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly, subscription $17.00 per annum, foreign mailing $4.25 additional; single copies 40 cents each.

CIRCULARS OF GENERAL INFORMATION concerning PATENTS or TRADEMARKS, price 15 cents each.

PRINTED COPIES OF PATENTS are furnished by the Patent Office at 50 cents each; PLANT PATENTS in color, $1.00 each; copies of TRADEMARKS and DESIGN PATENTS at 20 cents each. Address orders to the Commissioner of Patents, Washington, D.C., 20231.

Printing authorized by Section 11(a)3 of Title 35, U.S. Code P.O.

PATENT OFFICE NOTICES

Board of Appeals Decisions Rendered in the Month of January 1973

Examiner affirmed	136
Examiner affirmed in part	12
Examiner reversed	29
Total	177

Patent Suits

Notices under 35 U.S.C. 290; Patent Act of 1952

2,790,516, Wright and Butler, VEHICLE BRAKE ASSEMBLY; **2,921,650,** Butler, DISC BRAKE; **3,392,809,** Hodkinson and Evans. same; **Re. 24,870,** Butler, VEHICLE BRAKE, **filed** Dec. 5, 1967, D.C., E.D. Mich. (Detroit), Doc. 30629, *Dunlop Company Ltd.* v. *Kelsey-Hayes Company.* Judgment, patents infringed, May 19, 1972.

2,834,809, Britt and McConnell and Schutte, ABSORBENT PAPER, **filed** Aug. 26, 1960, D.C., E.D. Wis. (Madison), Doc. 60–C–156, *Scott Paper Co.* v. *Fort Howard Paper Co.* Stipulation, dismissal under Rule 41(a) F.R.C.P., June 16, 1972.

2,892,575, J. M. Turk, DISPENSER VALVE STRUCTURE; **2,992,760,** same; **3,300,105,** J. L. Rosen, same **filed** Aug. 1, 1972, D.C., C.D. Calif. (Los Angeles), Doc. 72–1757–F, *Hunt-Wesson Foods Inc. and Super Whip Valve Mfg. Company* v. *Clayton Corporation.*

2,921,650. (See 2,790,516.)

2,992,760. (See 2,892,575.)

3,103,666, A. R. Bone, TAG ATTACHING APPARATUS, **filed** Sept. 8, 1972, D.C. Hawaii (Honolulu), Doc. 72–3642, *Dennison Manufacturing Company* v. *Halmac Inc. et al.*

3,103,703, H. A. Ludewig, MOLD FOR PRODUCING FLEXIBLE BELTS WITH TEETH, **filed** Aug. 18, 1967, D.C., N.D. Ohio (Cleveland), Doc. C–67–602, *Didactics Corp.* v. *Sargent-Welch Scientific Company.* Consent judgment, Sargent-Welch Scientific Company formerly The Welch Scientific Company is the owner, Sept. 18, 1972.

3,115,207, A. M. Wiggins, UNIDIRECTIONAL MICROPHONE, **filed** Sept. 1, 1972, D.C., N.D. Ill. (Chicago), Doc. 72c2185, *Electro-Voice Inc.* v. *Shure Brothers Inc.*

3,316,248, J. R. Anderson, PROCESS AND APPARATUS FOR TEMPORARILY INDICATING CORRECTIONS IN TEXT OF PRINTED MATTER, **filed** Mar. 11, 1970, D.C., N.D. Ill. (Chicago), Doc. 70c584, *LaSalle Street Press Inc.* v. *Twentieth Century Press Inc.* Consent judgment, defendant restrained, Sept. 27, 1971.

3,178,673, J. H. Krehbiel, WIRE CONNECTOR, **filed** July 7, 1972, D.C., N.D. Ill. (Chicago), Doc. 72c1664, *Molex Inc.* v. *Aro Mfg. Co.* Stipulated complaint herein for infringement be dismissed with prejudice, Sept. 14, 1972.

3,237,485, J. M. Van Vlett, METHOD OF TAP MANUFACTURE, **filed** July 12, 1971, D.C., N.D. Ill. (Chicago), Doc. 71c1683, *Balax Inc.* v. *Continental Screw Co.* By consent of plaintiff cause dismissed for lack of venue and without prejudice, Sept. 30, 1971.

3,261,129, Brydolf and Kellems, PANEL HARDWARE, **filed** Sept. 11, 1972, D.C., C.D. Calif. (Los Angeles), Doc. 72–2155–F, *Acme General Corp.* v. *Nodak Corp. and Imperial Mobile Home Suppliers.*

3,300,105. (See 2,892,575.)

3,372,897, E. R. Lee, REAR VIEW MIRROR, **filed** Jan. 21, 1970, D.C., N.D. Ill. (Chicago), Doc. 70c133, *S. H. Leggitt Company* v. *Allen Electric and Equipment Co.* Court has jurisdiction, claim 4 is valid. The plaintiff's amended and supplemental complaint and defendant's counterclaims, are each dismissed without prejudice, Jan. 19, 1972.

3,495,181, M. G. Reiffin, DIRECT-CURRENT-COUPLED TRANSISTOR POWER AMPLIFIERS; **3,376,388,** same, TRANSISTOR POWER AMPLIFIER WITH PROTECTIVE CIRCUITRY, **filed** July 26, 1972, D.C., N.D. Ill. (Chicago), Doc. 72c1843, *Martin G. Reiffin* v. *Heath Company et al.*

3,392,809. (See 2,790,516.)

3,393,944, H. Reintjes, METHOD FOR PNEUMATICALLY INJECTING SOLID PARTICLES INTO A HIGH PRESSURE ZONE, **filed** Sept. 12, 1972, D.C. Del. (Wilmington), Doc. 4462, *United States of America* v. *Petrocarb Inc. and Bituminous Coal Research Inc.*

3,432,793, Muska, Schacker and McHattie, GROUNDING CONNECTION FOR ELECTRICAL UNIT, **filed** Sept. 8, 1972, D.C., N.D. Ill. (Chicago), Doc. 72c2234, *William A. Muska, James L. Schacker and Earl E. McHattie* v. *Sierra Elec.*

3,439,450, J. Richards, POROUS BLOCK FOR CONSERVING SOIL MOISTURE, **filed** Nov. 30, 1971, D.C., C.D. Calif. (Los Angeles), Doc. 71–2838–DWW, *The Regents of the University of California* v. *Gordon A. Chapman, doing business as Sombrero Sales.* Consent judgment defendant permanently enjoined, Sept. 1, 1972.

3,483,580, Cherry and Shackelford, INFLATABLE FOOTWEAR FORM, **filed** Apr. 23, 1970, D.C., S.D.N.Y., Doc. 70–C–1656, *Inflat-A-Industries Inc.* v. *Dan-Dee Imports Inc.* Stipulation and order, action settled with prejudice upon terms and conditions indicated; defendant hereby concedes the validity of patent, Sept. 13, 1972.

3.493,879, G. R. Stanley, HIGH POWER HIGH FIDELITY SOLID STATE AMPLIFIER, **filed** Sept. 6, 1972, D.C., N.D. Ind. (South Bend), Doc. 72–S–172, *International Radio Electronics Corp.* v. *Bruno Eidietis and David Liss, doing business as Audio Specialists.*

3,495,181. (See 3,376,388.)

3,509,586, W. E. Politz, SINK STRAINER MOUNTING MEANS, **filed** Sept. 12, 1972, D.C., N.D. Ohio (Cleveland), Doc. C72–958, *Stephen A. Young* v. *Jameco Industries Inc. et al.*

3,356,190, Hirsch and Koster, PROTECTIVE PACKAGE AND METHOD OF MAKING SAME, **filed** Feb. 15, 1972, D.C., S.D.N.Y., Doc. 72–C–686, *Stanley Hirsch* v. *Willcox and Gibbs.* Judgment ordered, defendants Willcox and Gibbs Inc. and Spur Pallet have judgment against the plaintiff, dismissing the complaint, Sept. 5, 1972.

3,620,909, C. R. Gleason, METHOD FOR RECLAIMING PULP FROM WASTE PAPERS, **filed** Mar. 16, 1972, D.C., N.D. Ill. (Chicago), Doc. 72c684, *Clark Products Inc.* v. *Waste Paper Reclm. Corp. et al.* Stipulation of voluntary dismissal under Rule 41(a), May 24, 1972.

3,631,847, J. C. Hobbs, METHOD AND APPARATUS FOR INJECTING FLUID INTO THE VASCULAR SYSTEM, **filed** Sept. 6, 1972, D.C., N.D. Ill. (Chicago), Doc. 72c2207, *James C. Hobbs II and Barber Colman Co.* v. *Medrad Inc.*

3,632,879, R. Freisinger, AUTOMATIC TELEPHONE DIALER FOR EMERGENCY MESSAGES, **filed** Aug. 15, 1972, D.C.N.J. (Newark), Doc. 1399–72, *Napco Security Systems Inc.* v. *Atlantic Metal Products Inc.* Consolidated with Civil Action No. 1399–72, *Atlantic Metal Products* v. *Napco Security Systems Inc.*, Sept. 14, 1972.

Re. 24,870. (See 2,790,516.)

Re. 26,518, Mau and Magy, THREAD AND OTHER FORM ROLLING DIES, **filed** Sept. 12, 1972, D.C., N.D. Ohio (Cleveland), Doc. C–72–959, *The National Rolled Thread Die Co.* v. *E. W. Ferry Screw Products Inc.* **Same, filed** Sept. 12, 1972, D.C., N.D. Ohio (Cleveland), Doc. C–72–960, *The National Rolled Thread Die Co.* v. *The Lamson and Sessions Co.* **Same, filed** Sept. 12, 1972, D.C., N.D. Ohio (Cleveland), Doc. C–72–961, *The National Rolled Thread Die Co.* v. *Pratt and Whitney Inc., Colt Industry Operating Inc., and Colt Industries Inc.*

RECOMMENDED INTERNATIONAL NONPROPRIETARY NAMES (REC. I.N.N.): LIST 12 [2]

In accordance with paragraph 7 of the Procedure for the Selection of Recommended International Nonproprietary Names for Pharmaceutical Substances,[1] notice is hereby given that the following are selected as recommended international nonproprietary names.

The inclusion of a name in the lists of recommended international nonproprietary names does not imply any recommendation for the use of the substance in medicine or pharmacy.

RECOMMENDED INTERNATIONAL NONPROPRIETARY NAME (*Latin, English*)	CHEMICAL NAME OR DESCRIPTION AND MOLECULAR FORMULA
aceglatonum aceglatone	D-glucaric acid 1,4 : 6,3-dilactone diacetate $C_{10}H_{10}O_8$
acetyldigitoxinum acetyldigitoxin	*a*-acetyldigitoxin $C_{43}H_{66}O_{14}$
acidum cinepazicum cinepazic acid	4-(3,4,5-trimethoxycinnamoyl)-1-piperazineacetic acid $C_{18}H_{24}N_2O_6$
acidum dimecroticum dimecrotic acid	2,4-dimethoxy-*β*-methylcinnamic acid $C_{12}H_{14}O_4$
acidum fenofibricum fenofibric acid	2-[*p*-(*p*-chlorophenoxy)phenoxy]propionic acid $C_{15}H_{13}ClO_4$
acidum iodoxamicum iodoxamic acid	3,3′-[ethylenebis(oxyethyleneoxyethylenecarbonylimino)]bis[2,4,6-triiodobenzoic acid] $C_{26}H_{26}I_6N_2O_{10}$
acidum iolidonicum iolidonic acid	*a*-ethyl-2,4,6-triiodo-3-(2-oxo-1-pyrrolidinyl)hydrocinnamic acid $C_{15}H_{16}I_3NO_3$
acidum iolixanicum iolixanic acid	2-[2-[3-(*N*-ethylacetamido)-2,4,6-triiodophenoxy]ethoxy]propionic acid $C_{15}H_{18}I_3NO_6$
acidum iomeglamicum iomeglamic acid	3′-amino-2′,4′,6′-triiodo-*N*-methylglutaranilic acid $C_{12}H_{13}I_3N_2O_3$
acidum piromidicum piromidic acid	8-ethyl-5,8-dihydro-5-oxo-2-(1-pyrrolidinyl)pyrido[2,3-*d*]pyrimidine-6-carboxylic acid $C_{14}H_{16}N_4O_3$
acidum protizinicum protizinic acid	7-methoxy-*a*,10-dimethylphenothiazine-2-acetic acid $C_{17}H_{17}NO_3S$
aclantatum aclantate	4-(2-chloro-*m*-toluidino)-3-thiophenecarboxylic acid, hydroxymethyl ester, acetate (ester) $C_{15}H_{14}ClNO_4S$
acrocinonidum acrocinonide	9-fluoro-11*β*,16*a*,17,21-tetrahydroxypregna-1,4-diene–3,20-dione cyclic 16,17-acetal with acrolein $C_{24}H_{29}FO_6$
alfadolonum alfadolone	3*a*,21-dihydroxy-5*a*-pregnane-11,20-dione $C_{21}H_{32}O_4$
alfaxalonum alfaxalone	3*a*-hydroxy-5*a*-pregnane-11,20-dione $C_{21}H_{32}O_3$
alonimidum alonimid	2,3-dihydrospiro[naphthalene-1(4*H*),3′-piperidine]-2′,4,6′-trione $C_{14}H_{13}NO_3$
amiterolum amiterol	*p*-amino-*a*-[(*sec*-butylamino)methyl]benzyl alcohol $C_{12}H_{20}N_2O$
amixetrinum amixetrine	1-[*β*-(isopentyloxy)phenethyl]pyrrolidine $C_{17}H_{27}NO$
amoxicillinum amoxicillin	(—)-6-[2-amino-2-(*p*-hydroxyphenyl)acetamido]-3,3-dimethyl-7-oxo-4-thia-1-azabicyclo[3.2.0]heptane-2-carboxylic acid $C_{16}H_{19}N_3O_5S$
aprindinum aprindine	*N*-[3-(diethylamino)propyl]-*N*-phenyl-2-indanamine $C_{22}H_{30}N_2$
azalomycinum azalomycin	an antibiotic obtained from cultures of *Streptomyces hydroscopicus* var. *azalomyceticus*, or the same substance produced by any other means
bemetizidum bemetizide	6-chloro-3,4-dihydro-3-(*a*-methylbenzyl)2*H*-1,2,4-benzothiadiazine-7-sulfonamide 1,1-dioxide $C_{15}H_{16}ClN_3O_4S_2$
benaprizinum benaprizine	2-ethylpropylamino)ethyl benzilate $C_{21}H_{27}NO_3$
benperidolum benperidol	1-[1-[3-(*p*-fluorobenzoyl)propyl]-4-piperidyl]-2-benzimidazolinone $C_{22}H_{24}FN_3O_2$
benproperinum benproperine	1-[2-(2-benzylphenoxy)-1-methylethyl]piperidine $C_{21}H_{27}NO$
benserazidum benserazide	DL-serine 2-(2,3,4-trihydroxybenzyl)hydrazide $C_{10}H_{15}N_3O_5$
betamethasoni acibutas betamethasone acibutate	9-fluoro-11*β*,17,21-trihydroxy-16*β*-methylpregna-1,4-diene-3,20-dione 21-acetate 17-isobutyrate $C_{28}H_{37}FO_7$
bidimazii iodidum bidimazium iodide	4-(4-biphenylyl)-2-[*p*-(dimethylamino)styryl]-3-methylthiazolium iodide $C_{26}H_{25}IN_2S$
bromopridum bromopride	4-amino-5-bromo-*N*-[2-diethylamino)ethyl]-*o*-anisamide $C_{14}H_{22}BrN_3O_2$
bupranololum bupranolol	1-(*tert*-butylamino)-3-[(6-chloro-*m*-tolyl)oxy]-2-propanol $C_{14}H_{22}ClNO_2$
calcifediolum calcifediol	9,10-secocholesta-5,7,10(19)-triene-3*β*,25-diol $C_{27}H_{44}O_2$
cambendazolum cambendazole	isopropyl 2-(4-thiazolyl)-5-benzimidazolecarbamate $C_{14}H_{14}N_4O_2S$
carbasalatum calcicum carbasalate calcium	salicylic acid acetate, calcium salt, compound with urea (1 : 1) $C_{18}H_{14}CaO_8 \cdot CH_4N_2O$
cefradinum cefradine	7-[2-amino-2-(1,4-cyclohexadien-1-yl)acetamido]-3-methyl-8-oxo-5-thia-1-azabicyclo-[4.2.0]oct-2-ene-2-carboxylic acid $C_{16}H_{19}N_3O_4S$

---

[1] *Off. Rec. Wld Hlth Org.*, 1955, *60*, 3 (Resolution EB15.R7); 1969, *173*, 10 (Resolution EB43.R9).

[2] Other lists of recommended international nonproprietary names can be found in *Chron. Wld Hlth Org.*, 1955, *9*, 185; *WHO, Chronicle*, 1959, *13*, 106, 463; 1962, *16*, 101; 1965, *19*, 165, 206, 249; 1966, *20*, 421; 1967, *21*, 538; 1968, *22*, 463; 1969, *23*, 490; 1970, *24*, 526; 1971, *25*, 476.

RECOMMENDED INTERNATIONAL NONPROPRIETARY NAME (*Latin, English*)	CHEMICAL NAME OR DESCRIPTION AND MOLECULAR FORMULA
ciclacillinum ciclacillin	(1-aminocyclohexyl)penicillin *or* 6-(1-aminocyclohexanecarboxamido)-3,3-dimethyl-7-oxo-4-thia-1-azabicyclo[3.2.0]heptane-2-carboxylic acid $C_{15}H_{23}N_3O_4S$
cetiedilum cetiedil	α-cyclohexyl-3-thiopheneacetic acid, 2-(hexahydro-1*H*-azepin-1-yl)ethyl ester $C_{20}H_{31}NO_2S$
chymopapainum chymopapain	a proteolytic enzyme isolated from papaya latex; differs from papain only slightly in general behaviour, such as substrate specificity, activation, inhibition, etc.
ciclopiroxum ciclopirox	6-cyclohexyl-1-hydroxy-4-methyl-2(1*H*)-pyridone $C_{12}H_{17}NO_2$
ciltoprazinum ciltoprazine	1-(5-chloro-2-methoxybenzoyl)-3-[3-(4-*m*-tolyl-1-piperazinyl)propyl]urea $C_{23}H_{29}ClN_4O_3$
cinepazidum cinepazide	1-[(1-pyrrolidinylcarbonyl)methyl]-4-(3,4,5-trimethoxycinnamoyl)piperazine $C_{22}H_{31}N_3O_5$
citenazonum citenazone	5-formyl-2-thiophenecarbonitrile thiosemicarbazone $C_7H_6N_4S_2$
clobetasolum clobetasol	21-chloro-9-fluoro11β,17-dihydroxy-16β-methylpregna-1,4-diene-3,20-dione $C_{22}H_{28}ClFO_4$
clobetasonum clobetasone	21-chloro-9-fluoro-17-hydroxy-16β-methylpregna-1,4-diene-3,11,20-trione $C_{22}H_{26}ClFO_4$
clociguanilum clociguanil	4,6-diamino-1-[(3,4-dichlorobenzyl)oxy]-1,2-dihydro-2,2-dimethyl-*s*-triazine $C_{12}H_{15}Cl_2N_5O$
cloguanamilum cloguanamil	1-amidino-3-(3-chloro-4-cyanophenyl)urea $C_9H_8ClN_5O$
clometacinum clometacin	3-(*p*-chlorobenzoyl)-6-methoxy-2-methylindole-1-acetic acid $C_{19}H_{16}ClNO_4$
cotriptylinum cotriptyline	1-(dimethylamino)-3-(10,11-dihydro-5*H*-dibenzo[*a,d*]cyclohepten-5-ylidene)-2-propanone $C_{20}H_{21}NO$
coumazolinum coumazoline	2-[(2-ethylbenzofuran-3-yl)methyl]-2-imidazoline $C_{14}H_{16}N_2O$
dacarbazinum dacarbazine	5-(3,3-dimethyl-1-triazeno)imidazole-4-carboxamide $C_6H_{10}N_6O$
desonidum desonide	11β,16α,17,21-tetrahydroxypregna-1,4-diene–3,20-dione cyclic 16,17-acetal with acetone $C_{24}H_{32}O_6$
dexproxibutenum dexproxibutene	(+)-3-[(dimethylamino)methyl]-1,2-diphenyl-3-buten-2-ol propionate (ester) $C_{22}H_{27}NO_2$
difetarsonum difetarsone	*N,N*-ethylenediarsanilic acid $C_{14}H_{18}As_2N_2O_6$
dimetofrinum dimetofrine	4-hydroxy-3,5-dimethoxy-α[(methylamino)methyl]benzyl alcohol $C_{11}H_{17}NO_4$
dinoprostonum dinoprostone	7-[3-hydroxy-2-(3-hydroxy-1-octenyl)-5-oxocyclopentyl]-5-heptenoic acid or prostaglandin E_2 $C_{20}H_{32}O_5$
dinoprostum dinoprost	7-[3,5-dihydroxy-2-(3-hydroxy-1-octenyl)cyclopentyl]-5-heptenoic acid or prostaglandin $F_{2\alpha}$ $C_{20}H_{34}O_5$
doxibetasolum doxibetasol	9-fluoro-11β,17-dihydroxy-16β-methylpregna-1,4-diene-3,20-dione $C_{22}H_{29}FO_4$
droperidolum droperidol	1-[1-[3-(*p*-fluorobenzoyl)propyl]-1,2,3,6-tetrahydro-4-pyridyl]-2-benzimidazolinone $C_{22}H_{22}FN_3O_2$
duometacinum duometacin	3-(*p*-anisoyl)-6-methoxy-2-methylindole-1-acetic acid $C_{20}H_{19}NO_5$
econazolum econazole	1-[2,4-dichloro-β-[(*p*-chlorobenzyl)oxy]phenethyl]imidazole $C_{18}H_{15}Cl_3N_2O$
etocarlidum etocarlide	4,4′-diethoxythiocarbanilide $C_{17}H_{20}N_2O_2S$
exiprobenum exiproben	o-[3-(hexyloxy)-2-hydroxypropoxy]benzoic acid $C_{16}H_{24}O_5$
febuverinum febuverine	1,4-piperazinediethanol di(2-phenylbutyrate ester) $C_{28}H_{38}N_2O_4$
feclobuzonum feclobuzone	*p*-chlorobenzoic acid, ester with 4-butyl-4-(hydroxymethyl)-1,2-diphenyl-3,5,pyrazolidinedione $C_{27}H_{25}ClN_2O_4$
fenabutenum fenabutene	*p*-(1-methylpropenyl)phenyl acetate $C_{12}H_{14}O_2$
fenoterolum fenoterol	3,5-dihydroxy-α[[(*p*-hydroxy-α-methylphenethyl)amino]methyl]benzyl alcohol $C_{17}H_{21}NO_4$
fenoxedilum fenoxedil	2-(*p*-butoxyphenoxy)-*N*-(2,5-diethoxyphenyl)-*N*-[2-(diethylamino)ethyl]acetamide $C_{28}H_{42}N_2O_5$
fenpiverinii bromidum fenpiverinium bromide	1-(3-carbamoyl-3,3-diphenylpropyl)-1-methylpiperidinium bromide $C_{22}H_{29}BrN_2O$
ferropolimalerum ferropolimaler	maleic acid polymer with methyl vinyl ether, iron(2+) salt $(C_7H_8FeO_5)n$
fluperamidum fluperamide	4-(4-chloro-α,α,α-trifluoro-*m*-tolyl)-4-hydroxy-*N,N*-dimethyl-α,α-diphenyl-1-piperidinebutyramide $C_{30}H_{32}ClF_3N_2O_2$
fosazepamum fosazepam	7-chloro-1-[(dimethylphosphinyl)methyl]-1,3-dihydro-5-phenyl-2*H*-1,4-benzodiazepin-2-one $C_{18}H_{18}ClN_2O_2P$
gitoformatum gitoformate	gitoxin 3′,3′′,3′′′,4′′′,16-pentaformate; 3β-[2,6-dideoxy-β-D-*ribo*-hexopyranosyl-(1→4)-*O*-2,6-dideoxy-β-D-*ribo*-hexopyranosyl-(1→4)-2,6-dideoxy-β-D-*ribo*-hexopyranosyl)oxy]-14,16β-dihydroxy-5β-card-20(22)-enolide 3′,3′′,3′′′,4′′′,16-pentaformate $C_{46}H_{64}O_{19}$
gramicidinum S gramicidin S	cyclo(L-valyl-L-ornithyl-L-leucyl-D-phenylalanyl-L-prolyl-L-valyl-L-ornithyl-L-leucyl-D-phenylalanyl-L-prolyl) $C_{60}H_{92}N_{12}O_{10}$
guanabenzum guanabenz	[(2,6-dichlorobenzylidene)amino]guanidine $C_8H_8Cl_2N_4$
guanazodinum guanazodine	[(octahydro-2-azocinyl)methl]guanidine $C_9H_{20}N_4$
ifenprodilum ifenprodil	4-benzyl-α-(*p*-hydroxyphenyl)-β-methyl-1-piperidineethanol $C_{21}H_{27}NO_2$
intriptylinum intriptyline	4-(5*H*-dibenzo[*a,d*]cyclohepten-5-ylidene)-*N,N*-dimethyl-2-butynylamine $C_{21}H_{19}N$
ketazolamum ketazolam	11-chloro-8,12b-dihydro-2,8-dimethyl-12b-phenyl-4*H*-[1,3]oxazino[3,2-*d*][1,4]benzodiazepine-4,7(6*H*)-dione $C_{20}H_{17}ClN_2O_3$
lapirii chloridum lapirium chloride	1-[[(2-hydroxyethyl)carbamoyl]methyl]pyridinium chloride laurate (ester) $C_{21}H_{35}ClN_2O_3$
lenperonum lenperone	4′-fluoro-4-[4-(*p*-fluorobenzoyl)piperidino]butyrophenone $C_{22}H_{23}F_2NO_2$

RECOMMENDED INTERNATIONAL NONPROPRIETARY NAME (*Latin, English*)	CHEMICAL NAME OR DESCRIPTION AND MOLECULAR FORMULA
levacetylmethadolum levacetylmethadol	(—)-3-acetoxy-6-dimethylamino-4,4-diphenylheptane $C_{23}H_{31}NO_2$
lomustinum lomustine	1-(2-chloroethyl)-3-cyclohexyl-1-nitrosourea $C_9H_{16}ClN_3O_2$
loperamidum loperamide	4-(*p*-chlorophenyl)-4-hydroxy-*N,N*-dimethyl-α,α-diphenyl-1-piperidinebutyramide $C_{29}H_{33}ClN_2O_2$
lotucainum lotucaine	2,2,5,5-tetramethyl-α-[(o-tolyloxy)methyl]-1-pyrrolidineethanol $C_{18}H_{29}NO_2$
mepramidilum mepramidil	3,4,5-trimethoxybenzoic acid.3-[(3,3-diphenylpropyl)amino]propyl ester $C_{28}H_{33}NO_5$
metipiroxum metipirox	1-hydroxy-4,6-dimethyl-2(1*H*)-pyridone $C_7H_9NO_2$
metrizamidum metrizamide	2-[3-acetamido-2,4,6-triiodo-5-(*N*-methylacetamido)benzamido]-2-deoxy-D-glucose $C_{18}H_{22}I_3N_3O_8$
metynodiolum metynodiol	11β-methyl-19-nor-17α-pregn-4-en-20-yne-3β,17-diol $C_{21}H_{30}O_2$
miboleronum mibolerone	17β-hydroxy-7α,17-dimethylester-4-en-3-one $C_{20}H_{30}O_2$
mitolactolum mitolactol	1,6-dibromo-1,6-dideoxy-D-galactitol $C_6H_{12}Br_2O_4$
molsidominum molsidomine	*N*-carboxy-3-morpholinosydnone imine ethyl ester $C_9H_{14}N_4O_4$
morsuximidum morsuximide	2-methyl-*N*-(morpholinomethyl)-2-phenylsuccinimide $C_{15}H_{20}N_2O_3$
moxipraquinum moxipraquine	4-[6-[(6-methoxy-8-quinolyl)amino]hexyl]-α-methyl-1-piperazinepropanol $C_{24}H_{38}N_4O_2$
nicergolinum nicergoline	10-methoxy-1,6-dimethylergoline-8β-methanol 5-bromonicotinate (ester) $C_{24}H_{26}BrN_3O_3$
nifedipinum nifedipine	1,4-dihydro-2,6-dimethyl-4-(o-nitrophenyl)-3,5-pyridinedicarboxylic acid, dimethyl ester $C_{17}H_{18}N_2O_6$
nimetazepamum nimetazepam	1,3-dihydro-1-methyl-7-nitro-5-phenyl-2*H*-1,4-benzodiazepin-2-one $C_{16}H_{13}N_3O_3$
nimorazolum nimorazole	4-[2-(5-nitroimidazol-1-yl)ethyl]morpholine $C_9H_{14}N_4O_3$
orazamidum orazamide	5-aminoimidazole-4-carboxamide orotate $C_4H_6N_4O \cdot C_5H_4N_2O_4 \cdot 2H_2O$ or $C_9H_{10}N_6O_5 \cdot 2H_2O$
osmadizonum osmadizone	[2-(phenylsulfinyl)ethyl]malonic acid mono(1,2-diphenylhydrazide) $C_{23}H_{22}N_2O_4S$
panidazolum panidazole	4-[2-(2-methyl-5-nitroimidazol-1-yl)ethyl]pyridine $C_{11}H_{12}N_4O_2$
pentapiperii metilsulfas pentapiperium metilsulfate	4-hydroxy-1,1-dimethylpiperidinium methyl sulfate 3-methyl-2-phenylvalerate ester $C_{20}H_{33}NO_6S$
picoperinum picoperine	1-[2-[*N*-(2-pyridylmethyl)anilino]ethyl]piperidine $C_{19}H_{25}N_3$
polidocanolum polidocanol	polyethylene glycol monododecyl ether (average polymer, n=9; nonaethylene glycol monododecyl ether)
poloxamerum 331 poloxamer 331	α-hydro-ω-hydroxypoly(oxyethylene)poly(oxypropylene) (53–59 moles)poly(oxyethylene) block copolymer average molecular weight: 3,800
poloxamerum 407 poloxamer 407	α-hydro-ω-hydroxypoly(oxyethylene)poly(oxypropylene) (63–71 moles)poly(oxyethylene) block copolymer average molecular weight: 12,500
pretiadilum pretiadil	6,11-dihydro-6-methyl-11-[3-[methyl(α-methylphenethyl)amino]propyl]dibenzo-[1,2,5]thiadiazepine 5,5-dioxide $C_{26}H_{31}N_3O_2S$
quindoxinum quindoxin	quinoxaline 1,4-dioxide $C_8H_6N_2O_2$
ribostamycinum ribostamycin	*O*-2,6-diamino-2,6-dideoxy-α-D-glucopyranosyl-(1→4)-*O*-[β-D-ribofuranosyl-(1→5)]-2-deoxystreptamine $C_{17}H_{34}N_4O_{10}$
rimazolii metilsulfas rimazolium metilsulfate	3-(ethoxycarbonyl)-6,7,8,9-tetrahydro-1,6-dimethyl-4-oxo-4*H*-pyrido[1,2-*a*]pyrimidinium methyl sulfate $C_{14}H_{22}N_2O_7S$
rimiterolum rimiterol	α-(3,4-dihydroxyphenyl)-2-piperidinemethanol $C_{12}H_{17}NO_3$
ruvazonum ruvazone	*o*-ethoxybenzoic acid (1-carboxyethylidene)hydrazide $C_{12}H_{14}N_2O_4$
semustinum semustine	1-(2-chloroethyl)-3-(4-methylcyclohexyl)-1-nitrosourea $C_{10}H_{18}ClN_3O_2$
sopitazinum sopitazine	10-[(4-isopropyl-1-piperazinyl)carbonyl]phenothiazine $C_{20}H_{23}N_3OS$
sudoxicamum sudoxicam	4-hydroxy-2-methyl-*N*-2-thiazolyl-2*H*-1,2-benzothiazine-3-carboxamide 1,1-dioxide $C_{13}H_{11}N_3O_4S_2$
sulbenicillinum sulbenicillin	3,3-dimethyl-7-oxo-6-(2-phenyl-2-sulfoacetamido)-4-thia-1-azabicyclo[3.2.0]heptane-2-carboxylic acid $C_{16}H_{18}N_2O_7S_2$
sulfabenzamidum sulfabenzamide	N^1-benzoylsulfanilamide $C_{13}H_{12}N_2O_3S$
sultopridum sultopride	*N*-[(1-ethyl-2-pyrrolidinyl)methyl]-5-(ethylsulfonyl)-o-anisamide $C_{17}H_{26}N_2O_4S$
talsupramum talsupram	1,3-dihydro-*N*,3,3-trimethyl-1-phenylbenzo(*c*)thiophene-1-propylamine $C_{20}H_{25}NS$
taurultamum taurultam	tetrahydro-2*H*-1,2,4-thiadiazine 1,1-dioxide $C_3H_8N_2O_2S$
thyroglobulinum thyroglobulin	thyroglobulin is a substance obtained by the fractionation of thyroid glands from the hog, *Sus scrofa* Linné var. *domesticus* Gray (Fam. *Suidae*), containing not less than 0.7 percent of total iodine (I)
tiaramidum tiaramide	4-[(5-chloro-2-oxo-3-benzothiazolinyl)acetyl]-1-piperazine ethanol $C_{15}H_{18}ClN_3O_3S$
tofisopamum tofisopam	1-(3.4-dimethoxyphenyl)-5-ethyl-7,8-dimethoxy-4-methyl-5*H*-2,3-benzodiazepine $C_{22}H_{26}N_2O_4$
toldimfosum toldimfos	[4-(dimethylamino)-o-tolyl]phosphinic acid $C_9H_{14}NO_2P$

tralonidum tralonide	9,11β-dichloro-6α,21-difluoro-16α,17-dihydroxypregna-1,4-diene-3,20-dione cyclic acetal with acetone $C_{24}H_{28}Cl_2F_2O_4$
trazitilinum trazitiline	1-(9,10-dihydro-9,10-ethano-9-anthryl)-4-methylpiperazine $C_{21}H_{24}N_2$
treosulfanum treosulfan	L-threitol 1,4-dimethanesulfonate $C_6H_{14}O_8S_2$
urapidilum urapidil	6-[[3-[4-(o-methoxyphenyl)-1-piperazinyl]propyl]amino]-1,3-dimethyluracil $C_{20}H_{29}N_5O_3$
zepastinum zepastine	6,11-dihydro-6-methyl-11-(1αH,5αH-tropan-3α-yloxy)dibenzo[*c,f*][1,2]thiazepine 5,5-dioxide $C_{22}H_{26}N_2O_3S$
zipeprolum zipeprol	α-(α-methoxybenzyl)-4-(β-methoxyphenethyl)-1-piperazineethanol $C_{23}H_{32}N_2O_3$

AMENDMENTS TO PREVIOUS LISTS

Vol. 16, No. 3

RECOMMENDED INTERNATIONAL NONPROPRIETARY NAMES (*Rec. I.N.N.*): LIST 4

p. 108:	paromomycinum paromomycin	*replace description by the following:* *O*-2,6-diamino-2,6-dideoxy-β-L-idopyranosyl-(1→3)-*O*-β-D-ribofuranosyl-(1→5)-*O*-[2-amino-2-deoxy-α-D-glucopyranosyl-(1→4)]-2-deoxystreptamine $C_{23}H_{45}N_5O_{14}$

Errata

All reference to Patent No. 3,712,975 to Joseph B. Allen et al., Line Segment Intersection Test, appearing in the OFFICIAL GAZETTE of Jan. 23, 1973, should be deleted as the application inadvertently issued.

All reference to Patent No. 3,713,172 to Peter Senak, Jr., Method of Minimizing Error in Incremental Whole Unit Positioning From Data Having Fractional Units, appearing in the OFFICIAL GAZETTE of Jan. 23, 1973, should be deleted as the application inadvertently issued.

All reference to Patent No. 3,713,173 to Eugene Allen et al., Method of Color Matching With More Than Three Components, appearing in the OFFICIAL GAZETTE of Jan. 23, 1973, should be deleted as the application inadvertently issued.

All reference to Patent No. 3,714,667 to Edwin Ira Stearns, Evaluation of Matches in Computer Color Matching, appearing in the OFFICIAL GAZETTE of Jan. 30, 1973, should be deleted as the application inadvertently issued.

PATENT EXAMINING CORPS

R. A. WAHL, Assistant Commissioner
WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF FEBRUARY 6, 1973

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—M. STERMAN, Director Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	12-16-71
GENERAL ORGANIC CHEMISTRY, GROUP 120—I. MARCUS, Director Heterocyclic; Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	12-12-71
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—L. J. BERCOVITZ, Director Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	8-18-71
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—A. P. KENT, Director Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	10-13-71
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—R. FRIEDMAN, Director Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	11-01-71
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—N. ANSHER, Director Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	6-14-72
SPECIAL LAWS ADMINISTRATION, GROUP 220—R. L. CAMPBELL, Director Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	5-31-72
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	4-03-72
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—L. FORMAN, Director Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	10-27-71
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—W. L. CARLSON, Director Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	12-27-71
DESIGNS, GROUP 290—R. L. CAMPBELL, Director Industrial Arts; Household, Personal and Fine Arts.	5-04-71
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—A. BERLIN, Director Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	3-01-72
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—D. J. STOCKING, Director Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus: Plastics Working Apparatus: Plastic Block and Earthenware Apparatus: Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	1-03-72
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—A. RUEGG, Director Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	3-03-72
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—M. M. NEWMAN, Director Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	3-06-72
MISCELLANEOUS CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—T. J. HICKEY, Director Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	10-26-71

Expiration of patents: The patents within the range of numbers indicated below expire during February 1973, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents........ Numbers 2,733,439 to 2,736,897, inclusive
Plant Patents........ Number 1,456

REISSUES

FEBRUARY 27, 1973

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

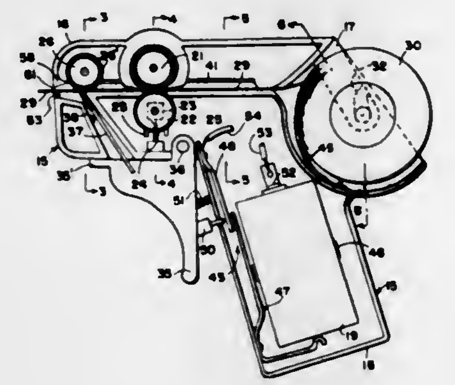
27,585

DEVICES FOR DISPENSING TINSEL AND THE LIKE ADAPTABLE FOR DECORATING CHRISTMAS TREES

**John Postolowski, 45—12 163rd St.,
Flushing, N.Y. 11358**

Original No. 3,494,235, dated Feb. 10, 1970, Ser. No. 711,603, Mar. 8, 1968. Application for reissue Sept. 23, 1971, Ser. No. 183,095

Int. Cl. B26d *5/20*
U.S. Cl. 83—225 **9 Claims**



Upon the pressing of a spring-biased element which may be the trigger of a gun-shape, tinsel issues through the muzzle from off a supply roll mounted at the stock. The upper part of the barrel of the gun is movable to allow the tinsel to be threaded by being laid in a track which keeps it from getting caught in its passage to discharge end and also guide the cut-off blade. The stock houses a dry cell to power a miniature electric motor driving nippling rollers. The trigger controls a switch in the motor circuit. Near muzzle end, there is an idler roller which is normally engaged by the cut-off blade carried by the trigger. At cut off, said blade automatically shifts said idler to free the new lead end of the tinsel.

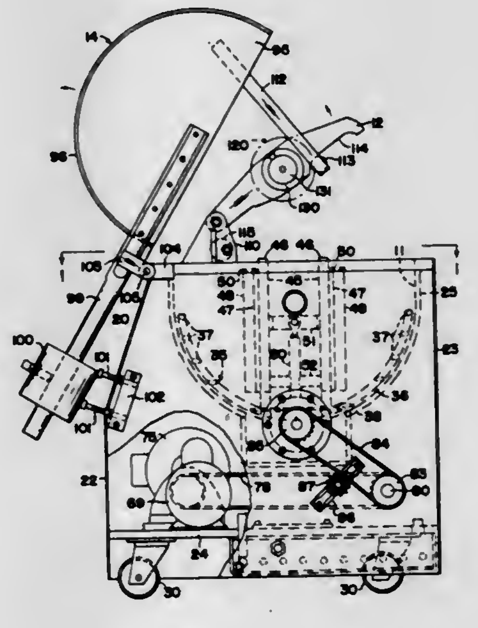
27,586

APPARATUS FOR FORMING CERAMIC SHELL MOLDS

Claude H. Watts, Mayfield Heights, and Floyd D. Benthimer, Warrensville Heights, Ohio, assignors to Precision Metalsmiths, Inc.

Original No. 3,590,905, dated July 6, 1971, Ser. No. 719,575, Apr. 8, 1968. Application for reissue Nov. 15, 1971, Ser. No. 198,620

Int. Cl. B22c *13/08*
U.S. Cl. 164—165 **16 Claims**



Apparatus for use in forming ceramic shell molds including a slurry tank, a pair of pivoted arms adapted to support a pattern setup for rotation about a horizontal axis and to lower the setup into the tank for the application of a slurry coating, and a cover adapted to close and seal the tank, whereby a vacuum can be produced therein during application of the slurry coating.

27,587

TREATING VEHICLE FOR POLYESTER FILAMENTARY MATERIAL AND METHOD OF IMPROVING THE PROPERTIES OF SUCH MATERIAL

Paul Paliyenko and Herbert Wright Coates, Charlotte, N.C., assignors to Celanese Corporation, New York, N.Y.

No Drawing. Original No. 3,251,794, dated May 17, 1966, Ser. No. 209,772, July 13, 1962, which is a continuation of Ser. No. 741,820, May 16, 1968. Application for reissue May 22, 1970, Ser. No. 41,679

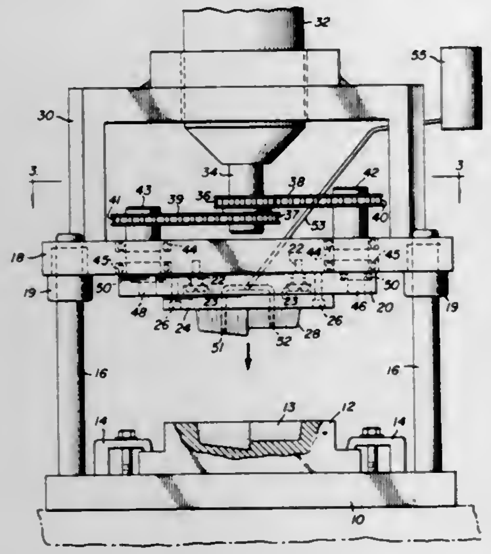
Int. Cl. C08g *47/10, 51/24*
U.S. Cl. 260—29.2 M **10 Claims**

Polyester filamentary materials and particularly filling material adapted for use in pillows, paddings, comforters and the like, having improved crimp characteristics, high resilience and high bulk, said filamentary material having been treated with an aqueous emulsion of silicone resin, a curing catalyst therefor, and an antistatic agent, preferably a quaternary ammonium salt.

27,588

APPARATUS FOR SHAPING ELECTRODES

Elmer P. Hausermann, 301 S. Kenilworth,
Bensenville, Ill. 60126
Original No. 3,465,480, dated Sept. 9, 1969, Ser. No. 622,532, Mar. 13, 1967. Application for reissue Dec. 14, 1970, Ser. No. 98,218
Int. Cl. B24b *19/00*
U.S. Cl. 51—157 10 Claims

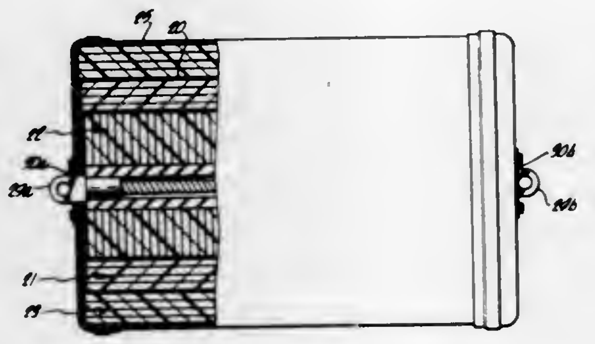


Apparatus for shaping electrodes comprising an abrasive die cavity into which an electrode workpiece is forced and wherein an oscillatory motion is given either the workpiece or the die cavity to thereby form the workpiece into the identical shape and contour of the die member.

27,589

BOAT FENDER STRUCTURES

Duff L. Dean, deceased, late of North Hollywood, Calif., by Jean C. Dean, executrix, Palo Alto, Calif., and Karl E. Balliet, Bedford, Va., assignors to Triple D Industries, Inc., Burbank, Calif.
Original No. 3,455,269, dated July 15, 1969, Ser. No. 732,481, Apr. 26, 1968, which is a continuation-in-part of Ser. No. 596,892, Nov. 25, 1966. Application for reissue June 11, 1971, Ser. No. 152,119
Int. Cl. B63b *21/00*
U.S. Cl. 114—219 5 Claims



A boat fender structure having several different bagged configurations of buoyant material one inside of the other. The inside configuration comprises relatively rigid, disc-shaped sections stacked one next to the other. The outer configurations comprise sheets of relatively resilient, buoyant material which are wrapped in the form of a spiral.

PLANT PATENTS

GRANTED FEBRUARY 27, 1973

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

3,310

MILKWEED PLANT

Barnell L. Cobia, 135 Temple Grove Drive,
Winter Garden, Fla. 32787
Filed May 18, 1971, Ser. No. 144,693
Int. Cl. A01h *5/00*
U.S. Cl. Plt.—88 1 Claim

A new and distinct plant variety of the milkweed family is structurally closely similar in appearance to plant specimens of the *Hoya carnosa compacta* variety but is distinguished from the latter variety by characteristic leaf blade border variegations.

3,311

CHRYSANTHEMUM PLANT

Walter H. Jessel, Jr., Doylestown, and William E. Duffett, Akron, Ohio, assignors to Yoder Brothers, Inc., Barberton, Ohio
Filed June 15, 1971, Ser. No. 153,455
Int. Cl. A01h *5/00*
U.S. Cl. Plt.—80 1 Claim

1. A new and distinct cultivar of chrysanthemum characterized particularly as to uniqueness when compared to the parent cultivar Escapade by its looser, less incured petal form; larger flower size; 6–9 days later response and 6–10 inch additional vigor; larger foliage; and its more generally lavender overall flower color.

3,312

IRIS PLANT

Carl G. Klehm, 2 E. Algonquin Road,
Arlington Heights, Ill. 60005
Filed June 23, 1971, Ser. No. 156,139
Int. Cl. A01h *5/00*
U.S. Cl. Plt.—68 1 Claim

1. A new and distinct variety of iris plant, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of a vigorous habit of growth, with large rhizomes and strong, stiff stems, distinctive rippled foliage, extremely large flowers, with little or no crinkling or rippling anywhere on the blossoms, outstanding "plasticity" of the flowers (flower falls hold a horizontal position during weathering) which contributes to their massive appearance, and a distinctive and attractive pure white flower color, with bright golden beards on the flower falls.

3,313

CHRYSANTHEMUM PLANT

Walter H. Jessel, Jr., Doylestown, and William E. Duffett, Akron, Ohio, assignors to Yoder Brothers, Inc., Barberton, Ohio
Filed June 15, 1971, Ser. No. 153,457
Int. Cl. A01h *5/00*
U.S. Cl. Plt.—80 1 Claim

1. A new and distinct cultivar of chrysanthemum characterized particularly as to its uniqueness when compared to the cultivar Caravelle by a longer recommended flowering period, one week earlier response, approximately one inch to one-and-a-quarter inches larger flower, a flatter petal and more decorative, less formal flower form, a more salmon pink flower color, with better color retention, approximately 4″ more vigor, lighter color and more coarse foliage, more prominent stipules, and less prominent veins in the leaves; and characterized particularly as to its uniqueness when compared to the cultivar Telstar by a flower approximately ¾″ smaller at maturity, less reflexing of the petals as the flower matures, more salmon pink coloration, approximately 1″ more vigor, foliage which is lighter in color and smaller, and smaller stipules.

PATENTS

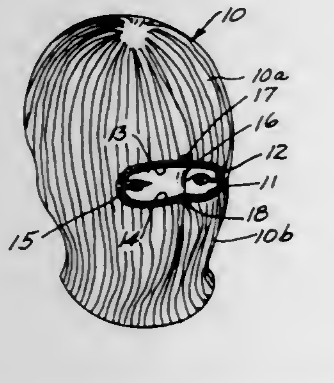
GRANTED FEBRUARY 27, 1973

GENERAL AND MECHANICAL

3,717,882

CAP WITH ADJUSTABLE FACE MASK

Walter E. Schuessler, 800 Red Bud Lane, Wilmette, Ill.
Filed April 29, 1971, Ser. No. 138,690
Int. Cl. A42b *1/06*
U.S. Cl. 2—173 **5 Claims**

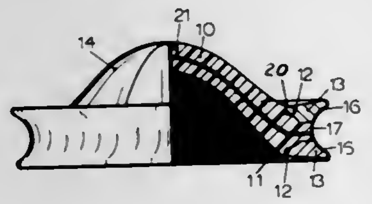


A cap formed of stretchable knitted material and having a face mask portion with a single eye opening. The eye opening may be enlarged by stretching of the material to expose the entire lower face portion of the wearer. Releasable fastening means are provided at mid points along the upper and lower edges of the opening so that when maximum protection against the weather is desired, the fasteners may be connected to bring the fabric completely over the wearer's nose and expose only his eyes.

3,717,883

CARDIAC VALVE REPLACEMENT

Fred D. Mosher, Erie, Pa., assignor to Techno Corporation, Erie, Pa.
Continuation-in-part of Ser. No. 769,932, Oct. 23, 1968, abandoned. This application Nov. 23, 1970, Ser. No. 91,950
Int. Cl. A61f *1/22*; **F16k** *15/16, 17/04*
U.S. Cl. 3—1 **2 Claims**

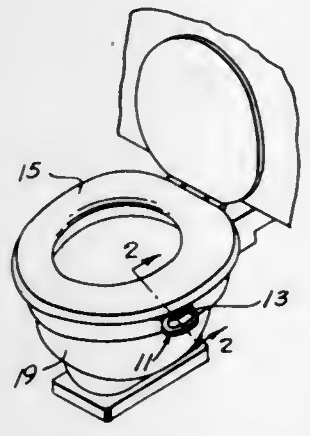


A valve suitable for cardiac surgery to replace a diseased valve. The valve is made of a molded material which will be compatible with the human body. The valve has a generally hemispherical shape with annular grooves around its base. Rings are disposed in the grooves which merge with the base to define a concave peripheral groove. The concave groove is provided so that a soft fibrous material may be secured thereto allowing the entire assembly to be sutured in a flexible conduit such as a vein or a principal artery. The hemispherical part of the valve is divided into petals which will spread like the sections of an orange peel when fluid force is exerted in one direction. The petals will close when a force is exerted in the opposite direction.

3,717,884

SEAT LIFTER

Charles P. Mantooth, 2011 Magnolia Ave. N.E., Knoxville, Tenn.
Filed Aug. 27, 1971, Ser. No. 175,641
Int. Cl. A47k *13/00*
U.S. Cl. 4—237 **4 Claims**

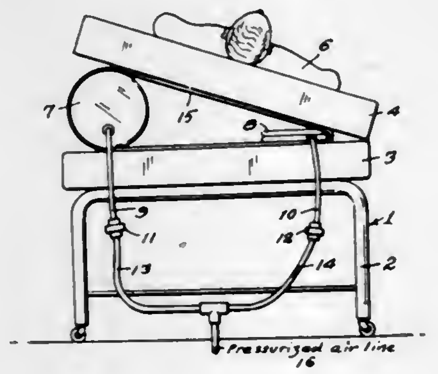


A lifting handle for a toilet seat, consisting of a plate-like flange which can be fastened to the underside of a toilet seat by screws, with a laterally projecting hand grip having tom and bottom ribs in the form of closed loops. The bottom rib depends adjacent the toilet seat so as to act as a splash deflector.

3,717,885

CLINICAL MANIPULATOR

Baltzar Leo De Mare, 627 W. Belair Ave., Aberdeen, Md. 21001
Filed May 24, 1971, Ser. No. 146,389
Int. Cl. A61g *1/02, 7/10*
U.S. Cl. 5—61 **3 Claims**

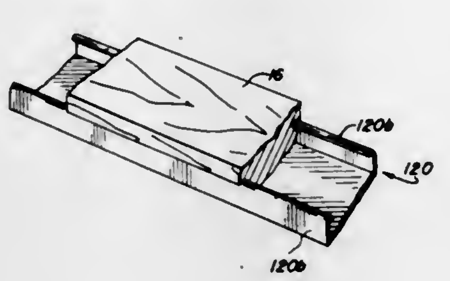


A clinical manipulator for tilting the body of a bed patient around the long axis of the body to facilitate washing, applying dressings, massaging and to prevent formation of bed sores. A pair of inflatable, elongated bags are placed, one each, between the underside of the mattress and the top of the bed springs and disposed adjacent the sides thereof. The bags are connected to a source of pressurized air. By alternately inflating and deflating the bags, the mattress is tilted from side to side with the patient.

3,717,886

BOX SPRING FRAME

Edwin B. Watts, Rosemont, Ill., assignor to Sealy, Inc., Chicago, Ill.
Filed Feb. 25, 1971, Ser. No. 118,631
Int. Cl. A47c *15/30*
U.S. Cl. 5—239 **6 Claims**

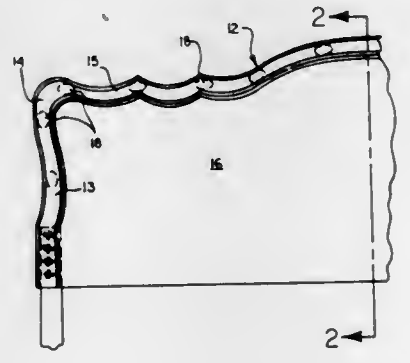


A box spring frame for supporting a mattress used in conjunction with the frame. The box spring frame includes frame means that define an outer perimeter of the box spring frame. The frame means has a plurality of slat members extending therebetween that are each formed to have a top face and a bottom face. A cap member is positioned contiguous to the bottom face of each slat member. The slat members and the cap members are constructed of materials that are lightweight and have strong compression and tensile strengths, respectively. Accordingly, to utilize the strongest characteristics of the slat members and the cap members they are positioned within the frame so that a major portion of the cross-sectional area of each slat member is placed into compression and each cap member is placed in tension when a load is placed on the frame.

3,717,887

UNITARY PLASTIC BED FRAME

Charles H. Thomas, 310 Woodsway Lane, Lenoir, N.C.
Continuation-in-part of Ser. No. 872,105, Oct. 29, 1969, abandoned. This application Aug. 20, 1970, Ser. No. 65,730
Int. Cl. A47c *19/00*
U.S. Cl. 5—280 **9 Claims**

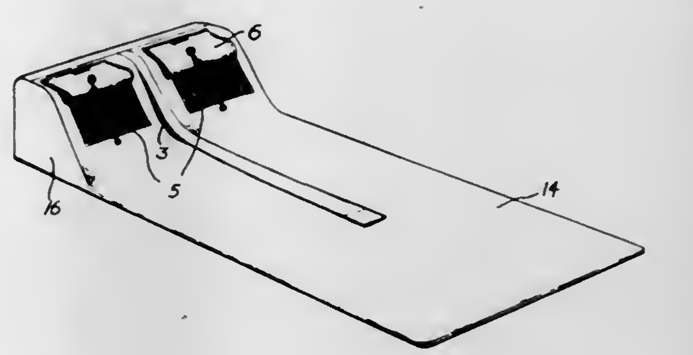


A plastic end member for beds having the appearance of being wooden, and molded as an integral frame with the outer surface having a wood-grain finish. In an alternate embodiment, the rear surface of the frame is formed in one of two prescribed configurations in order to attach either a solid panel or a series of splats across the width thereof. The invention further includes a unique type of mold for the alternative embodiments in which a single face die is used with either of two rear dies to form the prescribed rear configuration of the frame.

3,717,888

SLEEPING BAG

David P. Phelan, 3402 S.E. Main, Portland, Oreg.
Filed Nov. 2, 1970, Ser. No. 86,258
Int. Cl. A47g *9/00*
U.S. Cl. 5—343 **5 Claims**

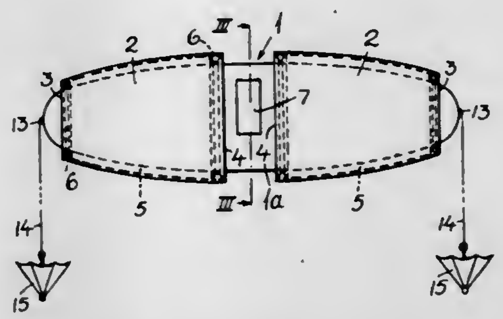


A device for enveloping a sleeper to provide him with protective covering comprising an envelope having an elongated top panel closing off the top of the envelope. A zipper closed slot in the top panel is openable to provide entry into the device. Inflatable bladder structure when inflated functions to hold the top panel at the head end of the envelope elevated from the base of the envelope. Net covered windows provide for the admission of air to the interior of the envelope, and such are opened and closed by flaps which may be manipulated by cords which extend into the interior of the envelope.

3,717,889

LIFE-BOATS

Peer Hvoslef, Monolittveien 16, Oslo, Norway
Filed July 27, 1971, Ser. No. 166,492
Int. Cl. B63c *906*
U.S. Cl. 9—4 **5 Claims**



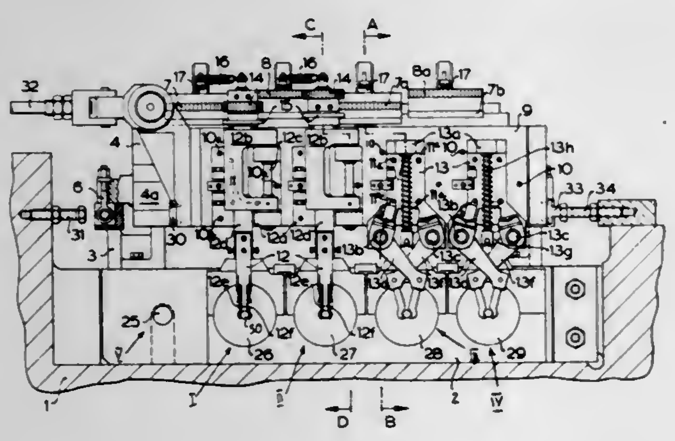
A life-boat having a closed smooth hull of circular cross-section and substantially elliptical longitudinal section, wherein the front and rear part of the hull are each surrounded by a freely rotatably mounted shell extending from the respective end of the hull towards the middle thereof, said shells having such a length that between the opposed inner ends thereof there is an intermediate exposed circumferential part of the hull suitable for the provision of the light and access to the hull.

3,717,890

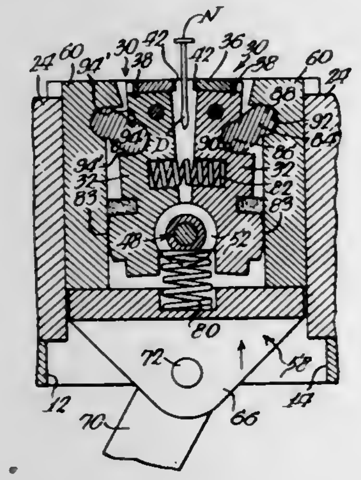
TRANSFER MECHANISM FOR MULTISTAGE MACHINE TOOLS

Alois Weller, Dusseldorf, Germany, assignor to Malmedie & Co. Maschinenfabrik GmbH, Dusseldorf, Germany
Filed Nov. 5, 1971, Ser. No. 196,137
Claims priority, application Germany, Nov. 7, 1970, P 20 54 820.3
Int. Cl. B21k *1/44, 1/58, 1/64*
U.S. Cl. 10—12 T **10 Claims**

A multistage press for the production of metallic nuts, bolts or the like has a die breast with a horizontal row of work stations and a carriage which is reciprocable along the die breast through distances corresponding to that between two neighboring work stations. The frame of the press supports a gear segment and a coaxial cam for each work station. A transfer device of a first type can be attached to the carriage for each work station or for one or more selected work stations, and such transfer device employs a shaft which carries a follower tracking one of the cams, a gear meshing with one of the gear segments, and a pair of elastic fingers which can transport and simultaneously invert a blank during movement of the carriage with reference to the die breast. A transfer device of a second type can be attached to the carriage for each work station or for one or more selected work stations in addition to or as a substitute for a transfer device of the first type. Each transfer device of the second type has a pair of jaws which can be moved between open and closed positions by a rotary cam provided in the machine frame. The gear and the follower on the shaft of each transfer device of the first type can be replaced by a retainer which holds the shaft against rotation and also prevents the shaft from pivoting about an axis which is parallel to its own axis when the carriage moves with reference to the die breast.

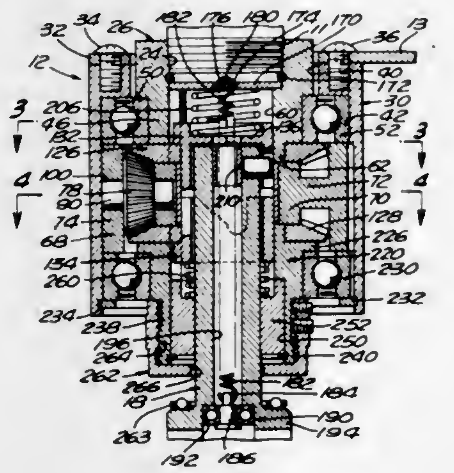


3,717,891
NAIL SHANK BROACHING APPARATUS AND METHOD
Anthony Kobylanski, Montreal, Quebec, Canada, assignor to Signode Corporation, Glenview, Ill.
Filed Jan. 28, 1971, Ser. No. 110,508
Int. Cl. B21g *3/14*
U.S. Cl. 10—54 **3 Claims**



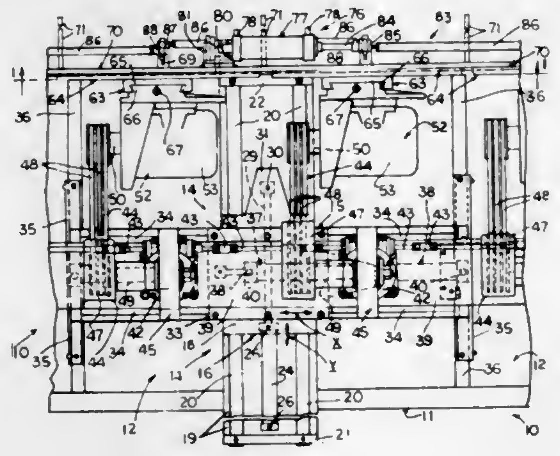
A method of, and a device for broaching nail shanks. Pairs of nails having distended shank portions near their points are positioned between pairs of spaced apart broaching surfaces, which surfaces are then closed to contact the shanks above the distended portions. Then the surfaces are moved downwardly along the shanks to reshape the distended portions. The nails are moved into broaching position transversely of their axes, and are supported adjacent their heads against axial movement during the broaching operation.

3,717,892
TAPPING ATTACHMENT FOR NUMERICAL CONTROL
Allan S. Johnson, Costa Mesa, Calif., assignor to Tapmatic Corporation
Filed April 9, 1970, Ser. No. 26,894
Int. Cl. B23q *1/46, 5/14*
U.S. Cl. 10—89 F **10 Claims**



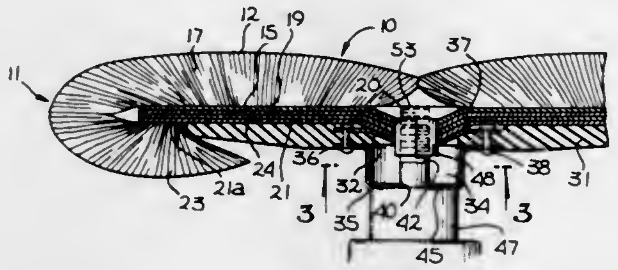
The invention is a tapping attachment of the type having free axial float. Direct and reverse drive is provided for by way of planetary gears for driving at the same speed in direct and reverse drive. An adjustment is provided for the magnitude of the free axial float. Spring biased clutch driver members are provided for both the direct and reverse drive providing a narrow, neutral position which cooperates with the adjustment of the free axial float. The attachment accommodates itself in a number of ways to numerical or computer control.

3,717,893
AUTOMATIC TAPE-CONTROLLED WORK FINISHING MACHINE
George R. Carlson, 830 Cranbrook Road, Birmingham, Mich.
Filed Sept. 11, 1970, Ser. No. 71,445
Int. Cl. B24b *29/00*
U.S. Cl. 15—97 R **3 Claims**



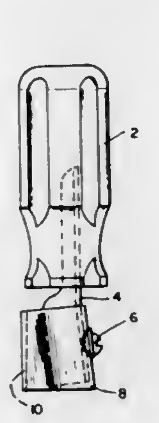
A multiple head buffing machine featuring a plurality of like work holders and a like number of motor-driven buffing wheels thereabove has these wheels coupled for simultaneous identical tilting action in operating on work pieces on the holders. The latter are carried for side-to-side and front-to-rear indexing motions, or equivalent compound motions in polishing, by a dual carriage assembly; and the universal movements of motorized finishing wheels and carriage-borne work holders, as directly powered by electrical and/or hydraulic motor means of one sort or another, are under the sole and master automatic control of a magnetic tape or equivalent tape or card type programming and feed-back system, which forwards "on-off," rate timing or equivalent signals to such motor means.

3,717,894
EDGE GUARD FOR BUFFING MACHINE
Orval W. Wakefield, Cypress, Calif., assignor to Pit-Bar Manufacturing Company, Los Angeles, Calif.
Filed May 6, 1971, Ser. No. 140,683
Int. Cl. A47l *11/14*
U.S. Cl. 15—97 R **4 Claims**



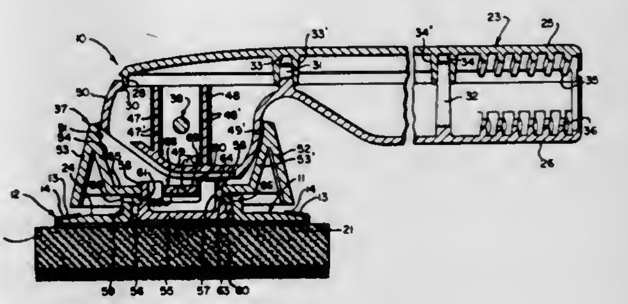
The present invention discloses an edge guard for a buffer pad. The buffed pad is formed of a canvas backing provided with a nap of wool on the front working surface thereof. The edge guard is similarly formed of a canvas backing with a wool nap, but the nap therefor is on the back surface of the canvas backing and only extends about an annular area adjacent to the outer circumference thereof. During the assembly of the buffer pad on a circular rubber back-up disc that is used for holding the buffer pad on the projecting end of a driving spindle, the edge guard pad is first positioned on the back-up disc with the back surface of its canvas backing against the back-up disc such that the annular area provided with the nap of wool surrounds and extends beyond the outer circumferential edge of the back-up disc. Then the buffer pad is positioned on the back-up disc with the back surface of its canvas backing against the front surface of the edge guard pad. The assembly is then fastened together by a clamping nut.

3,717,895
BATTERY TERMINAL POST AND POST CLAMP CLEANER TOOL
Frederick R. McFarland and Walter L. Diffenderfer, Lancaster, Pa., assignors to K-D Manufacturing Company, Lancaster, Pa.
Filed Mar. 19, 1971, Ser. No. 126,056
Int. Cl. H01r *43/00*
U.S. Cl. 15—105 **8 Claims**



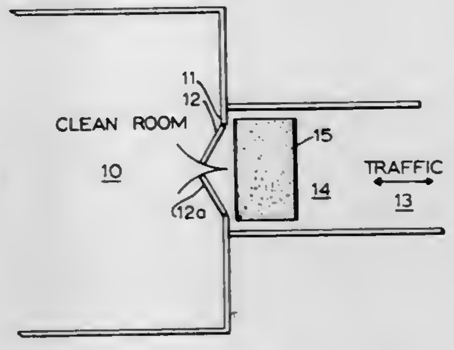
Battery post and battery post clamp cleaning tools comprise, in their operative portions, wound sheet spring steel with axially disposed lips projecting inwardly and outwardly respectively. The inwardly projecting lip conforms in shape to the outer surface of the battery post while the outwardly projecting lip conforms to the surface shape of the post hole in the battery clamp.

3,717,896
PAINT APPLICATOR
David O. Chase; Martin V. Maloney, both of Skaneateles; Frederick J. Wood, Jr., Lancaster, and Barry B. Wood, Williamsville, all of N.Y., assignors to Shur-Line Manufacturing Co., Inc., Lancaster, N.Y.
Filed Jan. 26, 1971, Ser. No. 109,891
Int. Cl. B25g *3/38;* **B44d** *3/28*
U.S. Cl. 15—210 R **15 Claims**



A paint applicator including a frame plate of generally rectangular configuration having a front surface and a rear surface and side edges which are tapered proximate their ends, a flexible backing plate proximate said front surface for mounting an absorbent pad, substantially parallel channel flanges on said backing plate fro engaging the central portion of said side edges of said frame plate in complementary mating engagement, lugs extending outwardly from said front surface of said frame plate for bracketing the ends of said backing plate to thereby prevent the backing plate from shifting from its position on the frame plate, disengagement between said lugs and the ends of said backing plate being permitted by squeezing the channel flanges toward each other in the area of said tapered ends to cause said backing plate to bow away from the front surface of the frame plate preparatory to effecting sliding disengagement between the backing plate and the frame plate, a handle on the rear surface of the frame plate, and an indexing mechanism for permitting selective positioning of the handle about an axis extending substantially perpendicularly to the backing plate.

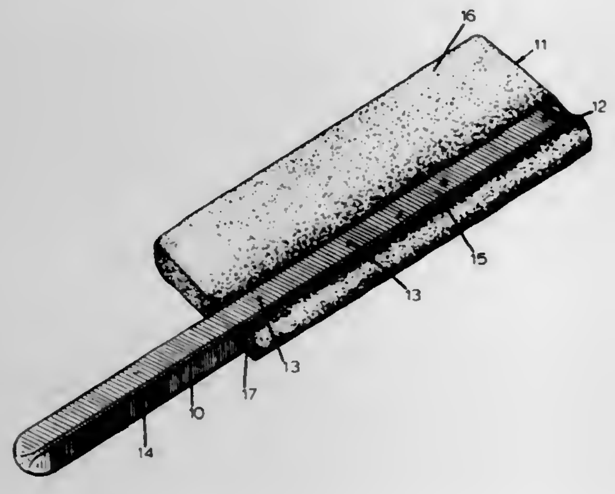
3,717,897
TACKY FLOOR PAD
Homer C. Amos, 1086 Marshall Way, and Edward T. Strickland, 171 Luring Drive, Palm Springs, both of Calif.
Filed June 18, 1970, Ser. No. 47,453
Int. Cl. A47l *23/22*
U.S. Cl. 15—215 **10 Claims**



At an entrance doorway leading into a clean room is a pad for cleaning shoes and wheels. The pad is substantially as wide as said doorway and longer than a large step taken by a person walking, and it is adhesively adhered to the passageway floor in front of the doorway. The pad has a thin base material and a thin water-washable adhesive covering its upper surface for removing dirt and other foreign matter from shoes and wheels. The adhesive presents a fairly high temporary tack for grabbing dirt aggressively and firmly, yet releasing it readily when washed.

3,717,898
FOAM BRUSH

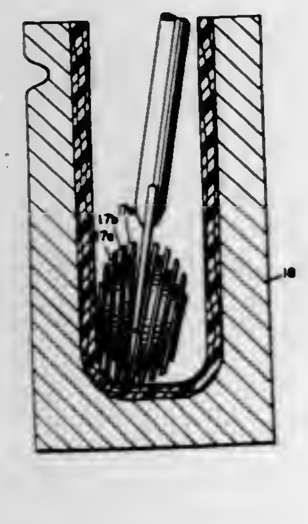
Kermith W. Jones, 116½ William St., Jamestown, N.Y.
Filed Nov. 9, 1970, Ser. No. 87,683
Int. Cl. A47l *1/10, 13/46*
U.S. Cl. 15—244 R **1 Claim**



A brush for dusting and for removing snow from automotive windshields and the like made up of a rigid handle having a slot cut in one end and a rectangular block of relatively flexible closed cell foam disposed in the slot with rivets holding the foam in clamped relationship in the slot. The foam material extends from one side of the handle several inches so that it can be used to get into recesses in windshields and similar places.

3,717,899
RESIN RADIUS ROLLER

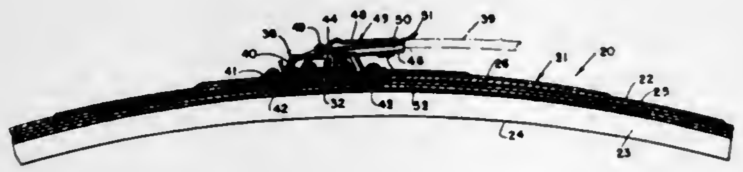
Charles R. Gardner, Glendale, and Jay Johnson, La Canada, both of Calif., assignors to Republic Corporation, Century City, Calif.
Filed Dec. 17, 1970, Ser. No. 99,209
Int. Cl. B29d *9/02*
U.S. Cl. 15—230.11 **14 Claims**



A resin radius roller for use in connection with resin impregnated fibrous materials which includes a shaft having a handle at one end and an axle, perpendicularly arranged, at the other end, and wheels having circular fins rotatably mounted on the axle on either side of the shaft, said fins decreasing in diameter as their distance from said shaft increases, said wheels being free to move laterally as well as with a rocking motion. The resin radius roller can be used in the corner of a mold to work air bubbles out of resinous materials without in any way catching or snagging the material being rolled.

3,717,900
WINDSHIELD WIPER ASSEMBLY

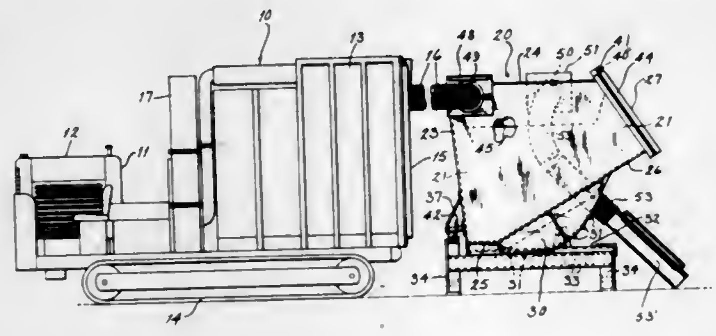
William J. Quinlan, and Lawrence L. Huver, both of Hastings, Mich., assignors to Hastings Manufacturing Company, Hastings, Mich.
Filed Nov. 19, 1970, Ser. No. 90,987
Int. Cl. B60s *1/38*
U.S. Cl. 15—250.36 **17 Claims**



An elongated and longitudinally curved blade body of resiliently flexible material has a hollow crown portion integral with a lower wiping portion. A set of superposed metallic leaf springs are contained within the hollow crown portion of the blade body. Various types of wiper arm connectors may be secured to the blade body by fasteners which engage the leaf springs in the crown portion.

3,717,901
REFUSE HOPPERS

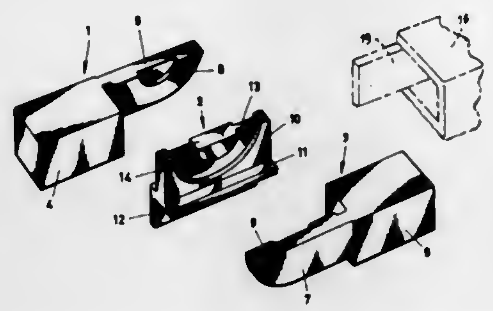
Duncan Johnstone, Lannon, Wis., assignor to DP Way Corporation, Milwaukee, Wis.
Filed Mar. 25, 1971, Ser. No. 128,014
Int. Cl. A47l *9/10*
U.S. Cl. 15—314 **6 Claims**



A refuse hopper that can be positioned at a convenient location in a foundry or factory and separably sealingly connected to a mobile vacuum cleaning machine, said hopper being designed to have refuse drawn into and deposited therein instead of said refuse being sucked directly into the cleaning machine. Thus when said hopper is filled it can be detached and hauled away to a remote dumping area while said cleaning machine is connected to another strategically placed hopper, thereby permitting the continuous utilization of said vacuum cleaning machine without requiring frequent interruptions in order to transport said machine to a remote location for dumping.

3,717,902
HINGE CONSTRUCTION

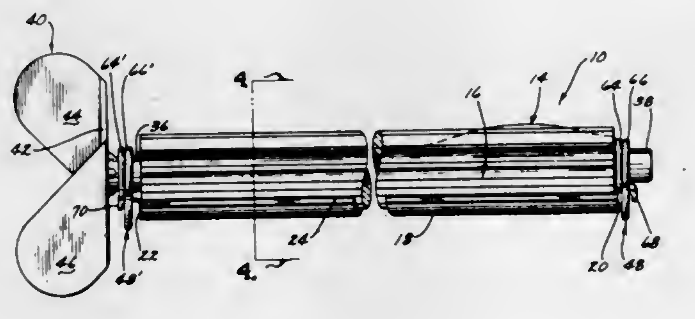
Franciscus Gerhardus Savenije, Deventer, Netherlands, assignor to Auping N.V., Deventer, the Netherlands
Filed July 16, 1970, Ser. No. 55,483
Int. Cl. E05d *1/06*
U.S. Cl. 16—171 **4 Claims**



A hinge construction for hinging at least one hollow tubular member at one of its ends to another member for relative swinging through less than 90°, comprises a first small block having flat side secured to that other member and a second small block fitting tightly in the end of the hollow member and having a thinner part with a flat side projecting beyond the hollow member. Both flat sides lie opposite each other and one has a projection fitting slidingly in a semicircular groove in the other flat side and a retaining element maintaining the thin part of the second block against the flat side of the first block. A limiting element limits the angle of relative swinging movement.

3,717,903
HAND OPERATED FISH SKINNING TOOL

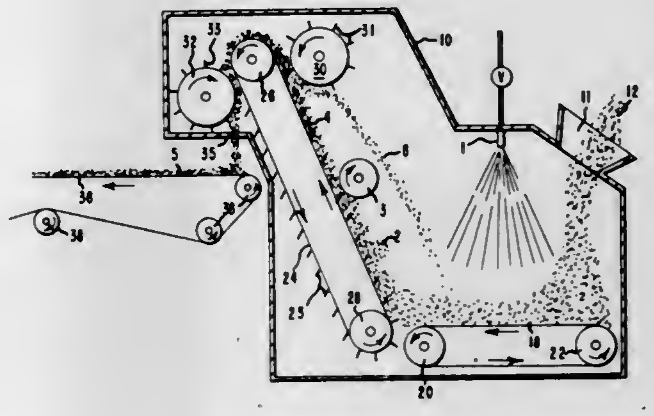
Ray T. Townsend, Des Moines, Iowa, assignor to Townsend Engineering Company, Des Moines, Iowa
Filed Nov. 9, 1970, Ser. No. 87,819
Int. Cl. A22c *25/17*
U.S. Cl. 17—67 **6 Claims**



A hand operated fish skinning tool comprising a support means having a curved pressure surface formed thereon with a handle means extending rearwardly therefrom at one end thereof. A toothed roller is rotatably mounted on the support means so that the curved pressure surface partially extends around the roller. An actuating element is connected to one end of the roller for actuating the same so that the actuating element is positioned at one end of the support means and the handle means is positioned at the other end of the support means. A pair of spring clips embrace shaft stubs extending from opposite ends of the roller and are connected to opposite ends of the support means to yieldably urge the toothed roller into engagement with the curved pressure surface.

3,717,904
PROCESS OF FORMING A UNIFORM BATT FROM STAPLE FIBERS

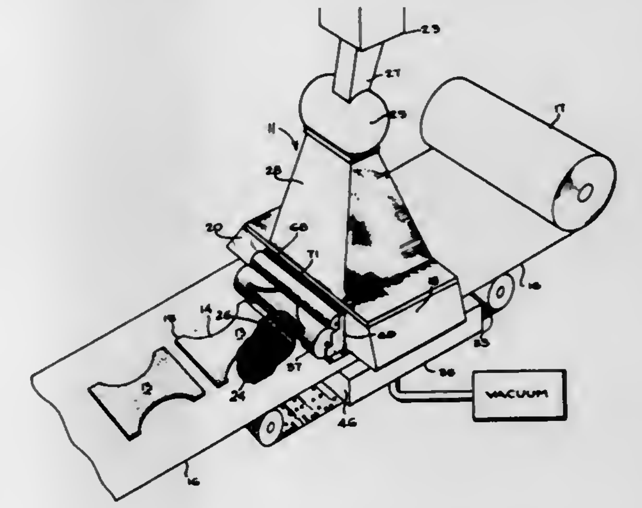
Willard H. Bonner, and Robert L. Craven, both of Wilmington, Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.
Continuation-in-part of Ser. No. 8,600, Feb. 4, 1970, abandoned. This application Nov. 15, 1971, Ser. No. 198,815
Int. Cl. D01b *3/04*
U.S. Cl. 19—66 R **1 Claim**



A procedure for processing staple fibers into uniform batts by the use of a water spray to wet the fibers and a compression device to depress the fibers more densely into batt form.

3,717,905
AIR LAYING APPARATUS

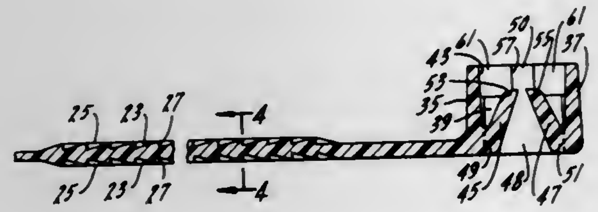
Warren R. Furbeck, Knoxville, Tenn., assignor to International Paper Comapny, New York, N.Y.
Continuation-in-part of Ser. No. 26,002, April 6, 1970, abandoned, which is a continuation-in-part of Ser. No. 672,477, Oct. 3, 1967, Pat. No. 3,509,604. This application Aug. 23, 1971, Ser. No. 174,092
Int. Cl. D01g *25/00*
U.S. Cl. 19—148 **6 Claims**



A stream of air carries loose fibers through enclosed ducts and deposits them in a series of equally spaced, substantially identical pads on a continuously moving web as it moves through a generally enclosed chamber. The web and now formed pads exit the chamber through an opening which is sealed by a unitary seal roll. The seal roll is provided with a circumferential cavity corresponding to the contour of the individual pads and is of a circumference equal to the distance between leading edges of successive pads. The seal roll is rotated at a tangential velocity equal to the linear velocity of the web moving under the roll so that a pad passing under the roll mates in the cavity in the roll surface thereby sealing against air leakage into the generally enclosed chamber and compacting the fibers of the pad in a controlled manner.

3,717,906
CABLE TIE

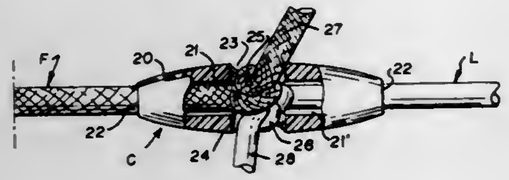
Peter M. Wells, Sycamore, Ill., assignor to Ideal Industries, Inc., Sycamore, Ill.
Filed Sept. 29, 1970, Ser. No. 76,524
Int. Cl. B65d *63/00*; **A44b** *17/00*
U.S. Cl. 24—16 PB **7 Claims**



A cable tie including a flat ratchet toothed strap and a hollow frame having pawls to engage the ratchet teeth of the strap. The pawls extend from opposite walls of the frame at the entrance thereto and converge in the direction of the outlet. The pawls terminate short of the outlet of the frame in free end surfaces which are generally flat and which are back tapered. The ratchet teeth on the strap are also back tapered and are bordered by flanges. In one modification, the tip of the strap is bent slightly out of the plane of the strap. In another modification, a mounting boss is attached to the frame. In yet another modification, an indicia receiving plate is formed between the strap and the frame.

3,717,907
LEADER CONNECTOR

Gerald B. Klein, 13451 Stuart Court, Broomfield, Colo.
Filed March 25, 1971, Ser. No. 128,015
Int. Cl. F16g *11/00, 11/02*
U.S. Cl. 24—128 **16 Claims**

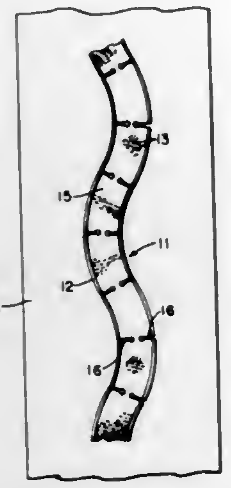


A connector or a link for joining a leader to a fly line is formed as a small cigar or like shaped member. A passageway opening at each end receives the end of the line and the end of the leader. A transverse hole at the center intersects the passageways from the ends to provide opposing side openings. The end of the line and the end of the leader are threaded through their passageways to project from the side openings. They are then knotted and the knots are pulled back into the side opening to complete the connection.

3,717,908
DEFORMABLE FASTENING DEVICE

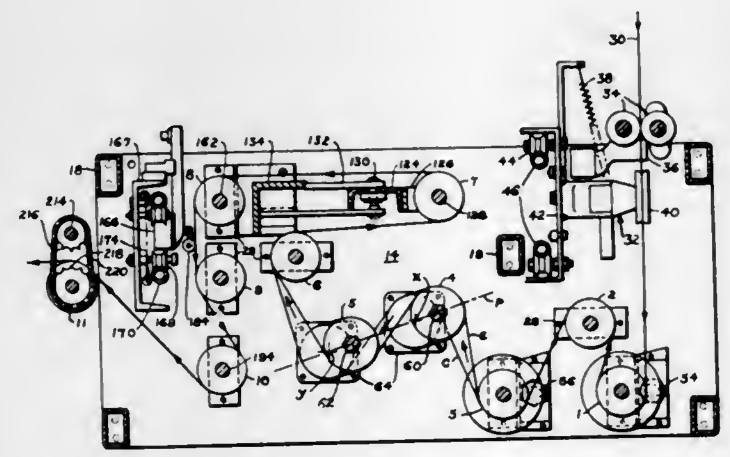
Joseph Perina, Huntington, N.Y., assignor to American Velcro Inc., New York, N.Y.
Filed March 31, 1971, Ser. No. 129,904
Int. Cl. A44b *17/00*
U.S. Cl. 26—204 **6 Claims**

There is described a deformable fastening member of a separable type fastener including a flexible backing strip and a multiplicity of hooking elements projecting from one surface thereof. The backing strip includes a plurality of spaced apart relief slots extending into the strip from the edge portions thereof. The slots allow the strip to be easily bent and attached to substantially any curved surface.



3,717,909
CLOTH STRAIGHTENING APPARATUS

J. Douglas Robertson, Taunton, Mass., assignor to Mount Hope Machine Company, Incorporated, Taunton, Mass.
Filed May 13, 1970, Ser. No. 36,848
Int. Cl. D06h *3/12*
U.S. Cl. 26—51.4 **20 Claims**



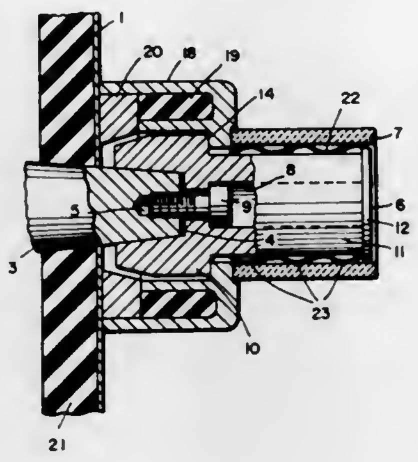
A cloth straightener for knitted or woven cloth comprises a series of feed rolls and cloth straightening rolls, at least some of which are driven at different or differentiable linear surface velocities in predetermined, adjustable ratios. Various zones of the cloth, defined between successive driven rolls, can thus be subjected to different degrees of tension. In each zone, the minimum level of tension is applied that is found necessary to the optimum performance of various feeding, straightening, and detecting operations.

3,717,910
HEATABLE PIN ASSEMBLY FOR TREATING THREAD

Karl Fries, Elsenfeld, Germany, assignor to Akzona Incorporated, Asheville, N.C.
Filed April 10, 1970, Ser. No. 27,224
Claims priority, application Germany, April 19, 1969, P 19 19 935.0
Int. Cl. D02j *13/00*
U.S. Cl. 28—62 **1 Claim**

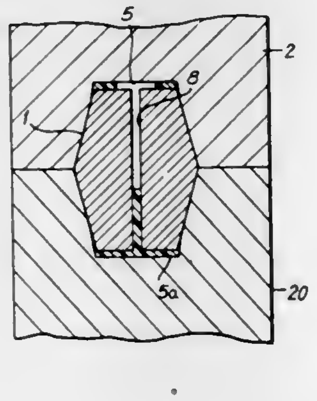
A heatable stretching and fixing pin assembly for thread or yarn treatment wherein a heated, stationary, cylindrical metal

pin is equipped with an interchangeable thread-contacting collar which is mounted and held on the pin by a radially-compressible, annularly-fitting and heat-conducting metallic element such as a basket spring or tolerance ring.



3,717,911
METHOD OF MAKING A NIPPLE-ELECTRODE JOINT

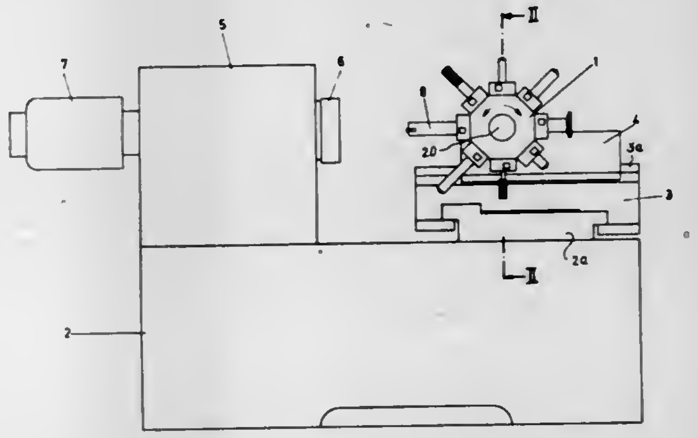
Irvin William Gazda, Johnson City, Tenn., assignor to Great Lakes Carbon Corporation, New York, N.Y.
Filed Feb. 9, 1971, Ser. No. 113,995
Int. Cl. H01j *9/00*
U.S. Cl. 29—25.14 **8 Claims**



The invention relates to nipple-electrode assemblies and joints, such as those used in electric arc furnaces, and to a means of distributing thread clearance throughout the assembly and/or joint. These means include the pre-positioning of the nipple in the socket of the electrode section into which the nipple is threaded so as to provide a clearance between the non-load bearing flanks of the threads of said threaded nipple and said threaded electrode socket and the placing within the space between the base of the nipple and the bottom of the socket of the electrode section a hot, non-gaseous fluid, carbonizable material which solidifies upon cooling, thereby preparing a preassembly wherein the nipple is fixed in the electrode section, thereby maintaining the aforedescribed pre-positioning and thread clearance and thereby also providing room for thermal expansion of the threads of the connection. The hot, carbonizable material is introduced into the space between the base of the nipple and the bottom of the socket, while in a hot, fluid condition, through a hole in the nipple after the nipple has been threaded into the electrode socket, after which the carbonizable material solidifies. Upon connection of the projecting end of the nipple into a socket of an electrode section and use in a column of electrodes in an electric arc furnace, the solidified carbonizable material again becomes heated, melts and some of it flows downwardly through the hole into the corresponding space in the socket of the electrode section of the column and then becomes solid and carbonizes due to the heat encountered, thereby locking the nipple in the sockets of both electrode sections joined.

3,717,912
INDEXING APPARATUS FOR TOOL HOLDERS OF MACHINE TOOLS

Heinrich Lahm, Esslingen-Sirnau, Germany, assignor to Index-Werke KG Hahn & Tessky, Esslingen, Germany
Filed Sept. 16, 1971, Ser. No. 181,119
Claims priority, application Germany, Mar. 3, 1971, P 21 10 147.3
Int. Cl. B23b *7/04*
U.S. Cl. 29—39 **26 Claims**

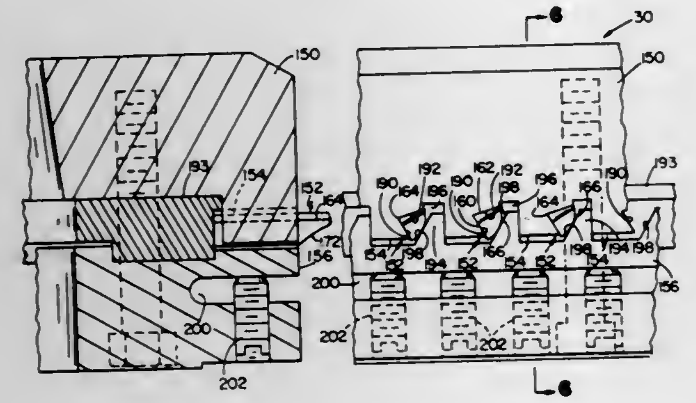


The turret-shaped holder for a set of tools in a machine tool is indexible by an apparatus which employs a pair of clutch members one of which is rotatable with reference to the other clutch member to thereby disengage a face gear on the holder from a stationary face gear so that the holder can be rotated to a selected angular position. The rotary clutch member meshes with a sleeve which rotatably surrounds the shaft of the holder and moves the holder axially in response to rotation and/or axial movement of the rotary clutch member. A clutch in the variable-speed drive which rotates the holder when the face gears are disengaged from each other allows for limited rotation of the holder when the teeth of the face gears mesh with each other. A package of dished springs urges the face gears apart and maintains the claws of the clutch members in abutment with each other. The system which selects the angular positions of the holder has a set of cams which are rotatable with the shaft of the holder. Such system insures that a selected tool on the holder is moved to its operative positioin by the shortest possible route so that the shaft of the holder need not rotate through more than 180 degrees.

3,717,913
GEAR MAKING

Paul Maker, Marion, Mass., assignor to Bird Island, Inc., Boston, Mass.
Division of Ser. No. 11,503, Feb. 16, 1970, Pat. No. 3,638,850. This application Dec. 13, 1971, Ser. No. 207,474
Int. Cl. B26d *1/12*
U.S. Cl. 29—103 C **7 Claims**

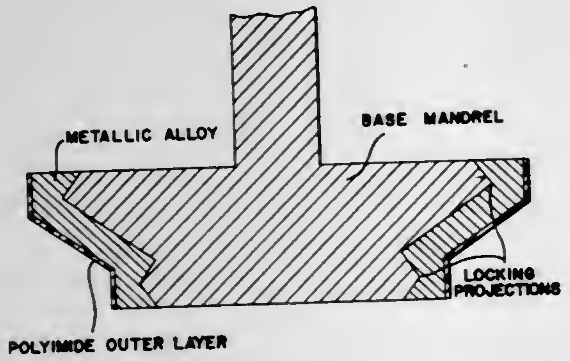
In gear making apparatus a rotary cutter has a tool holding body with a plurality of tools removably mounted in recesses spaced around the body periphery, each tool having a profile generating cutting edge at the intersection of two planar surfaces, each recess having at least one planar surface in flush contact with one of the planar surfaces of the mounted tool to



positively locate the cutting edge so that all cutting edges lie on a single surface of revolution.

3,717,914
REUSABLE MANDREL FOR STRUCTURES HAVING ZERO DRAFT OR RE-ENTRANT GEOMETRIES

Robert J. Baird, Indianapolis, Ind., and Thomas G. Everett, Jr., Flanders, N.J., assignors to Union Carbide Corporation, New York, N.Y.
Filed June 24, 1971, Ser. No. 156,191
Int. Cl. B32b *15/08*
U.S. Cl. 29—195 **3 Claims**



A mandrel, and process therefor, consisting of a high melting temperature base material, such as aluminum, having an undercoating of a low melting temperature metallic alloy and an overcoating of a polyimide material. In casting or plasma deposition applications, the undercoated metallic alloy is removed at an elevated temperature thereby facilitating the removal of the base mandrel.

3,717,915
ALUMINUM OFFSET PRINTING PLATE

Adolf Teubler, Uedorf, near Bonn, and Paul Eversheim, Bonn, Germany, assignors to Vereinigte Leichtmetallwerke GmbH, Bonn, Germany
No Drawing. Original application Sept. 24, 1969, Ser. No. 860,805, now Patent No. 3,672,878, dated June 27, 1972. Divided and this application Oct. 26, 1971, Ser. No. 192,621
Claims priority, application Germany, Sept. 27, 1968, P 17 83 066.9; June 9, 1969, P 19 29 146.4
Int. Cl. B32b *15/20;* **B41n** *1/08*
U.S. Cl. 29—197.5 **12 Claims**

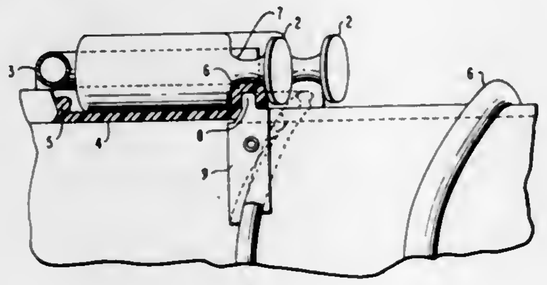
An aluminum printing plate for use in offset roller plating comprising a core consisting of an aluminum base alloy including the following alloying components:

	Percent
Magnesium	0.8–2.5
Silicon	0.2–0.4
Manganese	0.8–1.4
Copper	0.05–0.3
Iron	0.2–0.6
Zinc	0.01–0.2
Aluminum	Balance

provided on both major faces thereof with plating layers essentially consisting of aluminum.

3,717,916
APPARATUS FOR FORMING SPIRAL WOUND PIPES

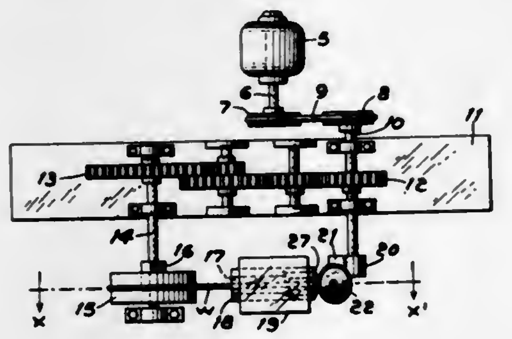
Michael Wienand, Siegberg; Klaus Jensen, Buisdorf; Franz Primessing, Mondorf, and Franz-Werner Alfter, Oberlar, all of Germany, assignors to Dynamit Nobel Aktiengesellschaft Troisdorf, Germany
Division of Ser. No. 764,427, Oct. 2, 1968, Pat. No. 3,606,670. This application Sept. 8, 1971, Ser. No. 178,706
Int. Cl. B23p *19/00, 19/02*
U.S. Cl. 29—200 B **4 Claims**



A pipe is continuously formed by spirally winding a band onto the cylindrical portion of a mandrel after the band exits from a synthetic material extruding machine while still thermoelastic or after a preformed band is passed through the suitable heating device. One longitudinal edge of the band is provided with a radially outwardly widening tongue and the other longitudinal edge of the band is provided with a radially inwardly widening channel. In forming the pipe, the tongue is cooled to be rigid and inserted into the thermoelastically heated channel of an adjacent lap of the spirally wound band.

3,717,917
APPARATUS FOR CUTTING A WIRE AND CRIMPING A WINDING TO THE WIRE

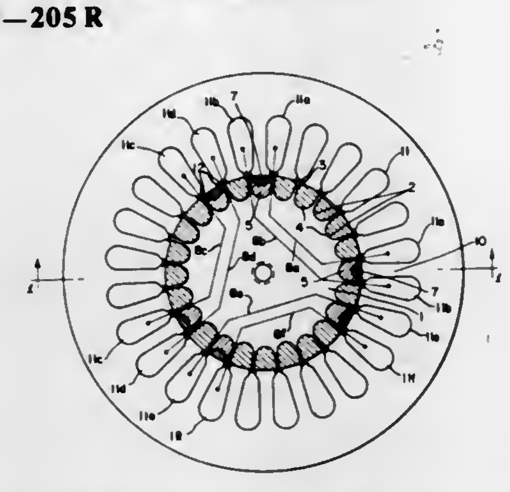
John L. Marks, Peabody, Mass., assignor to International Telephone and Telegraph Corporation, Nutley, N.J.
Filed May 26, 1971, Ser. No. 147,096
Int. Cl. H01r *43/00*
U.S. Cl. 29—203 D **10 Claims**



This is an apparatus for cutting a wire and crimping a winding to the cut wire. A drive shaft is coupled to means for feeding wire to be cut and rotating means for cutting the wire and crimping the winding to the wire. The rotating cutting means includes a disk cutter having a bevelled edge. During the course of one revolution of the cutter, the outermost portion of the bevelled edge is positioned adjacent the point where the wire is to be cut, and the plane of the bevelled edge is slightly less than parallel with the axis of the wire so as to cause a crimping to the wire of the winding which surrounds the wire while the wire is being cut.

3,717,918
INSERTING TOOL FOR INSERTING COILS INTO STATOR GROOVES

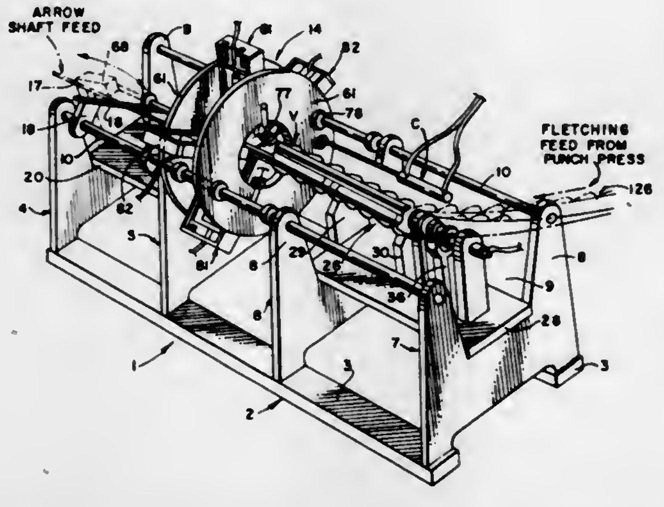
Hans Droll, 6 Bergen-Enkheim, Nordring, Germany
Filed June 7, 1971, Ser. No. 150,431
Claims priority, application Germany, June 6, 1970, P 20 27 979.2
Int. Cl. H02k *15/06*
U.S. Cl. 29—205 R **5 Claims**



A device for placing pre-wound coils into stator grooves including a generally circular stripper member movable through the stator. Projections are arranged about the periphery of the stripper member with fingers located in the slots formed between the projections. Some fingers, and preferably at least one finger adjacent each tooth which contains a prewound coil to be placed into the stator is fixed onto the stripper member for movement therewith as the latter moves through the stator. A guide rod fixed relative to the stator is placed between each fixed mounting finger and the inner periphery of the stator to prevent wear of the fixed mounting finger as the stripper member moves through the stator.

3,717,919
FLETCHING MACHINE

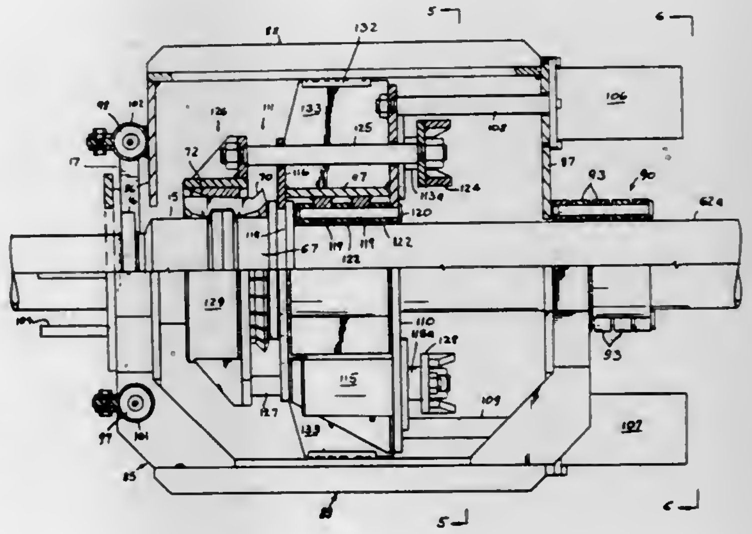
Fred B. Bear, Lake Street, Grayling, Mich.
Filed April 27, 1972, Ser. No. 248,020
Int. Cl. B23p *19/04*
U.S. Cl. 29—208 R **33 Claims**



A fletching apparatus for arrows includes means feeding unfletched shafts to a chuck device for holding the shaft while a reciprocating carriage surrounding the shaft moves to a first position where one or a plurality of carriage-mounted applicator assemblies each pick up a feather or vane from a continuous feather supply disposed rearward of the chucked arrow nock. The carriage then shifts to a second position locating the applicator assemblies forward of the nock whereupon one or more of the assemblies are actuated to deposit the feather(s) on the shaft concurrently with the actuation of sealing means engaging the base of the feather(s) to attach same to the arrow shaft.

3,717,920
APPARATUS FOR MAKING AN UNDERWATER PIPELINE CONNECTION

John P. Oliver, and Alfred W. Wedel, Houston, Tex., assignors to Cameron Iron Works, Inc., Houston, Tex.
Division of Ser. No. 30,538, April 21, 1970. This application March 25, 1971, Ser. No. 127,946
Int. Cl. B23p *19/04;* **F16l** *1/00*
U.S. Cl. 29—237 **3 Claims**

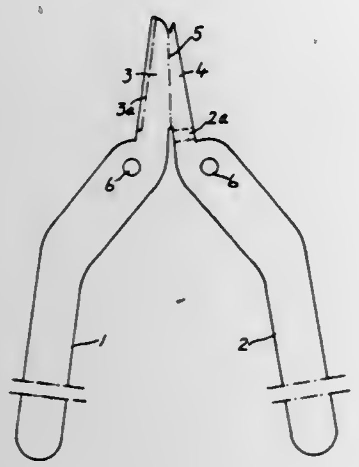


A lateral pipeline being laid is connected to a main pipeline lying on the bottom of the ocean by a tie-in assembly that is connected to the lateral line above the surface of the water. The main line is equipped with a stub section of pipeline to which the lateral is to be connected. The angle between the lateral and the main line is measured and from this the tie-in assembly is designed. This assembly also includes two ball and socket type joints that permit limited misalignment between the sections of the tie-in assembly and the stub section of the pipeline connected to the main line and also allows relative rotation between at least two portions of the tie-in assembly. A connector assembly is used to connect the tie-in assembly to the stub pipeline section. An actuator is releasably connected to the tie-in assembly above the surface of the water and lowered with the tie-in assembly into the water to actuate the connector assembly to connect the tie-in assembly and the stub pipeline section. This actuator can then be recovered and used again.

3,717,921
MANUFACTURE OF SCISSORS, TONGS, PLIERS OR THE LIKE CUTTING OR GRIPPING TOOLS

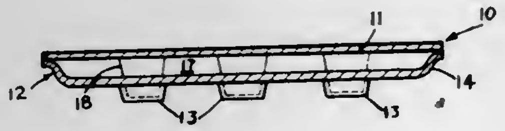
Guran Ygfors, Sollentuna, Sweden, assignor to Ygfors Trading AB, Jarfalla, Sweden
Filed Oct. 14, 1970, Ser. No. 80,730
Claims priority, application Sweden, Oct. 17, 1969, 14266/69
Int. Cl. B23q *17/00;* **B23p** *17/00, 19/00*
U.S. Cl. 29—407 **16 Claims**

An improved cutting or gripping implement manufactured by punching out a blank from sheet metal, the blank having a configuration of shanks, bending the blank into a shank structure, laminating the shanks, connecting them by a fastener, and providing plastic handles over the shanks.



3,717,922
METHOD OF MAKING SKIN REINFORCED PALLET

Henry J. Witkowski, 5625 East Lake Road, Erie, Pa.
Continuation of Ser. No. 814,724, April 9, 1969, abandoned. This application June 8, 1971, Ser. No. 151,129
Int. Cl. B23p *17/00*
U.S. Cl. 29—421 **1 Claim**

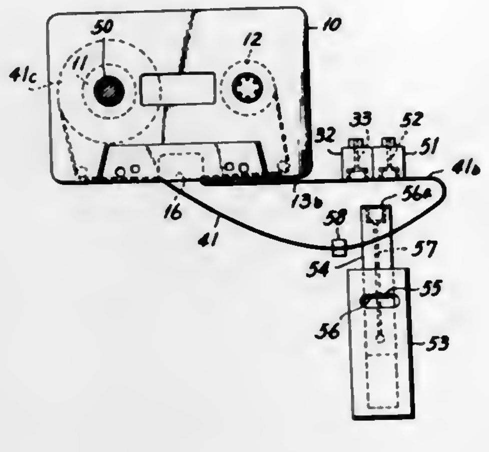


The disclosure describes a preferred form of a method of making a pallet by forming legs on a sheet of material and attaching a second sheet to the marginal edges of the first sheet and filling the space between the sheets and the legs with a foamable plastic material such as polyurethane, or the like. The sheets may be any vacuum formable material such as thermoformable plastic. They could also be other materials that may be formed or molded into sheets with legs, such as cardboard, metal, wood, or other suitable structural materials.

3,717,923
METHOD AND AN APPARATUS FOR MANUFACTURING A TAPE CASSETTE

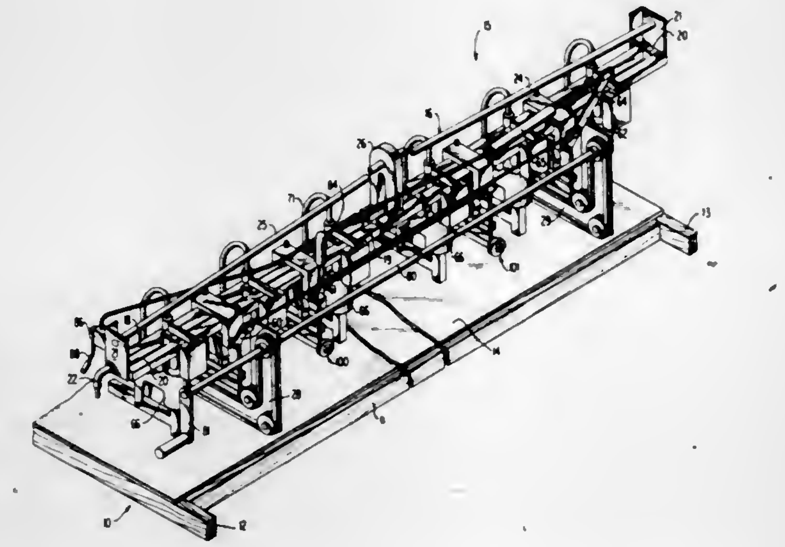
Kinjiro Arai, and Yoshio Nakatani, both of Yokohama, Kanagawa-ken, Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Kanagawa-ken, Japan
Filed Feb. 5, 1971, Ser. No. 112,871
Claims priority, application Japan, Feb. 7, 1970, 45/10378
Int. Cl. B23p *19/00, 19/04*
U.S. Cl. 29—429 **10 Claims**

A method for manufacturing a tape cassette comprises the process steps of pulling a tape leader out of a tape cassette case, cutting off the pulled out tape leader, jointing one end of the cut off tape leader piece and one end of a magnetic tape, winding a predetermined length of the magnetic tape thus jointed into a spool provided in the cassette case, jointing the other cut off tape leader piece and the other end of the magnetic tape and winding up the whole magnetic tape and the tape leader piece into the cassette case. A winding of the magnetic tape is placed outside of the cassette case and the magnetic tape is supplied to the spool in the cassette case from outside during the winding process. An apparatus for manufacturing a tape cassette carries out the above listed steps of the aforementioned manufacturing method.



3,717,924
MULTIPLE STAPLING SYSTEM

George W. Kennedy, 2564 Grand Prix Court, Atlanta, Ga.
Filed Jan. 8, 1971, Ser. No. 104,969
Int. Cl. B27f *7/02*
U.S. Cl. 29—432 **10 Claims**



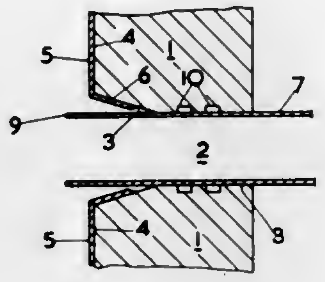
A method and apparatus for simultaneously inserting a plurality of staples in a work piece wherein a plurality of stapling machines are supported from the work piece in spaced relation above the work piece and moved across the work piece. The stapling machines are lowered intermittently into contact with the work piece and actuated to drive staples in the work piece.

3,717,925
METHOD OF MAKING EXPLOSIVELY WELDED JOINTS

Roy Hardwick, Leeds, England, assignor to Yorkshire Imperial Metals Limited, Stourton, near Leeds, England
Filed March 1, 1971, Ser. No. 119,609
Claims priority, application Great Britain, March 9, 1970, 11,181/70
Int. Cl. B23k *21/00*
U.S. Cl. 29—470.1 **6 Claims**

A method of securing in an aperture in a tubeplate of a heat exchanger a thin tube of a corrosion resistant costly metal

such as tantalum, in which a thin sheet of cladding, also of tantalum, is placed over the tubeplate in which the tube is secured to the cladding sheet by a lap weld within the aperture by means of an explosive welding technique. The tube is also welded to the tubeplate material within the aperture to ensure lateral rigidity.



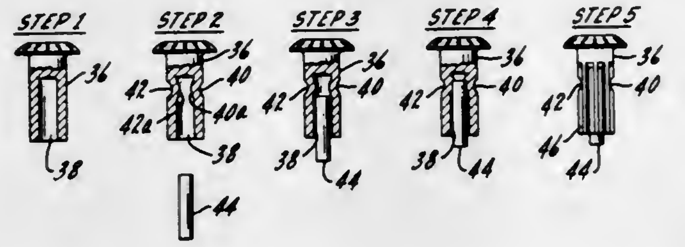
3,717,926
METHOD OF JOINING GRAPHITE ARTICLES

Leonid Trifonovich Anikin, Nizhegorodskaya ulitsa, 94, korpus 3, kv. 42; Gennady Alexandrovich Kravetsky, Novo-Basmannaya ulitsa, 4/6, kv. 201; Viktoria Sergeevna Dergunova, ulitsa Chaplygina, 13/2, kv. 85, all of Moscow, and Valery Vasilievich Dutov, ulitsa Volkovskaya, 9, kv. 16, Ljubertsy Moskovskoi oblasti, all of U.S.S.R.
Filed Jan. 29, 1970, Ser. No. 6,950
Int. Cl. B23k *31/02*
U.S. Cl. 29—472.7 **2 Claims**

A method of joining graphite articles in which a layer of metal is interposed between the surfaces of the articles to be joined, after which the joint area is heated to a temperature which is at least as high as the temperature at which a eutectic of the carbide of the metal and carbon is formed, or, alternatively, to a temperature somewhat higher than the said temperature whereby the resistance of the thus obtained joint to high temperature is considerably increased.

3,717,927
METHOD OF MAKING TIRE STUDS

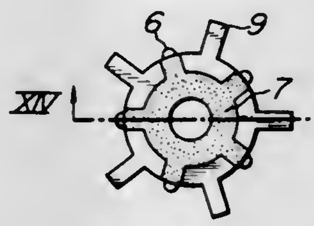
Clarence J. Smith, Rockford, Ill., assignor to The Shaler Company, Waupun, Wis.
Continuation of Ser. No. 863,676, Sept. 25, 1969, abandoned, which is a continuation of Ser. No. 736,876, April 10, 1968, abandoned, which is a division of Ser. No. 542,075, April 12, 1966, Pat. No. 3,404,718. This application Sept. 15, 1970, Ser. No. 72,520
Int. Cl. B21d *39/00;* **B23p** *11/00*
U.S. Cl. 29—517 **5 Claims**



This application discloses a tire stud and method of making the same by inserting a hard, wear resistant pin into frictional engagement with interference means in a socket in a tire stud body section such that the end of the pin is spaced from the bottom of the socket, and securing said pin in said socket against displacement during the use of the tire stud.

3,717,928
METHOD OF MANUFACTURING COMMUTATORS FOR SMALL-SIZE ELECTRIC MACHINES

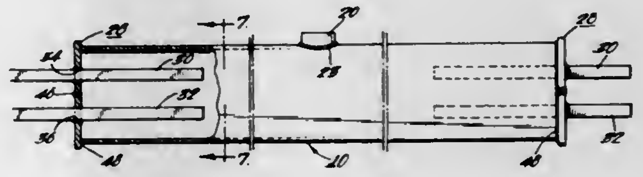
Terumoto Yamaguchi, Anjo, Japan, assignor to Nippondenso Kabushiki Kaisha, Aichi-ken, Japan
Filed Jan. 5, 1971, Ser. No. 104,074
Claims priority, application Japan, Jan. 20, 1970, 45/5252
Int. Cl. H01r *43/00*
U.S. Cl. 29—597 **1 Claim**



A method of manufacturing commutators for small-size electric machines, which includes the steps of press forming a flanged hollow cylindrical workpiece, which has a flange at one end and is made of a conducting material, with outward protuberances defining corresponding inner recesses or cavities along a portion of the workpiece adjacent the flange, press forming the resultant workpiece into an axially grooved, flanged hollow body having eventual commutator segment portions and outward bridge portions bridging adjacent commutator segment portions, forming inner nails on the resultant body at positions corresponding to the respective commutator segment portions, mold filling an insulating material in the resultant nailed body, and die-stamping connection hooks from the flange while at the same time removing the outward protuberances.

3,717,929
METHOD OF MAKING ALKALI METAL-FILLED ELECTRICAL CONDUCTORS AND TERMINATIONS THEREFOR

Cliff C. Atkinson, Niagara Falls, Rolland O. Butler, Grand Island, and Francis J. Ross, Niagara Falls, N.Y., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.
Filed June 3, 1970, Ser. No. 43,043
Int. Cl. H01b *13/00*
U.S. Cl. 29—624 **10 Claims**



A method of fabricating a sodium-filled conductor with low-resistance copper terminations by welding copper inserts, which are to provide the desired terminations, into an aperture in a support of a material which is readily weldable to steel but more difficult to weld to copper, the support being of relatively small size, however, so that the copper insert can be readily hermetically joined to the support by welding. The support is then positioned so as to close an opening in a steel casing and welded thereto with the insert extending from the interior to the exterior of the casing. The casing is cleaned internally and molten sodium is flowed into it in an environment of an inert gas while maintaining the casing at a temperature above the melting point of sodium, until the casing is filled and the portions of the copper inserts extending inside the casing are immersed in the molten sodium. Thereafter the casing and the molten sodium are cooled to solidify the sodium and to provide an intimate low-resistance contact between the solidified sodium and the portion of the insert within the casing. All openings through the casing are hermetically sealed after it has been filled with the sodium. Low-resistance terminations are thereby provided readily and reproducibly.

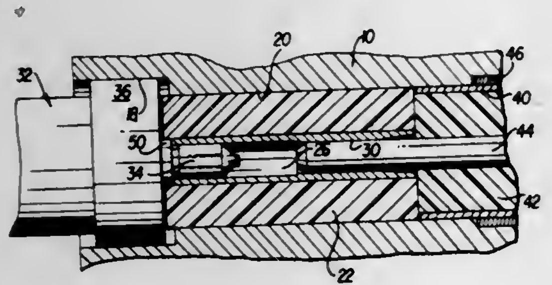
3,717,930
METHOD OF CONNECTING A CENTER CONTACT WITHIN A COAX CONNECTOR

Armand Samuel Apa, Camp Hill, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed July 6, 1971, Ser. No. 159,847

Int. Cl. H02g *15/00*; **H01r** *43/00*; **H05k** *43/00*

U.S. Cl. 29—629 **4 Claims**



A method of connecting a center contact within a coax connector is disclosed which involves inserting a dielectric sleeve into one end of a coupling member for connecting high frequency coaxial cable so that the center conductor of a cable terminating in the coupling member is received in the inner end of the dielectric sleeve, inserting a center contact member into the other end of the dielectric sleeve a predetermined distance with an insertion tool for press-fitting the same over the cable center conductor in the dielectric sleeve, and removing the insertion tool whereby the center contact member is left positioned within the dielectric sleeve and firmly connected to the cable center conductor in one connector half of a coupling assembly ready for being connected to the other half thereof.

3,717,931
ANCHOR FOR DENTAL PROSTHESES

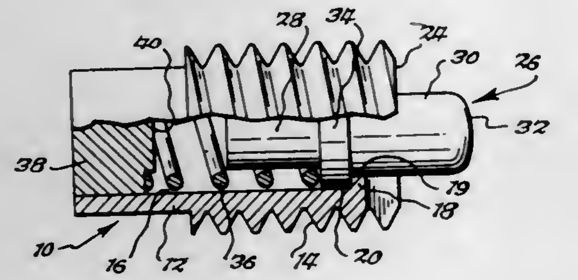
Karl Konig, Hagen-Haspe, Germany, assignor to Bohadan Melnyk, Buffalo, N.Y.

Filed May 14, 1971, Ser. No. 143,443

Claims priority, application Germany, Sept. 29, 1970, G 70 35 972.9

Int. Cl. A61c *13/22*

U.S. Cl. 32—5 **6 Claims**



An anchor comprising a tubular housing adapted to be threaded into a tapped opening in a simulated tooth forming a part of a dental prosthesis. An axially movable, spring biased plunger is mounted in the housing for movement into an extended position of use in the natural undercut area of a fixed tooth in a patient's mouth and into a retracted position within the housing. The plunger is provided with an annular shoulder engagable with an abutment shoulder in the housing for limited movement into the extended position and an inner end engagable with a plug mounted in the housing for limited movement into the retracted position.

3,717,932
TOOTH REPLACEMENT

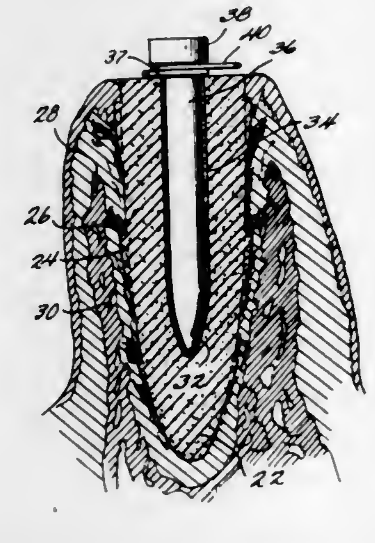
Herbert Brainin, Los Angeles, Calif., assignor to Vitredent Corporation, Los Angeles, Calif.

Filed June 1, 1970, Ser. No. 42,069

Claims priority, application Great Britain, March 19, 1970, 13,196/70

Int. Cl. A61c *13/00*

U.S. Cl. 32—10 A **9 Claims**



A dental implant member for attachment to an artificial-tooth crown consists of or is externally coated with an impermeable carbon. The implant is preferably cone shaped and most preferably has external splines along the length.

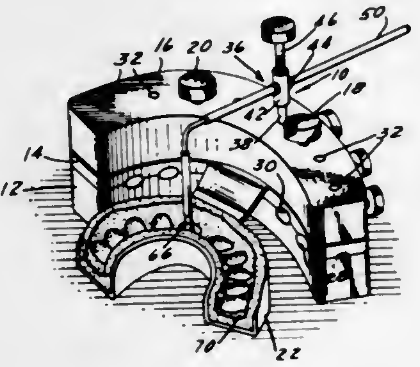
3,717,933
DENTAL APPARATUS

Denny W. Charron, 9361 Randall Ave., La Habra, Calif. 90631

Filed Nov. 1, 1971, Ser. No. 194,118

Int. Cl. A61c *13/00*

U.S. Cl. 32—11 **6 Claims**



A dental apparatus or jig for use in making dental restorations. There is support means having three parts for clamping a dental tray or impression holder in position and for the vertical rods of dowel pin holders and support means. Each dowel pin holder and support means comprises an assembly of a tubular member held in a horizontal position by a vertically adjustable rod, and a core secured in the tubular member, a free end of the core extending outwardly beyond the inner end of the tubular member and said free end is turned downwardly, there being a dowel pin clamp secured to the lower end of the down-turned free end portion for releasably holding a dowel pin. The exposed free end portion of the core is pliant and is easily bent to hold a dowel pin at a selected or required position or angle.

3,717,934
SIZING DEVICE FOR MEASURING THE DIAMETER OF A WORKPIECE OF NON-CIRCULAR CROSS-SECTION

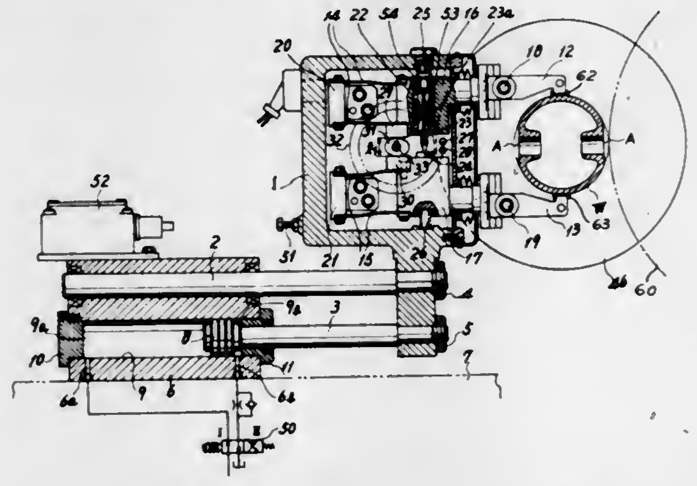
Mineo Ishikawa, Kariya-shi, Japan, assignor to Toyoda Koki Kabushiki Kaisha, Kariya-shi, Japan

Filed Feb. 26, 1971, Ser. No. 119,213

Claims priority, application Japan, Feb. 26, 1970, 45/16,488

Int. Cl. G01b *5/00*

U.S. Cl. 33—147 N **10 Claims**



A sizing device has a pair of measuring feelers urged into engagement with a rotating workpiece of non-circular cross-section. The feelers are operated by a cam alternately to engage with and disengage from the workpiece for measuring a particular single diameter of the workpiece. The cam is rotated in coordination with the rotation of the workpiece by a synchronous receiver through the synchronous signal generated by a synchronous transmitter in response to the rotation of the workpiece.

3,717,935
INCLINOMETER OR OSCILLATION MEASURING DEVICE

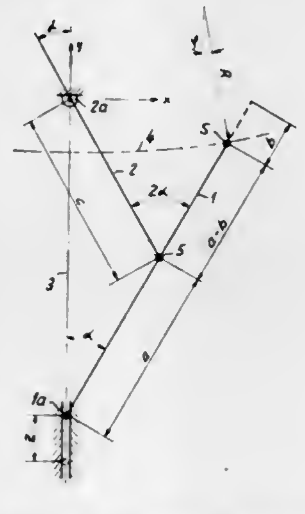
Johann Meier, 6645 Brione sopra Minusio, Casa Clarissa, Switzerland

Filed Oct. 12, 1970, Ser. No. 80,051

Claims priority, application Switzerland, Oct. 15, 1969, 15531/69

Int. Cl. G01c *9/12*

U.S. Cl. 33—391 **13 Claims**



An inclinometer or oscillation measuring device which is manifested by the features that there is provided a pendulum member having an elliptically guiding arrangement consisting of a link hingedly connected with this pendulum member and a rectilinear displacement path for the pivot point of the pendulum member along a line extending through the pivot point of the link at the end remote from the pendulum. Furthermore, the pendulum and link components are dimensioned and/or arranged in such a way that the link is balanced and the pivots so located that the center of gravity of the pendulum member travels along a curve with a continuously upward curvature from its central point.

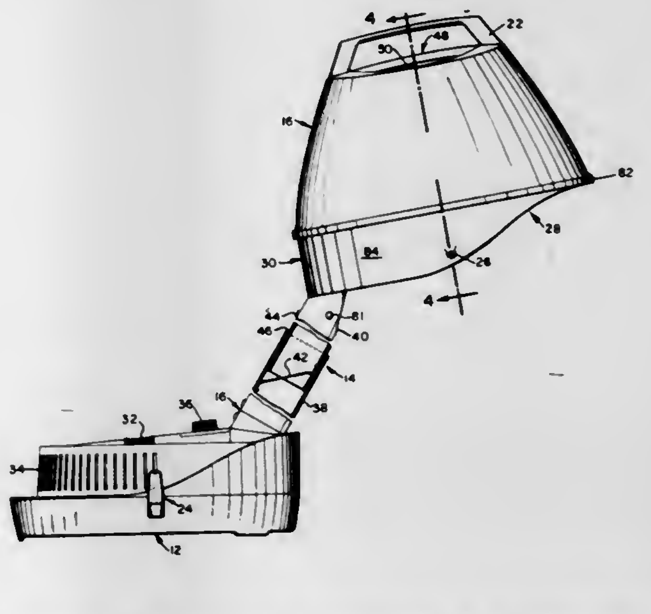
3,717,936
RIGID HAIR DRYER HOOD

Robert J. Tolmie, Fairfield, and Zoran Kovacic, Bridgeport, both of Conn., assignors to Sperry Rand Corporation, New York, N.Y.

Filed Feb. 26, 1971, Ser. No. 119,315

Int. Cl. A45d *20/00*

U.S. Cl. 34—99 **12 Claims**



A rigid hair dryer hood is mounted to a conventional base containing means for supplying pressurized hot air to the hood through a generally vertical duct on which the hood is mounted. The hood has a generally circular opening at the center of the top thereof allowing the escape of hot moist air. Hot air is directed up the duct to a lower ring of vent holes located around the rear base of the hood just above the neck level approximately from ear to ear. A second ring of holes above ear level are substantially equally spaced around the back of the hood from approximately temple to temple. The first and second ring of air holes direct the air upwardly toward the head at approximately 45° to the vertical. A rectangular array of air holes are located above the second ring and direct air substantially normally to the back contour of the head. An air directing bridge is provided extending from this array upwardly and across the opening in the top of the hood. Air holes therein direct hot air substantially normally across the midportion of the top of the head. A third ring of air holes direct air vertically along the inside of the front of the hood just above the forehead from substantially temple to temple.

3,717,937
FLIGHTING FOR DEHYDRATOR DRUM

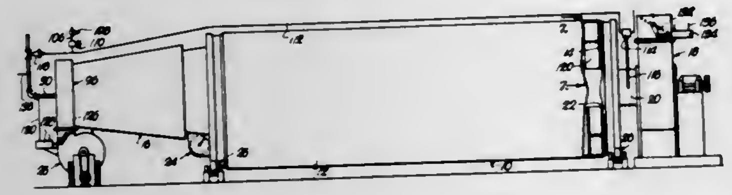
Stanley P. Thompson, 2718 Osborn Rd., Topeka, Kans.

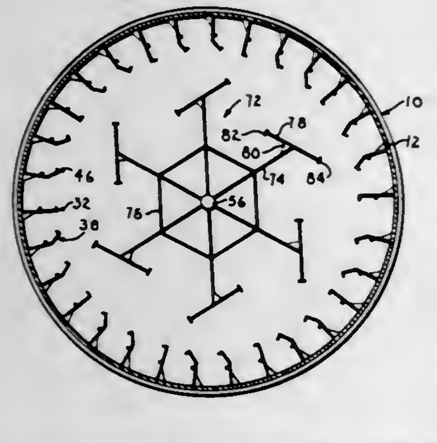
Continuation-in-part of Ser. No. 773,188, Nov. 4, 1968, Pat. No. 3,593,430. This application April 19, 1971, Ser. No. 135,078

Int. Cl. F26g *11/02*

U.S. Cl. 34—108 **9 Claims**

A dehydrator includes a drum having an inlet and an outlet mounted for rotation about its longitudinal axis. Internal flighting for facilitating uniform drying of material passed through the drum includes a plurality of circumferentially spaced vanes which are rigid with the inner surface of the drum. At least a portion of the vanes are provided with laterally extending cleats which break up clumps of material falling off the vanes. Centrally disposed in the drum is another arrangement of flighting which acts as a retainer for catching material which gravitates from the aforementioned vanes. The central flighting comprises a shaft with a plurality of longitudinally extending axially projecting plates having one or more interference structures traversing the plane of a plate at oblique angles. When a pair of structures are utilized they are disposed in either parallel or perpendicular relationship to each other.





3,717,938

APPARATUS AND METHOD FOR DRYING OR PREHEATING PULVERULENT MATERIAL

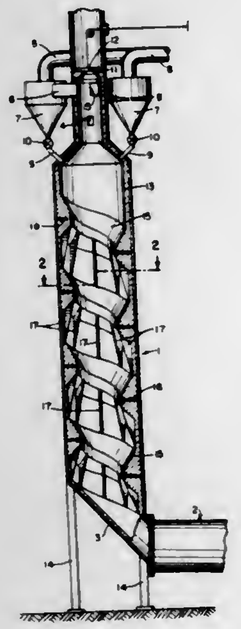
Karl Jens Sylvest, Copenhagen-Valby, Denmark, assignor to F. L. Smidth & Co., Cresskill, N.J.

Filed Sept. 28, 1970, Ser. No. 68,050

Claims priority, application Great Britain, Sept. 2, 1969, 43,349/69

Int. Cl. F26b *17/12*

U.S. Cl. 34—168 **10 Claims**



An apparatus and method for drying or preheating granular or pulverulent material. The apparatus is in the form of an upright stack or tubular conduit within which a continuous helical surface extends sloping in a downward manner. Heated gas flows from the bottom of the stack along at least one vertical channel within the stack to heat the material descending down the stack. Specific means are provided within the stack to prevent the gas from flowing continuously over the helical surface.

3,717,939

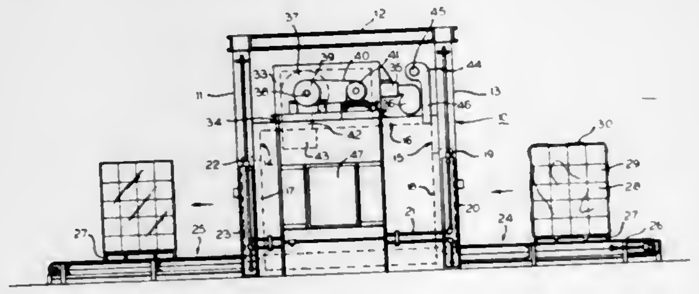
SHRINK FILM OVEN

John Z. Mitchell, Watertown, Wis., assignor to Oven Systems, Inc.

Filed Feb. 23, 1971, Ser. No. 118,120

Int. Cl. F26b *19/00*

U.S. Cl. 34—230 **8 Claims**



Objects which are covered with a heat shrinkable plastic film are transported through an oven. The oven is characterized by having an array of hot gas discharge outlets which are fed from a common source. The outlets are equipped with louvers for directing the hot gases in a manner that permits control of the film shrinkage sequence. The outlets are fed from a damper controlled distribution system that is adapted for controlling both the volume and velocity of the hot gases.

3,717,940

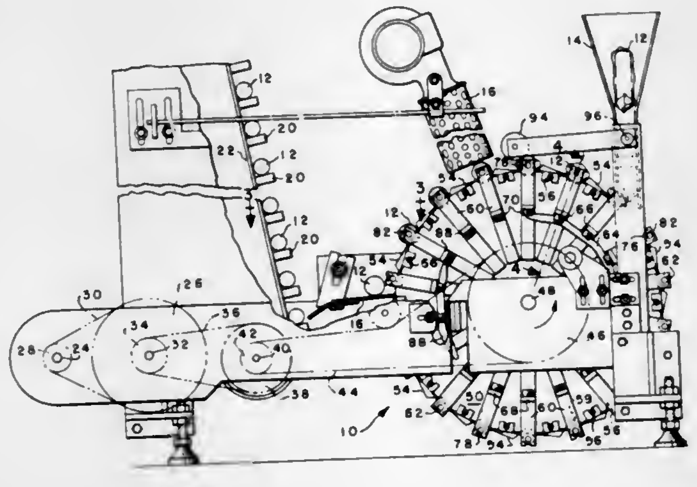
COIN MACHINE

Richard D. Wylie, Gaffney, and Bobby Morrison, Spartanburg, both of S.C., assignors to Deering Milliken Research Corporation, Spartenburg, S.C.

Filed May 3, 1971, Ser. No. 139,457

Int. Cl. F26b *19/00*

U.S. Cl. 34—236 **11 Claims**



Improved mechanism to transfer rolls of coins wrapped in shrink film from the wrapping station to the heat shrink station and further to the coin elevator by means of a rotary transfer drum which securely holds the rolls of coins during transfer thereof.

3,717,941

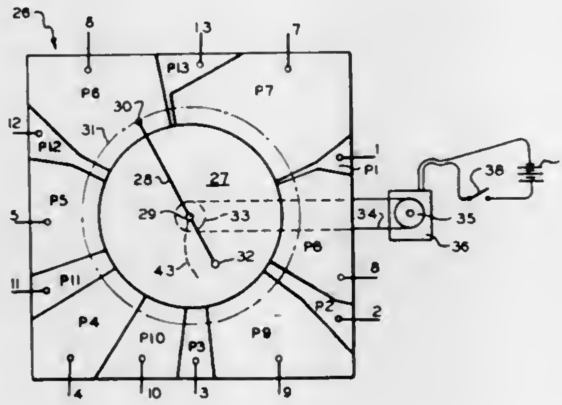
PROBABILITY TEACHING AID

Benjamin E. Tomerlin, 214 Augusta Drive, North Syracuse, N.Y.

Filed Dec. 30, 1971, Ser. No. 213,924

Int. Cl. G09b *19/00*

U.S. Cl. 35—30 **3 Claims**



An electrical probability teaching device has a rotary switch in which a brush contact connected to one side of a battery is rotated over a certain number of contact plates having surface areas proportioned in degrees of arc contacted by the brush according to known areas under the probability curve calculated for that certain number of divisions. Each contact plate is electrically connected through a resistor of a different value through a readout device so that different values of readout are obtained for the various plates on which the brush comes to rest. A checkerboard arrangement of a plurality of pins, arranged in rows and columns, in which each interior pin is connected by like resistors to each of the four pins adjacent to it vertically and horizontally, is used to teach the use of the probability curve in solving problems having two variables. The electrical connection between the battery and the resistors of different value is provided with a male-female connection so that the connectors may be separated and one connected to one of the pins and the other used as a probe in teaching the method of using the probability curve in solving problems.

3,717,942

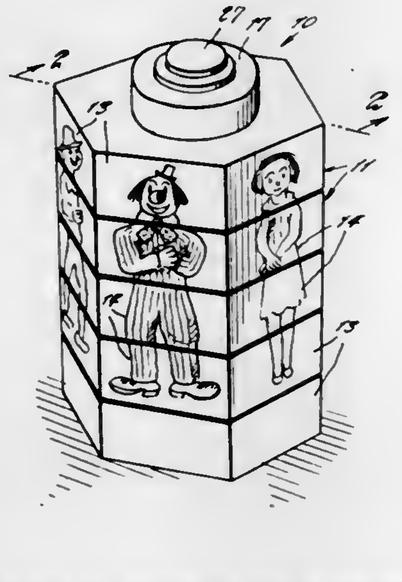
ROTATABLE AMUSEMENT AND EDUCATION DEVICE

Benedict F. Presby, 630 Humbolt Street, Brooklyn, N.Y.

Filed March 16, 1971, Ser. No. 124,819

Int. Cl. G09b *1/20*

U.S. Cl. 35—77 **1 Claim**



A toy for children for diversion and developing analytic observation, the toy consisting of a series of flat boxes having polygonic side edges, the boxes being stacked one over the other and rotatable about a center longitudinal axis so to selectively align certain of the polygonic side edge faces of the box, each of the faces having a drawing detail, so that when the correct faces are aligned together, the drawing details, together, compose a complete drawing of a person, an object, a word or any other visual design, thus solved by the child.

3,717,943

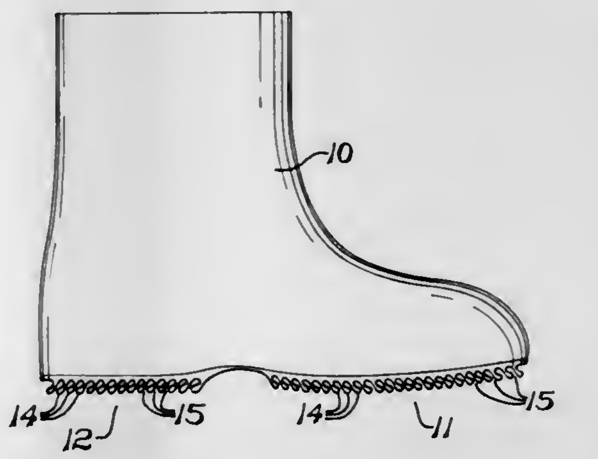
MUD RESISTANT ELASTOMERS

Roy L. Orndorff, Jr., Kent, Ohio, assignor to The B. F. Goodrich Company, New York, N.Y.

Filed Aug. 23, 1971, Ser. No. 173,961

Int. Cl. A43b *13/06*

U.S. Cl. 36—32 R **13 Claims**



A sole construction such as used on overshoes, boots or shoes having a resilient planar body with a plurality of spaced fins that extend transversely across the body. The fins are evenly spaced and have lobes with relatively thin portions at the juncture to the planar body. All fins are identical and are inclined relative to a horizontal plane. The fin structure may be applied to the sides of the boot structure to reduce mud pick-up through the ability of the fins to trap air between adjacent fins.

3,717,944

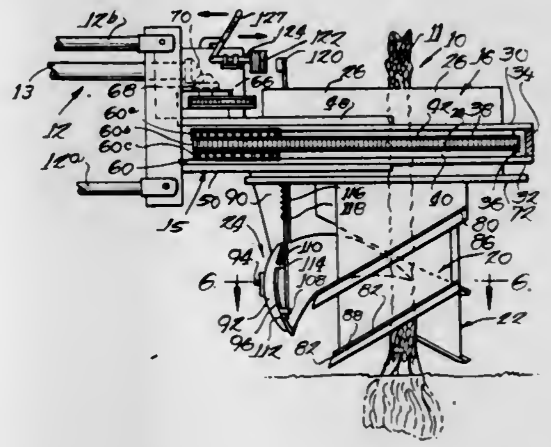
APPARATUS FOR ROOTED PLANT EXCAVATING

Samuel E. Clegg, 729 Bartlett Avenue, Plainfield, Ill.

Filed Nov. 3, 1970, Ser. No. 86,432

Int. Cl. A01g *23/06*

U.S. Cl. 37—2 R **28 Claims**



A rooted plant and soil ball may be excavated from the surrounding soil by means of an apparatus, the preferred form of which comprises a pair of diametrically opposed soil cutting members held in fixed position on a rotatable, C-shaped support member for cutting a substantially cylindrical trench in the soil surrounding the plant. After the trench has been cut, either the cutting members or a separate cutting element is moved inwardly relative to the support member for undercutting the plant.

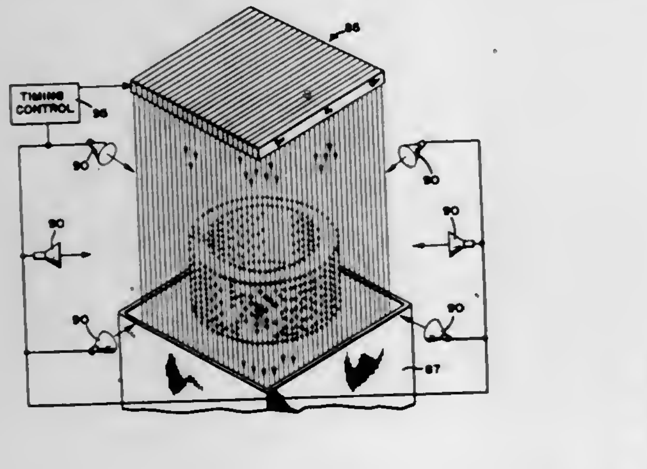
3,717,945
IMAGE CONSTRUCTION SYSTEM USING MULTIPLE ARRAYS OF DROP GENERATORS

Richard P. Taylor; Russell H. Van Brimer, and Fred E. Culp, Dayton, all of Ohio, assignors to The Mead Corporation, Dayton, Ohio

Division of Ser. No. 768,790, Oct. 18, 1968, Pat. No. 3,560,641. This application Sept. 8, 1970, Ser. No. 70,337

Int. Cl. G09f *19/02*

U.S. Cl. 40—106.25 **2 Claims**



Arrays of laterally spaced orifices, all communicating with a liquid pressure supply, all subjected to vibration at the same frequency to separate the liquid jets into streams of individual drops, provide a system for locating all of the drops with a predetermined space-time correlation by irradiating the drops in space at a predetermined time to make them visible, thus creating variable three dimensional visible shapes for study.

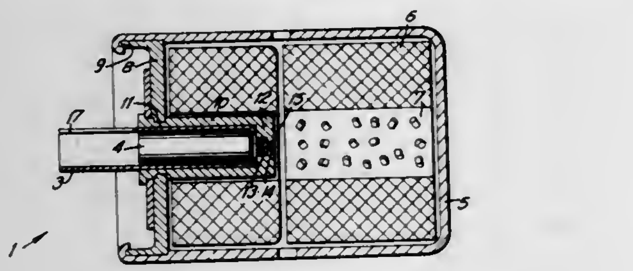
3,717,946
DEVICE FOR SHOOTING A PROJECTILE

Rene M. J. Chavee, Genk, Belgium, assignor to Fabrique Nationale D'Armes de Guerre, Societe Anonyme, Herstallez-Liege, Belgium

Filed Oct. 6, 1970, Ser. No. 78,516

Int. Cl. F41c *27/06;* **F42b** *11/42*

U.S. Cl. 42—1 F **3 Claims**



A device for shooting a projectile with ball cartridges by means of a gun or the like, comprising, on one hand, an adapter tube containing, at close vicinity to one of its ends, a damping cylinder made of a relatively resilient material and, on the other hand, a supporting tube contained in the projectile and opening onto the rear face thereof, the bottom of said supporting tube carrying a primer, the adapter tube being adapted, on one hand, to be inserted into said supporting tube and, on the other hand, to be slid about the barrel of the arm used for shooting. Also a projectile particularly conditioned to operate with said device.

3,717,947
FISHING DEVICE

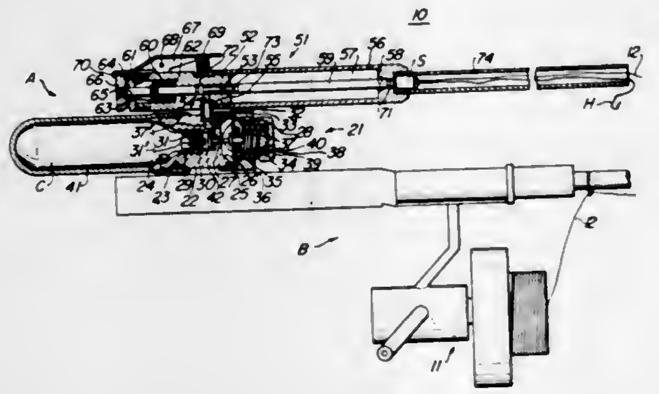
Hideo Nomura, Chigasaki-shi, Japan, assignor to Miyata Industry Co., Ltd., Chigasaki-shi, Japan

Filed Mar. 24, 1971, Ser. No. 127,636

Claims priority, application Japan, Dec. 8, 1970, 45/108,264, 45/121,712; Dec. 28, 1970, 46/132,761

Int. Cl. A01k *91/02*

U.S. Cl. 43—19 **7 Claims**



A fishing device comprising a fishing rod and a fluid pressure-actuated tool for casting a sinker and an associated line. The tool has a bore for receiving a neck portion of a small-sized bomb which contains a pressurized gas. The bore is in communication with a pressure storage chamber which is normally out of communication with the interior of a barrel to be loaded with the sinker. A valve located within the storage chamber is operable by a trigger and is employed to control the communication between the pressure storage chamber and the barrel. The valve also has a spring biased portion which passes through the breach plug member closing the rearward end of the pressure storage chamber.

3,717,948
UNIVERSAL UNIT FOR TOY BLOCKS

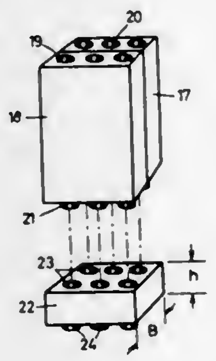
Walter Schnabel, Im Wolfsgalgen 25, 7141 Schwieberdingen, Germany

Filed Feb. 22, 1971, Ser. No. 117,238

Claims priority, application Germany, March 13, 1970, P 20 11 878.9

Int. Cl. A63h *33/08*

U.S. Cl. 46—25 **5 Claims**



A universal block unit for interengagement with conventional toy blocks comprising a panel having normally offset rims along the longitudinal edges. The rims are provided with elements conforming to those of the toy blocks and interlocking therewith. The universal block has a height equal to a multiple of the toy blocks and a length equal to a multiple of the distance between the centers of the interlocking elements.

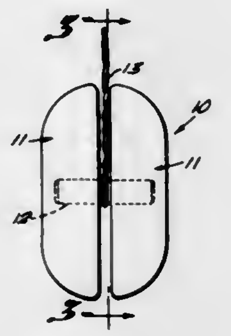
3,717,949
TETHERED AERIAL TOPS

Joseph T. Radovan, 101 N.W. 162nd Street, Miami, Fla.

Filed May 14, 1971, Ser. No. 143,482

Int. Cl. A63h *27/12*

U.S. Cl. 45—61 **1 Claim**



A yo-yo construction wherein the side disc members of the yo-yo spool are of integrally molded, substantially hollow construction is described. The spool disc members are formed with concave outer wall portions which are reinforced with a plurality of equidistantly peripherally spaced, diametrically extending web portions the converging inner ends of which merge to provide an axially extending cylindrical sleeve defining a cylindrical recess for the friction-fit reception of the interconnecting pin in the assembly of the yo-yo.

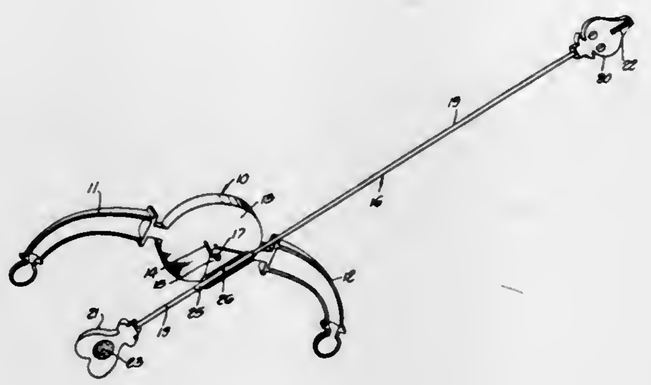
3,717,950
ADJUSTABLE DIVINING ROD DEVICE

Arthur P. Venditti, Salem, Mass., assignor to Reuben B. Klamer, Beverly Hills, Calif.

Filed Feb. 25, 1970, Ser. No. 14,056

Int. Cl. A63h *33/26*

U.S. Cl. 46—241 **3 Claims**



There is disclosed herein equipment for a game including a divining rod device, gameboard and playing cards. The divining rod device includes a handle member having pivotally attached thereto a counterbalanced arm or rod with a magnet at one end thereof. The gameboard is of laminated construction and has a metal innerlayer. The playing cards have various indicia thereon and are positioned at indicated locations on the gameboard. The divining rod device is held by the handle member substantially parallel with the board and several inches thereabove. The end of the rod with the magnet is in the form of a pointer which is swept back and forth over the board until this end makes contact with a card on the board because of the attraction of the magnet to the board. In this manner, a card is selected to thereby provide a "reading" according to the game.

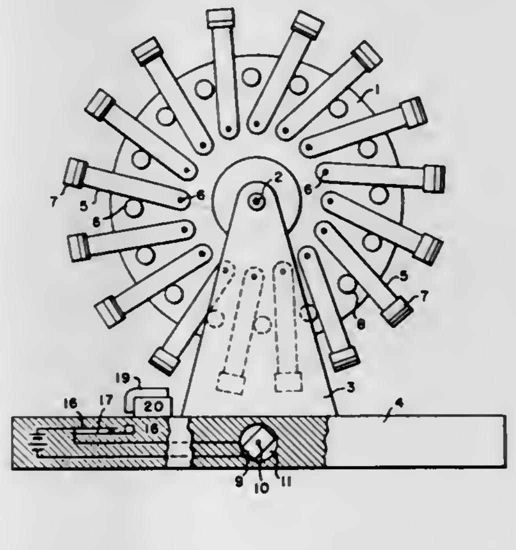
3,717,951
TOY COMPRISING A MODEL OF A PERPETUUM MOBILE

Erland Samuel Ljungdahl, 9 Fafnerstigen, 18264, Djursholm, Sweden

Filed Apr. 30, 1971, Ser. No. 138,950

Int. Cl. A63h *33/26*

U.S. Cl. 46—243 **3 Claims**



A toy resembling a so called perpetuum mobile with a wheel provided with tiltable arms round its periphery which arms have weights at the outer ends thereof and are adapted to make a tilting movement when the wheel rotates, giving the impression to drive said wheel because of said tilting movement. The weights are constituted by permanent magnets which have poles of alternating polarity. For driving said wheel, there is an electromagnetic means for producing a rotating or linearly moving magnetic field built in or hidden in a base plate belonging to the toy. A permanent magnet which can be placed on said base plate so as to give impression of attracting said magnets of said wheel, is adapted to operate a switch hidden in said base plate for closing the current path from the battery (also hidden in said base plate) to said electromagnetic means.

3,717,952
TOY VEHICLE

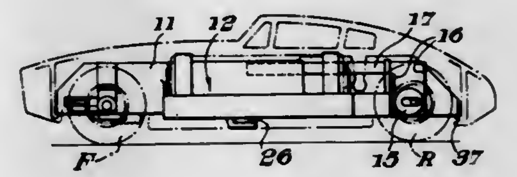
Ned Strongin, 1140 Broadway, New York, N.Y.

Filed Nov. 10, 1971, Ser. No. 197,247

Claims priority, application Great Britain, Nov. 25, 1970, 56,066/70

Int. Cl. A63h *33/26, 17/36*

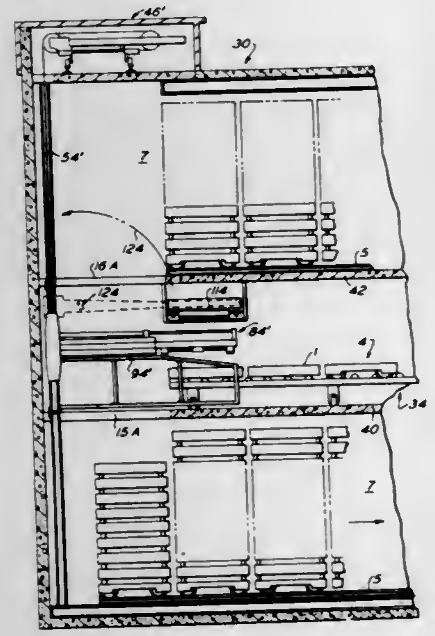
U.S. Cl. 46—244 D **6 Claims**



A toy vehicle such as an automobile, driven by an electric motor and having wheels which are steered as the vehicle moves, the steering being programmed by a control member carried by the vehicle and driven by the motor.

3,717,953
APPARATUS FOR CULTIVATING PLANTS

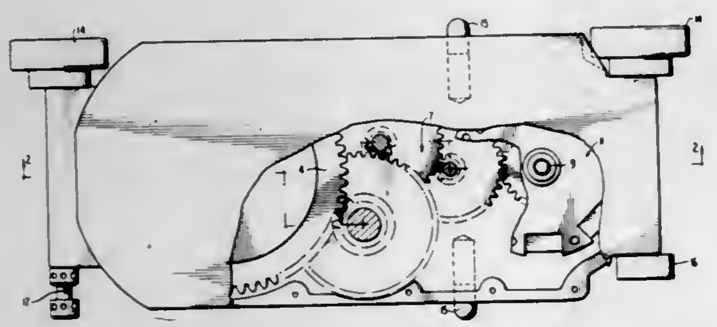
Jorg Kuhn, Alpsteinstrasse 56, Herisau, Sweden, and Elmar Sohm, Voralberg, Lauterach, Austria
Continuation-in-part of Ser. No. 4,918, Jan. 22, 1970, abandoned. This application Nov. 10, 1971, Ser. No. 197,432
Int. Cl. A01g *1/04*
U.S. Cl. 47—1.1 **18 Claims**



This invention relates to apparatus for cultivating plants such as mushrooms. The plants are positioned in receptacles stacked on one another and located in air-conditioned chambers. Each receptacle is individually subjected to preconditioned air having a short distance of travel defined by channels between adjacent receptacles. An elevating means and a horizontally movable processing line are arranged for processing receptacles from a plurality of said chambers which are disposed parallel to one another.

3,717,954
MOTOR DRIVEN OPERATING MECHANISM FOR REVOLVING DOORS

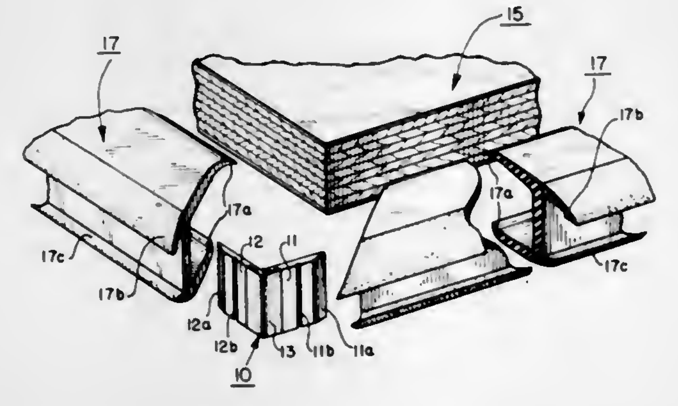
Amuel E. Sheckells, R. R. No. 3 Heckel Road, P.O. Box 77A, Evansville, Ind.
Filed Oct. 20, 1971, Ser. No. 190,716
Int. Cl. E05d *15/02*
U.S. Cl. 49—43 **13 Claims**



A motor driven revolving door operating mechanism including a main gear connected to the revolving door shaft, a centrifugal brake assembly, a gear train assembly connected between the main gear and centrifugal brake assembly and a drive motor connected to the gear train assembly, the motor being disposed in the same horizontal plane as the main gear; the main gear, centrifugal brake assembly, gear train assembly and motor all being positioned within a housing in spaced, parallel, closely adjacent horizontal planes to thereby form a low-profile motor driven operating mechanism adapted for selective installation in either an overhead or floor-type revolving door installation.

3,717,955
PANEL SEAL

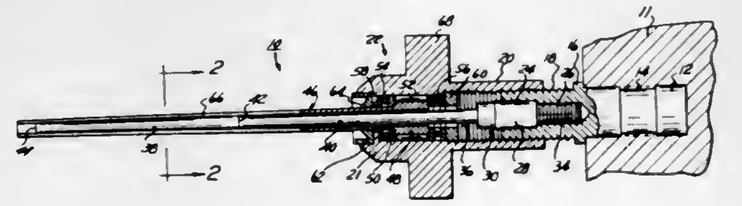
Burton Alfred Urbanick, La Grange, Ill., assignor to Met-L-Wood Corporation, Chicago, Ill.
Filed Jan. 10, 1972, Ser. No. 216,579
Int. Cl. E06b *7/23*
U.S. Cl. 49—488 **11 Claims**



An expansion joint cover for a door panel assembly is disclosed. A gasketing having a U-shaped channel portion composed of a relatively rigid plastic-like material is secured to the perimeter of a door panel. Intersecting segments of the gasket along adjacent edges of the panel form joints whereat the cover members are applied. The expansion joint cover is an L-shaped sheet-like plastic member with each leg of the L composed of a relatively rigid material and the bight portion composed of a relatively flexible material. Each leg is ultrasonically welded to the base of the channel portion of respective ones of a pair of intersecting gasket segments to securely retain the segments in their assembled location while the flexible material overlying the joint accommodates normal expansion and contraction. Other features are disclosed.

3,717,956
EXPANDING LAP ARBOR

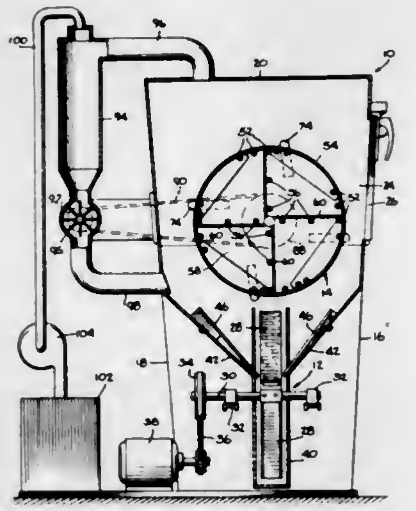
Albert B. Keatts, 20978 Knapp Street, Chatsworth, Calif.
Filed Dec. 11, 1970, Ser. No. 97,249
Int. Cl. B24b *25/00, 27/00, 9/02*
U.S. Cl. 51—1 **4 Claims**



An expanding lap arbor which is composed of a pair of telescoped tapered members, which are longitudinally movable relative to each other; the tapered outer member is slit longitudinally and is longitudinally slidable along the tapered inner member by means of a hand wheel so that upon rotation of the hand wheel the outer member will be longitudinally displaced along the tapered inner member thereby expanding the outer member due to its slotted construction at a calibrated amount predetermined for each complete rotation of the hand wheel.

3,717,957
TUMBLING OF WORKPIECES

Helen H. Walker, 607 Charlton Street, Valdosta, Ga.
Continuation-in-part of Ser. No. 37,737, May 15, 1970, abandoned.
Filed May 10, 1971, Ser. No. 141,716
Int. Cl. B24c *3/30*
U.S. Cl. 51—9 **20 Claims**

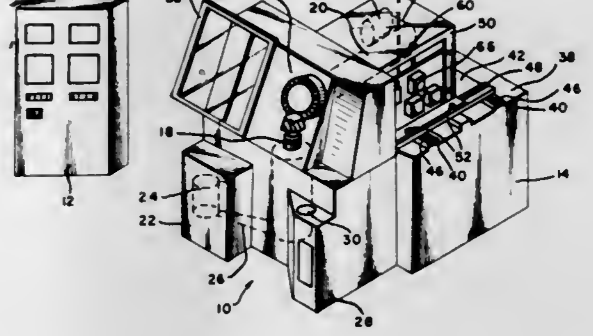


A shot blasting apparatus in which abrasive shot is impelled at workpieces held for tumbling action within a rotating container of perforate outer wall construction and having perforate internal wall construction dividing the interior of the container into sectors allowing separate tumbling of different types of workpieces. One embodiment shows arrangements for conveniently changing compartment arrangements within the container.

3,717,958
MACHINE FOR LAPPING GEARS

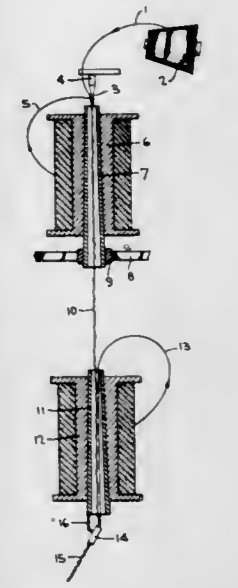
Charles G. Ellwanger, and Harry Pedersen, both of Rochester, N.Y., assignors to The Gleason Works, Rochester, N.Y.
Filed Dec. 16, 1970, Ser. No. 98,512
Int. Cl. B24b *37/00*
U.S. Cl. 51—26 **33 Claims**

A and machine for lapping hypoid gear pairs by a new method to provide improved tooth engagement characteristics, resulting in good sound qualities over a remarkably increased range of pinion axial adjustment in assembly. The method employs a plurality of special lapping cycles acting on the periphery of the gear teeth to achieve full control of tooth surface mismatch. The lapping machine controls backlash settings, set-overs, and all lapping motions with only three actuators, carries out the new method and achieves a versatility of lapping control far exceeding that available in prior art machines. A control panel provides an array of thumbwheel switches, graduated dials and selector switches for rapid entry of all lapping cycle control data, i.e., backlash, lapping motions and motion rates, number of passes, speeds and torques, all of these parameters being controlled independently for both forward and reverse sides of the teeth. The control panel also permits ready selection of alternative lapping methods including conventional one-cycle lapping methods as well as the novel multi-cycle methods disclosed herein. Stepping motors, responsive to data entered into the control panel, operate linear actuators to displace the gear spindle for effecting all lapping motions and relative gear-to-pinion displacements. The machine is designed with a vertically oriented pinion spindle to reduce floor space and to facilitate adaptation to full automation and is also designed with all relative lapping motions being accomplished by movement of the gear spindle on a unique support structure specially designed to simplify machine control functions.



3,717,959
PROCESS FOR PRODUCING FANCY EFFECT YARNS

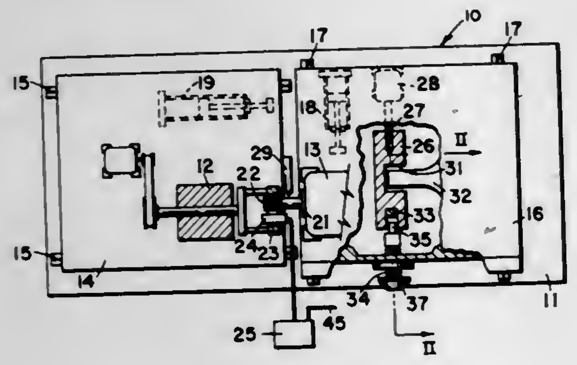
Remy Chatin, Chavanoz, France, assignor to Moulinage Et Retorderic De Chavanoz, Chavanoz, France
Filed Feb. 10, 1971, Ser. No. 114,185
Int. Cl. D02g *3/34*
U.S. Cl. 57—160 **7 Claims**



An improved process and product obtained thereby for the production of fancy effect yarns such as chenille yarns, boucle or loop yarns, flame or flake yarns, etc., which comprises overfeeding at least one effect yarn in relation to at least one core yarn, twisting the effect and core yarns to form an intermediate yarn, twisting the intermediate yarn prior to the blocking of the twist, binding the intermediate yarn with a binding yarn upon the blocking of the twist to form a fancy yarn and taking up the fancy yarn.

3,717,960
GRINDING MACHINE

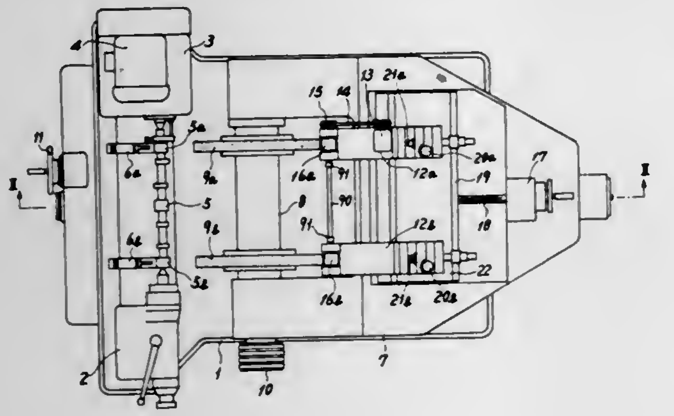
Martin L. Kuniholm, Worcester, Mass., assignor to The Heald Machine Company, Worcester, Mass.
Continuation of Ser. No. 846,900, Aug. 1, 1969, abandoned. This application June 28, 1971, Ser. No. 157,693
Int. Cl. B24b *51/00*
U.S. Cl. 51—165.9 **2 Claims**



This invention relates to a grinding machine and, more particularly, to apparatus for forming a surface of revolution by the abrasive process, wherein the force between the wheel and workpiece is closely controlled.

3,717,961
MULTI-WHEEL GRINDING MACHINE

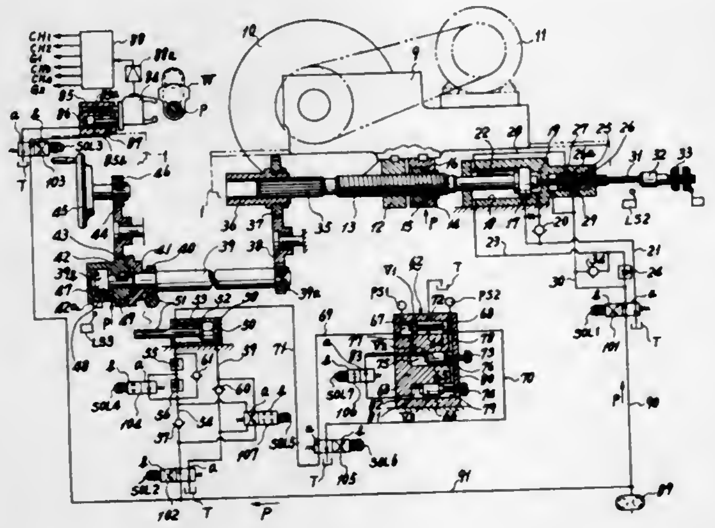
Isao Suzuki, Okazaki, Japan, assignor to Toyoda Koki Kabushiki Kaisha, Kariya-shi, Japan
Filed March 11, 1971, Ser. No. 123,215
Claims priority, application Japan, March 11, 1970, 45/20716
Int. Cl. B24b *49/02*
U.S. Cl. 51—165.88 **10 Claims**



A multi-wheel grinding machine is provided having a plurality of grinding wheels for simultaneously performing a grinding operation on a plurality of portions of a workpiece. A separate dressing head corresponding to each grinding wheel is provided for respectively dressing the several grinding wheels in a controlled manner. Thus, when a difference between the diameters of the respective portions being ground on the workpiece as sensed by automatic sizing devices provided for this purpose is determined to be outside a predetermined limit, the infeed movement of the wheel slide carrying the grinding wheels is stopped and the dressing heads are respectively advanced for dressing the grinding wheels unevenly to eliminate this difference, whereby the plurality of portions of the workpiece may be effectively ground to the same diameter.

3,717,962
MACHINE TOOL WITH TIME CONTROL DEVICE

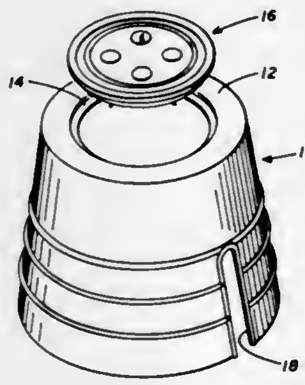
Takeshi Kusakabe; Makoto Kikuchi, both of Kariya, and Isao Suzuki, Okazaki, all of Japan, assignors to Toyoda Koki Kabushiki Kaisha, Kariya-shi, Japan
Filed July 29, 1971, Ser. No. 167,117
Claims priority, application Japan, July 31, 1970, 45/67570
Int. Cl. B24b *49/04*
U.S. Cl. 51—165.91 **14 Claims**



A machine tool for performing a predetermined machining cycle includes a feed means for effecting relative movement between a work support and a tool support. A first timer is timed out after a predetermined time period from the start of a machining cycle for setting a constant machining cycle time. A second timer is timed out after a predetermined time period from the start of a machining cycle for setting at least one check point during a machine cycle. Any difference between the predetermined machining cycle and an actual machining cycle is detected at the check point. The actual machining cycle is then compensated to perform the predetermined machining cycle.

3,717,963
METER HOUSING

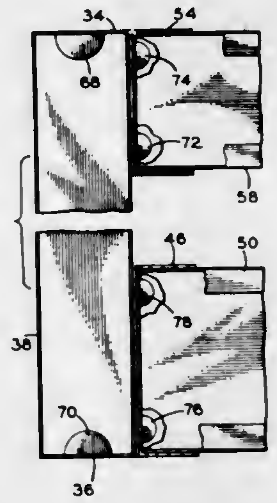
John T. Sauriol, Dallas, Tex., assignor to Intercontinental Plastics Manufacturing, Dallas, Tex.
Filed March 5, 1971, Ser. No. 121,480
Int. Cl. E02d *29/08*
U.S. Cl. 52—19 **3 Claims**



A water meter housing and cover has a body portion of generally frustoconical shape. The top of the body member has a recessed flange therein for receiving a cover. The cover has a downwardly extending ring integral therewith for reinforcement. The body has vertical slots running from the bottom portion thereof extending upwardly less than the height of the body. The exterior of the body further has peripheral reinforcing stabilizing rings integral therewith.

3,717,964
MODULE FRAMES

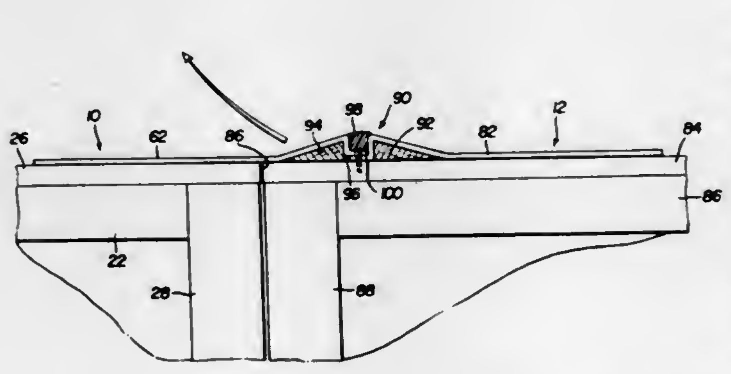
Victor E. Brown; Raul L. Mora, both of Fort Lauderdale, and Evans T. Morton, Pompano Beach, all of Fla., assignors to Behring Corporation, Ft. Lauderdale, Fla.
Filed July 9, 1970, Ser. No. 53,502
Int. Cl. E04b *1/34*
U.S. Cl. 52—79 **5 Claims**



The method of making frames and frame units for modules of modular buildings includes steps of punching perimeter beams to form stops on the beams where cross-beams are to be located, and assembling the cross-beams with a pair of the perimeter beams by butting the ends of the cross-beams against corresponding stops to position the cross-beams without using jigs or fixtures to establish their positions. Retainers may be formed in the perimeter beams next to the stops to temporarily retain the cross-beams in place until they are welded to the perimter beams. In some frame units, the perimeter beams and cross-beams are metal channels, and the beams are assembled flange-to-flange and web-to-web. One weld is made to connect each abutting pair of flanges next to the webs, and another weld is made at a point separated farther from the webs so that the webs reinforce each other and the flanges reinforce each other. Cross-beams may also be welded to the stops on the perimeter beams. The invention includes the frame units, part of the strength and load handling capabilities of which are derived from particular arrangements of stops and welds.

3,717,965
ROOF SEALING OF MODULES

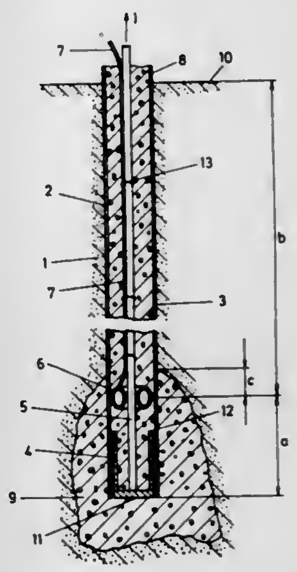
Evans T. Morton, Pompano Beach, and Kimbel L. Vescio, Fort Lauderdale, both of Fla., assignors to Behring Corporation, Fort Lauderdale, Fla.
Filed April 16, 1971, Ser. No. 134,624
Int. Cl. E04b *1/348*
U.S. Cl. 52—79 **5 Claims**



In a modular building having modules abutting each other to form a living unit, the roofing for the modules is sealed by providing a receptacle on the roof of one of the modules adjacent to the juncture between two modules, overlapping roof membranes within the receptacle, sealing the overlapping joint of the membranes within the receptacle with sealing cement in the receptacle, and sealing the roof membranes at edges of the modules. In a preferred embodiment, the modules have an opening in a wall next to the roof, and this opening is sealed by a waterproof sheet which is affixed to the roof and extends from the roof over the wall opening. This sealing sheet is provided on the module before it is assembled with other modules to form a living unit in order to protect the module against rain during storage and transport of the module. At one edge of the roof of the module which is the preferred embodiment, a mansard structure is affixed to the roof, and the roof membranes extend over the mansard structure and are sealed at the edge of the mansard structure by means of a sealing strip.

3,717,966
ANCHOR TIE CONSTRUCTION AND METHOD OF SETTING AN ANCHOR TIE IN THE GROUND

Ernst Reichert, Poring, Germany, assignor to Stump Bohr AG, Zurich, Switzerland
Filed Jan. 26, 1971, Ser. No. 109,776
Claims priority, application Germany, Jan. 30, 1970, P 20 04 270.0
Int. Cl. E02d *5/80*
U.S. Cl. 52—127 **9 Claims**



A method of setting an anchor tie in the ground, the anchor tie comprising an anchor body and a rod or bar connected to the anchor body and extending to above ground level. The anchor tie is placed in a bore hole traversing the ground and settable material, such as concrete, is introduced into the bore hole to surround the anchor body and the adjacent portion of the rod. In accordance with the invention, the settable material surrounding the rod adjacent the anchor body is displaced from the settable material in the region of the anchor body by introducing a pressure medium between the respective regions. This may be accomplished by surrounding the rod adjacent the anchor body with an inflatable elastic annular tube or bag into which pressure medium, such as water, is forced after the settable material has been poured but before it has set.

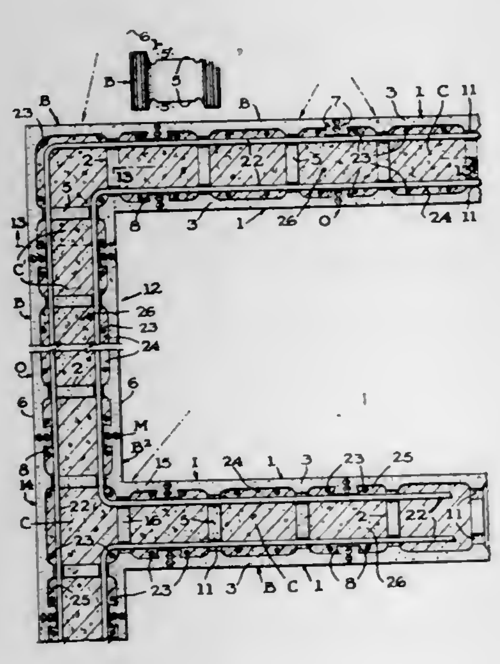
Considered from another aspect, the invention provides for an anchor tie construction wherein the anchor body proper is set in the ground, surrounded by a set mass of material, such as concrete, the rod extending from the anchor body being spaced from the set mass in the region adjacent the anchor body by an inflated annular bag or tube surrounding the rod means.

Considered from a still further aspect, the invention provides for a testing method for determining the resistance to pulling force of an anchor tie construction set in the ground. According to the method, a pressure medium containing bag or tube surrounds the rod adjacent the anchor tie body proper. Communication to ground level is established with the pressure medium containing bag or tube, for example by a pipe or conduit extending from the bag to above ground level. A pulling or drawing force is then exerted on the rod. If the anchor tie is dislodged by this force, it will press against the pressure medium containing bag, thereby causing pressure medium to be forced through the conduit towards ground level. By contrast, if the anchor tie withstands the pulling force, no pressure medium will reach ground level.

3,717,967

BLOCK AND BUIDLING CONSTRUCTION USING SAME

Paul A. Wood, 3215 Franklin Rd., S.W., Roanoke, Va.
Filed Jan. 6, 1972, Ser. No. 215,766
Int. Cl. E04b *1/16, 2/26*
U.S. Cl. 52—259 **8 Claims**



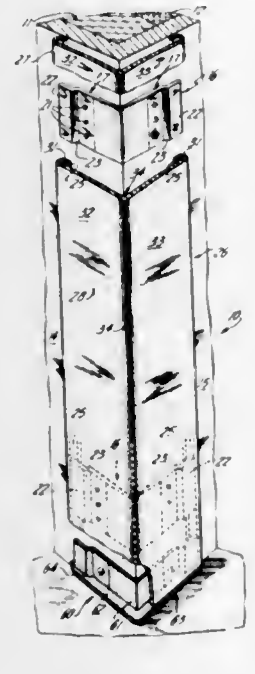
A building construction utilizes hollow modular masonry blocks, each provided with at least one centrally disposed full-size cavity and one half-size cavity as defined by cross webs joining a pair of parallel sidewalls. The sidewalls terminate, at least at one end, in freely projecting extensions each having a distal inturned end flange adapted to laterally abut a similar construction of an adjacent block. The shoulder as provided behind each end flange serves to position and retain full-length vertically installed reinforcing bars through unobstructed vertically aligned cavities in the successive courses of the blocks from floor to floor while recesses in the top of each web receive horizontal reinforcing elements and permit the communication of a filler of concrete both horizontally and vertically throughout the wall.

3,717,968

SURFACE-MOUNTED WALL GUARDS

Robert W. Olsen, Chatham Borough, N.J., and Richard E. Herrick, Escondido, Calif., assignors to Construction Specialties, Inc., Cranford, N.J.
Filed July 16, 1970, Ser. No. 55,491
Int. Cl. E04b *5/00, 7/00*
U.S. Cl. 52—288 **2 Claims**

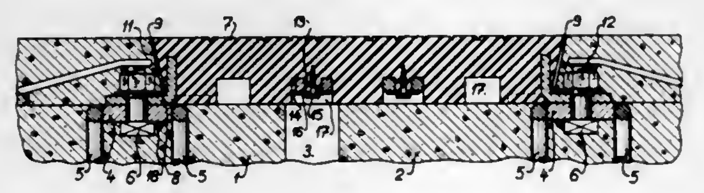
A wall guard for protecting wall corners or other wall areas subject to abuse including an elongate resilient strip to be mounted directly upon completed wall surfaces. The elongate strip includes a central portion conforming generally to the wall area to be protected, the central portion being supported in spaced relation to the underlying wall surface. The strip includes inturned edges defining concealed channels near the edges which receive retainers mounted upon the protected wall portion. The retainers, which include portions extending into the channels, are entirely masked by the protective strip to give a clean, neat appearance. The retainers may conform to the underlying wall section, as by forming the retainers for extension about a wall corner, in which case the retainers afford easy alignment of the strip and protected wall area. At the ends of the strip, a combined retainer and cap engages the strip to close the space defined between the strip and wall.



3,717,969

PACKING PIECE FOR CIVIL ENGINEERING WORKS

Etienne-Thomas Sequaris, Andrimont, Belgium, assignor to Helka S. A., Fribourg, Switzerland
Filed June 15, 1970, Ser. No. 46,298
Claims priority, application Switzerland, June 20, 1969, 9431/69
Int. Cl. E01c *11/10;* **E04f** *15/14*
U.S. Cl. 52—396 **17 Claims**

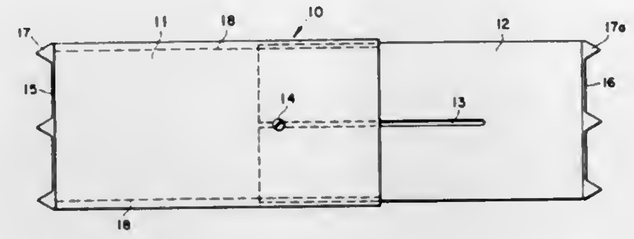


A packing piece of elastomeric material for civil engineering constructions has integrally moulded thereto, a plurality of projecting members each of which is surrounded by a rigid metal member to prevent, or reduce the deformation of the packing piece during compression in a direction at right angles to the force applying the compression. The rigid metal members are maintained in position around the projections by means of washers and wood screws which are threaded into the free ends of the projections.

3,717,970

WALLBOARD REPAIR DEVICE

William J. Rosenblum, Route 1, P.O. Box 108, Carthage, Tex.
Filed July 7, 1970, Ser. No. 52,918
Int. Cl. E02d *37/00*
U.S. Cl. 52—514 **5 Claims**

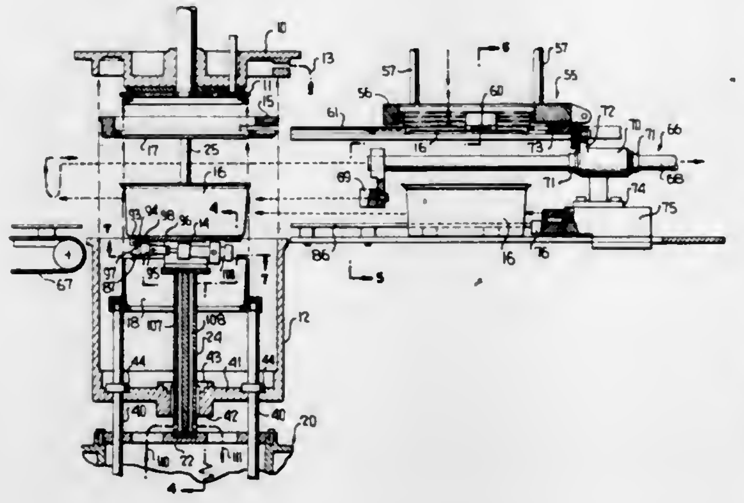


A repair device for patching holes in wallboard, plaster walls and other wall material which require plaster or composition materials in order to become patched. The device provides support for said patching materials and can be adapted to fit any size or shape hole which occurs. The device comprises two slidably connected pieces that can be locked together to form a flat, recessed backing support that is inserted into a trimmed hole in the wall.

3,717,971

MACHINE FOR POSITIONING A FLEXIBLE CONTAINER FOR SEAMING

Dietrich K. Naggert, Calumet, Ill., assignor to Continental Can Company, Inc., New York, N.Y.
Filed Feb. 22, 1971, Ser. No. 117,305
Int. Cl. B65b *31/02*
U.S. Cl. 53—89 **14 Claims**

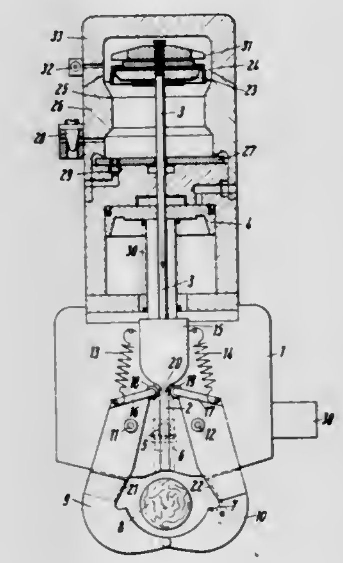


This disclosure relates to an adaptation of a conventional vacuum closing machine for closing flexible containers. A flexible container, such as a ham can, is filled with the product and delivered to the closing machine. The container, together with the closure therefor, are separately moved into the interior of the closing machine and are separately supported therein. Thereafter, mechanism is actuated to move a vacuum pot into a sealed position around the container and closure, and the lifting of the closure off of the support therefor by a mold, which mold receives the container and both supports and shapes the container. After a vacuum has been drawn in the pot, the container with the closure sitting thereon is moved by the mold into a seaming position. The machine includes a special stop for positioning a container on the container support and special pusher mechanism for effecting the feeding of containers and closures to the machine and for discharging closed containers from the machine.

3,717,972

APPARATUS FOR CLOSING OPEN-TOPPED FLEXIBLE CONTAINERS

Herbert Niedecker, Am Ellerhang 6, 6243 Falkonstein (Taunus), Germany
Filed Feb. 22, 1971, Ser. No. 117,570
Claims priority, application Germany, Feb. 28, 1970, P 20 09 541.4; Sept. 12, 1970, P 20 45 229.3
Int. Cl. B65b *51/04*
U.S. Cl. 53—138 A **11 Claims**



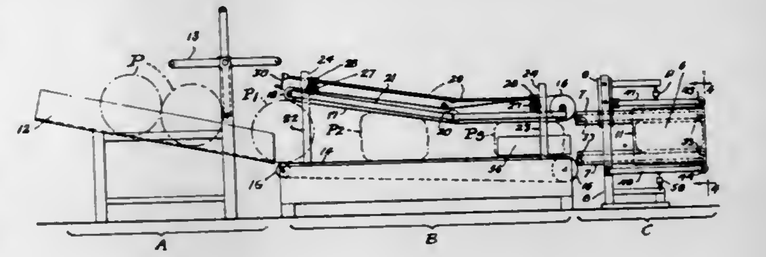
In an apparatus for closing open-topped containers made of flexible material, such as sausage casings, displacement of a single drive element serves to flatten the mouth of the container and then to compress it transversely, surround it with a U-shaped clip and close the clip to seal the container. The drive element is a punch which carries a cam whose advancing contour causes a pair of gathering arms surrounding the top of said container to pivot about pins against the action of springs and thereby flatten the container top. Further advance of the punch carries the clip and ultimately closes it.

Braking means such as a piston-cylinder or springs may be provided to slow down the advance of the punch during a part of the stroke as compared to the final part of the stroke when the full velocity is desired to close the clip.

3,717,973

PACKAGING COMPRESSIBLE MATERIAL

William A. Brady, Jr., Norristown, Pa., assignor to Certain-Teed Saint Gobain Insulation Corporation, Valley Forge, Pa.
Filed Jan. 8, 1971, Ser. No. 104,906
Int. Cl. B65b *63/02*
U.S. Cl. 53—124 E **7 Claims**



A charge or batch of compressible material is first compressed and is then advanced into the interior of a packaging enclosure, such as a package wrapper, while the wrapper is supported in distended condition. The wrapper has an inside dimension smaller than the charge of compressible material to be inserted prior to compression thereof but larger than the compressed charge. After advancement of the compressed charge into the interior of the wrapper, both the wrapper and the charge are delivered from the apparatus at the same rate, and concurrently the compression is released so that the package is completed as the wrapper and charge are being delivered from the apparatus.

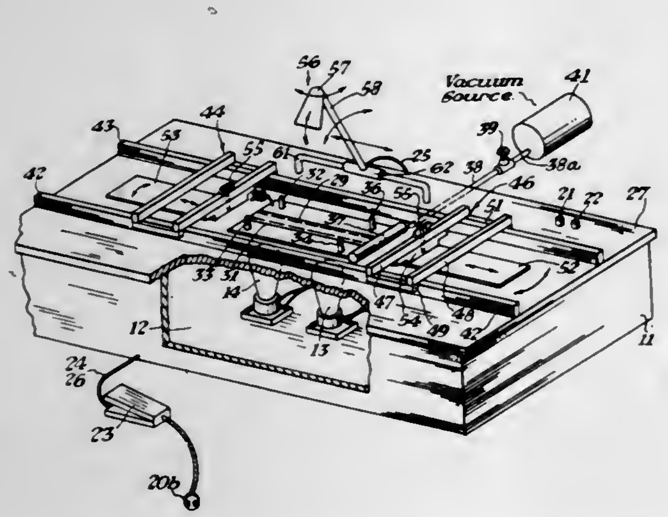
3,717,974
SELECTIVE ADSORPTION PROCESS FOR AIR SEPARATION

Louis Bela Batta, Grand Island, N.Y., assignor to Union Carbide Corporation, New York, N.Y.
Continuation-in-part of Ser. No. 103,768, Jan. 4, 1971, Pat. No. 3,636,679, which is a continuation-in-part of Ser. No. 787,847, Dec. 30, 1968, Pat. No. 3,564,816. This application Jan. 24, 1972, Ser. No. 219,942
Int. Cl. B01d *53/04*
U.S. Cl. 55—58 **5 Claims**

Air is separated by selective adsorption of nitrogen in a high performance adiabatic pressure swing process using zeolitic molecular sieve adsorbent by returning at least four times as much oxygen to the absorbent as is introduced in the feed air.

3,717,975
APPARATUS FOR CORRECTING PRINTING ERRORS

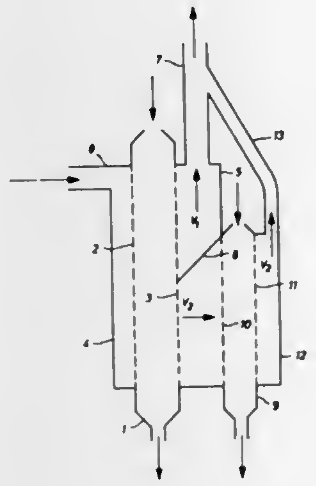
Donald W. Bloom, Sr., R.D. No. 8, Box 337, Greensburg, Pa.
Filed July 2, 1971, Ser. No. 159,183
Int. Cl. G03b *27/04*
U.S. Cl. 355—78 **6 Claims**



This invention relates to a photo correction apparatus that employs a light chamber and a pair of slidable masks with a light in the base of the chamber to facilitate the registration of a print having need of corrections with a film having the needed corrections thereon. The slidable masks are so positioned as to allow the exposure of selected correct lines on the original, while obliterating the incorrect lines. The apparatus may then have a film print with corrections thereon positioned in registration over the then partially exposed film to allow the slidable masks to be moved to position corrected portions of the film, which are then in turn exposed to a light source so that the finished fully exposed film is corrected. The apparatus also includes a safety light that is housed in the light chamber, which light source has a color that will not expose the film to be exposed to the exposure light source. This aids the user in determining whether registration has been maintained.

3,717,976
PROCESS FOR REMOVING SULFUR OXIDES FROM SULFUR OXIDE CONTAINING EXHAUST GAS

Gunther Gappa, Gelsenkirchen-Buer; Karl Knoblauch; Franz Maier, both of Essen-Frillendorf; Jurgen Schwarte, Essen Adelgundenweg 65; all of Germany, and Peter Steiner, Edison, N.J., assignors to Bergwerksverband G.m.b.H., Essen, Germany
Filed Oct. 22, 1971, Ser. No. 191,622
Claims priority, application Germany, Aug. 17, 1971, P 21 41 075.3
Int. Cl. B01d *53/06*
U.S. Cl. 55—73 **5 Claims**

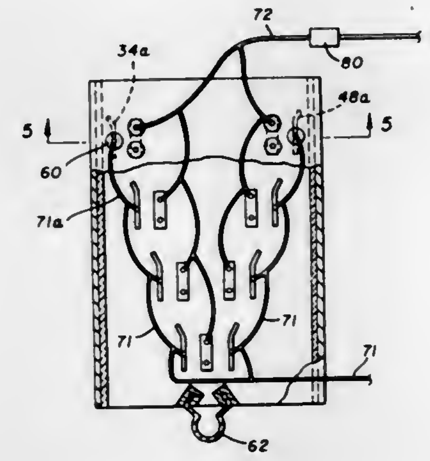


Process for removing sulfur oxides from water vapor, steam and oxygen containing exhaust gases and in particular from power plant exhaust gases by passing the exhaust gases through a reactor provided with a bed of granular carbon containing material adapted to move in said reactor in a direction from the top to the bottom thereof, which comprises withdrawing a portion of the exhaust gas after it has passed only through the upper part of said reactor, said gas constituting desulfurized gas and allowing the remaining portion of the gas to pass substantially completely through the moving carbon containing granulate bed into the bottom part of said reactor, withdrawing this remaining part of the gas from the bottom part of said reactor and subjecting the same to a further desulfurization treatment.

3,717,977
SMOKE POLLUTANT CONCENTRATOR

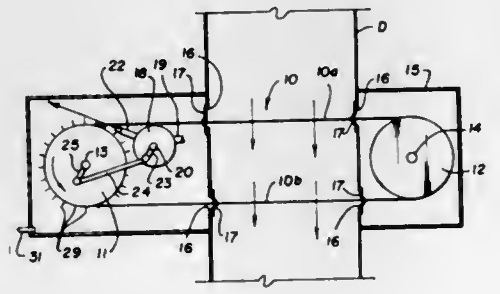
Charles W. Stone, New Philadelphia, Ohio, assignor to William J. Freeman and Reese Taylor, Akron, Ohio, part interest to each
Continuation-in-part of Ser. No. 731,906, May 24, 1968, abandoned, which is a continuation-in-part of Ser. No. 501,678, Oct. 22, 1965, abandoned. This application April 5, 1971, Ser. No. 131,032
Int. Cl. B03c *3/04*
U.S. Cl. 55—110 **2 Claims**

An improved type of air pollution control device wherein micro-particles of a size incapable of normally being picked up by a conventional electrostatic precipitator are agglomerated by the use of an unbalanced and intermittent electrostatic field which agglomerates them to sufficient size to facilitate removal. In addition to agglomerating particles the attracting electrodes are arranged in a uniquely spaced arrangement of zones so that a progressive cleaning action occurs during movement of the gaseous medium through the unit to thus, in effect, achieve self-cleaning without the need for shutdown which would otherwise be required.



3,717,978
AIF FILTER SYSTEM

Edwin F. Osborne, Jr., 402 Ripple Creek, Houston, Tex. 77024
Filed July 9, 1971, Ser. No. 161,083
Int. Cl. B01d *46/18*
U.S. Cl. 55—242 **10 Claims**

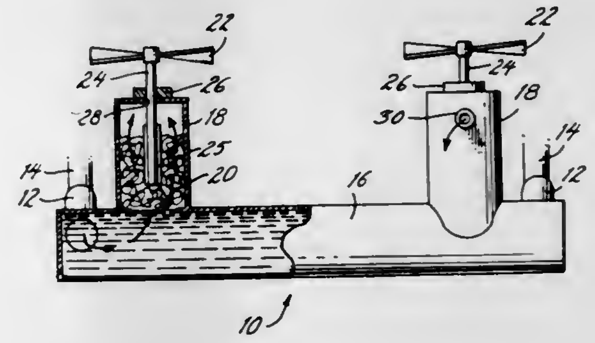


A system for filtering and cleaning air or gas streams, wherein an endless foraminous belt is trained over spaced-apart rollers, including a drive roller having bristle-type belt-engaging elements and is moved across the path of flow of an air or gas stream by means of a water-driven turbine having its drive shaft connected to the drive roller and having its water exhaust stream directed to effect washing of particulate matter from the belt.

3,717,979
ANTI-POLUTION DEVICE

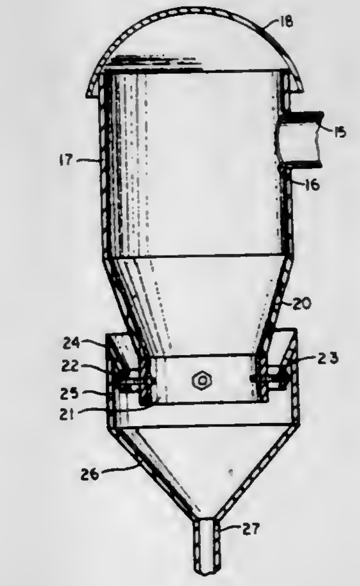
Ernest Waters, Philadelphia, Pa., assignor to Louis J. Gagliardi, a part interest
Filed May 3, 1971, Ser. No. 139,592
Int. Cl. B01d *47/02*
U.S. Cl. 55—233 **4 Claims**

An anti-polution device having a horizontal, cylindrical water filled housing connected to a pair of automotive exhaust pipes and to a pair of vertical cylindrical tubes each containing a filter medium and a propeller attached to a vertical rod passing into said filter medium. Each vertical cylindrical tube has a horizontal exhaust tube for expelling the remaining minute impurities. The exhaust fumes pass into the water filled housing and some of the impurities are removed. The partially cleaned exhaust fumes next pass into the filter medium of the vertical rods and are further cleansed. The propeller which is actuated by the air currents helps retain these fumes in the filter medium for a longer period of time before allowing same to pass out the exhaust tubes house causing greater cleansing of the fumes.



3,717,980
POLLUTION CONTROL APPARATUS

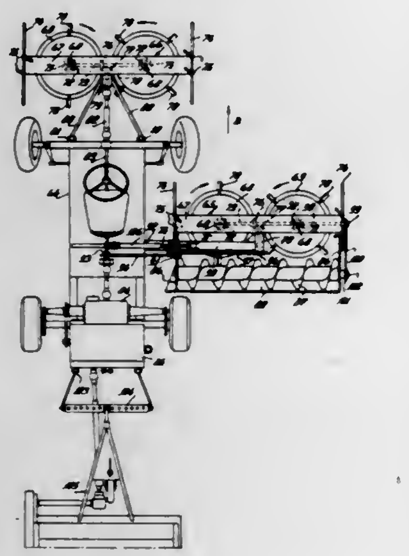
Antonios Papastavrou, 2300 W. Chicago Avenue, Chicago, Ill.
Filed April 27, 1970, Ser. No. 32,318
Int. Cl. B01d *45/00*
U.S. Cl. 55—461 **2 Claims**



Pollution control apparatus in which smoke flows from a chimney through a horizontal pipe section into the side of a generally tubular structure closed at its upper end, thence downwardly through a convergent section and thence upwardly through an exit opening in surrounding relation to the convergent section. A funnel-shaped structure is positioned below the convergent section to receive and direct downwardly traveling particulate matter into the upper end of a relatively thin vertical pipe the lower end of which is coupled to a collection chamber near ground level.

3,717,981
MOWING MACHINES

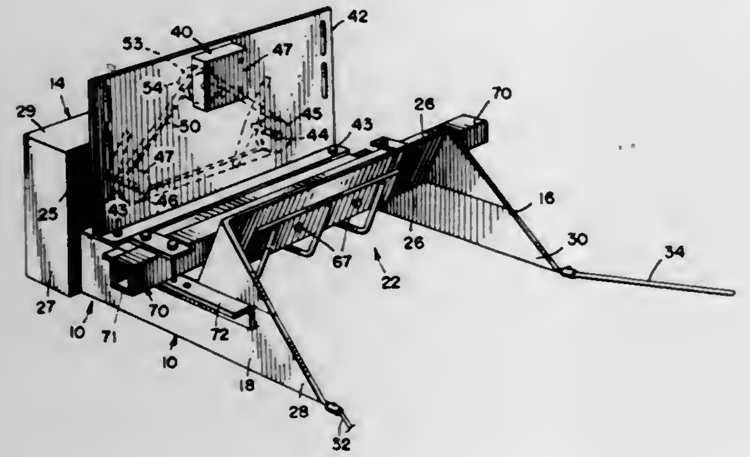
Cornelis van der Lely, 7, Bruschenrain, Zug, Switzerland
Continuation of Ser. No. 778,444, Nov. 25, 1968, abandoned.
This application Aug. 11, 1970, Ser. No. 62,998
Claims priority, application Netherlands, Dec. 4, 1967, 6716443
Int. Cl. A01d *75/30*
U.S. Cl. 56—6 **9 Claims**



According to this invention, at least one mowing mechanism is mounted on a mobile frame, and the mowing mechanism has a frame beam which extends transverse to the intended direction of travel during use of the machine. The frame beam is spaced from the cutting elements with the mowing mechanism having a single support which is located approximately centrally along the frame beam. The frame beam is pivotable about an axis afforded by said support during use of the machine to match ground undulations.

3,717,982
CORN DETASSELER HEAD

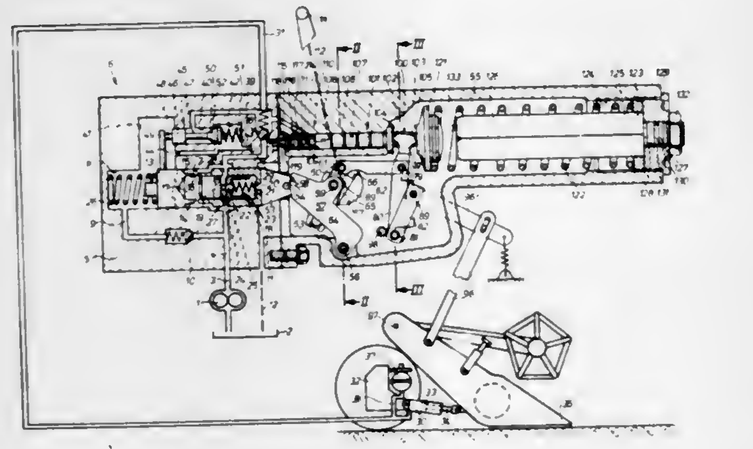
Elmo R. Meiners, Anchor, Ill., assignor to M & W Gear Company, Inc., Gibson City, Ill.
Filed July 6, 1971, Ser. No. 159,645
Int. Cl. A01d *45/02*
U.S. Cl. 56—63 **5 Claims**



An improved corn detasseler head unit for mounting on a corn detasseling machine. The head unit includes an open sided conduit or channel for bending and aligning cornstalks with tassels thereon. Cutter blades are disposed at one end of the conduit to sever the tassel from the cornstalks as they pass through the conduit. The improvement comprises a plurality of guide members positioned in the bottom open side of the conduit to guide the cornstalks toward the cutter blades while preventing leaves on the cornstalk from being cut by the cutter blades.

3,717,983
CONTROL APPARATUS FOR A HARVESTING MACHINE

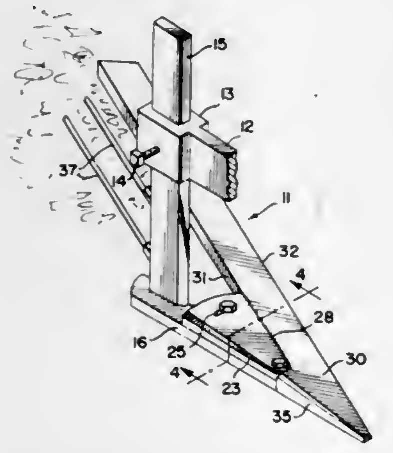
Werner Reitz, 7 Stuttgart 31, and Gunther Schwerin, 7012 Fellbach, both of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany
Filed Nov. 1, 1971, Ser. No. 194,225
Claims priority, application Germany, Nov. 2, 1970, P 20 53 815.2
Int. Cl. A01d *67/00*
U.S. Cl. 56—208 **13 Claims**



A control apparatus for lifting and lowering the mowing platform of a harvesting machine having a first housing for a control valve controlling the flow of pressure fluid from a pump into working conduits for the hydraulic lifting motor of the platform and a second housing attached to the first housing, and enveloping the cylinder of a pressure-responsive piston, a location-representing linkage connected with the nowing platform, and a regulator controlled by the pressure-responsive piston and by the location-representing linkage to operate the control valve by a part acting on a control valve slide portion of the control valve, projecting out of the first housing into the second housing. A manually operated lever controls the regulator to obtain a position of the mowing platform spaced from the ground.

3,717,984
BEAN VINE CUTTER

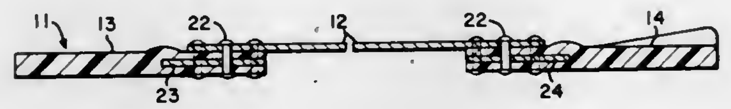
Roy Wright, Route 2, Box 38, Boone, Colo.
Filed Sept. 13, 1971, Ser. No. 180,002
Int. Cl. A01d *55/00*
U.S. Cl. 56—229 **4 Claims**



A bean vine cutter is disclosed wherein a vertical bar is capable of being attached to a drawing vehicle such as a tractor. The bean vine cutter of the present invention is attached to the bottom portion of said bar. The bean vine cutter includes an elongated cutting knife having a forward portion with a triangular configuration and of decreasing thickness towards the front. The cutting knife is secured to a triangular plate which in turn overlies a triangular portion of a plate having a tail end. The tail end is secured to the bar. The bar also has a plurality of parallelly disposed rods extending rearwardly as a means for guiding the cut vines.

3,717,985
MOWER BLADE

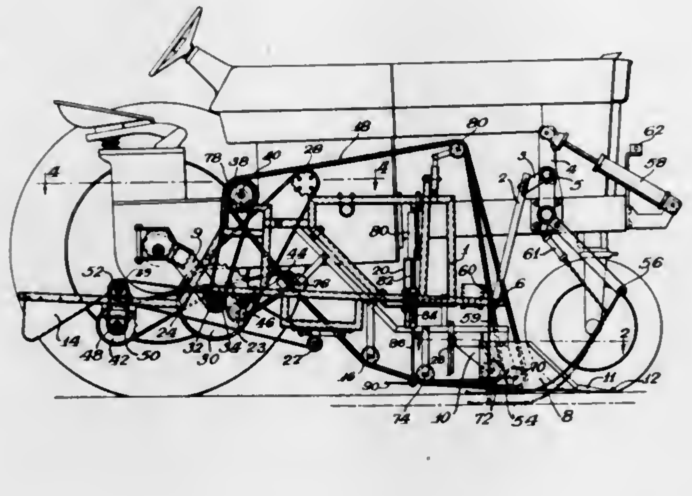
Abraham L. Freedlander, Dayton, Ohio, and Wayne C. Garrett and Robert E. Matthews, Waynesville, N.C., assignors to Dayco Corporation, Dayton, Ohio
Filed Aug. 21, 1968, Ser. No. 754,433
The portion of the term of the patent subsequent to Apr. 29, 1986, has been disclaimed
Int. Cl. A01d *55/18*
U.S. Cl. 56—295 **3 Claims**



A flexible mower blade having cutting arms formed of an elastomeric material such as urethane and having a rigid insert within each arm terminating short of the cutting edges. The arms are secured to a rigid member which is mounted on the lawn mower shaft.

3,717,986
ASPARAGUS HARVESTER

Lewis E. Lawson, LaSueur, Minn., assignor to Green Giant Company, LeSueur, Minn.
Filed Jan. 17, 1966, Ser. No. 521,021
Int. Cl. A01d *45/00*
U.S. Cl. 56—327 A **3 Claims**



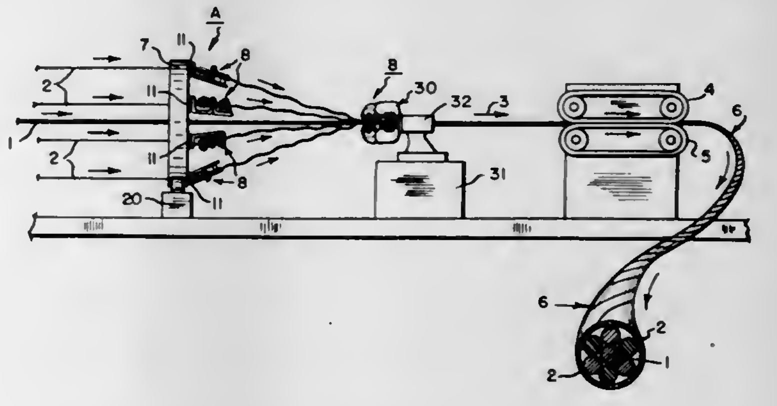
Apparatus for harvesting asparagus. A movable frame has cutting means mounted thereon for severing asparagus spears of a selected height as the frame travels in an asparagus field. A pair of cooperating endless belts are provided for gripping, firmly and gently, the selected asparagus spears from their opposite sides, taken relative to the direction of travel of the frame. The gripping of the spears by the endless belts occurs before, during, and after the cutting means severs the said spears.

ERRATUM

For Class 57—160 see:
Patent No. 3,717,959

3,717,987
FLAT WIRE STRUCTURE AND APPARATUS AND METHOD OF MAKING SAME

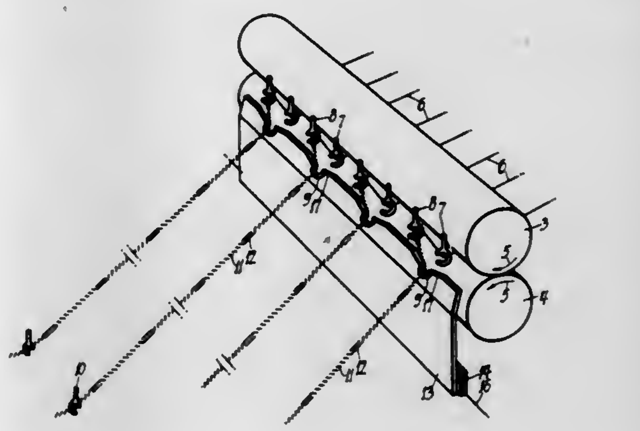
William J. Gilmore, and Lilburn L. Mesler, both of Bridgeport, Conn., assignors to American Chain & Cable Company, Inc., New York, N.Y.
Filed March 27, 1970, Ser. No. 23,433
Int. Cl. D07b *1/08, 5/10*
U.S. Cl. 57—9 **16 Claims**



A multi-wire structure comprising an inner core member and one or more strips of flat wire wrapped helically about the core member. Each flat wire is helically twisted about its longitudinal axis by forming means to permanently deform it prior to being wrapped about the core member.

3,717,988
FORMATION OF TWISTED THREAD ASSEMBLIES

Gordon William Walls, Victoria, Australia, assignor to Commonwealth Scientific and Industrial Research Organization, Campbell, Australian Capitol Territory, Australia
Filed Feb. 9, 1971, Ser. No. 114,016
Claims priority, application Australia, Feb. 9, 1970, PA 0281/70
Int. Cl. D01h *7/92*
U.S. Cl. 57—34 AT **5 Claims**



Apparatus for forming a twisted-thread assembly comprising strand twisting means to impart to a strand alternating zones of opposite twist and strand convergence means adjacent the twisting means to converge the twisted strand with another strand to enable the strands to twist ply together thereby to form a twisted-thread assembly. A surface engages the strands after they leave the convergence means and in such a manner as to inhibit separation of the strands under ballooning forces generated by rotation of the strands as they twist ply together.

3,717,989
CARRIER FOR PACKAGES OF TEXTILE YARN

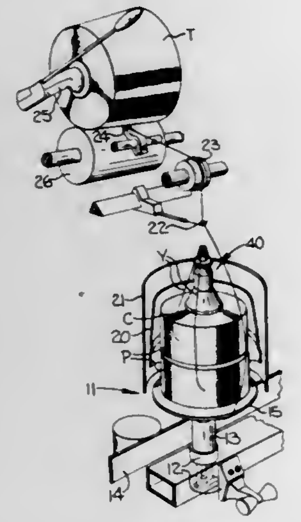
Werner Heimann, Krefeld-Forstwald, and Ulrich Lossa, Krefeld, both of Germany, assignors to Palitex Project Company GmbH, Krefeld, Germany

Filed April 15, 1971, Ser. No. 134,331

Claims priority, application Germany, April 29, 1970, G 70 16 214.0

Int. Cl. D01h *7/86*; **B65h** *75/18*

U.S. Cl. 57—58.52 **8 Claims**



A carrier for packages of yarn wound on hollow, elongate cores having cooperating means at each end thereof for axially, detachably interlocking at least two cores together for providing superimposed packages of yarn for simultaneous or successive withdrawal of yarn therefrom for further processing. The carrier is particularly adaptable for inserting the yarn packages in and withdrawing the yarn packages from a spindle assembly having a basket mechanism of a textile yarn twister. The carrier comprises a generally elongate body portion, means on the body portion cooperating with the interlocking means on one end of the cores for axially, detachably interlocking the carrier with the interlocked yarn package cores, and means on the body portion for manually gripping and handling the carrier and interlocked yarn packages without touching the yarn for mounting and withdrawal of the yarn packages in a textile machine.

3,717,990
TIME CORRECTION DEVICE FOR DIGITAL WATCHES

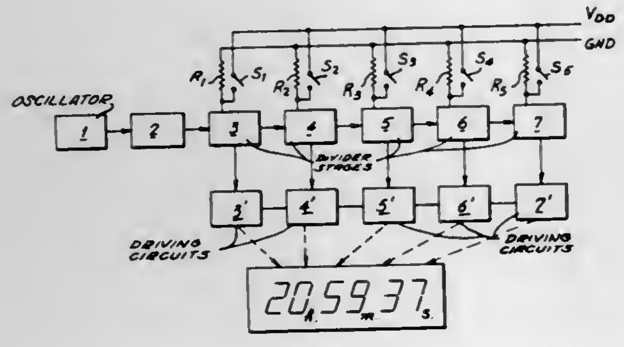
Kinji Fujita, Shimosuwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed Dec. 15, 1971, Ser. No. 208,311

Claims priority, application Japan, Dec. 17, 1970, 45/112397

Int. Cl. G04b *19/30*; **G04c** *9/00*

U.S. Cl. 58—50 R **9 Claims**



A time correction device for electronic watches having multi-stage divider circuitry for dividing the high frequency output signals of an oscillator into low frequency timing signals including a gate at the input of each divider stage to be corrected for selectively applying to said divider stage the output signal of the prior stage or the inverse of said prior stage output signal. A switch is provided for manually actuating the gate to pass one of the prior stage output signal and the inverse thereof.

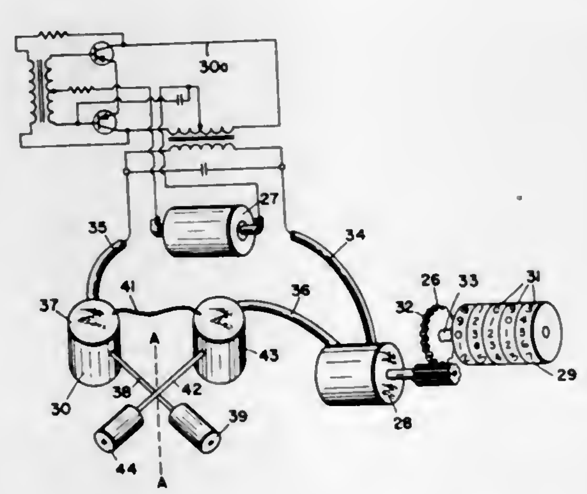
3,717,991
IMPACT TIME INDICATOR

John Klar, Boylston, Mass., assignor to The Heald Machine Company, Worcestor, Mass.

Filed June 18, 1971, Ser. No. 154,682

Int. Cl. G04b *37/12*; **G04f** *9/04*

U.S. Cl. 58—152 R **8 Claims**



This invention relates to an impact time indicator and, more particularly, to apparatus for insertion in a container for shipping delicate devices to indicate the time when an accident takes place.

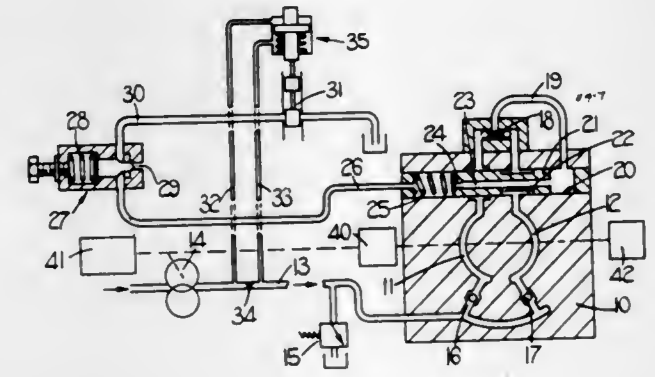
3,717,992
CONTROL ARRANGEMENT FOR HYDRAULIC TRANSMISSION SYSTEM

Leonard William Eyles, Ormskirk, England, assignor to Joseph Lucas (Industries) Limited, Birmingham, England

Filed Dec. 1, 1970, Ser. No. 93,957

Int. Cl. F02b *41/00*

U.S. Cl. 60—19 **6 Claims**



A hydraulic transmission system is provided with a by-pass relief valve between the pressure and return lines, with such relief valve being operable by a servo pressure. The servo pressure is controlled by a valve responsive to the fluid flow through a fixed displacement pump driven by an engine providing the input to the transmission system. Increase in engine speed above a predetermined level, due to an external torque applied to the output shaft of the transmission, operates the relief valve to by-pass the system.

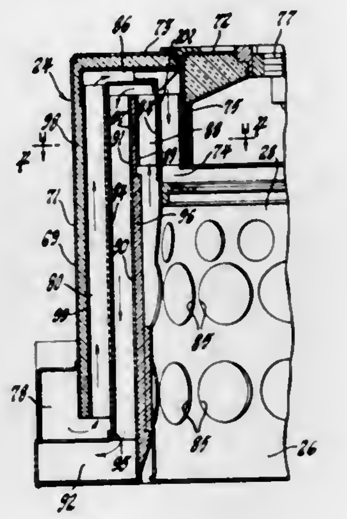
3,717,993
PREHEATER ASSEMBLY FOR STIRLING ENGINE

Russell F. Potter, Lockport, N.Y., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 2, 1970, Ser. No. 85,959

Int. Cl. F02m *23/14*

U.S. Cl. 60—24 **1 Claim**



An air preheater for an external combustion engine which is supported around the engine cylinder to form a combustion chamber therebetween. Air enters the preheater inlet and flows through an annular flow passage in counter direction to the hot exhaust gas which flows through an abutting annular flow passage. The passages are separated by a thermally conductive wall. Insulation on the outer walls of the preheater prevents heat loss from intake air to atmosphere and an insulated divider wall separates the hot gas flow passage from the combustion chamber to prevent reheating of the exhaust gas.

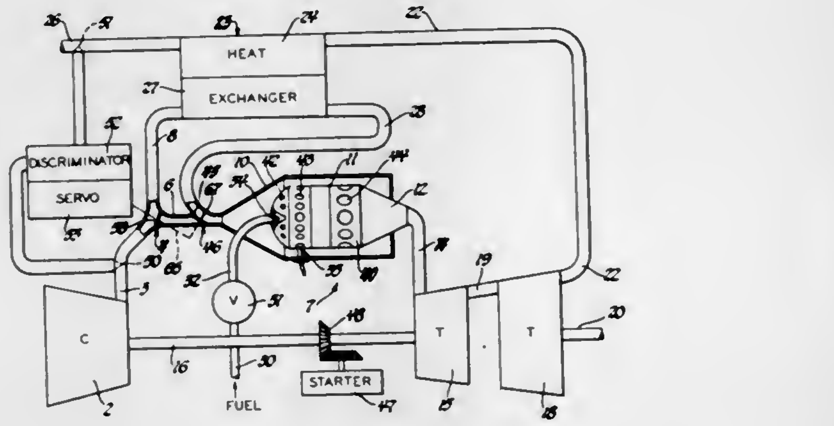
3,717,994
GAS TURBINE SYSTEM WITH REGENERATOR BYPASS ONLY DURING STARTING

Jackson R. Templin, Anderson, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 12, 1970, Ser. No. 88,903

Int. Cl. F02c *7/10*

U.S. Cl. 60—39.51 R **5 Claims**



A regenerative gas turbine engine has the engine compressor connected to the engine combustion apparatus through a regenerator in normal operation of the engine so as to heat the air prior to combustion. During starting of the engine, the regenerator is by-passed so that the compressed air warmed by compression will not be cooled in the regenerator.

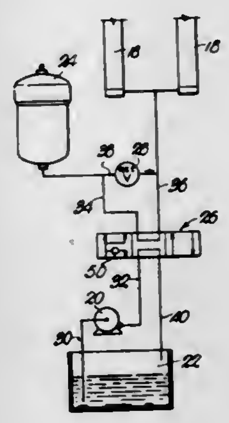
3,717,995
HYDRAULIC FLOTATION FOR IMPLEMENT HEADER

Cecil L. Case, Newton, Kans., assignor to Hesston Corporation, Hesston, Kans.

Filed Oct. 12, 1971, Ser. No. 188,296

Int. Cl. F15b *1/02*

U.S. Cl. 60—470 **7 Claims**



A hydraulic flotation system for an implement header or the like utilizes a pressure sensitive relief valve in cooperation with a special arrangement of hydraulic flow lines to prevent a gas and liquid, header-supporting accumulator, during lowering of the header from a raised, over-the-road position, from exhausting pressurized liquid below that level needed to support the header in a flotation condition at a preseleted, lowered operating position.

3,717,996
HYDRODYNAMIC TORQUE CONVERTERS

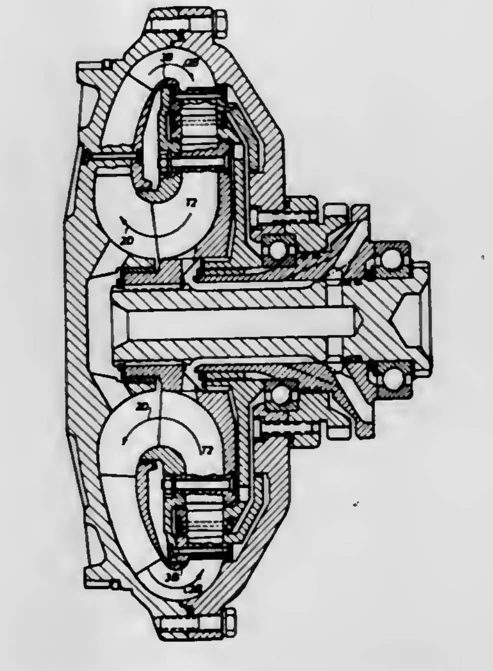
Karl Gustav Ahlen, Stockholm, Sweden, assignor to S.R.M. Hydromekanik AB, Stockholm-Vallingby, Sweden

Filed Aug. 13, 1971, Ser. No. 171,636

Claims priority, application Great Britain, Mar. 5, 1971, 6,155/71

Int. Cl. F16h *41/04*

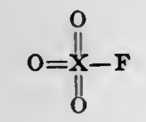
U.S. Cl. 60—327 **26 Claims**



This specification describes a hydrodynamic torque converter in which a ring of pump blades, a ring of guide blades and at least two rings of turbine blades are mounted in a toroidal working chamber. The invention enables different input torque characteristics to be obtained by varying the outlet angles of the blades of a turbine ring disposed to immediately precede the ring of pump blades. The outlets of the said turbine blades direct the fluid to the inlet of the pump blades and, for a low input torque ratio, the outlet angle of the said turbine blades is such that the fluid is always directed in the same direction as the direction of rotation of the ring of pump blades.

3,717,997
METHOD FOR OPERATING HYBRID ENGINES
Orval E. Ayers and Chester W. Huskins, Huntsville, Ala., assignors to the United States of America as represented by the Secretary of the Army
No Drawing. Filed Dec. 23, 1963, Ser. No. 333,240
Int. Cl. C06d *5/10*
U.S. Cl. 60—220 **8 Claims**

5. The method of operating a hybrid-fueled rocket engine, said method comprising bringing together and igniting in the combustion chamber of said engine a solid fuel and an oxidizer, said fuel grain consisting essentially of a cured, intimate mixture of about 10% by weight to about 95% by weight of a polymer selected from the group consisting of polymers of the hydrocarbon conjugated dienes containing four to six carbon atoms per molecule of diene, copolymers of the hydrocarbon conjugated dienes of four to six carbon atoms per molecule with each other, copolymers of the hydrocarbon conjugated dienes of four to six carbon atoms with 2,3-bis(difluoroamino)propyl acrylate, polymers of 2,3-bis(difluoroamino)propyl acrylate, polymers of the ethylenically unsaturated aliphatic hydrocarbon carboxylic acids of up to about eight carbon atoms, polymers of the lower alkyl esters of the ethylenically unsaturated aliphatic hydrocarbon carboxylic acids of up to about eight carbon atoms, copolymers of the ethylenically unsaturated aliphatic hydrocarbon carboxylic acids of up to eight carbon atoms with each other, copolymers of the ethylenically unsaturated aliphatic hydrcarbon carboxylic acids of up to eight carbon atoms with the lower alkyl esters of these acids, copolymers of the ethylenically unsaturated hydrocarbon carboxylic acids of up to about eight atoms with the hydrocarbon conjugated dienes of 4 to 6 carbon atoms, and copolymers of the lower alkyl esters of the ethylenically unsaturated aliphatic hydrocarbon carboxylic acids of up to about eight carbon atoms with the hydrocarbon conjugated dienes of 4 to 6 carbon atoms, and from about 10% by weight to about 90% by weight of at least one of the group consisting of powdered aluminum, aluminum hydride, and lithium hydride, said oxidizer consisting essentially of a mixture of a perhalogenyl fluoride of the formula

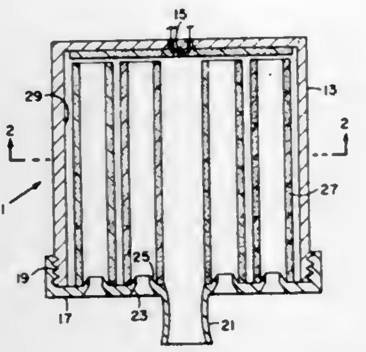


$$O=\underset{\underset{\displaystyle O}{\|}}{\overset{\overset{\displaystyle O}{\|}}{X}}-F$$

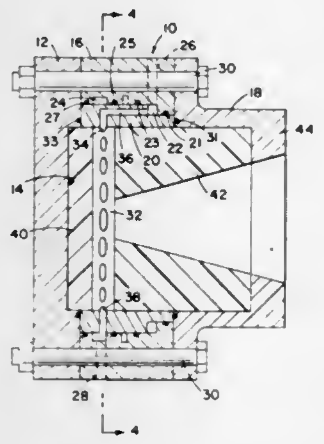
and chlorine pentafluoride, the ratio by weight of perhalogenyl fluoride to chlorine pentafluoride being from about 1.0:10.0 to about 10.0:1.0, where X is selected from the group consisting of the heptavalent radical of chlorine, bromine, and iodine.

3,717,998
ROCKET MOTOR WITH COMBINED NOZZLE AND SUSPENSION PLATE
Robert E. Betts, Huntsville, Ala., assignor to the United States of America as represented by the Secretary of the Army
Filed June 3, 1971, Ser. No. 149,432
Int. Cl. F02k *9/04*
U.S. Cl. 60—255 **3 Claims**

A solid propellant rocket motor that has a nozzle-suspension plate which incorporates a grain trap as an integral part of the nozzle. The nozzle-suspension plate has a plurality of nozzles through which exhaust gases are expended. A central exhaust nozzle provides exhaust for outer burning surfaces of propellant grains within the rocket motor and each individual nozzle around the central nozzle provides an exhaust nozzle for the inner burning surface of a respective propellant grain. With this arrangement, the nozzle areas to propellant burning surfaces are chosen such that the propellant grains have approximately a zero pressure differential across the grain at propellant burnout.



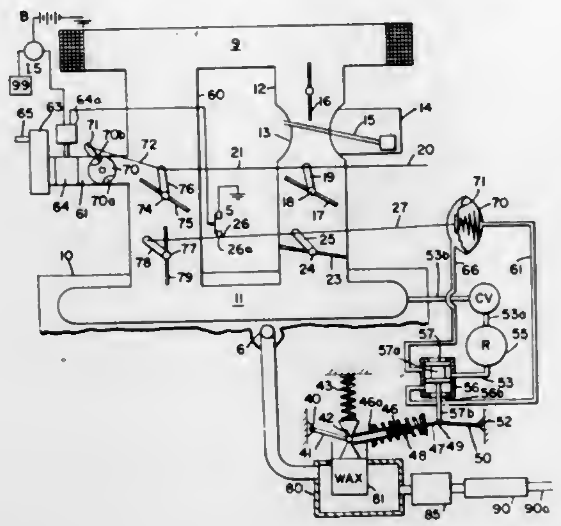
3,717,999
LOW L/D ROCKET ENGINE WITH TANGENTIAL-TANGENTIAL INJECTION
Ben F. Wilson, Huntsville, Ala., assignor to the United States of America as represented by the Secretary of the Army
Filed Dec. 5, 1969, Ser. No. 885,393
Int. Cl. F02k *9/02*
U.S. Cl. 60—258 **6 Claims**



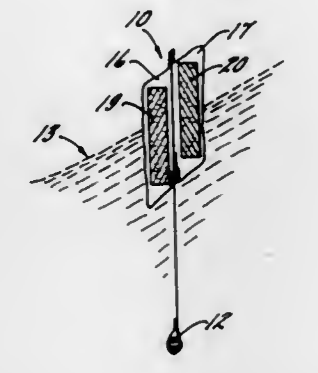
A rocket engine with a low combustion chamber length to diameter ratio that is accomplished by injecting both the fuel and oxidizer tangentially into a cylindrical combustion chamber that has only a diverging exhaust nozzle. By injecting the fuel and oxidizer tangentially, a smaller combustion chamber can be used, and the exhaust nozzle may be only a diverging nozzle.

3,718,000
DUAL FUELED ENGINE WITH TEMPERATURE SWITCHOVER
Brooks Walker, 1280 Columbus Avenue, San Francisco, Calif.
Continuation-in-part of Ser. No. 17,167, March 6, 1970, abandoned. This application June 1, 1971, Ser. No. 148,545
Int. Cl. F02b *75/10*
U.S. Cl. 60—285 **4 Claims**

A duel fueled motor using a liquid fuel such as gasoline and a gaseous fuel such as LPG or pressurized natural gas with one or two exhaust treating devices in the exhaust system that operate efficiently when above a selected temperature in treating exhaust from gasoline powered operation, a thermally sensitive controlled changeover from gas to gasoline when the treater reaches a desired temperature and switches back to gas fuel when below a desired temperature.

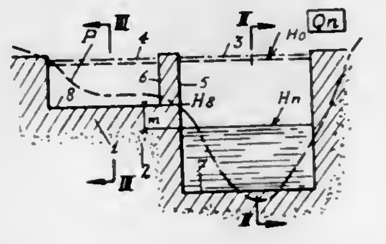


3,718,001
WAVE RIDING WATER BARRIER
John D. Harper, P.O. Box 83, Route 1, Elgin, Ill.
Filed Feb. 17, 1971, Ser. No. 116,166
Int. Cl. E02b *15/04*
U.S. Cl. 61—1 F **2 Claims**



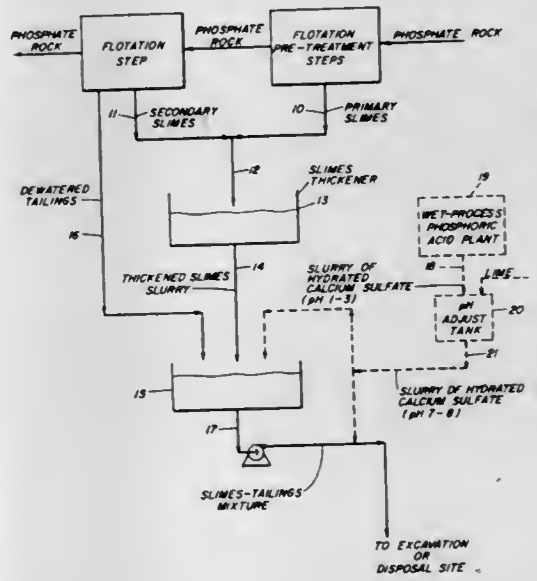
A floating barrier formed of flexible material having flexible buoyancy pockets on either side of the barrier fitted with float elements slightly smaller than the pockets so that the elements can move relatively in a vertical direction in response to wave action without moving or bending the barrier itself. The float elements are protected in sealed plastic bags.

3,718,002
MOVABLE DAM AND METHOD OF OPERATION
Jean Aubert, 8 Rue la Boetie, Paris, France
Filed July 27, 1971, Ser. No. 166,475
Claims priority, application France, July 31, 1970, 7028323
Int. Cl. E02b *7/20, 7/46*
U.S. Cl. 61—22 **13 Claims**



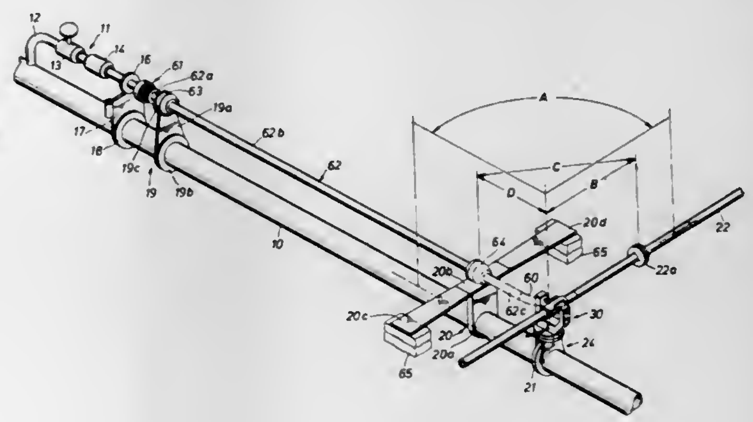
A movable dam for a navigable watercourse or lake in which a stationary portion of the dam is anchored in the bed of the water course and a movable gate system serves to regulate the cross-sectional area for flow of water through the dam.

3,718,003
PROCESS FOR PRODUCING LAND-FILLS
Charles Calvin Cook, Lakeland, and Erwin Mathew Haynsworth, Tampa, Fla., assignors to American Cyanamid Company, Stamford, Conn.
Continuation-in-part of application Ser. No. 24,090, Mar. 31, 1970. This application Nov. 24, 1971, Ser. No. 201,860
Int. Cl. E02d *3/10*
U.S. Cl. 61—35 **5 Claims**



Waste slimes and tailings obtained from the beneficiation of various ores are utilized in the reclamation of otherwise useless land. Novel processes for formulating waste slimes and tailings into a reconstituted fertile soil having acceptable bearing strength are described. An object of this invention is to provide a convenient means for eliminating or minimizing the land and water pollution hazards normally associated with the disposal of the waste slimes produced in ore processing plants.

3,718,004
METHOD FOR MAKING AN UNDERWATER PIPELINE CONNECTION
John P. Oliver; Alfred W. Wedel, both of P.O. Box 1212, and Paul T. Priesmeyer, P.O. Box 1396, all of, Houston, Tex.
Filed April 21, 1970, Ser. No. 30,538
Int. Cl. F16l *1/00*
U.S. Cl. 61—72.3 **6 Claims**

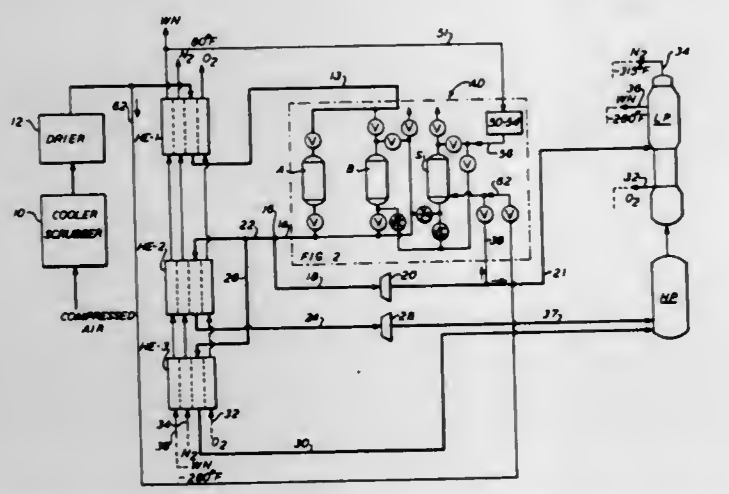


A lateral pipeline being laid is connected to a main pipeline lying on the bottom of the ocean by a tie-in assembly that is connected to the lateral line above the surface of the water. The main line is equipped with a stub section of pipeline to which the lateral is to be connected. The angle between the lateral and the main line is measured and from this the tie-in assembly is designed. This assembly also includes two ball and socket type joints that permit limited misalignment between the sections of the tie-in assembly and the stub section of the pipeline connected to the main line and also allows relative rotation between at least two portions of the tie-in assembly. A connector assembly is used to connect the tie-in assembly to the stub pipeline section. An actuator is releasably connected to the tie-in assembly above the surface of the water and lowered with the tie-in assembly into the water to actuate the connector assembly to connect the tie-in assembly and the stub pipeline section. This actuator can then be recovered and used again.

3,718,005
REACTIVATED LOW TEMPERATURE ADSORBER SYSTEM WITH A NON-ADSORBING COLD ACCUMULATOR

Richard L. McDermott, Somerset, N.J., assignor to Airco, Inc., New York, N.Y.

Filed March 25, 1970, Ser. No. 22,483
Int. Cl. F25j *3/04, 5/00*
U.S. Cl. 62—13 13 Claims



A gas processing system having cyclicly reactivated adsorbers normally operable in a low temperature range, a cold accumulator for refrigeration storage, and valved conduits interconnecting the adsorbers, accumulator and a source of reactivation gas, providing for isolation of an adsorber for reactivation; transfer of the adsorber refrigeration to the accumulator by a reactivation gas stream; reactivation and purging of the adsorber by heated reactivation gas; cooling of the adsorber by reactivation gas at ambient temperature; retransfer of the refrigeration from the accumulator to the adsorber by a counterstream of reactivation gas; and supplemental final cool-down of the adsorber by cold system gas.

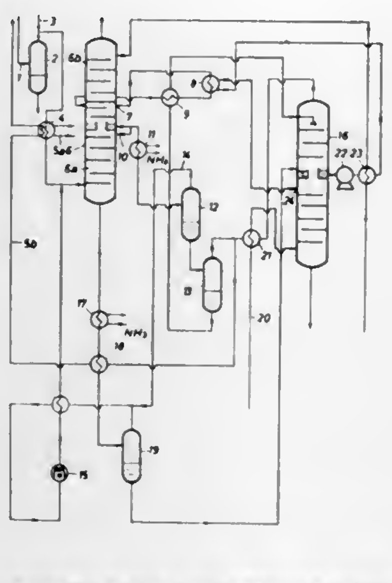
3,718,006
PROCESS FOR SELECTIVE ABSORPTION

Gerhard Ranke, Pocking, and Hans Jungfer, Hohenschaftlarn, both of Germany, assignors to Linde Aktiengesellschaft, Wiesbaden, Germany

Filed Dec. 9, 1969, Ser. No. 883,406
Claims priority, application Germany, Dec. 11, 1968, P 18 14 064.2
Int. Cl. F25j *3/03, 5/00*
U.S. Cl. 62—17 9 Claims

A process for the removal of at least one component from a gaseous mixture by selective absorption in a solvent, said component having an exothermic heat of solution in said solvent, said process comprising the steps of:

a. passing said gaseous mixture into the bottom zone of an absorption column having top, middle and bottom zones;
b. passing said solvent into the top zone of said absorption column;
c. withdrawing partially absorbed gaseous mixture from the middle zone of said column;

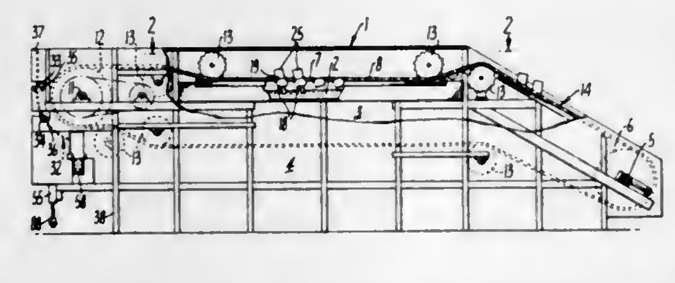


d. cooling said partially absorbed gaseous mixture;
e. recycling resultant cooled mixture to said absorption column; and
f. further contacting resultant recycled cooled gaseous mixture with said solvent to complete said absorption.

3,718,007
METHOD AND APPARATUS FOR HANDLING AND COOLING BOTTLES

Benjamin F. Randrup, 1488 High School Road, Sebastopol, Calif. 95472

Filed Nov. 28, 1969, Ser. No. 880,740
Int. Cl. F25d *13/06*
U.S. Cl. 62—63 4 Claims



Bottles or like articles are conveyed past a station at which an operation is performed with the article inverted. The articles are conveyed along a generally horizontal path of travel past the station and are thereafter rotated substantially 180° to an upright position. The articles are then lowered from the path of travel and conveyed away. The method and apparatus lends itself particularly to a cooling operation wherein the bottle is conveyed through a liquid to cause the contents at the neck of the bottle to be frozen.

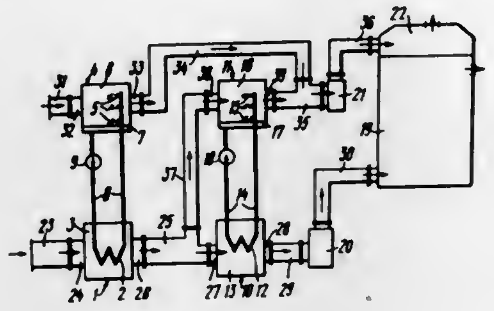
3,718,008
AIR CONDITIONING INSTALLATION

Lev Markovich Zusmanovich, Moscow, U.S.S.R., assignor to Tsentralny Nauchno-Issledovatelsky I Proektno Experimentalny Institut Inzhenernogo Oborudovania Gorodov, Moscow, U.S.S.R.

Filed April 7, 1971, Ser. No. 131,928
Int. Cl. F28d *17/04*
U.S. Cl. 62—309 6 Claims

An installation for conditioning air in an associated space, comprising at least two pairs of heat exchangers, each such pair including a surface heat exchangers and a mixing one, the

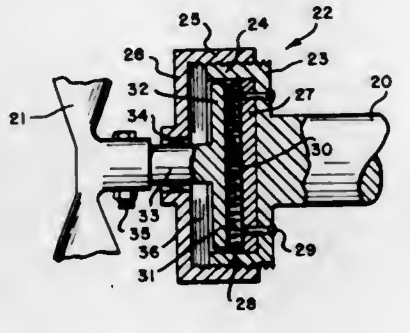
second (in the direction of the flow of the air being treated through the apparatus) pair of heat exchangers communicating through the surface heat exchanger of the first pair with the conduit through which ambient air to be treated by the apparatus is supplied, for this air, after its having been cooled in the last-mentioned heat exchanger, to be directed for still deeper cooling into the surface heat exchanger and the mixing heat exchanger of the second pair.



3,718,009
BREAKAWAY CLUTCH

Joseph Perina, Huntington, N.Y., assignor to American Velcro, Inc., Manchester, N.H.

Filed March 26, 1971, Ser. No. 128,239
Int. Cl. F16d *7/00, 43/20*
U.S. Cl. 64—28 R 2 Claims



A power transmission clutch has driving and driven members which are interconnected by means of hooking elements and these members are so supported that they can move out of contact with each other if and when the torque transmitted exceeds the capacity of the hooking elements.

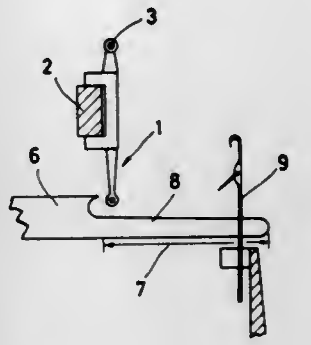
The clutch can be used to transmit power to the propeller of a small boat from the shaft of the boat engine. In this case the device is so constructed that the propeller cannot be lost should disengagement of the hooking elements on the driving and driven members occur.

3,718,010
METHOD AND DEVICE FOR LAYING-IN YARN IN A WARP KNITTING MACHINE

Karl Kohl 10 Chlorodontstrasse, 6053 Obertshausen bei, Offenbach am Main, Germany

Filed Oct. 21, 1970, Ser. No. 82,780
Claims priority, application Germany, Oct. 21, 1969, P 19 52 810.0
Int. Cl. D04b *23/06*
U.S. Cl. 66—84 2 Claims

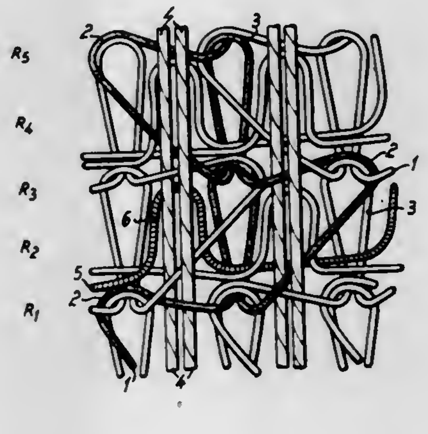
The operating speed of a Raschel knitting machine with a yarn laying-in arrangement is increased by spreading the lapping movements of the deflectors for the laid-in weft yarn over the knitting period of two or more courses in the ground fabric, the intervening courses being skipped by the laid-in yarn. The yarn deflectors are mounted on the sinker bar and moved into operating position only intermittently by a drive which operates the sinker bar with a different stroke in different courses.



3,718,011
METHOD OF PRODUCING A WARP KNITTED OR SEWN FABRIC

Ervin Peschl, Ceska u Brna, and Jan Skrepek, Olsany, Czechoslovakia, assignors to W. Schlafhorst & Co., Monchengladbach, Germany, and Vyzkumny Ustav Pletarsky, Brno, Czechoslovakia, fractional part interest to each

Filed Apr. 17, 1970, Ser. No. 29,522
Claims priority, application Czechoslovakia, Apr. 17, 1969, 2,747
Int. Cl. D04b *23/08*
U.S. Cl. 66—192 11 Claims



Method of producing a warp knitted or stitch-bonded fabric with knitting needles having a hook portion and a portion movable for closing the hook and at least two guide bars, includes the steps of laying-in a first thread in the needle hook portion with one of the guide bars, downwardly displacing the needle with the hook thereof remaining open, upwardly displacing the needle so that the first thread slides down onto the shank of the needle, laying-in a second thread in the needle hook portion with another of the guide bars, downwardly displacing the needle with the hook thereof closed by the movable hook-closing portion thereof so that the first thread, forming a tuck lap, slides from the shank and off the closed hook portion of the needle together with a stitch of a previously knitted course while the second thread in the next-succeeding course forms a stitch of a ground web structure, and during the foregoing steps, inserting unstitched standing threads in longitudinal direction in the ground web structure by means of an additional guide bar.

3,718,012
DEVICE FOR THE WET TREATMENT OF TEXTILE MATERIALS

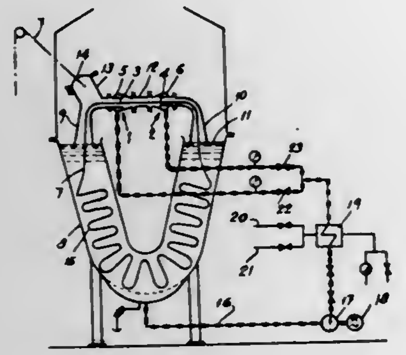
Maria Teresa Clermont Vinas, Paseo Can Feu 68/80, Sabadell, Spain

Filed Sept. 14, 1971, Ser. No. 180,261

Claims priority, application Spain, Sept. 21, 1971, 384,169

Int. Cl. B05c *3/12, 11/124*

U.S. Cl. 68—9 **8 Claims**



Device for the wet treatment of textile materials, such as fabrics in rope form, comprising two Venturi injectors of the central suction type, their relative position being so that their outlets are positioned opposed to each other. The textile material travels in a continuous form through the central suction conduits of the two injectors into the outer conduits of the same where the treatment fluid is injected through regulating devices which permit variation of the fluid flow quantity supplied to each injector between 0% and 100% of the total fluid flow, and, in that way, the suctional power of each injector. This determines the forward feeding of the fabric in the direction which corresponds to the injector with the greater suctional power, and the opposite injector with the smaller drawing power produces a slowing down and compactation effect on the fabric.

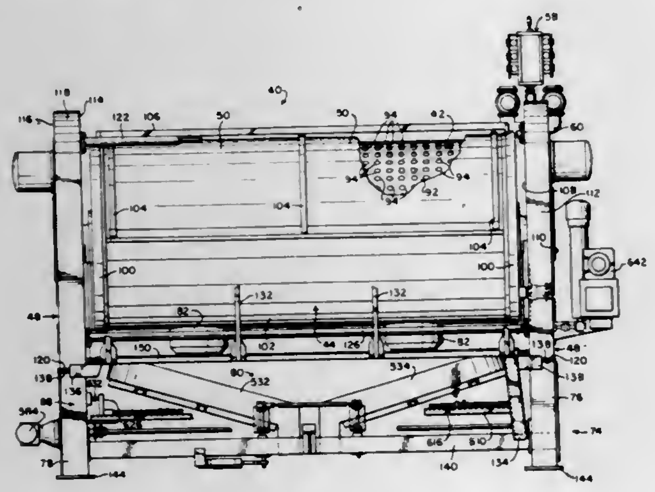
3,718,013
COMMERCIAL LAUNDRY MACHINE AND BASE ASSEMBLY AND CART POSITIONER THEREFOR

Alex Toth, Lincolnwood, Ill., assignor to Ellis Corporation, Chicago, Ill.

Division of Ser. No. 22,508, March 25, 1970, Pat. No. 3,613,406. This application July 28, 1971, Ser. No. 166,719

Int. Cl. D06f *39/08, 39/12*

U.S. Cl. 68—208 **8 Claims**



A commercial laundry machine includes an inner perforated cylinder and an outer casing both mounted on a pair of end frames for rotation about their common central axis, and includes a base assembly upon which the washer is supported. Movably mounted drain chutes on the base assembly serve to transfer discharged washing fluids from the casing, and are moved out of the way to clear the region beneath the machine for laundry carts. A cart positioning system moves carts from a convenient location at the front of the machine and an unloading position directly beneath the casing, and returns the full carts to the front of the machine.

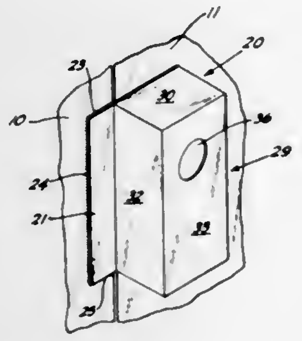
3,718,014
BURGLAR-PROOF LOCKING DEVICE

Fred M. Delgadillo, 1505 W. Carriage Drive, Santa Ana, Calif.

Filed Feb. 16, 1971, Ser. No. 115,344

Int. Cl. E05b *67/38*

U.S. Cl. 70—56 **7 Claims**



A burglar-proof locking device for securing, with a conventional padlock, first and second members wherein a padlock-receiving staple is secured to the first member. The device comprises a unitary, hollow, box-like structure having top, front, back and first and second side walls of dimensions suitable for containing the padlock therein. The back wall is adapted to be connected to the second member and has a staple-receiving slot therein. The structure has an open bottom for insertion of the padlock so that it may engage the staple. The structure also has an opening in the front wall thereof which faces and is aligned with the staple-receiving slot for providing access for a padlock-actuating key.

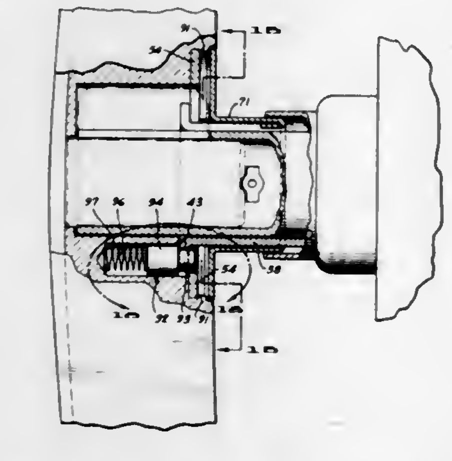
3,718,015
LOCK SET HANDLE

John Axel Tornoe, and Robert Anthony Marotto, both of Redwood City, Calif., assignors to Schlage Lock Company, San Francisco, Calif.

Filed March 17, 1971, Ser. No. 126,037

Int. Cl. E05b *3/04*

U.S. Cl. 70—224 **5 Claims**



A lock set handle for use with a lock set spindle rotatable about an axis has a handle body with a cavity adapted to receive the spindle and has driving means engageable with the spindle. Disposed eccentrically of the axis are means interengaging the driving means and the handle body for preventing relative rotation of the driving means and the handle body with respect to the axis. For a reversible handle, the interengaging means interlocks in either of two diametrically opposite positions.

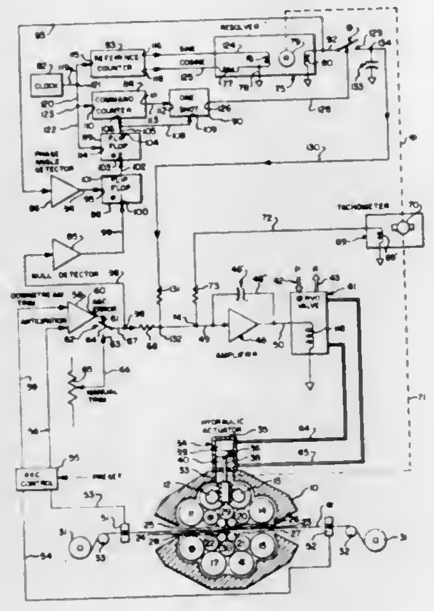
3,718,016
SCREWDOWN CONTROL SYSTEM FOR ROLLING MILLS

Patrick M. Dark, East Aurora, N.Y., assignor to Moog Inc., East Aurora, N.Y.

Filed Oct. 26, 1971, Ser. No. 192,486

Int. Cl. B21b *37/00*

U.S. Cl. 72—8 **14 Claims**



The velocity of a load is controlled by an electrohydraulic servoactuator including hydraulic actuator means for positioning said load, and electrical input servovalve means for controlling the flow of fluid with respect to said actuator means. When zero velocity is desired a position holding means of an electrical nature is activated to produce an input signal for said servovalve means to counteract the tendency for load position variation.

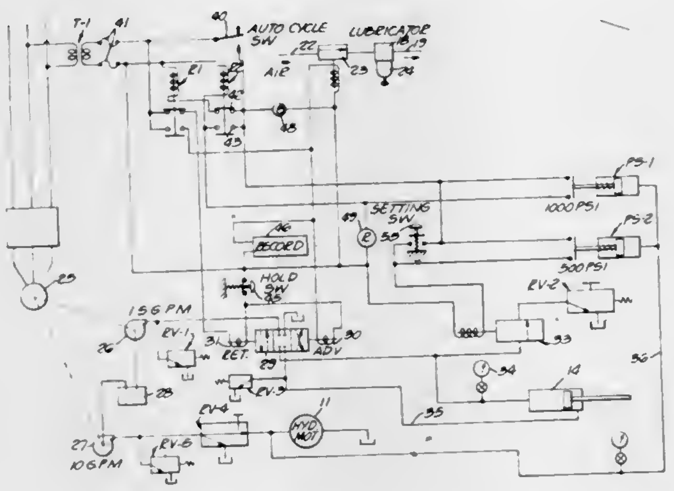
3,718,017
AUTOMATIC CONTROL SYSTEM FOR TUBE EXPANDER TOOL

Marvin J. Blackburn, Pasadena, Calif., assignor to Vernon Tool Company, Alhambra, Calif.

Filed Aug. 23, 1971, Ser. No. 173,864

Int. Cl. B21d *9/00*

U.S. Cl. 72—20 **21 Claims**



An automatic control system for a tube expander tool of the type having a hydraulically powered rotary tool which is advanced and retracted by a reversible linear motor. Operation of automatic cycling is initiated by a manual control whereas axial movement of the tool can be interrupted at any time by operating a hold control while rotation of the tool continues as long as necessary to iron out excess metal or to reposition the tube in the bore should this be desirable. The tool is maintained under constant load at all times by load sensor means in the tool advancing circuit and operable to vary the rate of tool advance to maintain a desired constant load and to prevent overloading. Accordingly, the rate of tool advance varies inversely as the load on the tool.

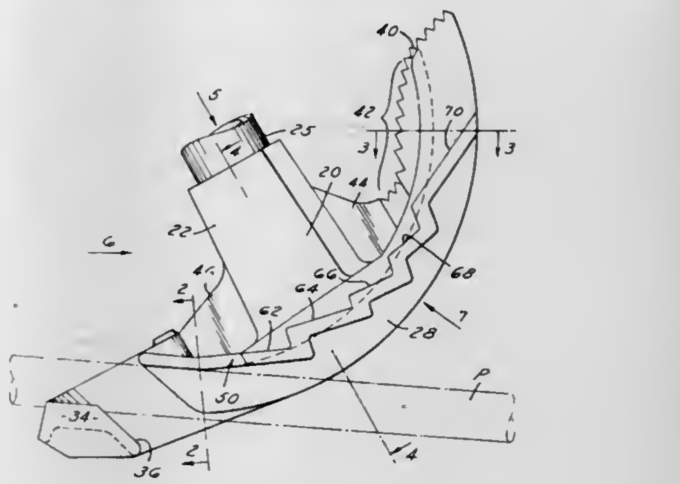
3,718,018
PIPE BENDING TOOL

John D. Benfield, 2920 East Jefferson, Detroit, Mich.

Filed April 14, 1971, Ser. No. 133,942

Int. Cl. B21c *51/00;* **B21j** *13/08*

U.S. Cl. 72—31 **5 Claims**



A pipe bending tool intended for foot pressure or arm leverage for actuation which incorporates visual planes in the body of the device together with indicia on both faces thereof to indicate to an operator when a certain angle of bend has been reached. The multiple planes, each for a particular angle, form a stepped zigzag side flange along one or both sides of the bending tool which not only reinforces but also protects the bend groove.

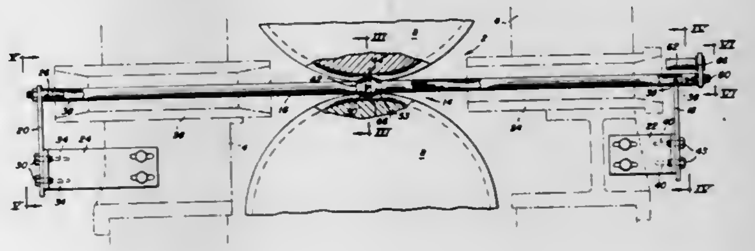
3,718,019
GAUGE DEVICE FOR ALIGNMENT OF ROLLS OF A ROLLING MILL

William A. Box, Bethel Park, and Joseph A. Wojnar, Pittsburgh, both of Pa., assignors to United States Steel Corporation, Pittsburgh, Pa.

Filed Dec. 16, 1971, Ser. No. 208,775

Int. Cl. B21b *31/00*

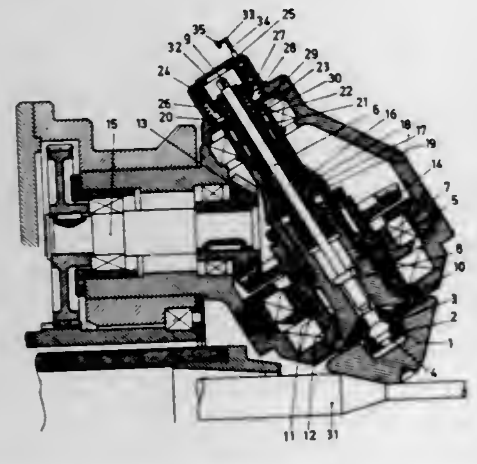
U.S. Cl. 72—35 **6 Claims**



Device includes a gauge head mounted on a tube positionable in a horizontal plane along the centerline of a rolling pass of a rolling mill including two pairs of opposed rolls disposed around a common point in the center of the roll pass. Gauge head is disposed in the mill pass and is made up of four electrical probes each having a spring-loaded contact tip projecting a uniform distance from the centerline of the tube. The contact tips are spaced 90° apart around the periphery of the tube and each is engageable by the rolling surface of one of the four rolls forming the roll pass when the roll is moved toward the centerline of the roll pass to a predetermined distance away from the centerline of the roll pass for rolling a particular size workpiece. Each of the contact tips is connected through its respective probe to an indicator light in an electrical circuit which causes the respective indicator light to light up when the contact tip is touched by the rolling surface of the roll during alignment of the mill.

3,718,020
ROLLING MILL

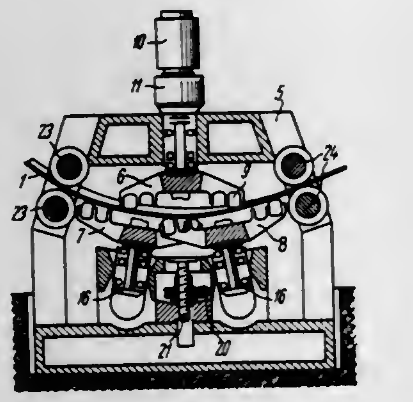
Hermann Leitner, Langenfeld, Germany, assignor to Siemag Siegener Maschinenbau GmbH, Dahlbruch, Germany
Filed March 1, 1971, Ser. No. 119,617
Claims priority, application Germany, March 3, 1970, P 20 09 867.3
Int. Cl. B21b *31/18*
U.S. Cl. 72—78 **15 Claims**



A rolling mill having cantilevered rolls of generally conical shape whose axes lie at an acute angle to the direction of stock movement.

3,718,021
METHOD OF SHAPING SHEET BLANKS TO SPHERICAL FORM AND A DEVICE TO REALIZE SAME

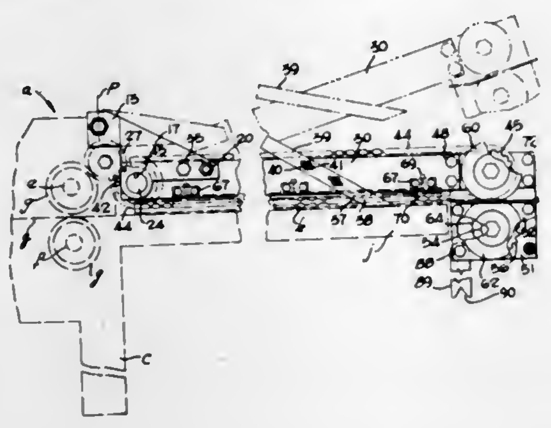
Jury Ivanovich Shein, Volgograd, U.S.S.R., assignor to Vsesojuzny nauchnoissledovatelsky i proektny institur, Lenina, U.S.S.R.
Filed Sept. 22, 1971, Ser. No. 182,659
Claims priority, application U.S.S.R., Sept. 22, 1970, 1,478,325; Oct. 20, 1970, 1,484,912
Int. Cl. B21d *5/14*
U.S. Cl. 72—126 **5 Claims**



A blank is continuously passed through groups of freely rotating rollers located circumferentially in each group and rotating along these circumferences. The axes of the groups lie on one plane and intersect in a point which is the center of the sphere, with the rollers bending the blank circumferentially and shaping it to a spherical form. The device comprises a forming unit composed of three rotary heads with bending rollers. Two heads whose rollers are directed to one side are adjustable for the radius of the sphere to be produced, and the rollers of the third head are directed towards the rollers of the two heads, thus forming a bending and a bearing group of deforming elements directed opposite each other.

3,718,022
COMBINED SLITTING AND OVERLAYING FEED APPARATUS FOR ROLL FORMER MACHINES AND THE LIKE

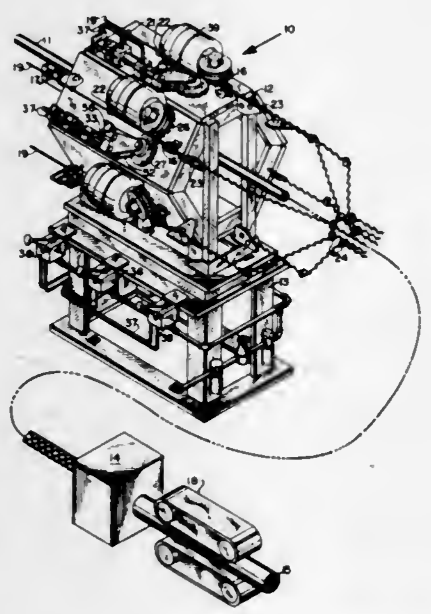
Lamont R. McClain, Mehlville, and Emil L. Slavik, Lemay, both of Mo., assignors to Engel Industries, Inc., Ballwin, Mo.
Filed July 8, 1971, Ser. No. 160,760
Int. Cl. B26d *7/06*
U.S. Cl. 72—132 **5 Claims**



A slitter attachment for roll former machines, which slits metal in a position forwardly of the feed table of the roll former machine and conveys it through the feed channels of the table to different laterally spaced portions of the rolls. Hinged by a lateral hinge pin to be raised out of position and lowered into engagement with the gear train of the roll former machine, the powered conveyor of the slitter has a laterally slidable support arm surrounded above and below by a cog belt. At the remote end of the arm are slitter rolls driven by the cog belt, whose lower run moves over one of the feed channels toward the rolls of the machine. A magnet, positioned just above this part of the cog belt, lifts the slit workpiece against its under surface and conveys it into the rolls of the machine.

3,718,023
WIRE CORRUGATOR

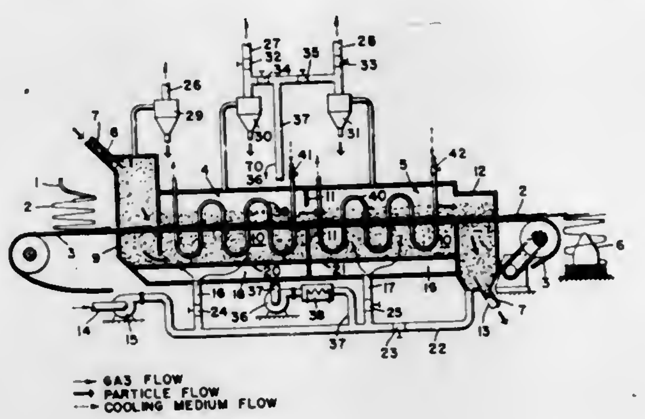
Willis L. Chrisman, Fairmont, and Walter R. Ring, Sr., Elm Montpelier, both of Ind., assignors to Anaconda Wire and Cable Company, New York, N.Y.
Filed Feb. 1, 1971, Ser. No. 111,416
Int. Cl. B21c *23/24*
U.S. Cl. 72—196 **11 Claims**



An apparatus for corrugating cable drain wires has an individual motor for each of a plurality of pairs of corrugating rolls mounted around a polygonal frame and having a common speed control.

3,718,024
APPARATUS INCLUDING A FLUIDIZED BED FOR COOLING STEEL ROD THROUGH TRANSFORMATION

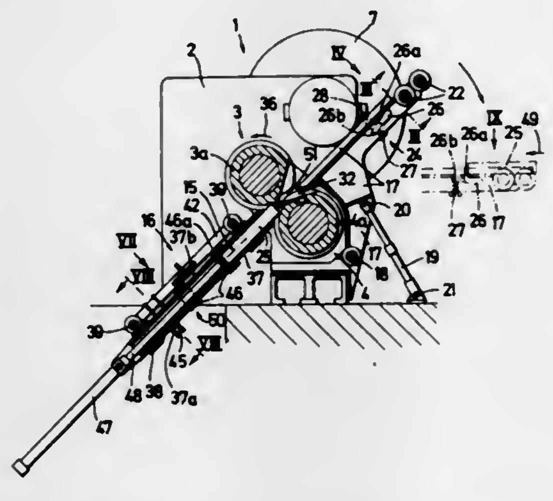
Vito J. Vitelli, Shrewsbury, Mass., assignor to Morgan Construction Company, Worcester, Mass.
Filed Feb. 12, 1971, Ser. No. 114,999
Int. Cl. C21d *9/56;* **B21c** *1/00*
U.S. Cl. 72—201 **17 Claims**



Apparatus and method are disclosed for the controlled cooling of steel rod, in a system which includes at least two cooling sections, at least one of which has a fluidized bed cooling means, each having means to control the rate of cooling therein. Several such control means are disclosed; among them are means to vary the fluidizing gas flow rate, means to recycle the fluidizing gas, means to preheat the fluidizing gas, means for converting a section from fluidized bed cooling to forced- or still-air cooling, and heat exchange means in contact with the cooling medium. The employment in such a system of plural cooling sections and such control means obtains a controlled-cooling method having a great latitude of cooling rates and of combinations thereof, and provides a system capable of handling a wide range of rod types, both plain carbon and alloy steels, and of producing a wide variety of end products.

3,718,025
MACHINE FOR STRETCHING MATERIAL PRIOR TO ROLLING OR FORGING

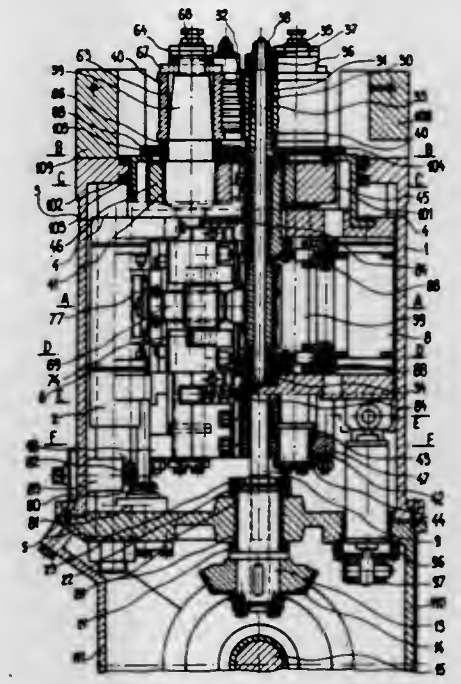
Eberhard Werner, Leverkusen, Germany, assignor to Eumuco Aktiengesellschaft fur Maschinenbau, Leverkusen, Germany
Filed Mar. 12, 1971, Ser. No. 123,751
Claims priority, application Germany, Mar. 14, 1970, P 20 12 249.0
Int. Cl. B21b *39/14*
U.S. Cl. 72—222 **19 Claims**



A machine for stretching workpieces comprises a pair of rolling tools, each rolling tool having a plurality of parallel annular segments on the cylindrical surface thereof such that workpieces are rolled between successive pairs of segments as they pass between the rolling tools. The rolling tools are positioned such that the rolling plane therebetween is located in a path inclined at an acute angle relative to the horizontal. Conveyor means is provided for successively feeding workpieces upwardly along the inclined path to successive segments of the pair of rolling tools and a pivotally mounted supporting table is provided at the opposite side of the pair of rolling tools, the surface of the table being along the inclined path for receiving workpieces from the rolling tools. Recesses are provided at one point in the surface of each of the rolling tools, rotation of the rolling tools being controlled such that they stop with the recesses facing each other forming a passage therebetween so that workpieces may slide downwardly from the supporting table through the passage to the conveyor means and then be conveyed upwardly as the pair of rolling tools begin to rotate again, whereby the workpiece may be rolled and carried upwardly onto the supporting table again and the cycle repeated a predetermined number of times.

3,718,026
CLUSTER MILL WITH CANTILEVERED ROLLS

Jan J. Gawlikowicz; Jerzy Krywult; Roman Wusatowski; Jozef Garczynski, all of Gliwice; Aleksander Makomaski, Katowice, and Leopold Sikora, Swietochlowice, all of Poland, assignors to Instytut Melaturgü Zelaza, Gliwice, Poland
Filed June 3, 1970, Ser. No. 42,910
Claims priority, application Poland, June 7, 1969, T-134056; April 14, 1970, P-140003
Int. Cl. B21b *29/00, 31/16*
U.S. Cl. 72—242 **14 Claims**



Cluster mill with cantilevered rolls designed mainly for rolling of workpieces comprises two cantilevered working rolls of small diameter and long body, and four cantilevered back-up rolls of relatively great diameter. Thanks to the small diameter of the working rolls a better elongation of the rolled metal is obtained, the whole rolling process being more economical.

A few passes, up to several dozens of passes may be cut on working surfaces of the working rolls, a great rigidity of said rolls being maintained, and thus metal workpieces may be precisely rolled.

The working rolls and back-up rolls are carried in a frame composed of plates and which are shiftable perpendicularly to the rolling line on columns. The working rolls are adjusted symetrically to the rolling line. A driving shaft sliding in a second driving shaft drives the working rolls through an assembly of gears, couplings being thereby eliminated. The drive from a common driving shaft may be transferred to the second driving shaft through bevel gears or through a frontal gear coupling or from an individual driving motor.

It is possible to combine a cluster mill with cantilevered rolls with every method of cluster mill setting, as hitherto known.

3,718,027
FORMING MACHINE FOR HEATED MATERIALS, PARTICULARLY METALS

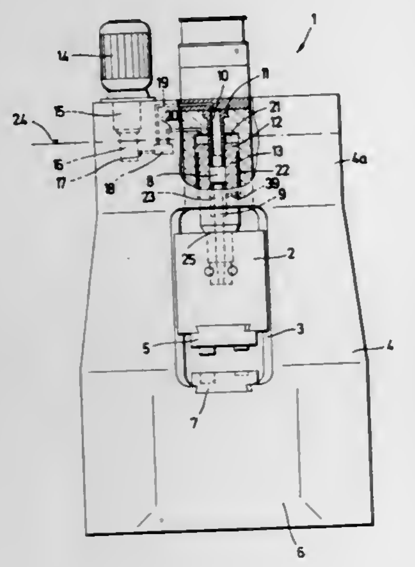
Gottfried Rau, Leverkusen, and Albert Eck, Wipperfurth, both of Germany, assignors to Eumuco Aktiengesellschaft fur Maschinenbau, Leverkusen, Germany

Filed Aug. 17, 1970, Ser. No. 64,177

Claims priority, application Germany, Aug. 16, 1969, P 19 41 806.5

Int. Cl. B21j *11/00*

U.S. Cl. 72—407 **18 Claims**



A forming machine having at least two piston means for providing a deforming force between the anvil block and ram. The piston means includes a first piston surface area that is substantially different than a second piston surface area. The smaller piston surface area is fixedly attached to the ram to effect hammering of the deformable material. The first and second piston surface areas are moved with the same hydraulic driving medium. The first and second piston surface areas are movable and controllable independently of each other.

3,718,028
TORSIONAL VIBRATOR FOR TESTING PLASTICS MATERIALS

Kurt Moser, Fribourg, and Beat Hochli, Bern, both of Switzerland, assignors to Lonza Ltd., Gampel/Valais (Direction: Basel), Switzerland

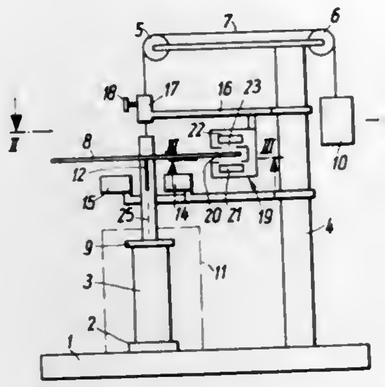
Filed March 12, 1971, Ser. No. 123,763

Claims priority, application Switzerland, Oct. 13, 1970, 1058/70

Int. Cl. G01n *3/32*

U.S. Cl. 73—15.4 **2 Claims**

A torsional vibrator for testing plastics materials having a first loading clamp for retention of one end of a plastics test piece, a vibration body, a second loading clamp rigidly joined to the vibration body for gripping the opposite end of the plastics test piece, a temperature chamber enclosing the plastics test piece, a device for exciting torsional vibrations of a torsion pendulum comprising the plastics test piece, the vibration body and the second loading clamp, and means for measuring the frequency of the pendulum vibrations including a light source and a photoelectric element receiving illumination therefrom and illumination varying means associated with the vibration body and disposed between the light source and photoelectric element.



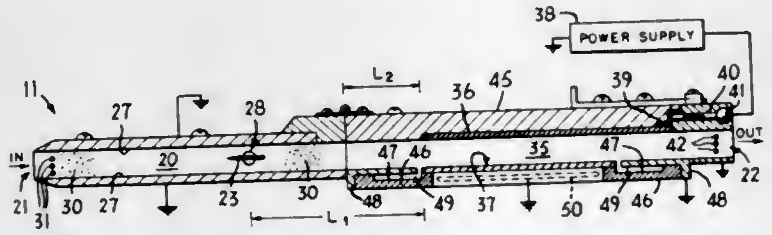
3,718,029
ELECTROSTATIC MASS PER UNIT VOLUME DUST MONITOR

Meredith C. Gourdine, Fort Lee, N.J., and S. Edward Law, Athens, Ga., assignors to Gourdine Systems Incorporated, Livingston, N.J.

Filed Jan. 25, 1971, Ser. No. 109,145

Int. Cl. G01n *15/00;* **B01d** *53/30;* **B03c** *3/00*

U.S. Cl. 73—28 **33 Claims**



Electrogasdynamic methods and apparatus for measuring the mass of particulate matter entrained in a gaseous flow per unit volume of such flow are disclosed. The gaseous flow is passed down a bounded flow path and the entrained particles are exposed to and charged by a corona discharge. The charged entrained particles are carried downstream to a collection section where the particles are repelled by a charged deposition electrode and driven toward a grounded electrode. A portion of the charged particles are collected on a dielectric surface positioned in front of the grounded electrode. The accumulated charge on the dielectric surface is then measured by an induction electrode and an electrometer to show the particle mass per unit volume of the flow.

3,718,030
METHOD AND APPARATUS FOR ANALYSIS OF FLUID SUSPENSIONS

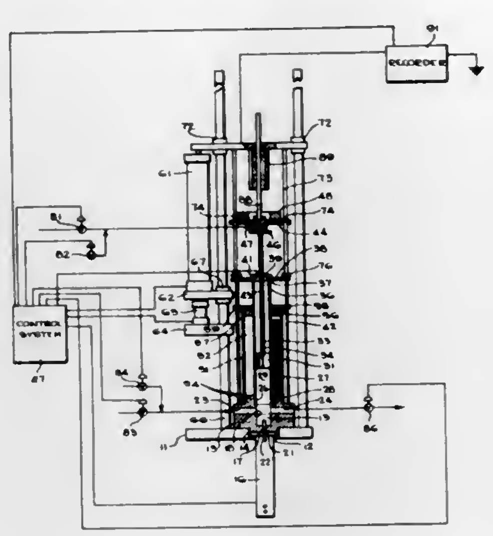
Richard B. Kesler, Appleton, Wis., assignor to The Institute Of Paper Chemistry, Appleton, Wis.

Filed Sept. 28, 1970, Ser. No. 75,967

Int. Cl. G01n *5/00*

U.S. Cl. 73—61 R **1 Claim**

A method and apparatus are described for determining the weight of a moisture-free, compressible material in a given volume of fluid suspension. The given volume of the suspension is confined and the material in the confined suspension is compressed with a movable porous surface at a predetermined pressure to form a mat of the material. The thickness of the mat thus formed is measured and the weight of the material is determined therefrom from a known relationship. The apparatus may be flushed out by movement of a lower nonporous piston which retracts to open an outlet from the chamber.



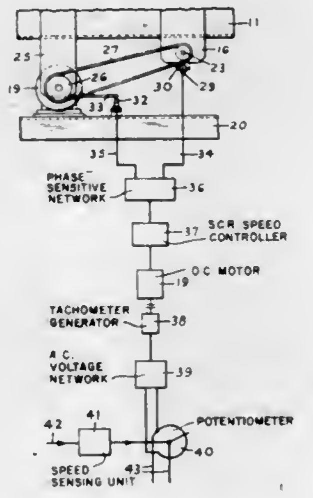
3,718,031
MASS MEASURING SYSTEM APPLIED TO BELT CONVEYORS

John L. Christmann, Passaic, N.J., assignor to Merrick Scale Mfg. Company, Passaic, N.J.

Filed Dec. 3, 1970, Ser. No. 94,778

Int. Cl. G01g *11/00*

U.S. Cl. 73—67.2 **10 Claims**



A 90° phase angle lag is created between the resonant vibration frequency of a load on a belt conveyor and the frequency of a motor driven eccentric inducing vibration to stringers supporting the belt conveyor between vertical members and deviation of said phase angle is detected by a phase sensitive network which adjusts the motor. The speed of the motor is converted into a linear alternating current voltage transmitted across a potentiometer adjusted by the speed of the belt conveyor to produce the product of the speed of the belt conveyor and the load on said conveyor.

3,718,032
ULTRASONIC VISUALIZATION

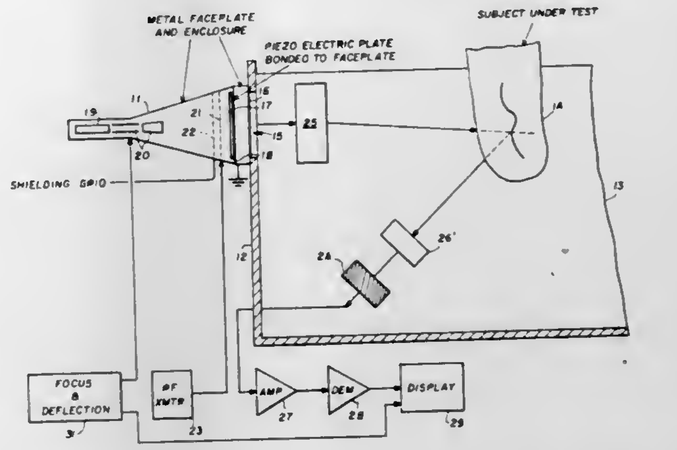
George William Gray, Lambertville, N.J., assignor to Hoffman-La Roche Inc., Nutley, N.J.

Filed Sept. 18, 1970, Ser. No. 73,521

Int. Cl. G01n *29/04*

U.S. Cl. 73—67.7 **7 Claims**

An ultrasonic transmitting apparatus for examination of a subject in a field comprising, a CRT transmitter having a transducer which is excited in a pattern to generate corresponding successive acoustic waves to scan the subject in "flying spot" type fashion, and a receiver for converting the subject reflected signals and providing a visual display.



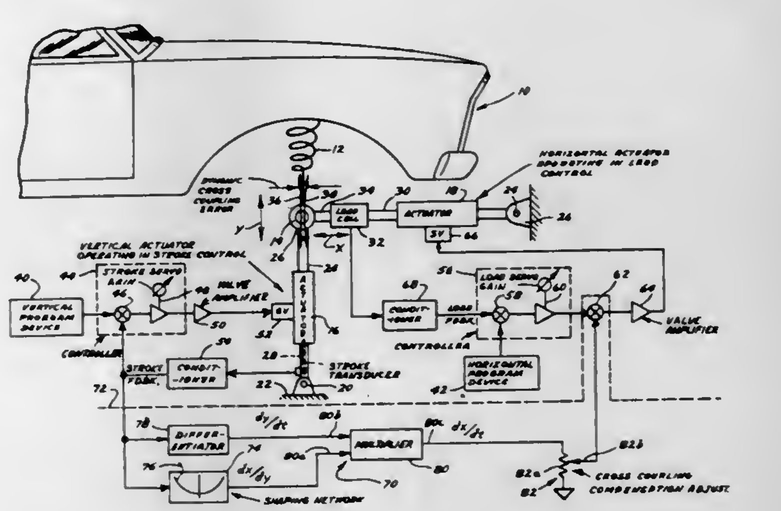
3,718,033
TESTING APPARATUS UTILIZING POSITION-FORCE CROSS COUPLING CONTROL

Niel R. Petersen, Hopkins, Minn., assignor to MTS Systems Corporation, Minneapolis, Minn.

Filed April 20, 1971, Ser. No. 135,560

Int. Cl. G01n *3/32*

U.S. Cl. 73—71.7 **7 Claims**


HORIZONTAL ACTUATOR OPERATING IN LOAD CONTROL
VERTICAL ACTUATOR OPERATING IN STROKE CONTROL
ACTUATOR
LOAD CELL
SHAPING NETWORK
CROSS COUPLING COMPENSATION ADJUST

Where a specimen, such as a wheel spindle of an automobile, is acted on by a first actuator to position the spindle along a vertical axis and a second actuator to apply a force or load along a horizontal axis, both of which actuators are pivotally mounted, cross coupling errors arise because the load being applied by the second actuator is influenced by the displacement produced by the first actuator. Compensation therefor is provided by multiplying a first signal representative of the change in horizontal displacement with respect to vertical displacement by a second signal representative of the vertical velocity of the specimen or the time rate of change of the vertical displacement thereof, the resulting product signal being employed in modifying the control of the horizontal actuator to provide the proper compensation.

3,718,034
HYDRAULIC CORROSION MONITORING COUPON INJECTOR

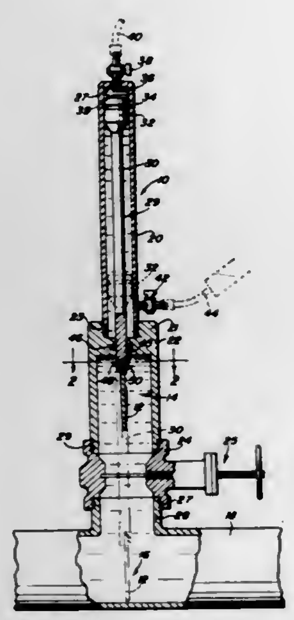
Dean E. Swearingen, 114 North Crownpoint, Ada, Okla.

Filed Sept. 17, 1970, Ser. No. 72,972

Int. Cl. G01n *17/00*

U.S. Cl. 73—86 **3 Claims**

A piston and cylinder assembly is mounted in valved communicating relation to the interior of a pipe line. The assembly includes a piston having a rod extending downwards toward a port in the pipe line. Upon proper actuation of hydraulic control means, the piston is forced downwardly until the piston rod is immersed in the fluid flowing through the pipe line. A metal plate is secured to the free end of the piston rod, the plate being subjected to the material flowing in the pipe line. After a certain interval, the hydraulic control means is actuated to cause retraction of the piston and the connected test plate. The plate is then removed and observed to determine the corrosive effect of the fluid on the pipe line.



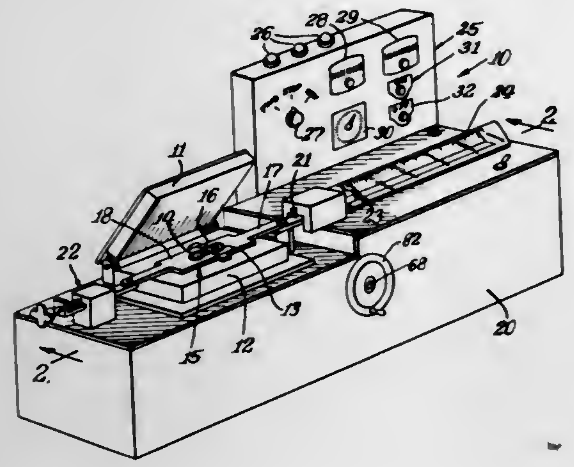
3,718,035
SHELL CORE TESTING APPARATUS

Albert H. Doerr, Coldwater, Mich., assignor to The Marmon Group, Inc.

Filed Oct. 16, 1970, Ser. No. 81,443

Int. Cl. G01n ***3/08***

U.S. Cl. 73—95 **13 Claims**



A testing apparatus for testing the tensile strength of a core formed of resin impregnated sand such as for use in a shell molding operation. The testing apparatus includes means for setting the resin impregnated sand to form a sample shell core and means for indicating the tensile strength of the set core. The indicating means includes a swingable element and means for progressively increasing torque to the swingable element to apply a progressively increasing tensile stress to the set core sample suitable to ultimately break the core sample. Scale means are associated with the indicating means for indicating the specific torque applied at the time of breakage of the sample.

3,718,036
VEHICLE TESTING APPARATUS

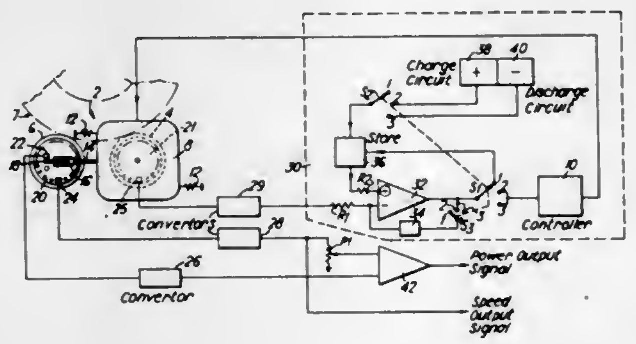
John Anthony Marten, Holt, and Bernard Arthur Gee, Marham, both of England, assignors to Suntester Limited, Norfolk, England

Filed March 29, 1971, Ser. No. 128,995

Claims priority, application Great Britain, March 31, 1970, 15,225/70

Int. Cl. G01l ***5/13***

U.S. Cl. 73—117 **7 Claims**



The disclosure describes a chassis dynamometer provided with control means which may be activated so as to maintain the acceleration of the dynamometer rollers at a predetermined constant positive or negative value. Means are provided to multiply the braking torque absorbed by the dynamometer by the speed of rotation of the idle roller and to add to the product a signal proportional to the speed of rotation of the rollers so as to maintain a signal substantially proportional to the traction power output of the vehicle being tested while accelerating or decelerating at the predetermined constant value.

3,718,037
PAPER MACHINE TENSION TESTER

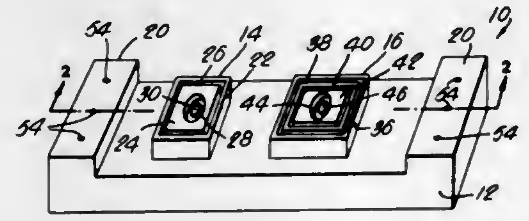
Peter Jack Eldon Crawford Stringer, Grand'Mere, Quebec, Canada; Richard Langhiam Castle Knight, Hazle Grove, and Donald Gordon Waye, Old Trafford, both of England, assignors to Consolidated Paper (Bahamas) Limited, Nassau, Bahamas

Filed Nov. 23, 1970, Ser. No. 91,745

Claims priority, application Canada, Nov. 24, 1969, 068,261

Int. Cl. G01l ***5/08***

U.S. Cl. 73—144 **16 Claims**



A device for measuring local tension or modulus of elasticity of web comprising a vacuum chamber into which a portion of the width of the web is drawn and the deflection of the web into the chamber measured to provide a measurement of the tension and to a pair of such devices having cavities of different widths operating together and the outputs compared to obtain a reading of the local modulus of elasticity of the web being tested.

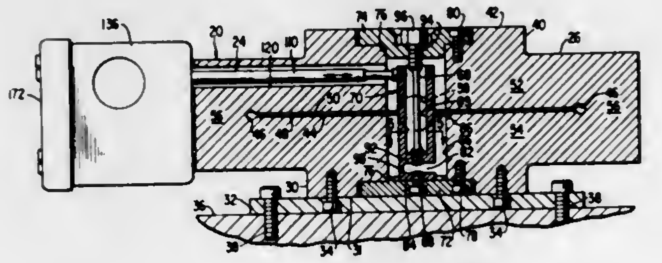
3,718,038
FORCE MEASURING INSTRUMENT

Clarence Johnson, 31649 Trillium Trail, Pepper Pike, Cleveland, Ohio

Filed Jan. 26, 1971, Ser. No. 109,851

Int. Cl. G01l ***1/04***

U.S. Cl. 73—141 A **1 Claim**



A force transducer having a force sensing deflection structure adapted to receive and be deflected by a force to be measured, a device providing a measurement of deflection, and deflection transmission linkage interconnecting the force sensing structure and the above-mentioned device. The transmission linkage comprises a number of serially connected parts which amplify the transmitted deflection and which are rigidly connected one to another to eliminate lost motion. The force sensing structure is formed with two deflection portions which are rigidly joined to each other only outwardly of an intermediate deflection space. These deflection portions are deflected by an applied force in such a manner that the deflected and undeflected positions of the region at which deflection is measured remain effectively parallel.

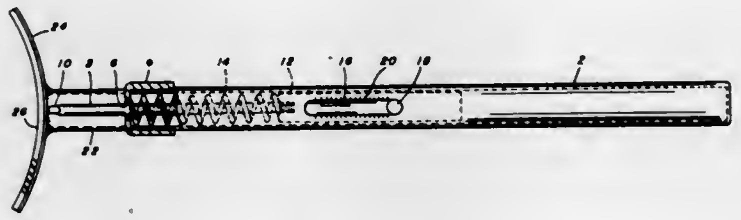
3,718,039
PAIL BAIL EAR TESTER

James A. Bacon, Cherry Hill, N.J., and Charles J. Lindenmuth, Levittown, Pa., assignors to United States Steel Corporation

Filed Dec. 2, 1971, Ser. No. 203,992

Int. Cl. G01l ***5/00***

U.S. Cl. 73—141 AB **3 Claims**



Device of the invention functions to apply pulling pressure on the bail ear of a pail to determine if the ear is securely affixed to the pail. The device includes a pressure plat attached to a leg extending at an angle from a lever having a spring-loaded bar with an ear-engaging end projecting therefrom, and indicating means connected with the bar to indicate the amount of pressure exerted on the ear when the end of the bar is engaged with the ear as the pressure plate is pressed against the body of the pail by exerting downward pressure on the end of the lever.

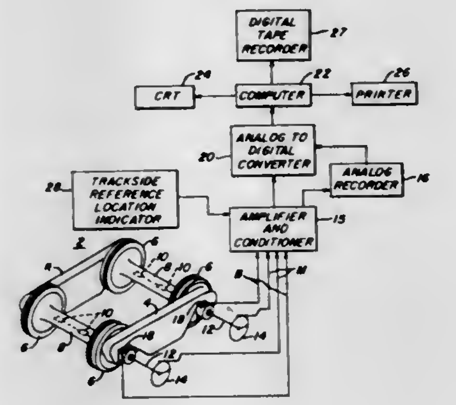
3,718,040
METHOD AND APPARATUS FOR EVALUATING RAILROAD TRACK STRUCTURE AND CAR PERFORMANCE

William H. Freeman, Port Cartier, Quebec, Canada; Leavitt A. Peterson, Glenshaw, and Joseph M. Wandrisco, Lower Burrell, both of Pa., assignors to Bessemer and Lake Erie Railway Company, by said Peterson; Quebec Cartier Mining Company, by said Freeman; United States Steel Corporation, by said Wandrisco

Filed Sept. 7, 1971, Ser. No. 178,131

Int. Cl. G01m ***19/00***

U.S. Cl. 73—146 **43 Claims**


DIGITAL TAPE RECORDER
CRT
COMPUTER
PRINTER
ANALOG TO DIGITAL CONVERTER
TRACKSIDE REFERENCE LOCATION INDICATOR
ANALOG RECORDER
AMPLIFIER AND CONDITIONER

Method and apparatus for determining dynamic lateral and vertical wheel-rail forces. Axle bending sensors and axle load cells provide signals to a computer programmed to calculate lateral and vertical wheel-rail forces. These forces are used as the basis for comparing the effects of a variety of car truck design criteria and track conditions. Comparison of forces developed by the same equipment on different runs over the same trackage discloses track condition changes between runs.

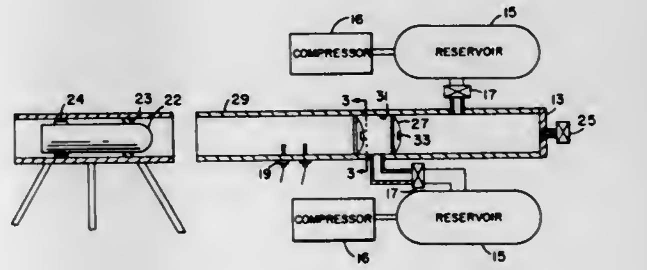
3,718,041
PROJECTILE DECELERATION DEVICE

Kenneth P. Jones, 9106 Camille Drive SE., Huntsville, Ala. 35802, and Cleves H. Howell, Jr., deceased, by Edith S. Howell, executrix, Huntsville, Ala.

Filed Oct. 1, 1971, Ser. No. 185,646

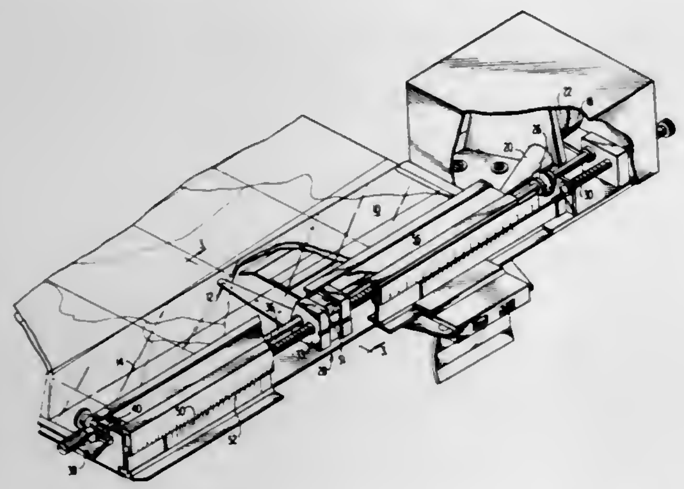
Int. Cl. G01m ***19/00***

U.S. Cl. 73—167 **6 Claims**



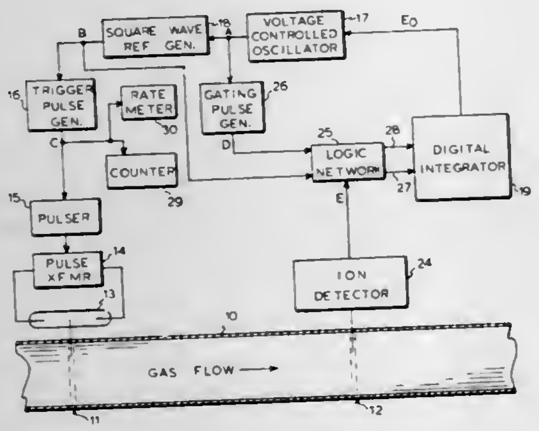
A tubular member disposed to receive a projectile in flight is provided with a closed end and supplied with compressed air to oppose progress of the projectile in the member and bring the projectile to a stop. A relief valve is provided to relieve the air pressure as the projectile comes to the stop to prevent reverse progress thereof.

3,718,042
AUTOMATIC GEOGRAPHICAL POSITION INDICATOR
Crisogono Herrera, Apdo Postal No. 1254, Monterrey, N. L., Mexico
Filed Dec. 2, 1970, Ser. No. 94,423
Int. Cl. G01c *21/00*
U.S. Cl. 73—178 R **4 Claims**



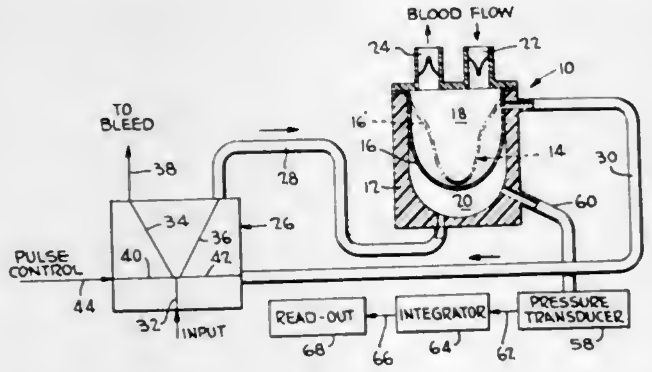
A navigation aid primarily for aircraft pilots and which functions as an automatic position indicator includes means for clamping a conventional air navigation chart beneath a transparent hollow housing so that the projected route between fixed points on the chart is visible through the housing. Mounted within the housing and movable longitudinally therealong is a cursor member. The means for moving the cursor member along the housing and over the projected flight path is a constant speed device adjustably geared to the cursor drive so that the speed of the cursor may be adjusted to that of the aircraft whereupon the position of the cursor over the navigational chart continuously corresponds to the position of the aircraft along the predetermined flight path.

3,718,043
IONIZATION GAS FLOW METER WITH PULSE RATE SERVO
Jack B. Fishman, Pasadena, and William E. Mutschler, La Verne, both of Calif., assignors to Nucleonics Development Company, Monrovia, Calif.
Filed Dec. 15, 1970, Ser. No. 98,280
Int. Cl. G01f *1/00*
U.S. Cl. 73—194 F **10 Claims**



An injection flow meter is provided with means for triggering an X-ray beam generator to produce a sheet of ions in gas flowing in a pipeline at a rate determined by a voltage controlled oscillator having a period approximately equal to the transit time of a sheet of ions to a detector downstream. A logic network, activated at approximately the time an ion sheet is to be detected in order to lock out spurious detector pulses, continually determines whether the ion sheet arrives before or after the X-ray beam generator is retriggered to so adjust the control voltage that the X-ray beam generator is continually retriggered at substantially the same time ion sheets are being detected. A failure to detect ion sheets will not affect the last established control voltage thereby dividing the flow into a number of precise units of volume even in the absence of detector pulses.

3,718,044
FLOW METER FOR INDIRECTLY MEASURING THE FLOW OF BLOOD FROM A BLOOD PUMP
James W. Joyce, Jr., Rockville, and Fernando Villarroel, Bowie, Md., assignors to the United States of America as represented by the Secretary of the Army
Filed Dec. 7, 1971, Ser. No. 205,618
Int. Cl. G01f *1/00*
U.S. Cl. 73—223 **3 Claims**

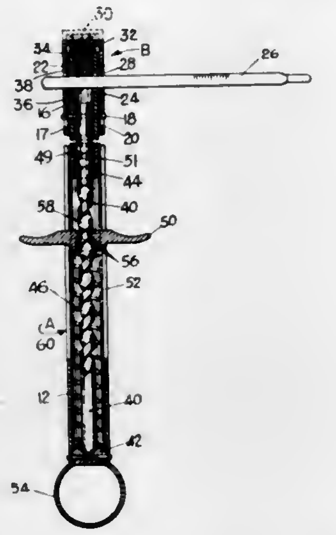


A flow meter is disclosed which indirectly measures the flow of blood from a blood pump without the necessity of entering the blood stream itself to secure a measurement. The flow meter is contemplated to be utilized in conjunction with a pulsatile blood pump of the type comprising a fixed volume cavity divided by a flexible member into a first chamber filled with blood and a second chamber, and wherein the blood in the first chamber is expelled by the pump upon compression of the flexible member by means of fluid pulses delivered by a fluid amplifier and applied to the second chamber. The instantaneous pressure of fluid in the second chamber is sensed and a signal is produced representative of the time varying value thereof. This signal is subsequently integrated to produce an output signal representative of the volume of fluid flow into the second chamber of the pump and thus the volume of blood flow from the first chamber of the pump since, in such a system, the volume of air that enters the second chamber during each cycle of pump operation is related to the volume of blood expelled from the first chamber.

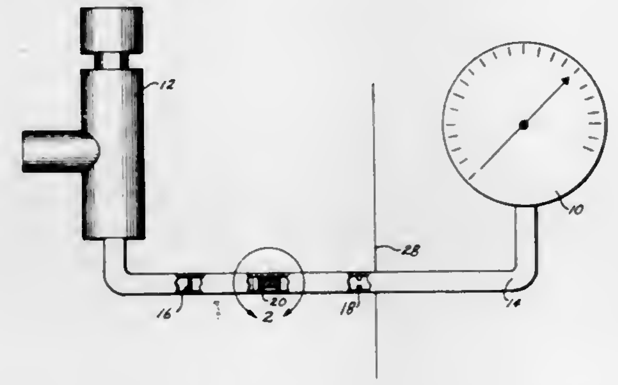
3,718,045
THERMOMETER SPINNER
Emery Dutch, 320 West 77th Street, New York, N.Y.
Filed July 19, 1971, Ser. No. 163,787
Int. Cl. G01k *5/06*
U.S. Cl. 73—373 **3 Claims**

An improved, hand-operated, thermometer spinner including a thermometer gripping and spinning section comprising a pair of telescoping members axially movable with respect to one another to expose an opening for receiving and gripping the thermometer. The gripping section is linked to a shaft

which is rotatable upon the application by hand of an axial force to a gripping member coupled to the shaft to convert the axial motion of the gripping member to the rotation of the shaft and thus of the gripping section.



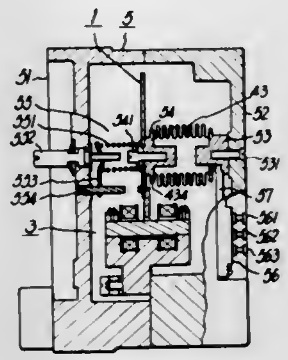
3,718,046
PRESSURE GAUGE ISOLATOR
Robert W. McJones, 529 Via Del Monte, Palos Verdes Estates, Calif.
Filed Oct. 8, 1970, Ser. No. 79,063
Int. Cl. G01l *19/06*
U.S. Cl. 73—395 **6 Claims**



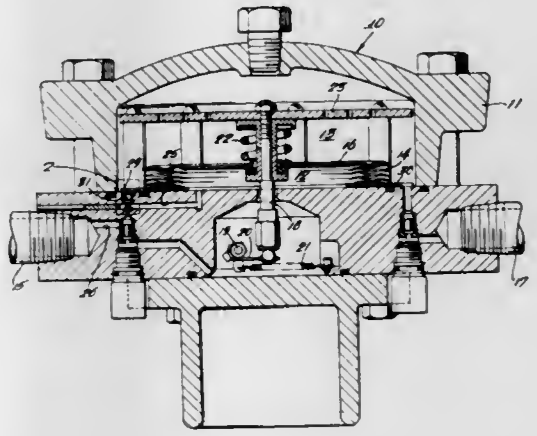
A pressure gauge isolator employs a tube or line between the pressure gauge and a source of pressure. A translatable piston or plug is disposed within the line between two constrictions. The first constriction prevents the plug from entering the system which comprises the source of pressure. The second constriction prevents the plug from passing beyond the constriction to prevent excessive pressurization of the gauge and to positively prevent the fluid of the pressure source from reaching the gauge. The plug or piston has a first end in sealing engagement with the inner wall of the tube and facing the pressure source. A second end of the plug has a diameter to provide a slight clearance between it and the inner wall of the tube. The plug is made of resilient material such as rubber.

3,718,047
FORCE-TO-SIGNAL CONVERTER
Mutsuaki Nakagawa; Takao Tauchi, and Tadashi Nishihara, all of Musashino-shi, Tokyo, Japan, assignors to Kabushiki Kaisha Yokogawa Denki Seisakusho, Tokyo, Japan
Filed Dec. 15, 1970, Ser. No. 98,268
Claims priority, application Japan, Dec. 26, 1969, 44/907; Jan. 12, 1970, 45/3406; Jan. 12, 1970, 45/3405; Jan. 27, 1970, 45/7533
Int. Cl. G01l *7/08, 9/10*
U.S. Cl. 73—398 R **7 Claims**

A force-to-signal converter having a device for receiving an external force, a device for transmitting the external force, a third device for converting the external force delivered from the second-mentioned device into a corresponding deflection, and a device for converting the deflection obtained from the third-mentioned device into a signal, in which the third-mentioned device is a substantially E-shaped spring.



3,718,048
RELIEF VALVES FOR DIFFERENTIAL PRESSURE FLOW METERS
Claude B. Nolte, Villanova, Pa., assignor to Kingmann-White, Inc., Placentia, Calif.
Filed June 7, 1971, Ser. No. 150,639
Int. Cl. G01l *13/02*
U.S. Cl. 73—407 R **10 Claims**



A differential pressure flow meter is provided with a relief valve for preventing inaccuracies from being induced in the readout of the meter by pressure reversals in the pipe. The flow meter has a bellows partitioning the meter casing into high and low pressure chambers at opposite sides of the bellows. In one embodiment, a flow passage in the casing extends between the high and low pressure chambers and a ball valve element is mounted in the flow passage with a portion of its surface confronting the low pressure chamber and biased against a shoulder by a spring. The ball is disengaged from its seat when the pressure in the low pressure chamber exceeds the pressure in the high pressure chamber to permit rapid equalization of pressure in the two chambers. In another embodiment, a disc-like valve element is mounted on the bellows for displacement with the bellows. The valve element is biased against a shoulder surrounding a passage in the bellows and is opened when a pressure reversal causes the bellows to contract toward the high pressure chamber. A stem on the valve element is adapted to engage an actuator in the high pressure chamber to open the valve and equalize the pressure in the two chambers.

3,718,049

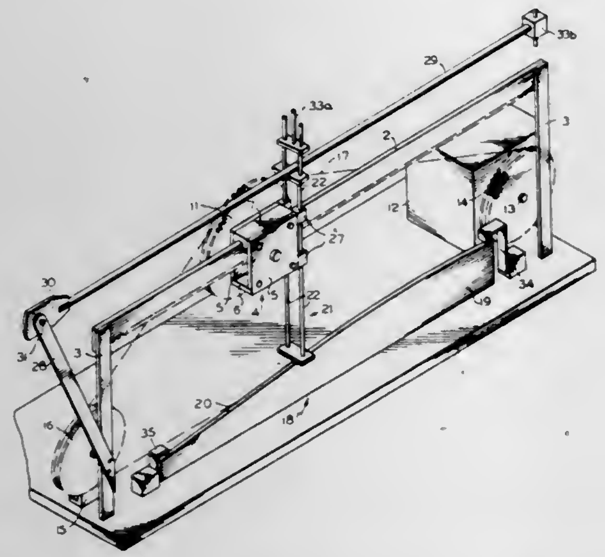
AUTOMATIC PROGRAM GENERATOR AND SIGNALLER SYSTEM

Charles Hanft, Hicksville, N.Y., assignor to The F. and M. Schaefer Brewing Co., Brooklyn, N.Y.

Filed May 14, 1971, Ser. No. 143,438

Int. Cl. F16h *27/02*

U.S. Cl. 74—89 **11 Claims**



A program cam assembly is mounted on a base. Mounted above the program cam assembly for longitudinal movement thereover is a carrier assembly carrying a cam follower assembly. The cam follower assembly has a cam follower which traverses a program surface of a program cam, thereby imparting vertical movement to the cam follower assembly. This vertical movement produces at least two separate program signals, The cam follower assembly is automatically operated to sequentially index a plurality of program cams beneath the cam follower.

3,718,050

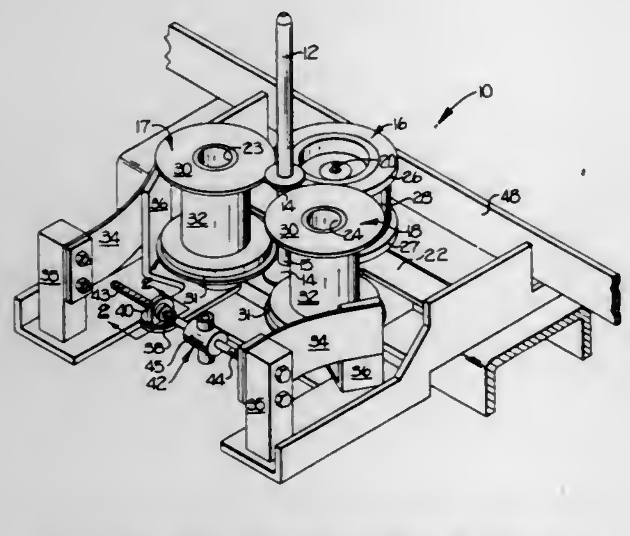
APPARATUS FOR ROTATING SPINDLE AT HIGH SPEED

Norbert J. B. Verhellen, Hickory, N.C., assignor to Regal Manufacturing Company, Hickory, N.C.

Filed Jan. 19, 1971, Ser. No. 107,629

Int. Cl. F16h *13/02;* **D01h** *7/46, 7/92*

U.S. Cl. 74—206 **4 Claims**



An apparatus for rotating a spindle at high speed comprising three rollers encompassing the spindle. The rollers are positioned to frictionally engage the driving whorl of the spindle to axially and rotatably support the same, and the diameters of the three rollers are substantially greater than the effective diameter of the spindle whorl such that the spindle is rotated at a multiple of the speed of the rollers. In one embodiment, a drive belt engages one of the rollers to effect rotation of the spindle and other two rollers, and in a second embodiment a circular band surrounds the three rollers and engages the drive belt. In both embodiments, means are provided for resiliently biasing the rollers into firm frictional engagement with the rollers.

3,718,051

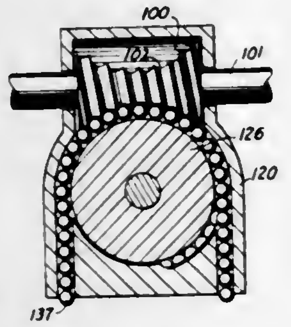
POWER TRANSFER SYSTEM

Francis B. Eck, 605 Brookline Dr. S.E., Marietta, Ga.

Filed Feb. 1, 1971, Ser. No. 111,450

Int. Cl. F16h *13/04, 1/04, 1/16*

U.S. Cl. 74—216.3 **10 Claims**



A power transfer system consisting of sprocket housings whose ports are inter-connected by flexible or formable or pre-shaped tubes, the tubes and the sprocket housings forming an endless track through which a plurality of juxtaposed spheres or balls are passed. The rotation of a sprocket in one housing causes transfer of the balls in their continuous path so as to rotate the sprocket in the other housing. Each sprocket is bifurcated and an arcuate member is placed adjacent the sprockets to facilitate the transfer of the balls from the housings to the tubes. A quick disconnect assembly is provided between the ports of each housing and the tubes, by which the tubes may be readily disconnected. The inadvertent discharge of the balls from the tubes and the housings is prevented by check members. The sprocket of the present invention cooperates, in certain embodiments with a pinion or a rack or a worm gear or a planetary arrangement.

3,718,052

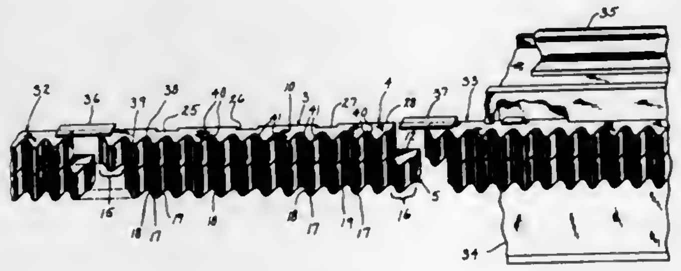
GEAR STRUCTURE AND METHOD OF MAKING THE SAME

William A. Barr, Milwaukee; Edwin C. Hahlbeck, Greendale, and Ferdinand L. Heine, Milwaukee, all of Wis., assignors to Milwaukee Gear Company, Milwaukee, Wis.

Continuation-in-part of Ser. No. 10,483, Feb. 11, 1970. This application April 5, 1971, Ser. No. 131,241

Int. Cl. F16h *55/06;* **B21d** *53/28*

U.S. Cl. 74—462 **12 Claims**



The manufacture of racks includes mounting of the rack elements relative to a meshing gear using as a reference only the operating pitch surfaces of the rack elements. Rack elements with different body dimensions mounted end to end to form a smooth rack. Rack elements mounted side-by-side with nonparallel standard pitch surfaces effect new modifications in axial tooth thickness. Rack elements with varying discrepancies in axial tooth thicknesses mounted together or separately produce a correct spur rack.

3,718,053

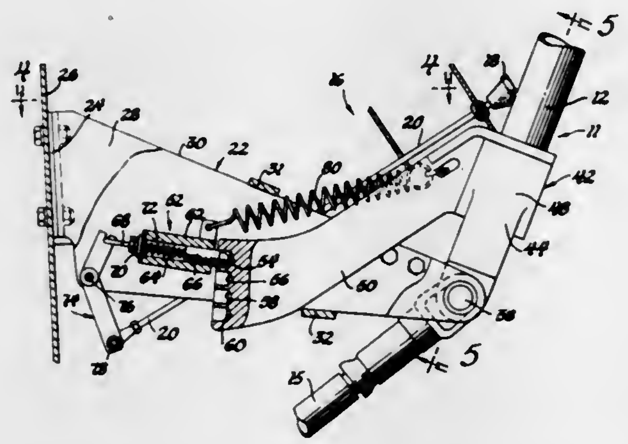
TILT STEERING WHEEL MECHANISM

James J. Cinadr, Parma, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 4, 1971, Ser. No. 186,097

Int. Cl. B62d *1/18*

U.S. Cl. 74—493 **2 Claims**



A tilt steering wheel mechanism having a column, the lower end of which is connected to a remotely controlled adjuster mechanism having a positioning member and a slidable bolt cooperating with the positioning member permitting the column to be pivoted to predetermined points about a horizontal axis for locking the wheel in an adjusted position.

3,718,054

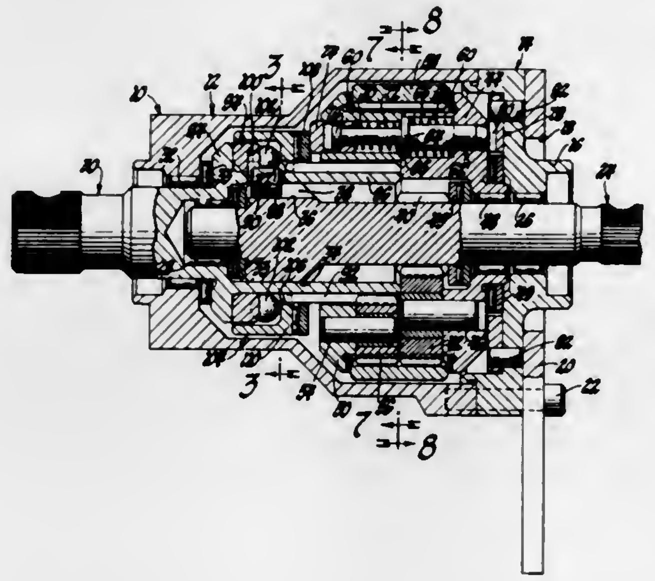
LOAD RESPONSIVE TORQUE TRANSMISSION MECHANISM

Ralph W. Perkins, and Russell L. Morden, both of Lansing, Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Oct. 7, 1971, Ser. No. 187,455

Int. Cl. F16h *5/54, 57/10*

U.S. Cl. 74—751 **4 Claims**



A load responsive torque transmission mechanism adapted to normally transfer torque at a unitary ratio and to automatically shift to a higher transmission ratio when the applied torque exceeds a predetermined minimum magnitude, the mechanism including an input shaft, an output shaft, a planetary gear train disposed therebetween, a pawl supported on the output shaft for unitary rotation therewith and for radial movement relative thereto between an extended position seated in a groove in the input shaft and directly coupling the input and output shafts and a retracted position, a plurality of spherical rolling elements disposed about the output shaft on opposite sides of the pawl such that radial movement of the latter effects lateral movement of the rolling elements, and cams associated with the rolling elements responsive to lateral movement thereof to impart thereto an axial component of motion. When excessive torque is applied to the input shaft the pawl is cammed out of the groove and the concurrent axial motion of the rolling elements actuates a plurality of lock pins which ground the planet carrier of the planetary gear train thereby to establish torque transmission through the gear train at a ratio exceeding unity.

3,718,055

ROTARY INDEXING MACHINE

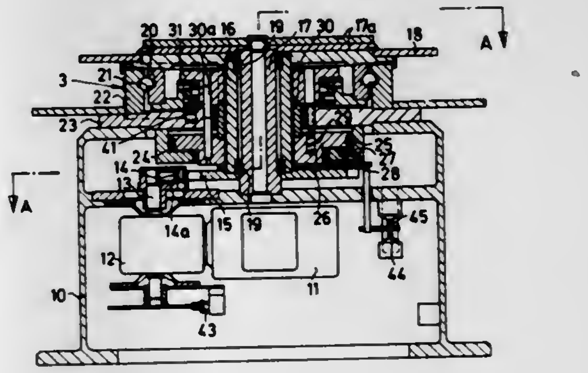
Heinz Maier, 7101 Sulzbach, Germany, assignor to Fischer-Brodbeck G.m.b.H. Prazisionsteile-Fabrik, Weinsberg, Germany

Filed Dec. 8, 1970, Ser. No. 96,065

Claims priority, application Germany, Dec. 11, 1969, P 19 62 097.4

Int. Cl. B23b *29/32*

U.S. Cl. 74—826 **11 Claims**



A rotary indexing machine in which for alternately turning the turntable one step in its peripheral direction and locking it between the steps the turntable is only rotatably mounted and immovable in its axial direction . This is effected by means of three crown gears, the first of which is secured to the turntable and surrounds a second stationary crown gear of the same pitch, while a third crown gear is alternately movable in opposite axial directions for simultaneously engaging it with the first and second gears so as to lock them to each other and thus to lock the turntable during its stopping periods and for disengaging it from the first and second gears during the turning movements of the turntable.

3,718,056

GEAR SHIFT CONTROL FOR AUTOMOTIVE TRANSMISSIONS AND THE LIKE

Winfried Felder, Aulendorf, and Walter Kuhn, Friedrichshafen, both of Germany, assignors to Zahnradfabrik Friedrichshafen Aktiengesellschaft, Friedrichshafen, Germany

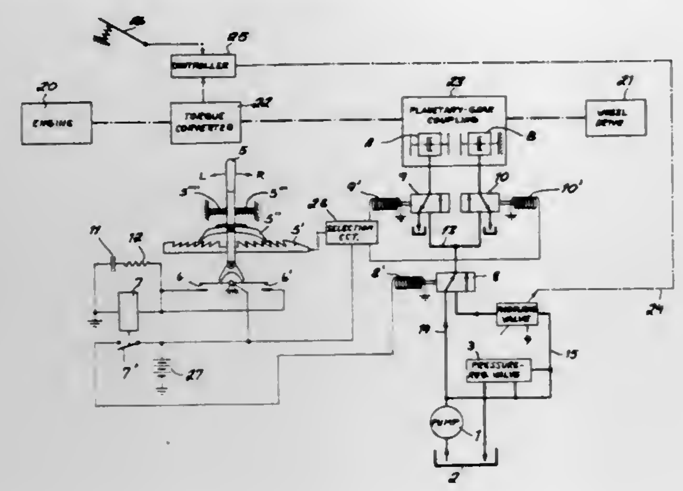
Filed Aug. 30, 1971, Ser. No. 176,180

Claims priority, application Germany, Sept. 1, 1970, P 20 43 196.3

Int. Cl. B60k *21/02, 29/00, 33/00*

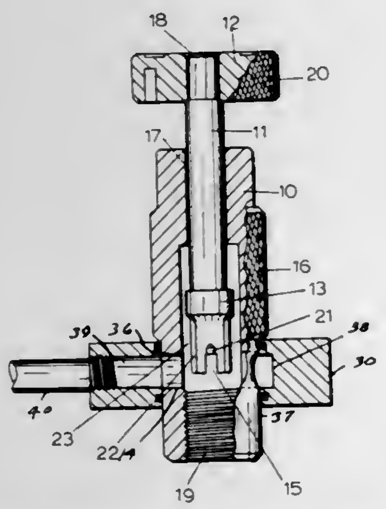
U.S. Cl. 74—865 **6 Claims**

A drive-establishing clutch or brake of an automotive power train, actuated hydraulically upon a shifting into gear, is connected through an individual control valve to a high-pressure duct communicating alternately with a source of constant hydraulic pressure and a source of variable hydraulic pressure dependent on such operating parameters as load and engine speed. As the gear-shift lever ist moved out of central position, a switch is closed to measure a short time interval after which the system switches from variable to constant supply pressure.



3,718,057
HIGH PRESSURE BLEED VALVE TOOL

Robert F. Berchtold, 3350 West 41st Street, Erie, Pa.
Continuation-in-part of Ser. No. 785,983, Dec. 23, 1968, abandoned. This application April 15, 1971, Ser. No. 134,221
Int. Cl. B60c *25/18*
U.S. Cl. 81—15.4 **2 Claims**

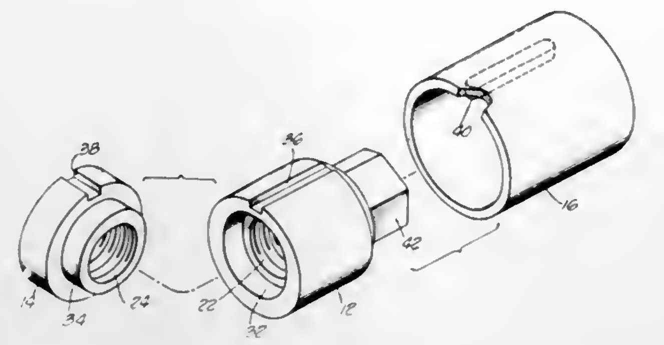


A tool for removing the check valve core, which is removably and threadably received in a valve casing of an inflation valve. The valve has a hollow barrel with a threaded stem therein. The barrel is made in such a way that it may be threadably received in the casing and the stem may be slid into engagement with the valve core so that the core can be threadably removed from the casing. There is ample room inside the barrel to receive the valve core and a bleed hole is formed in the side of the barrel to allow the air from the casing to escape after the valve is removed so that the valve cover will not become a projectile when the tool is removed.

3,718,058
CAMLOCK THREADED STUD ACTUATOR

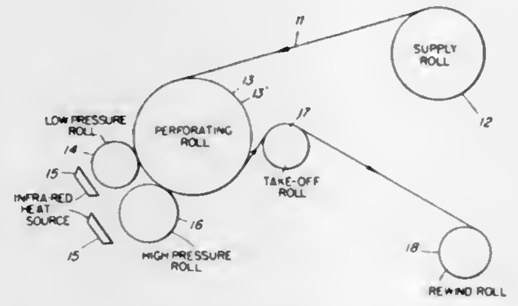
William Felix Jones, Jr., Houston, Tex., assignor to Borg-Warner Corporation, Chicago, Ill.
Filed July 16, 1971, Ser. No. 163,183
Int. Cl. B25b *3/50*
U.S. Cl. 81—53.2 **12 Claims**

A threaded stud actuator including two members having threaded bores adapted to be easily threaded in alignment along a threaded stud and having complementary camming structure between the members to cause the threaded bores of the members to grip the stud when relative rotation is imposed between the members.



3,718,059
PERMEABLE THERMOPLASTIC FILM PRODUCT AND METHOD

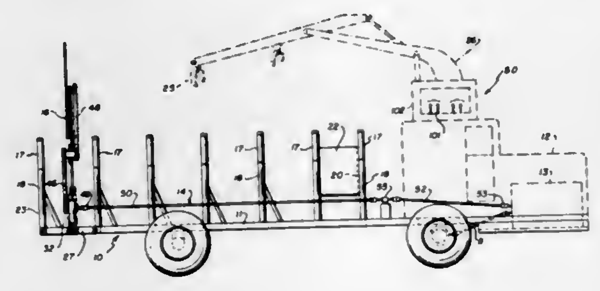
William J. Clayton, Fairport, N.Y., assignor to Mobil Oil Corporation
Continuation-in-part of application Ser. No. 676,560, Oct. 19, 1967. This application Dec. 18, 1969, Ser. No. 886,272
Int. Cl. B26f *1/00*
U.S. Cl. 83—2 **9 Claims**



The present invention relates to a thermoplastic film product and a method employed to increase the permeability of thermoplastic films by pressing such films, utilizing a resilient surface pressure roller, into contact with a discontinuous surface of a coated abrasive material whereby highly permeable films are produced which permit controlled passage of gases or vapors such as moisture vapor therethrough.

3,718,060
LOG-CUTTING APPARATUS

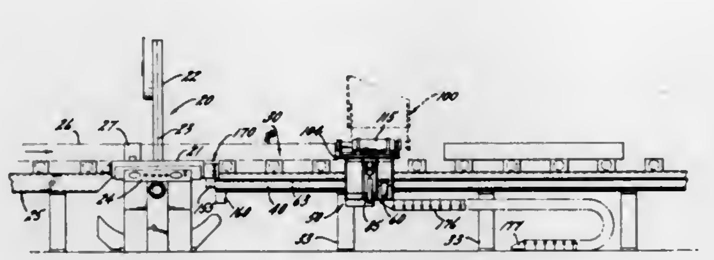
Fred W. Carlton and Jesse W. Carlton, both of Rte. 1, Oxford, Wis. 53952
Filed Sept. 21, 1970, Ser. No. 73,965
Int. Cl. B27b *5/10*
U.S. Cl. 83—84 **12 Claims**



A mobile log-cutting device which utilizes a pivotally actuated cutting means which is readily and safely engaged and disengaged from the logs being cut during a log-cutting operation.

3,718,061
STOP GAGE FOR BAND SAW CONVEYOR OR THE LIKE

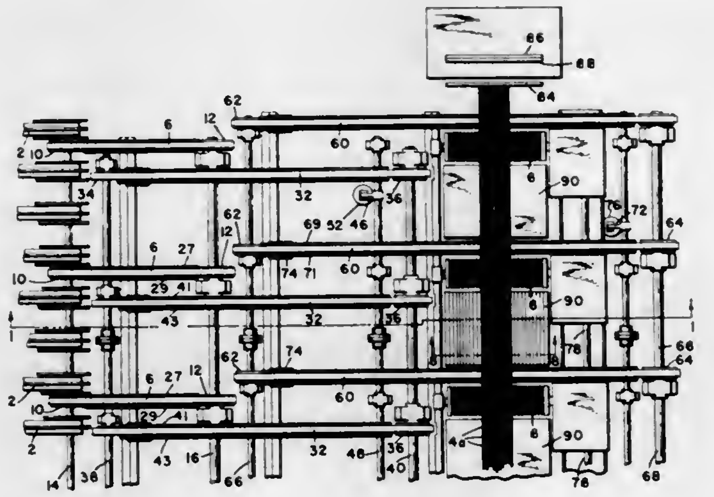
John P. Wilkin, Schaumburg, Ill., assignor to Armstrong-Blum Manufacturing Company, Chicago, Ill.
Filed June 29, 1970, Ser. No. 50,532
Int. Cl. B26d *7/16*
U.S. Cl. 83—201 **8 Claims**



A dead stop for positioning stock on the conveyor of a band saw to establish a desired cut off length. The stop member is mounted on a carriage which rides along a rail adjacent the conveyor on the downstream side and which may be clamped to the rail at a desired point. The stop member is hinged for upward swinging movement with provision for relative retreating movement along the hinge axis. A cam and cam follower are interposed between the stop member and the carriage with a fluid actuator for retracting and swinging up the stop member to permit a severed work piece to be transported along the conveyor for discharge. Upon impact the stop member retreats against the force applied by the actuator followed by prompt restoration to a reference position. The movement of the carriage and the clamping to the rail as well as the swinging of the stop member are all controlled from a control station at the band saw where the position of the stop member is accurately and continuously indicated on a calibrated tape which is subject to continuous tensioning and take-up by a negator spring.

3,718,062
PRODUCT HANDLING SYSTEM FOR COOLING BEDS

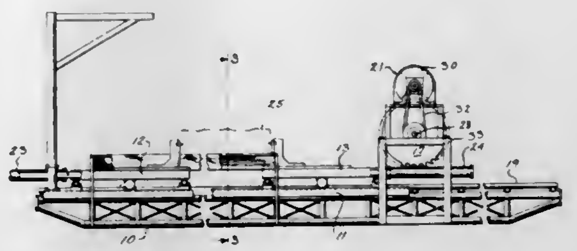
Martin Gilvar, Westboro, Mass., assignor to Morgan Construction Company, Worcester, Mass.
Filed April 26, 1971, Ser. No. 137,185
Int. Cl. B26d *3/16;* **B65g** *37/00*
U.S. Cl. 83—268 **17 Claims**



A mechanism for maintaining hot rolled bars in spaced parallelism from the time they leave the carryover racks until deposited on grooved runoff rolls where the same spacing of the bars is maintained. The spacing on the runoff rolls will match the spacing of the notched knives that cut the bars.

3,718,063
CANT-PRODUCING SAWMILLS

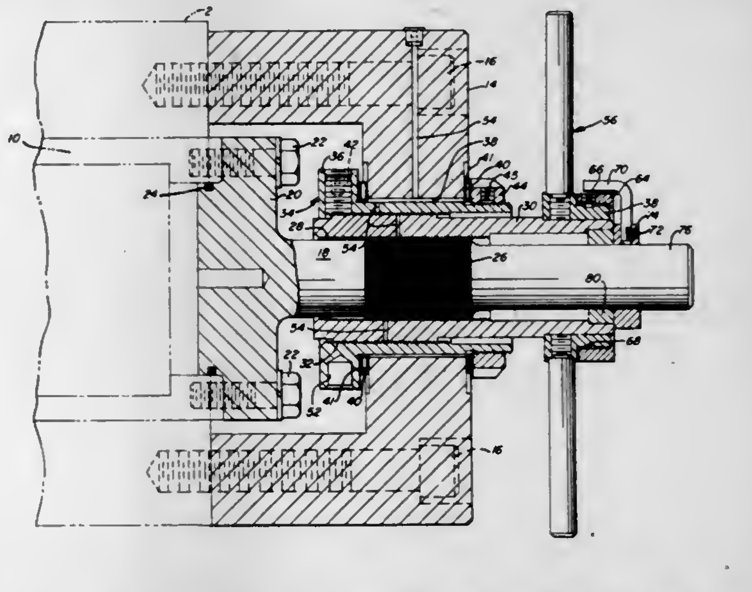
Thomas F. Meis, P.O. Box 27, Mondovi, Wis. 54755
Filed Oct. 14, 1970, Ser. No. 80,574
Int. Cl. B27b *7/00, 29/10*
U.S. Cl. 83—471.2 **1 Claim**



An improved machine for sawing rough logs into so-called cants, or logs that have been slabbed to provide a partially finished log which is adapted to be fed into a gang saw to produce flat boards, which machine includes a pair of parallel, independently laterally-movable circular saw blade units together with a log-retaining headblock assembly which is also laterally adjustable to permit the operator to select the size of the cant produced, and also including means for adjusting the position of a somewhat crooked or imperfect log relative to said saw blades to ensure the production of consistently uniform, high-quality cants.

3,718,064
APPARATUS FOR ADJUSTMENT OF SIDE TRIMMER KNIFE

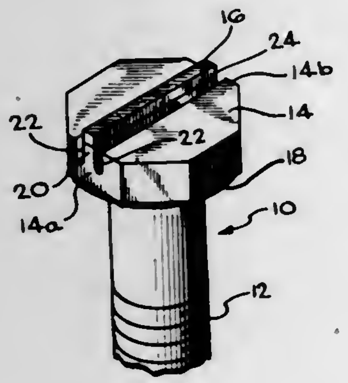
Eugene V. Abarotin, Franklin Township; Edward R. Bollinger, Delmont Borough, and Thomas E. Nicely, Franklin Township, all of Pa., assignors to United States Steel Corporation
Filed Jan. 21, 1971, Ser. No. 108,489
Int. Cl. B23d *19/04;* **B26d** *1/24*
U.S. Cl. 83—502 **5 Claims**



Apparatus consists of a differentially threaded sleeve surrounding and in threaded engagement with an adjustment rod which in turn is connected with an axially adjustable side trimmer knife-mounting in a side trimmer housing. An elongated nut, which is restrained from axial movement, is circumferentially mounted around the sleeve in threaded engagement therewith. Means are provided for selectively restraining the sleeve from axial movement relative to the adjustment rod during rotation of the sleeve. This permits the adjustment rod to move axially at a relatively high rate for coarse adjustment of the side trimmer knife. When the sleeve is free of axial-movement restraint during rotation, it moves axially in one direction while the adjustment rod moves axially in the opposite direction depending upon the direction of rotation of the sleeve. This causes the adjustment rod to move at a relatively low rate for fine adjustment of the side trimmer knife. The fine adjustment rate of movement is equal to the difference between the rate of axial movement of the sleeve and the rate of axial movement of the adjustment rod.

3,718,065
TENSION INDICATING FASTENER

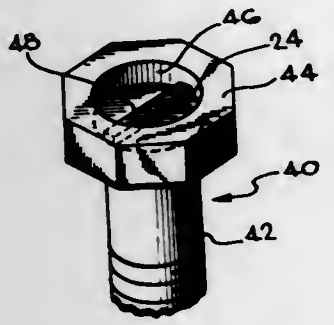
Theodore Liber, Chicago, Ill., assignor to I.I.T. Research Institute, Chicago, Ill.
Filed Dec. 24, 1970, Ser. No. 101,298
Int. Cl. G01d *21/00*
U.S. Cl. 85—62 **5 Claims**



A bolt having a shank and integral head has a strip of photoelastic material mounted in the head for manifesting in the form of photoelastic fringes linearly related to bolt tension the bending stresses created in the head during loading of the bolt. To determine the tension in the bolt during or after loading, polarized light is directed toward the photoelastic strip and reflected light from the strip is analyzed to measure fringe order. The fringe order is related to the amount of bending stresses in the head of the bolt by a predetermined calibration curve, the bending stresses being linearly related to bolt tension.

3,718,066
TENSION INDICATING FASTENER

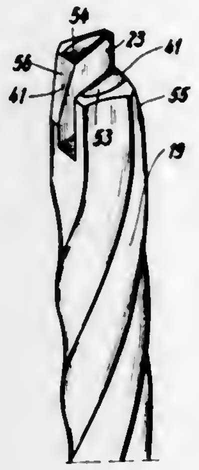
James W. Dally, Westmont, Ill., assignor to IIT Research Institute, Chicago, Ill.
Filed Dec. 28, 1970, Ser. No. 101,597
Int. Cl. G01d *21/00*
U.S. Cl. 85—62 **8 Claims**



A bolt having a shank and integral head has a strip of photoelastic material mounted on the head for manifesting in the form of photoelastic fringes linearly related to bolt tension the bending stresses created in the head during loading of the bolt. To determine the tension in the bolt during or after loading, polarized light is directed toward the photoelastic strip and reflected light from the strip is analyzed to measure fringe order. The fringe order is related to the amount of bending stresses in the head of the bolt by a predetermined calibration curve, the bending stresses being linearly related to bolt tension.

3,718,067
FASTENING SYSTEM

Artur Fischer, 219 Altheimer Str., D–7241 Tumlingen, Germany
Filed Dec. 15, 1970, Ser. No. 98,348
Claims priority, application Germany, Dec. 27, 1969, P 19 65 026.1; Jan. 30, 1970, P 20 04 162.7
Int. Cl. F16b *13/06*
U.S. Cl. 85—68 **6 Claims**

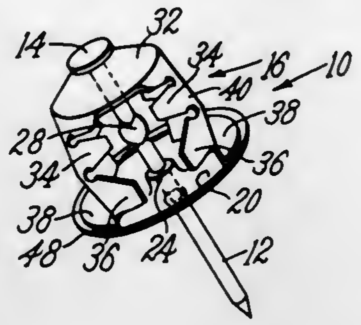


A flat first member has two major surfaces and is provided on its leading end portion with cutting edges. for drilling holes in a support structure. A pair of elongated ribs are each provided on one of the major surfaces extending between the trailing and leading end portions of the first member and located at opposite sides of a center line connecting the end portions. The ribs have respective inner edges which face towards the center line and which converge over at least a part of their length at an acute angle towards the leading end portion. An elongated second member has a front portion an axial slot of which can matingly but releasably receive at least the trailing end portion of the first member so that when by engagement of the rear portion of the second member with a tool the two members are jointly rotated, the cutting edges of the first member will drill a hole in the support structure whereupon the second member is released from the first member and withdrawn from the hole. An elongated third member is insertable into the thus-drilled hole and has an expandable portion provided with an axial slit so configurated that when it receives forcibly the trailing end portion of the first member, it is spread apart in locking engagement with the material of the support structure surrounding the hole. The opposite end of the third member is configurated as a threaded fastening portion which projects from the hole and to which an object may be secured.

3,718,068
HOLE PLUG FASTENERS

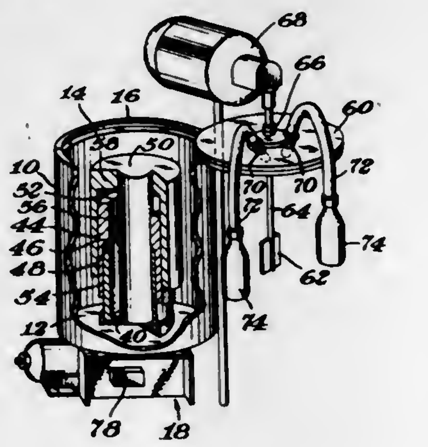
LaRoy B. Passer, Wyomissing, Pa., assignor to USM Corporation, Flemington, N.J.
Filed April 14, 1971, Ser. No. 133,802
Int. Cl. F16b *13/06*
U.S. Cl. 85—71 **3 Claims**

A composite blind fastener particularly well adapted for closing holes in the ½ to 1½ inch diameter range in sheet material is provided. It comprises a sealing disc or cap engageable with one side of a workpiece having a hole to be plugged, a headed mandrel extending through the cap and the hole in the workpiece, and an axially collapsible, radially expansible anchoring or clamping member secured on the mandrel for engagement with the blind side of the disc. Advantageously, the anchoring member may be stamped from a piece of sheet stock and formed with an initial body diameter slightly smaller than the hole to be plugged. Retraction of the mandrel head causes the inserted member to contract axially and be radially enlarged to clamp the disc in hole closing relation against the workpiece. The retracted mandrel is preferably formed to be locked into the installed plug fastener.



3,718,069
MIXER-MOLDER

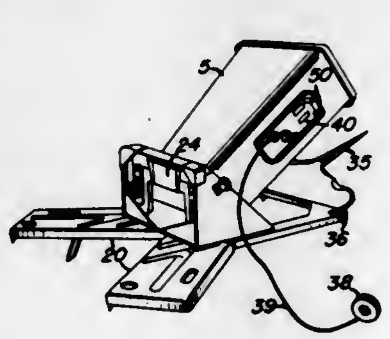
John J. Plomer, Midland, Hazen V. Doan, Auburn, and Thomas E. Slykhouse, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.
Filed Jan. 28, 1966, Ser. No. 524,375
Int. Cl. C06d *1/08*
U.S. Cl. 86—20 D **3 Claims**



The invention is a mixer-molder unit particularly suitable for use in the blending and in situ forming of solid propellant grains. Power supply, drive means and mix component supply means are exterior to the unit. The mixing container inside of the unit can be the actual motor case for holding a propellant grain.

3,718,070
EXPENDABLE LAUNCHER MUNITION

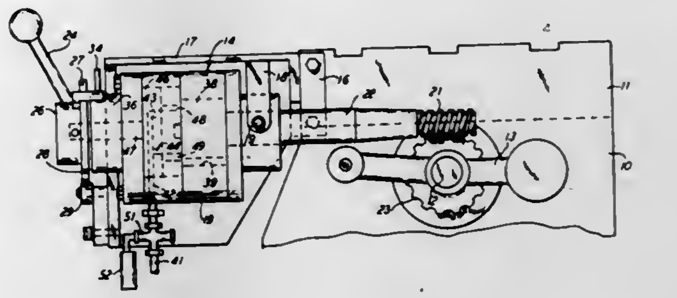
Clayton J. Schneider, Jr., East Aurora, N.Y., assignor to the United States of America as represented by the Secretary of the Army
Filed Apr. 23, 1971, Ser. No. 136,695
Int. Cl. F41f *3/04*
U.S. Cl. 89—1.8 **3 Claims**



An apparatus and method for launching munitions to a target site from an expendable launching means. The expendable launcher is designed so it is not capable of being re-used.

3,718,071
POWER FEED FOR THE TABLE OF A MACHINE TOOL OR THE LIKE

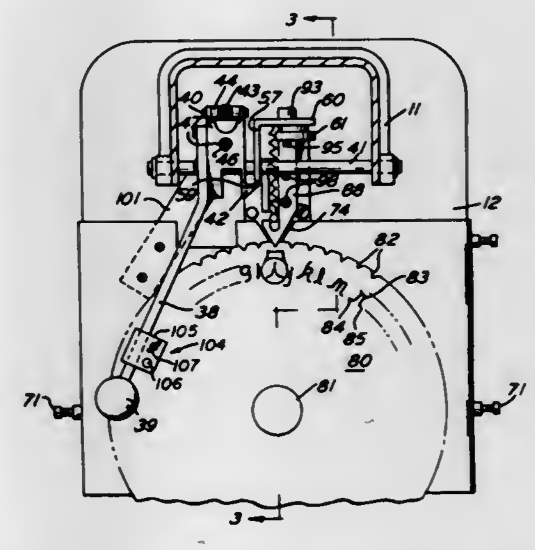
James P. Steibel, Sturtevant, Wis., assignor of a fractional part interest to Samuel J. Ashelford, Alexandria, Va.
Filed Oct. 29, 1971, Ser. No. 193,805
Int. Cl. B23c *9/00;* **B23q** *5/26*
U.S. Cl. 90—21.5 **11 Claims**



A power feed for the table of a machine tool which has rotatable shaft for moving the table. A power source is applied to the shaft through a drive member on the power source for engaging a driven member on the shaft, and thereby powering the table feed. The power source is shown pivotally mounted on the machine tool for engagement and disengagement of the drive member with the driven member so that the table can be either power driven, when the source is engaged, or it can be manually moved, when the power source is disengaged. A single control handle governs the pivotal action for the drive engagement mentioned, and the same single control handle governs the operation of the power source. The control handle has members connected thereto for effecting the pivotal action for drive engagement or disengagement, and the arrangement is such that the drive is engaged prior to the time that the power source is energized, such energizing being effected by movement of the handle beyond the position where the drive member is pivoted into engagement with the driven member.

3,718,072
ATTACHMENT KIT FOR COPYING MACHINE FOR ENGRAVING JEWELRY RINGS

George Berlant, Bellerose, N.Y., assignor to New Hermes Engraving Corporation, New York, N.Y.
Division of Ser. No. 887,947, Dec. 24, 1969, Pat. No. 3,608,429. This application Sept. 1, 1971, Ser. No. 176,960
Int. Cl. B23c *1/16*
U.S. Cl. 90—62 R **3 Claims**



An attachment kit for modifying a copying and engraving machine that utilizes a pattern carrier of a standard diameter so that it can copy indicia from a plurality of circular pattern carriers of different diameters. An adapter bracket properly positions the circular pattern carriers so that they can be engaged by a tracing tool. Additionally, the attachment kit includes a locking member that cooperates with the locking member on the machine that normally engages the standard pattern carrier so that the non-standard pattern carriers can be locked in position so that the indicia thereon can be copied and engraved. Furthermore, the attachment kit includes a member that limits the spacing between engraved characters to a predetermined distance and a screw device that controls the depth of the engraving cut.

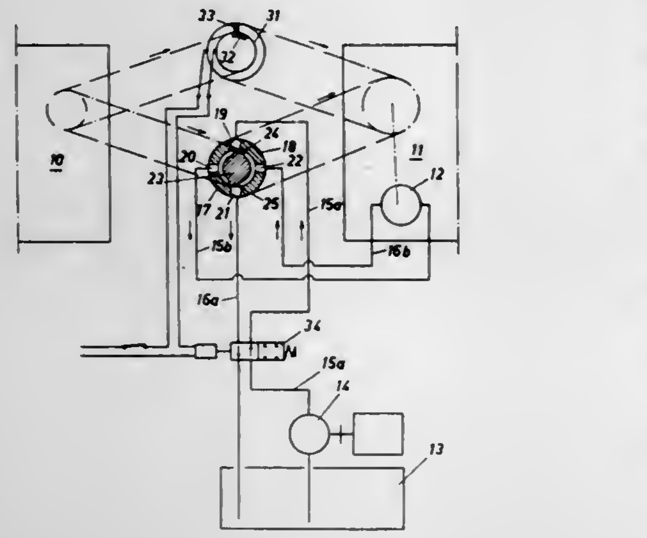
3,718,073
MEANS FOR SYNCHRONIZING A SPEED-FOLLOWING MACHINE IN RELATION TO A SPEED-SETTING MACHINE

Alf Harald Liljeqvist, 260 44 Mjohult, and Folke Liedholm, Havertgatan 33, Halsingborg, both of Sweden

Filed June 28, 1971, Ser. No. 157,131

Int. Cl. F15b *11/22*

U.S. Cl. 91—412 **4 Claims**



When two machines are working in tandem to perform successive working on a component there is an obvious need for synchronizing the running of the two machines, so that the second one is prepared to receive the component, when the first machine has terminated its working step thereon. An exact timing of the operation is obtained if the second machine is driven hydraulically and the conduits conveying the pressure fluid included a governing valve having two rotatable members, each driven by one of the machines and the conduits further include a solenoid valve, which is governed by signals from an indicating switch, likewise having two members, each driven by one of the machines. The governing valve determines the amount of hydraulic fluid supplied to the second machine and the indicating switch ensures that the conduits are open only within a selected range of angular displacement between the two machines.

3,718,074
COLOR DATA ACQUISITION CAMERA

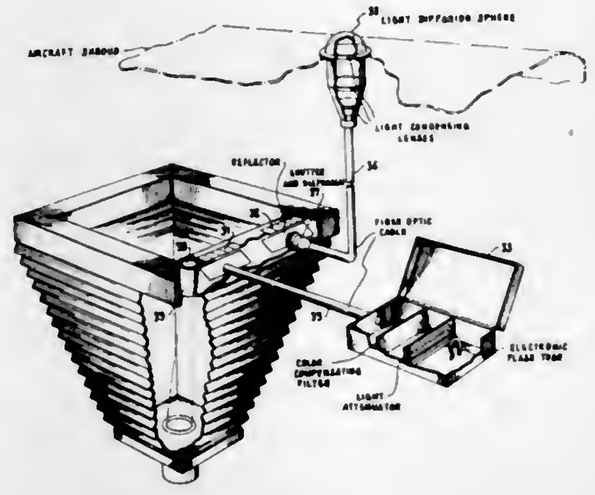
Richard H. Davis, 14406 Fontaine Court, Dale City, Va.

Filed May 13, 1971, Ser. No. 142,960

Int. Cl. G03b *17/24*

U.S. Cl. 95—1.1 **4 Claims**

This invention is a camera for use in making true color photographs which is especially useful in aerial and space photography applications. In accordance with the invention, the camera provides a gray scale reference image for each scene photographed. This reference image is exposed on an edge of the film by means of a light characteristic reference image negative disposed in close proximity to the film surface and fiber optic light transmission means which transmits light energy to the negative such that the edge of the film is exposed through the reference negative. Edge disposition of the reference image enables automatic processing of true color prints from the negative. The reference image may be made with a light source located in or near the camera and/or with light from the natural or artificial scene-illuminating source. A spot representing the density of the scene being photographed may be exposed adjacent to the one or two gray scale images by light passing through the camera lens and an internal lens system.



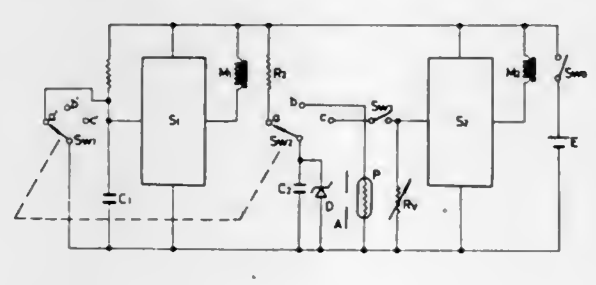
3,718,075
EXPOSURE CONTROLLING DEVICE FOR A CAMERA

Mitsutoshi Ogiso, and Tadashi Ito, both of Kanagawa-ken, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 23, 1970, Ser. No. 91,889

Int. Cl. G03b *9/62, 7/08*

U.S. Cl. 95—10 CT **6 Claims**



In the disclosed camera exposure control, a capacitor charged to a predetermined potential, is discharged for a predetermined time at a rate established by light passing through a preset iris in the lens of the camera. After the predetermined time, the residual charge across the capacitor serves as a memory value for controlling the camera's shutter.

3,718,076
SHUTTER SPEED CONTROL APPARATUS FOR A CAMERA

Hiroshi Ueda, Nara, and Yoshio Kuramoto, Sakai, Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha

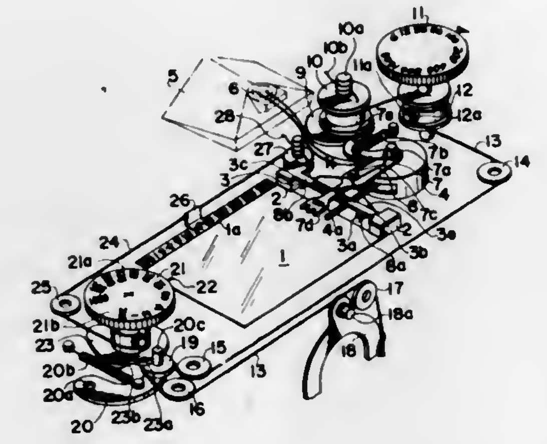
Filed Dec. 23, 1970, Ser. No. 101,062

Claims priority, application Japan, Dec. 29, 1969, 45/105,223

Int. Cl. G01j *1/42;* **G03b** *17/20*

U.S. Cl. 95—10 C **7 Claims**

A shutter control is adjustable to the lowest speed that will provide a non-blurred photograph when a shutter speed setting member is positioned at an automatic exposure position wherein the exposure setting is determined as a function of shutter speed diaphragm aperture and film speed settings. The viewfinder displays both indications of the intensity of light and the exposure condition set by the shutter control apparatus. The diaphragm aperture setting member is also set to a setting which represents the difference between a maximum setting and a pre-set setting in accordance with the rotation angle of a rotatable ring in the lens barrel of the camera.



3,718,077
TRANSISTORIZED CONTROL DEVICE FOR CAMERA SHUTTERS INCLUDING EXPOSURE SETTING AND SHUTTER DELAY TIMING MEANS

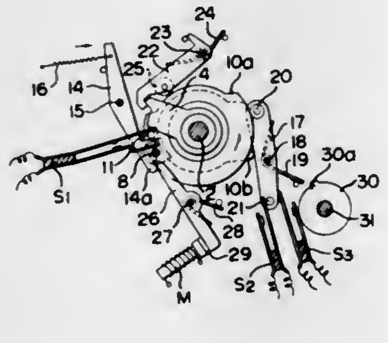
Shigeo Ono, Tokyo, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

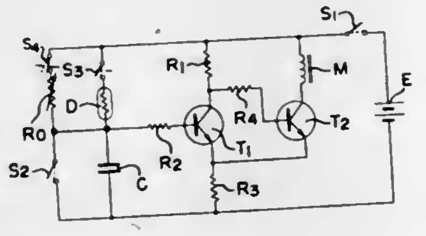
Continuation of Ser. No. 536,917, March 3, 1966, abandoned. This application Nov. 24, 1969, Ser. No. 872,476

Claims priority, application Japan, March 31, 1965, 40/18832

Int. Cl. G03b *7/08, 9/64*

U.S. Cl. 95—10 CT **7 Claims**





An apparatus for electronic exposure control in photographic cameras in which both the exposure time and the duration of a delayed action, which can be switched on as desired, are electronically controlled. A single capacitor is used for both delay timing networks and a single electromagnet serves as the stopping control. Current flows from a source only when the shutter button is released.

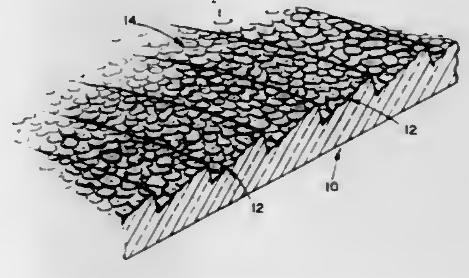
3,718,078
SMOOTHLY GRANULATED OPTICAL SURFACE AND METHOD FOR MAKING SAME

William T. Plummer, Concord, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Dec. 31, 1970, Ser. No. 103,199

Int. Cl. G02b *3/08*

U.S. Cl. 95—49 **20 Claims**



A method for forming a light-scattering surface in which the surface, made from a soluble material, is sprayed with droplets of a volatile solvent. After the droplets evaporate, the surface is found to be smoothly perturbated. Molds can be made of the perturbated surface from which duplicates can be pressed in large numbers and in a variety of materials. A surface perturbated according to the present process is useful in optical articles for randomly distributing, within a predetermined solid angle, light incident on said surface. Applications for the light-scattering surface include: focusing screens; fresnel condenser optics; and, non-glare windows.

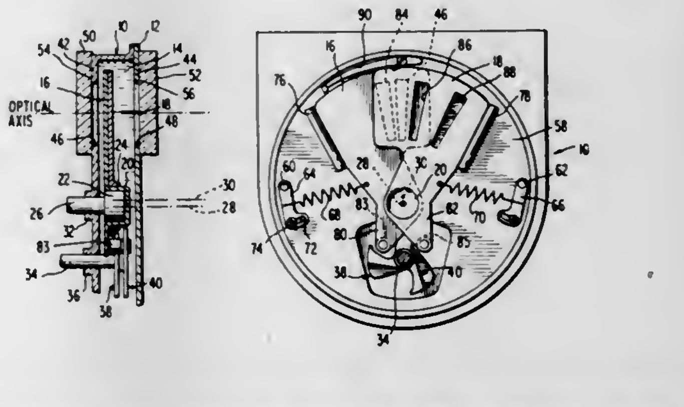
3,718,079
SHUTTER ASSEMBLY FOR PHOTOGRAPHIC EQUIPMENT

David L. Fuller, Atlanta, Ga., assignor to Scripto, Inc., Atlanta, Ga.

Filed Oct. 8, 1971, Ser. No. 187,772

Int. Cl. G03b *9/14*

U.S. Cl. 95—62 **14 Claims**



A between-the-lens shutter which includes a sealed casing containing a liquid of selected index of refraction to couple two optical elements of the camera lens and which also houses a pair of shutter blades. The shutter blades are mounted to pivot about an axis offset with respect to an aperture through the casing and are controlled by a common cocking-releasing cam. The shutters are cocked sequentially and released simultaneously. A high shutter speed effect is achieved by allowing both shutter blades, when released to return simultaneously toward their normal or rest positions and a slow shutter speed effect is achieved by delaying the return of the second-cocked shutter blade when the two blades are released simultaneously. The delayed return is achieved by a latch made operative by slightly shifting the pivot mounting for the two shutter blades, the latch temporarily holding the second shutter blade in cocked position and being disengaged from this shutter blade in response to movement of the other shutter blade to its rest position after both blades have been simultaneously released by the cam.

3,718,080

DEVICE FOR DEVELOPING TWO-COMPONENT DIAZO PHOTOSENSITIVE MATERIAL

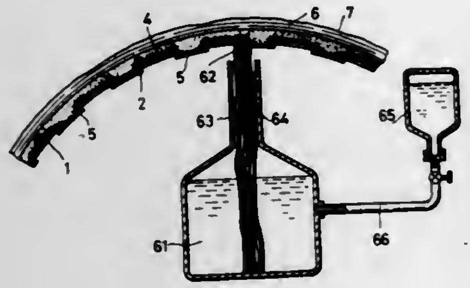
Yoshiro Yamamoto, Nagoya, and Michio Tajihi, Osaka, both of Japan, assignors to Kabushiki Kaisha Yamamoto Kogyosho, Nagoya, Japan

Filed Nov. 3, 1971, Ser. No. 195,367

Claims priority, application Japan, Nov. 19, 1970, 45/102259

Int. Cl. G03d *3/12*

U.S. Cl. 95—94 G **7 Claims**



A dry developing device for two-component diazo photosensitive material, comprising a heating chamber and a developing roller disposed therein. Liquid developer is applied to the inner peripheral surface of the developing roller gradually, so that it is gasified by the heat from the heating chamber for producing a gaseous developer layer on the outer peripheral surface of the developing roller where the photosensitive material is delivered and developed.

3,718,081

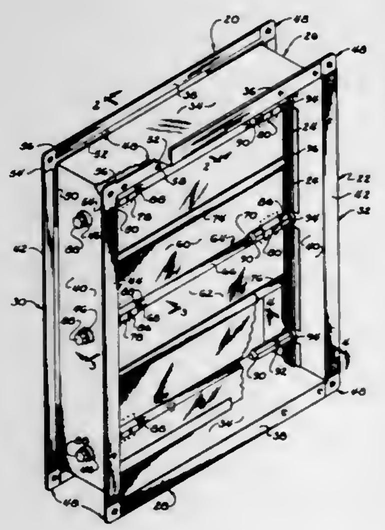
CONTROL DAMPER CONSTRUCTION

James R. Root, Independence, Mo., assignor to Ruskin Manufacturing Company, Grandview, Mo.

Filed Nov. 4, 1970, Ser. No. 86,697

Int. Cl. F24f *13/00*

U.S. Cl. 98—110 **13 Claims**



A control damper is provided with a pair of transversely polygonal axle members for mounting the damper vane on a supporting frame. The axle members are received within complementally polygonal channels at each end of the damper vane and are held in the channels by retainer components which bridge the respective channels. When the axle members are inserted into the channels, the retainer components are placed under tension to assure a tight interengagement of the axle members with the vane. A section of the frame adjacent each axle presents an integral outturned collar which serves as a bearing surface for a bushing received upon the end of each axle member. A multiple-flanged sealing member disposed on the inside of the frame provides for a tight fit between the vane and the sealing surface of the frame while reducing the tolerance requirements between the vane and the frame. The frame is provided with heavy, relatively rigid corner braces which provide added strength to the frame structure. The frame sections are rigidly secured to the braces by deforming a portion of the relative malleable frame section material into appropriate cavities in the corner braces.

Directional control of the damper vane is achieved through a reversible link which is coupled with an arm rigid with one of the axle members and also with an actuating lever. A motor mounting bracket for supporting a prime mover for the actuating lever is provided by a pair of planar members, each of which is secured to the damper frame in a flat disposition and each of which is provided with a line of weakness to allow bending of the planar members into two perpendicular bracket sections which have interengaging tab projections.

3,718,082

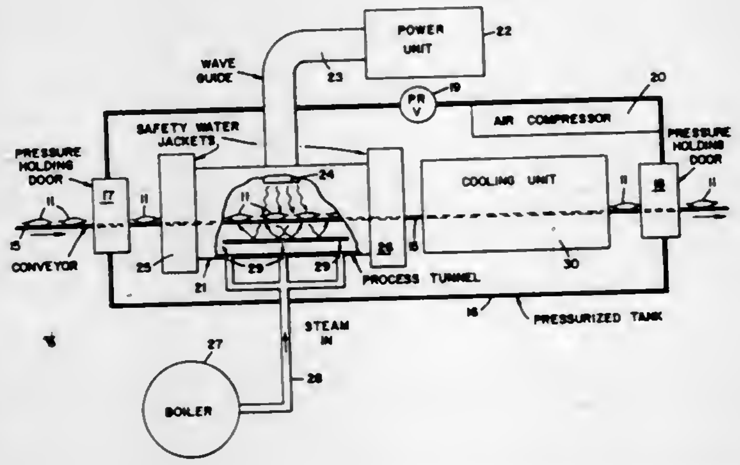
APPARATUS FOR CONTINUOUS ELECTROMAGNETIC STERILIZATION

Samuel P. Lipoma, 825-19th Place, Delano, Calif.

Filed April 20, 1971, Ser. No. 135,629

Int. Cl. A23l *3/04*

U.S. Cl. 99—470 **11 Claims**



Method and apparatus for sterilizing food in a continuous process with the aid of electromagnetic energy. A conveyor conducts food into and out from a pressure vessel that encloses and pressurizes an electromagnetic sterilizing tunnel and a cooling means, through both of which the conveyor conducts the food. The pressure vessel has pressure retaining means at the loci where the conveyor enters and leaves the tank. The food may be either in or out of containers; if in containers, the containers may be either open or closed and sealed, so long as the containers are of a type transparent to the electromagnetic energy being used. If the containers are not closed, a container sealing device is interposed between the sterilizing tunnel and the following cooling means. If the food has not been put in containers at all when it enters the pressure vessel, it is packaged inside the pressure vessel. Having the sterilizing and cooling done under pressure enables the use of high temperature sterilization and enables prevention of overcooking as well as preservation of the basic texture and shape of the food being treated. Superheated steam may be used in the sterilization step.

3,718,083

POULTRY PROCESSING APPARATUS

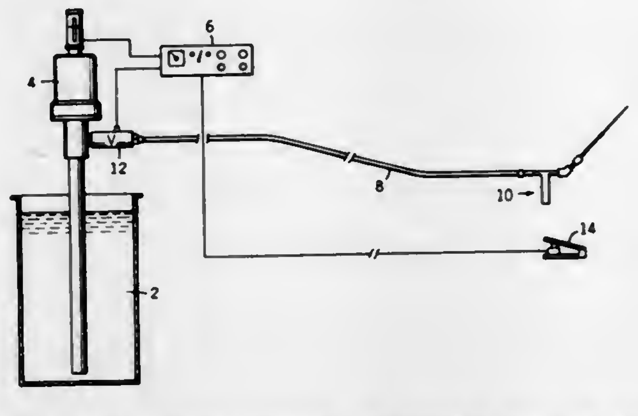
Roger E. Walters, Glendale, Mo., assignor to Ralston Purina Company, St. Louis, Mo.

Filed May 24, 1971, Ser. No. 146,066

Int. Cl. A23b *1/16*

U.S. Cl. 99—532 **6 Claims**

Apparatus is shown for injecting a material into a poultry product whereby the injection needles may be provided at a location remote from the pump and shut-off valve controlling the flow of material to the injecting apparatus. The injection apparatus consists of a needle assembly having the needles provided at a predetermined angle to the handle on the needle assembly such that when the operator holds the injection apparatus in the normal position, the needles are positioned to prevent the injection material from leaking or dripping therefrom. Further, since there is substantially no leakage of injection material from the needles, it is possible to inject birds with a desired quantity of fluid within very low tolerances.



3,718,084

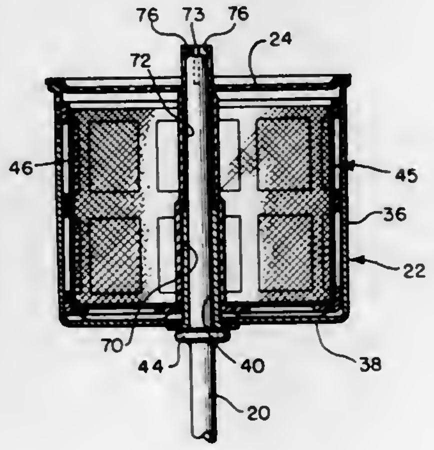
COFFEE MAKER BASKET AND FILTER

Dale E. Bufkin and Willard G. Murphy, Macon, Mo., assignors to McGraw-Edison Company, Elgin, Ill.

Filed Nov. 9, 1971, Ser. No. 197,081

Int. Cl. A47j *31/08*

U.S. Cl. 99—312 **8 Claims**



A basket filter for a percolator type coffee maker having a vessel and percolator tube supported therein, the basket filter having a stem which fits loosely over the tube until restrained thereon by the coffee maker basket or by shoulders on the tube, the top end of the stem extending along the tube and being of plastic or other flexible insulating material and having resilient tabs defined thereon which can be squeezed against the underlying tube for gripping same and simultaneously removing the tube, coffee maker basket and the basket filter from the vessel.

3,718,085

APPARATUS FOR PRINTING ON CYLINDRICAL ARTICLES

Georges Perret, Bergerac, France, assignor to Geneco Inc., Panama, Geneva, Switzerland

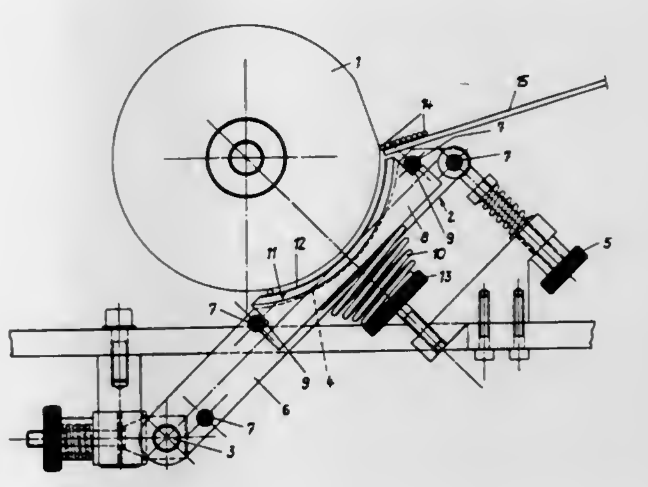
Filed Jan. 26, 1971, Ser. No. 109,796

Claims priority, application Switzerland, Jan. 28, 1970, 1210/70

Int. Cl. B41f *17/22*

U.S. Cl. 101—40 **3 Claims**

A printing machine for automatically printing cylindrical articles, such as tubes, has a stereotype on the cylindrical surface of a rotatable drum. A member having a surface in the form of a sector of a cylinder is floatably mounted on a rigid orientable cradle. Spring means urge the member towards the drum and stop means on the cradle cooperate with the member to define a rest position in which the said surface is concentric to the drum and separated therefrom by a gap smaller than the diameter of the articles. During printing, the articles roll one by one over the surface of the member which, by displacement, accomadates for irregularities in the shape of the articles.



3,718,086

SCREEN PRINTING MACHINE WITH ADJUSTABLE BRIDGE

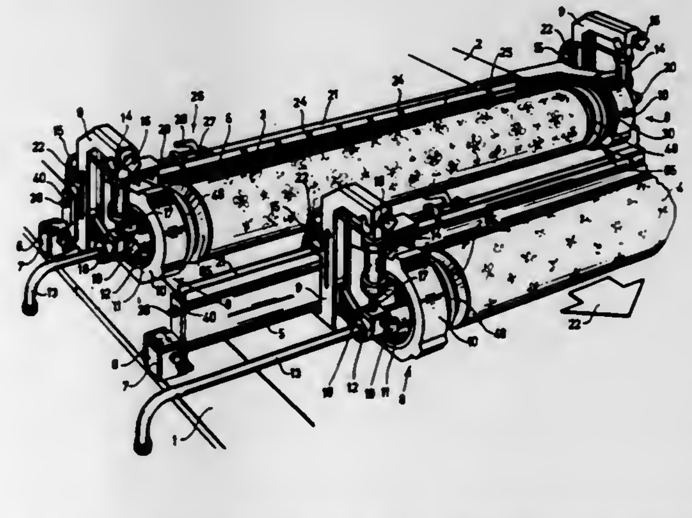
Jacobus G. Vertegaal, Boxmeer, Netherlands, assignor to Stork Amsterdam N.V., Amstelveen, Netherlands

Filed June 30, 1970, Ser. No. 51,043

Claims priority, application Netherlands, July 9, 1969, 6910509

Int. Cl. B41f *15/04;* **B41l** *13/00*

U.S. Cl. 101—115 **8 Claims**



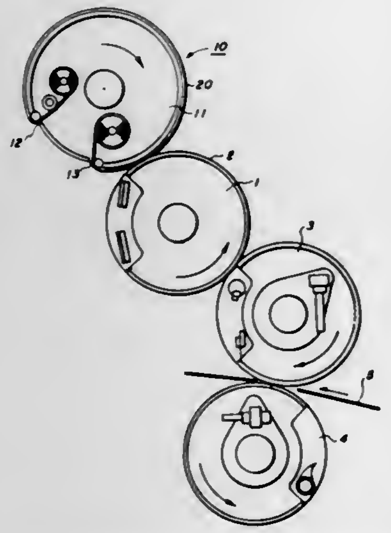
A screen printing machine has a plurality of cylindrical thin-walled screen stencils the ends of which are supported in stencil holders mounted on a bridge extending across the frame halves of the machine with there being a bridge for each stencil. An inner squeegee for dye paste is adjustable with respect to the stencil and is mounted in suspension supports at both ends of the stencil. Each bridge is parallel to its respective stencil and the stencil holders and suspension supports are slideably and lockingly mounted on the bridge. At least one drive gear is drivingly connected through a mating gear on each stencil with the drive gears protruding through the upper surface of a frame half and all the drive gears being drivingly connected to a single drive shaft mounted in a frame half and driven from a single motor.

3,718,087

APPARATUS FOR APPLYING INK AND IMMISCIBLE FLUID TO A PRINTING SURFACE

David A. Sokolov, Fairport, N.Y., assignor to Xerox Corporation, Rochester, N.Y.

Filed Nov. 20, 1969, Ser. No. 878,491
Int. Cl. B41f *7/38, 7/36*
U.S. Cl. 101—147 **2 Claims**



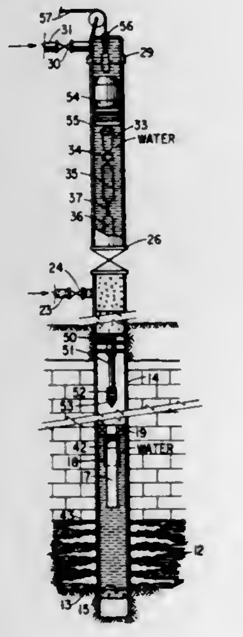
A method and apparatus for applying an ink-water solution to a surface bearing areas of ink receptivity in image configuration and areas of water receptivity in non-image areas to provide a master for printing duplicate copies of subject matter. The ink-water solution is applied to the master surface by an ink field created by an inking member which includes oleophilic material and hydrophilic material interconnected in a selected form. The ink field supplies a predetermined ink-water solution to the master according to the amount and properties of the ink and water respectively absorbed in the two diverse materials included in the inking member.

3,718,088

EXPLOSIVE FRACTURING METHOD

William G. Bearden, deceased, by Edith Mae Bearden, administratrix; Clarence R. Fast and Morton A. Mallinger, deceased, by Zella K. Mallinger, administratrix, Tulsa, Okla., assignors to Amoco Production Company, Tulsa, Okla.

Filed Apr. 23, 1971, Ser. No. 136,776
Int. Cl. E21b *43/26*
U.S. Cl. 102—21 **7 Claims**



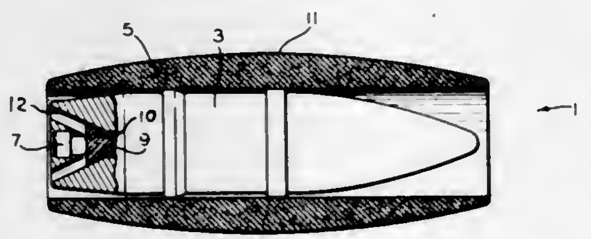
This invention is a method for increasing the permeability of underground formations by injecting a fluid explosive into subsurface crevices and detonating the explosive in these crevices. In particular it relates to the placement of detonators in a particular advantageous way which increases safety and insures more consistent detonation.

3,718,089

CASELESS, LINKLESS, TELESCOPED AMMUNITION

Harold H. Wiese, Davenport, Iowa, assignor to the United States of America as represented by the Secretary of the Army

Filed Mar. 23, 1970, Ser. No. 21,631
Int. Cl. F42b *5/18*
U.S. Cl. 102—38 **4 Claims**



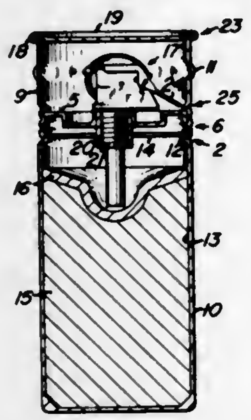
An improved caseless round of ammunition is provided by telescoping a projectile within a compressed molded propellant. The molded propellant is made with a barrel shaped exterior to facilitate pneumatic feeding through flexible tubing. The projectile includes an auxiliary propellant charge and rearwardly extending jet nozzles to initiate propulsion of the projectile immediately prior to ignition of the molded propellant.

3,718,090

INTEGRAL TWIST TOP FOR MECHANICALLY ACTUATED MUNITION CONTAINERS

Douglas W. Gregory, Forest Hill, Md., assignor to the United States of America as represented by the Secretary of the Army

Filed Aug. 4, 1970, Ser. No. 60,879
Int. Cl. F42b *27/02, 27/04*
U.S. Cl. 102—64 **7 Claims**



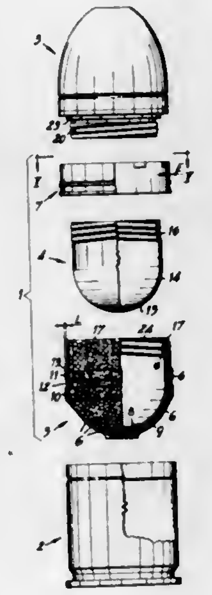
A container, item to be contained, and method of packaging which enables the packaging of specialty items in a single container to package and protect by conventional and available container manufacturing equipment and technique to reduce the capital equipment requirements and manufacturing and packaging costs. The inventive improvement being the mating of a set of threads formed in the container wall with a set of threads integral with the cap means and a scored structure located in juxtaposition to the threads formed in the container wall. The scored structure being adapted to separate the container into two sections when the container is held at opposite ends in each hand and each end twisted in opposing directions.

3,718,091

AMMUNITION AND A PROCESS FOR MANUFACTURING THE SAME

Paul Theate, 4000 Liege, Belgium, assignor to Fabrique Nationale d'Armes de Guerre, Societe Anonyme, Herstallez-Liege, Belgium

Filed Nov. 20, 1969, Ser. No. 878,396
Int. Cl. F42b *13/48*
U.S. Cl. 102—67 **8 Claims**



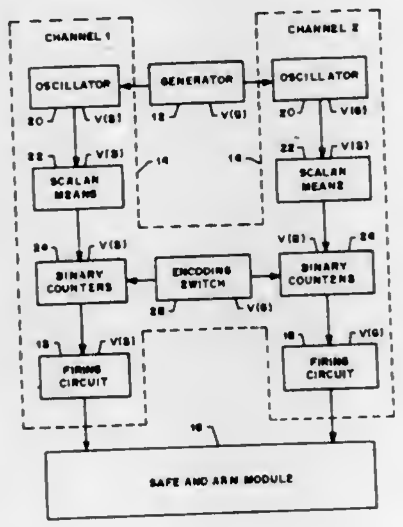
An ammunition such as a defensive grenade comprising an explosive body with preestablished fragmentation, a cartridge case and a fuse, said body acting as a support for the inner wall, the edge rotating band, the cartridge case and the fuse.

3,718,092

BATTERYLESS ELECTRONIC TIME FUZE

Robert L. Pitman, Wayne, Robert H. Haveson, Flanders, Jerry Lyon, Stanhope, Peter Weldon, Flanders, and Henry T. Rand, Denville, N.J., assignors to the United States of America as represented by the Secretary of the Army

Filed Jan. 11, 1971, Ser. No. 105,464
Int. Cl. F42c *11/02, 15/04, 15/40*
U.S. Cl. 102—70.2 R **15 Claims**



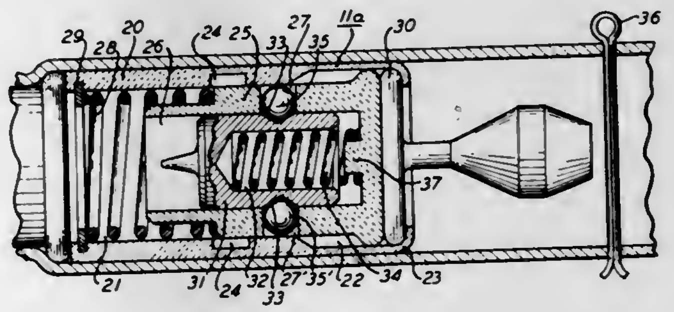
A batteryless electronic time fuze particularly suitable to use in an artillery projectile wherein the fuze comprises in combination: a lightweight pulse-producing generator, the generator producing a pulse at the moment of firing of the projectile; a digital timing network, the timing network energized by, and electronically connected to, the generator; and a safe and arm mechanism, this mechanism also energized by the generator and electrically connected to, and activated at a predetermined time by, said timing network.

3,718,093

FIRING PIN ASSEMBLY

Floyd J. Milanowski, Pocomoke City, Md., and Arthur J. Bowman, Jr., Succasunna, N.J., assignors to The United States of America as represented by the Secretary of the Army

Filed April 22, 1971, Ser. No. 136,424
Int. Cl. F42c *1/06*
U.S. Cl. 102—73 A **2 Claims**



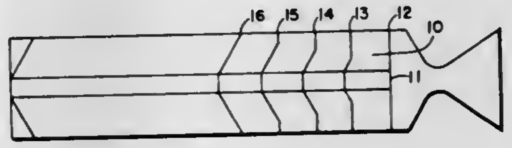
A firing pin assembly, adapted to provide an operable firing mechanism which will function when a practice bomb or similar device is delivered to a target from a plane at any approach angle.

3,718,094

GAS GENERATOR CHARGE WITH DECREASED TEMPERATURE SENSITIVITY

Norman W. Bermender, Waco, Tex., assignor to North American Aviation, Inc.

Filed July 30, 1962, Ser. No. 214,449
Int. Cl. F42b *1/00*
U.S. Cl. 102—101 **1 Claim**



1. A gas generator charge comprising:

a first cylindrical solid propellant grain having disposed concentrically therein a second less temperature sensitive solid propellant strand, wherein said second propellant strand is smaller than said first grain so as not to materially contribute to the gas production of the propellant as whole.

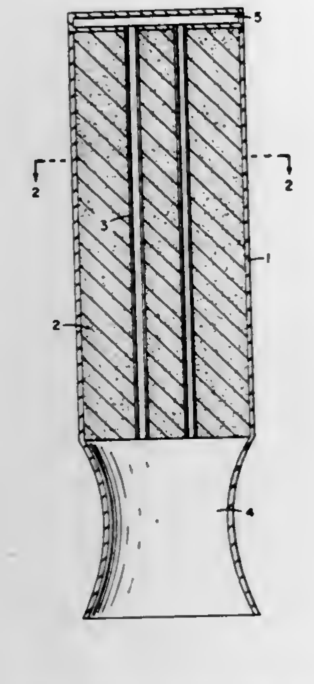
3,718,095

BURNOUT PERFORATION FOR ROCKET PROPELLANTS

John R. Mnnger, Huntsville, and Sherman E. Tate, Hartselle, Ala., assignors to the United States of America as represented by the Secretary of the Army

Filed Sept. 26, 1968, Ser. No. 763,030
Int. Cl. F02k *9/04*
U.S. Cl. 102—102 **2 Claims**

A means has been provided to utilize the previously open unused core space in the propellant grain of a rocket motor thus saving wasted space while providing additional thrust to the rocket. The core space is filled with propellant and filamentary means is located in the normal core space or a more rapid burning propellant is cast in the normal core space. The filamentary means can consist of thin metal tubes, strands of very high burning rate propellant or small holes drilled or cast through the propellant in the normal core space.



3,718,096

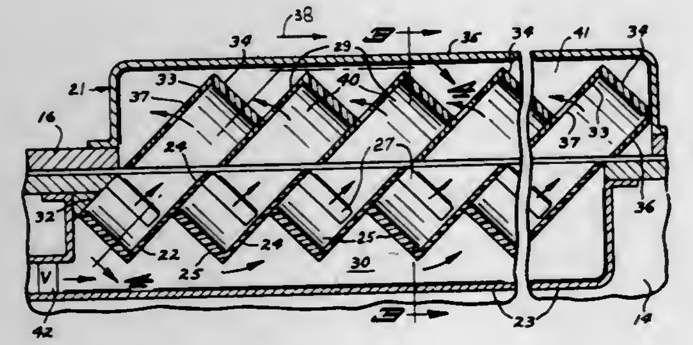
VORTEX THRUSTER FOR FLUID PROPELLED OBJECTS

Roger D. Bloomfield, Minneapolis, and Gary J. Wirth, both of St. Paul, Minn., assignors to Uniflo Systems Company, South Edina, Minn.

Filed Nov. 17, 1970, Ser. No. 90,257

Int. Cl. B61b *13/12*

U.S. Cl. 104—155 **10 Claims**



A thruster for fluid propelled objects such as levitated vehicles, or rotating machinery to increase the efficiency of relative thrust between the relatively moving parts. The primary device is a vehicle levitated through valves acting from a duct below the track. The vortex type thruster is designed to utilize substantially all of the energy stored in the fluid which is supplied under pressure through the thruster. The thruster is made in two sections, one forming a section of the stationary member, and a complementary section mounted on the moving member.

3,718,097

AUTOMATIC VEHICLE STOP MECHANISM

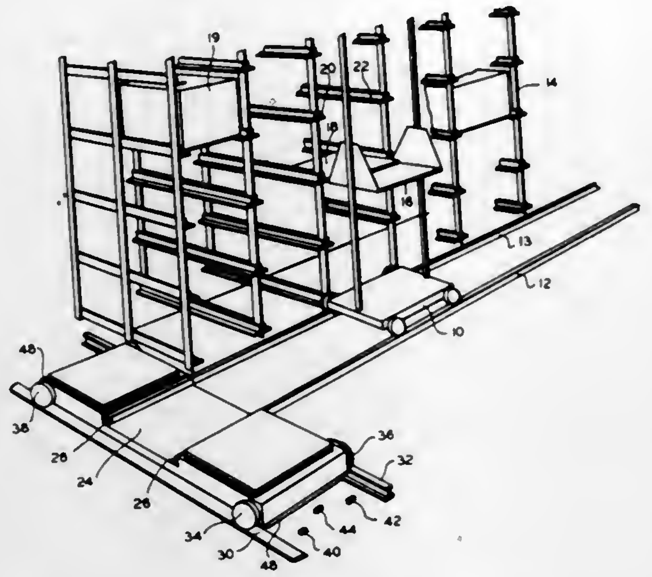
Howard C. La Tourneau, Augusta, and William E. Riedner, Battle Creek, Mich., assignors to Clark Equipment Company

Filed June 30, 1971, Ser. No. 158,432

Int. Cl. B61k *7/02;* **B65g** *1/06*

U.S. Cl. 104—249 **11 Claims**

This is a mechanism for automatically stopping a fixed path electric motor driven vehicle by first de-energizing the electric motor and then bringing the vehicle to a positive stop. Protruding stop members are placed in the path of the vehicle to actuate both the motor de-energizing switch and to engage the positive stop means.



3,718,098

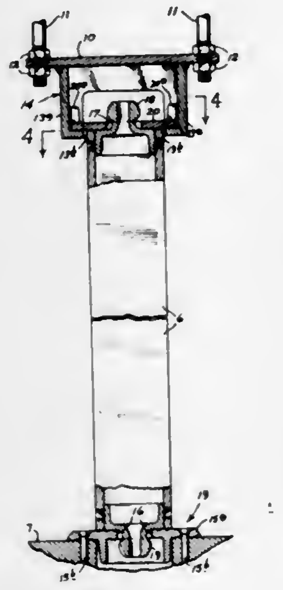
ELASTIC POST BRACING ASSEMBLY

William Don Miller, 5505 E. Evergreen Blvd., Vancouver, Wash. 98661

Filed Aug. 28, 1970, Ser. No. 67,775

Int. Cl. B61d *45/00;* **B60p** *7/10*

U.S. Cl. 105—369 B **5 Claims**



Bracing posts for railway boxcars engage adjacent, detached items of cargo, usually packaged, to prevent lateral displacement thereof. If a post engages one side of a rigid package of cargo and pins it against the side of the car, the package will tend to cant instead of slide longitudinally of a car under travel conditions inducing sway, acceleration and deceleration forces induced by motion. An elastic, tubular, vertical, non-circular post having substantial elasticity, fixed at its upper end, will twist about its longitudinal axis and will maintain face-to-face engagement with the cargo if it is journal-mounted at its lower end. This develops torque within the post to cam-lock the cargo against the side of a railway car, under bind or frictional engagement that will inhibit shifting even under the action of alternating opposed forces developed by such acceleration, deceleration, and sway of the car in motion. The grip developed by the twisted post maintains face-to-face engagement with the cargo, particularly if it is strapped cargo.

3,718,099

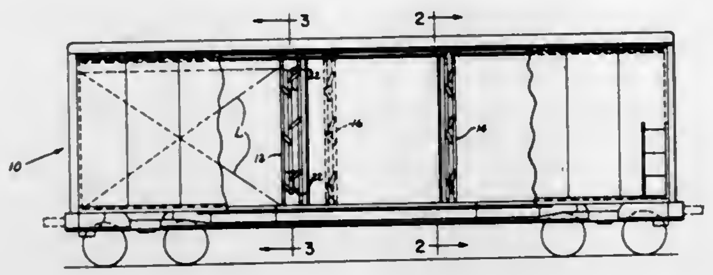
PRESSURE BULKHEAD FOR A RAILWAY CAR

Duane V. Thornton, and Jan D. Holt, both of St. Charles, Mo., assignors to ACF Industries, Incorporated, New York, N.Y.

Filed Nov. 4, 1970, Ser. No. 86,804

Int. Cl. B60p *7/14*

U.S. Cl. 105—369 BA **11 Claims**



Lading restraining bulkheads for a railway boxcar are movable on overhead tracks and floor tracks along both sides of the car. Each bulkhead has a platen supported on a frame by air bellows. The frame and platen have spring pressed detents extending into perforations of the tracks. The detents are beveled on the lading side so that a sufficient force on the platen will cam the detents open and move the platen toward the lading. This action will occur when an impact on the car causes compaction of the lading.

3,718,100

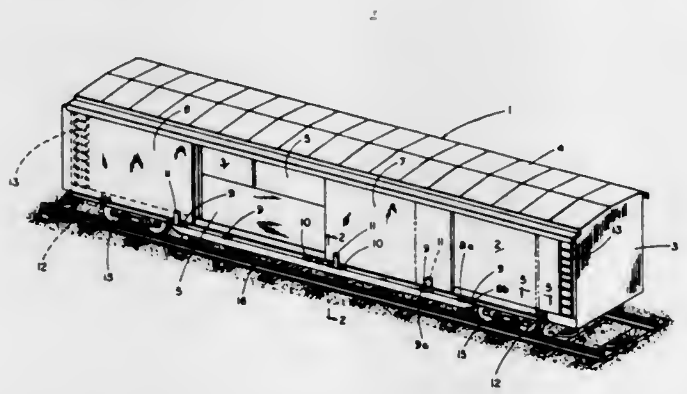
RAILROAD BOX CAR AND DOOR POSITIONING AND STOP MEANS THEREFOR

Franklin P. Adler, Michigan City, Ind.; John D. Bailey, Chicago, and George F. Bridges, South Holland, both of Ill., assignors to Pullman Incorporated, Chicago, Ill.

Filed Jan. 7, 1971, Ser. No. 104,700

Int. Cl. B61d *19/00*

U.S. Cl. 105—378 **13 Claims**



In a railroad box car having on each side a pair of outwardly and inwardly moving doors to open and close a central door opening, longitudinally spaced door positioning and door stop means in the form of bottom-of-door catch assemblies including a pair of longitudinally spaced catch units for holding the door in a closed position and a half-opened position and a fully opened position respectively and further stop means at each end of each side of the car inwardly of an end ladder to prevent movement of a respective door outwardly beyond the ladder to the fully opened position, each catch unit including a pivotally mounted vertical catch arm mounted on the door and engageable with stop blocks on the car side sill and the stop means including a horizontally extending stop arm normally urged outwardly in the path of the outwardly moving door by rotation of the stop arm down an inclined guide urging the stop arm in an outwardly extending position in the path of the door.

3,718,101

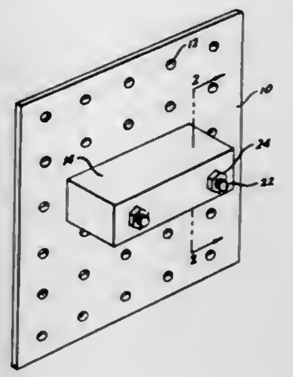
SHELF

Francis G. Sacks, Washington Court House, Sayette County, Ohio

Filed May 18, 1971, Ser. No. 144,519

Int. Cl. A47b *5/00*

U.S. Cl. 108—152 **2 Claims**



A display shelf comprises a hollow box of stiff board material having one side open. The shelf is mounted by assembly over a relatively rigid supporting block having upper and lower surfaces spaced to slidably and frictionally contact the interior surfaces of opposite horizontal sides of said shelf. The supporting block is fastened to an upright wall and the assembly of the hollow box-like shelf upon the supporting block produces a shelf structure which conceals its own support. In an embodiment particularly suited for attachment to perforated walls, bolt elements having an L-shaped shank have the foot portions of their shanks entered into perforations of the wall and the supporting block for the shelf is bored to receive threaded ends of the bolt elements. Appropriate nuts are engaged to the bolt elements to secure the supporting block to the perforated wall and then the box-like shelf is slidably assembled over the supporting block.

3,718,102

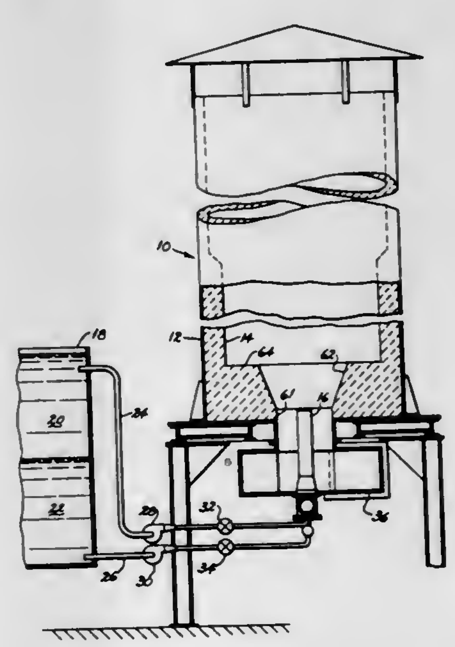
COMBUSTION APPARATUS

Klaus H. Hemsath, Sylvania, and Dale E. Wright, Perrysburg, both of Ohio, assignors to Midland-Ross Corporation, Cleveland, Ohio

Filed Oct. 29, 1971, Ser. No. 193,865

Int. Cl. F23g *7/00*

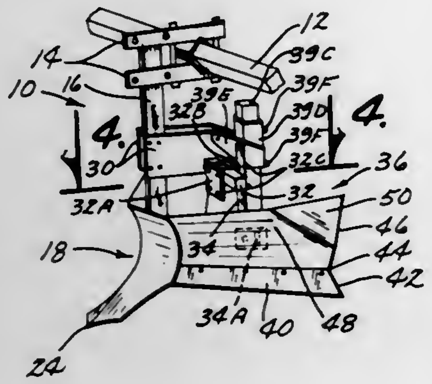
U.S. Cl. 110—7 R **13 Claims**



A combustion apparatus for incinerating non-homogeneous pumpable liquid wastes. A watery waste fraction and an oily waste fraction are introduced into a reaction chamber as separate aerosol streams. Combustion air and auxiliary gaseous fuel are used as propellants to produce the aerosol streams. The liquid waste injector includes a central atomizing nozzle for the watery waste liquid fraction and a surrounding annular conduit for auxiliary fuel and combustion air. Around the outside of this first annular conduit is a second annular conduit having a concentrically mounted annular nozzle at the end thereof for producing an aerosol from the oily waste liquid fraction. A high velocity gas stream contacts the oily waste as it is discharged from the nozzle and causes it to flow in a thin sheet over a surface portion of the annular nozzle to an edge thereof where it encounters a second high velocity gas stream directed perpendicularly within respect to the surface. The injector is coaxially mounted on the end of a cylindrical reaction chamber. An annular step is provided at the entrance end of the reaction chamber a short distance downstream from the injector nozzle to shield the chamber surface by preventing wall attachment of the burner flames. A helically swirling annular column of combustion air is supplied around the injector.

3,718,103
SEEDED SPLITTER AND SHAPER

Henry K. Orthman, Lexington, Nebr., assignor to Orthman Manufacturing Inc., Lexington, Nebr.
Filed Jan. 6, 1971, Ser. No. 104,405
Int. Cl. A01b *13/02*
U.S. Cl. 172—159 **7 Claims**

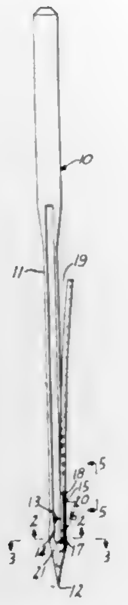


A tool bar having a plurality of spaced apart ground working assemblies including a furrowing shovel with outwardly and rearwardly extending vertically adjustable mold boards on opposite sides thereof. The outer ends of the mold boards have an upper convex forwardly rounded surface and a rear edge which extends forwardly and downwardly and meets at a vertex with upwardly and longitudinally inwardly extending rear edge on a cutting blade extending along the bottom of the mold board. The mold boards are supported independently of the furrowing shovel and the outer ends of adjacent mold boards are closely spaced to form a ridge such that seed is planted on a ledge between the valley formed by the furrowing shovel and the ridge formed by adjacent mold boards.

3,718,104
NEEDLE

John L. Grund, 8408 First Avenue North, Birmingham, Ala.
Filed March 8, 1971, Ser. No. 122,024
Int. Cl. D05b *53/00*
U.S. Cl. 112—224 **6 Claims**

A needle having elongated shank with point at one end and eye opening between spaced wall portions of shank. One wall portion terminates short of one end of eye opening to define thread receiving passageway. Elongated guide having arcuate portion as viewed in cross section, adjacent one end secured at said one end to shank intermediate thread receiving passageway and point and extends across passageway with longitudinal edges of arcuate portion extending inwardly along and adjacent opposite sides of passageway and adjacent wall portion with other end of guide extending alongside and in spaced relation to shank.



3,718,105
METHOD OF CONNECTING SLIDE FASTENERS TO FLY STRIPS FOR TROUSERS OR THE LIKE

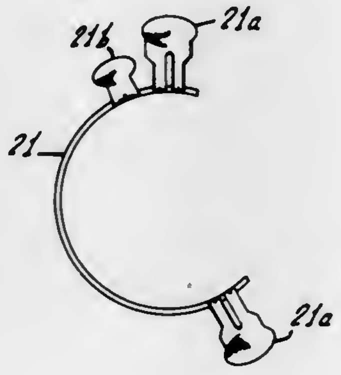
Friedrich Glindmeyer, Ellendorf, Germany, assignor to William Prym-Werke KG, Stolberg, Rhineland, Germany
Filed Mar. 16, 1972, Ser. No. 235,300
Claims priority, application Germany, Mar. 26, 1971, P 21 81 522.6
Int. Cl. D05b *3/12*
U.S. Cl. 112—265 **4 Claims**

A method for simultaneously connecting two continuous slide fastener stringers to faces of pairs of fly strips for trousers or the like which in the finished trouser face each other. Pairs of fly strips are fed in succession in longitudinal direction with their aforementioned faces facing upwardly and with the fly strips in each pair arranged laterally spaced from and mirror symmetrically with respect to each other toward a pair of spaced synchronously driven sewing machines. A continuous slide fastener chain is simultaneously fed toward the sewing machines. Before the chain reaches the machines the two stringers of the chain are separated and one of the stringers is reversed through 180° relative to its longitudinal direction with respect to the other of the stringers before being brought in engagement with respective fly strip. The two stringers are then in the thus obtained positions sewn to the fly strips as fly strips and stringers pass through the two sewing machines.

3,718,106
METHOD OF MAKING AN ELECTRIC SWITCH

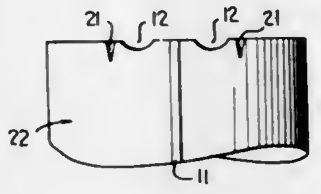
Thomas R. Beaver, Paso Robles, Calif., assignor to CTS Corporation, Elkhart, Ind.
Division of Ser. No. 843,864, March 10, 1969, Pat. No. 3,571,535. This application Feb. 4, 1971, Ser. No. 112,633
Int. Cl. B21d *53/36*
U.S. Cl. 113—119 **3 Claims**

An electric switch having a plurality of individual spaced contacts and a common contact lying in the same plane and supported by a stationary contact carrier of insulating material. Certain of the individual spaced contacts and at least a portion of the common contact have edge portions equally spaced from an elongated surface of the stationary contact carrier. Depending upon the switching requirements, the individual spaced contacts and the common contact can be provided with integral terminal means for connecting the contacts into an electrical circuit or some of the individual spaced contacts can be provided with integral stamped inductance means. A movable contact carrier of insulating material is movable along the elongated surface of the stationary contact carrier and a bridging contactor constrained to move with the movable contact carrier selectively connects or shorts certain individual spaced contacts. The bridging contactor for the electric switch is blanked from sheet material with a plurality of contact portions and stored for future use. Depending upon the application of the switch, the extra contact portions are severed from the contactor which is then curved and ready for assembly to produce the electric switch.



3,718,107
METHOD OF MAKING STRESS RELIEVED CONTAINERS

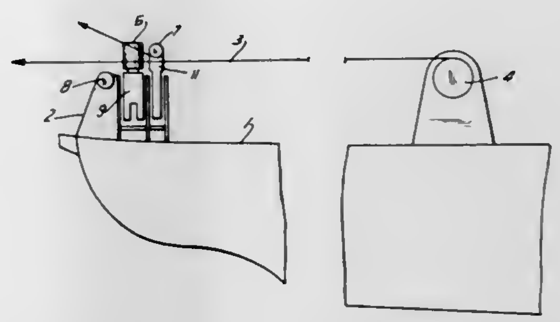
Herbert D. Bartels, Palos Heights, Ill., assignor to Continental Can Company, Inc., New York, N.Y.
Division of Ser. No. 2,304, Jan. 12, 1970, Pat. No. 3,670,921.
This application Aug. 24, 1971, Ser. No. 174,468
Int. Cl. B21d *51/00*
U.S. Cl. 113—116 W **3 Claims**



This disclosure relates to a metal container, and more particularly to a thin walled, metal can having a welded side seam and wherein at least one end thereof is necked-in and then outwardly flanged so as to receive an end of a reduced diameter. In order to prevent edge cracking during the flanging operation adjacent the welded seam, the necked-in edge of the can body is provided with a shallow notch on each side of the welded seam. In addition, in order to prevent wrinkling of the metal in alignment with the notches during the necking-in operation and subsequent fracture along the areas of wrinkling during flanging, the end edge portion of the blank from which the can body is formed is provided with stress relief indentations adjacent the notches.

3,718,108
GUIDE ARRANGEMENT

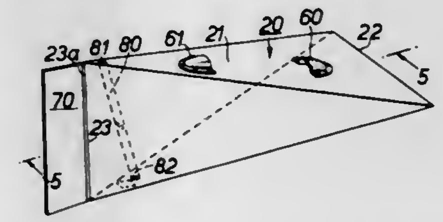
Hans Georg Janssen, Bremerhaven, Germany, assignor to Aktiengesellschaft "Weser", Bremen, Germany
Filed April 5, 1971, Ser. No. 131,169
Claims priority, application Germany, April 15, 1970, P 20 17 958.2
Int. Cl. B63b *21/14*
U.S. Cl. 114—181 **17 Claims**



The guide arrangement for marine hawsers comprises four rollers which are arranged pairwise so as to surround between them a guide passage for a hawser. The uppermost and, according to another concept, at least one of the upright rollers are mounted on pivotable arms so as to be pivotable with reference to the longitudinal axis of the guide passage, toward and away from this axis.

3,718,109
AQUATIC VEHICLE

Michael D. Skitsko, 9650 76th St., Edmonton, Canada
Division of Ser. No. 837,011, June 27, 1969, Pat. No. 3,606,859. This application March 2, 1971, Ser. No. 120,319
Claims priority, application Canada, July 10, 1968, 024,755; Sept. 23, 1968, 030,661
Int. Cl. B63h *1/30*
U.S. Cl. 115—28 R **16 Claims**

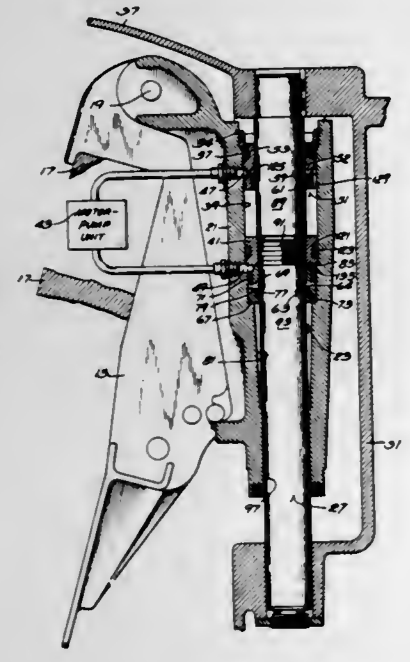


An amusement and exercising device including a body buoyant in water and so shaped as to propel itself forwardly upon rocking the body to and fro in the water. The body is preferably in the shape of an irregular tetrahedron having a narrow vertical edge providing a bow and a horizontal narrow edge at the opposite end providing a stern and with sculling devices consisting of flat board-like members pivotally attached to the body for limited arcuate movement. Directional control may be effected by a rudder pivotally mounted on the body and/or pivoting one of the sculling devices about a vertical axis. Toe grips are provided on the upper surface upon which an occupant may either sit or stand depending upon skill in manipulating the device.

3,718,110
HYDRAULIC ARRANGEMENT FOR VERTICALLY TRIMMING A MARINE PROPULSION UNIT

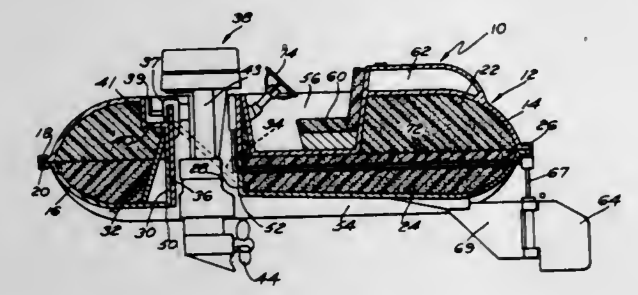
Clarence E. Blanchard, Kenosha, Wis., assignor to Outboard Marine Corporation, Waukegan, Ill.
Filed Sept. 15, 1971, Ser. No. 180,788
Int. Cl. B63h *5/12*
U.S. Cl. 115—41 HT **9 Claims**

Disclosed herein is a marine propulsion device, such as an outboard motor, including a transom bracket adapted to be attached to a boat transom, a swivel bracket pivotally connected to the transom bracket about a generally horizontal axis and having a vertically extending bore including a cylindrical portion, a propulsion unit including a housing supporting a propeller, a king pin having a length greater than the bore, and fixedly connected, at its upper and lower ends, to the housing and extending through the bore, a piston on the king pin in engagement with the cylindrical bore portion, means in the bore above the piston supporting the king pin for axial and rotative movement relative to the swivel bracket and for sealing an upper part of the bore against loss of hydraulic fluid, means in the bore below the piston for supporting the king pin for axial and rotative movement relative to the swivel bracket and for sealing a lower part of the bore against loss of hydraulic fluid, a pair of spaced hydraulic conduits extending through the swivel bracket and respectively communicating with the bore above and below the piston, and means communicating with the conduits for selectively supplying hydraulic fluid to the bore through one of the conduits and simultaneously draining hydraulic fluid from the bore through the other of the conduits.



3,718,111
MOTORIZED AQUA DISC

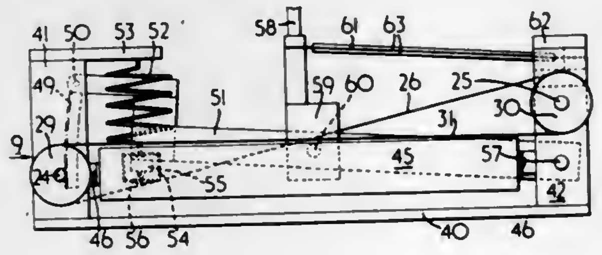
Michael Del Vecchio, 140 Regent Ave., Providence, R.I. 02908
Filed Apr. 5, 1971, Ser. No. 131,214
Int. Cl. B63b *35/00*
U.S. Cl. 115—70 **1 Claim**



A self-propelled recreational device for use in water having a disc-like body portion with flotation material located therein, a vertically extending opening formed in said body portion, and a motor assembly mounted on said body portion and extending downwardly through said opening and terminating in a propeller that projects below said body portion.

3,718,112
MEASURING MACHINE

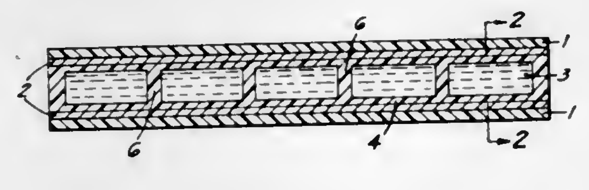
David Lester Edgar Perry, 80 Littlethorpe, Thorpe Bay, near Southend-on-Sea, England
Filed Nov. 2, 1970, Ser. No. 85,974
Claims priority, application Great Britain, Nov. 6, 1969, 54,374/69
Int. Cl. G01d *21/00*
U.S. Cl. 116—114 **14 Claims**



An analogue measuring machine has a sensing mechanism which reacts against a resistance mechanism, measurement being indicated by an indication mechanism driven by the sensing means. The indication mechanism comprises a thin flexible band which extends between first and second pulley wheels and has its ends secured to the pulley wheels. The first pulley wheel is driven by the sensing means to move an index carried by the band relatively to a scale. A driving means is arranged so that the second pulley wheel is driven in unison with the first pulley wheel to maintain the length of the band between the first and second pulley wheels constant.

3,718,113
BURIED PIPELINE SIGNAL

Paul H. Schertler and Rupert F. Strobel, St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed July 13, 1970, Ser. No. 54,104
Int. Cl. G01d *21/00*
U.S. Cl. 116—114 R **7 Claims**



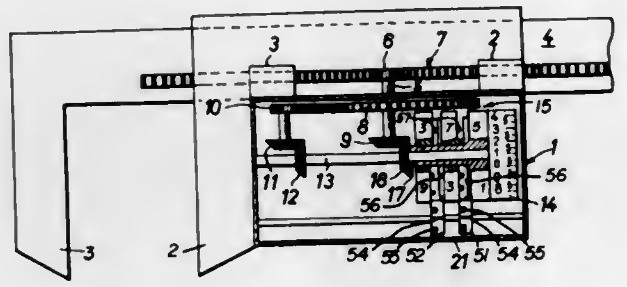
A buried visual warning device capable of producing a risable visible signal, comprising an underground corrosion-resistant, flexible, rupturable, essentially moisture and oxygen proof tubular member containing a visual signal producing means released into the air upon rupture of the tubular member. Also contemplated is the use of a plurality of the warning devices in spaced protective relationship about and parallel to a utility conduit.

3,718,114
LENGTH MEASURING INSTRUMENT

Artur Gneupel, 295 Frohburgstrasse, Zurich, Switzerland
Filed March 27, 1970, Ser. No. 23,352
Claims priority, application Switzerland, March 25, 1969, 4527/69
Int. Cl. G09f *9/00*
U.S. Cl. 116—129 **3 Claims**

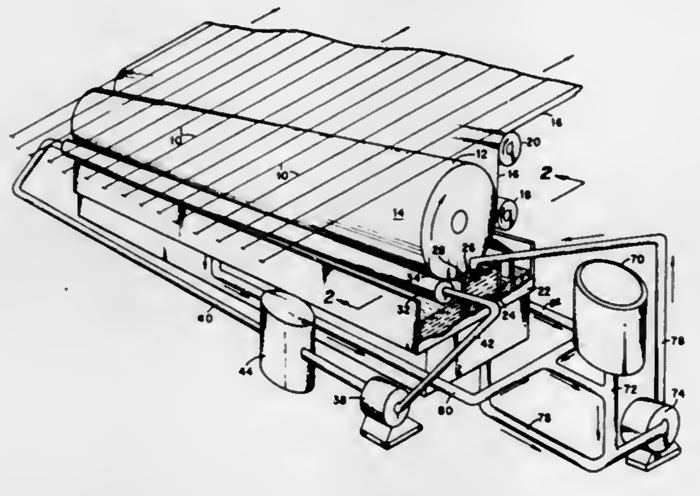
A length measuring instrument, such as a slide caliper, a height tracer or sliding compass comprises a slide movable

along a slide carrier and provided with a counter mechanism for direct indication and read-out of the measured values. The counter mechanism comprises a plurality of rotatable figure drums or counters driven by a gear having a pinion mounted on the input shaft of the gear and meshing with a rack extending longitudinally of the slide carrier. Two of said counters indicating the smallest and next higher digit of the measured values are independently and permanently connected for rotation by said input shaft, while the remaining counters are driven by the intermediary of a stepping mechanism from said counter corresponding to the next higher digit.



3,718,115
ADHESIVE APPLICATION SYSTEM

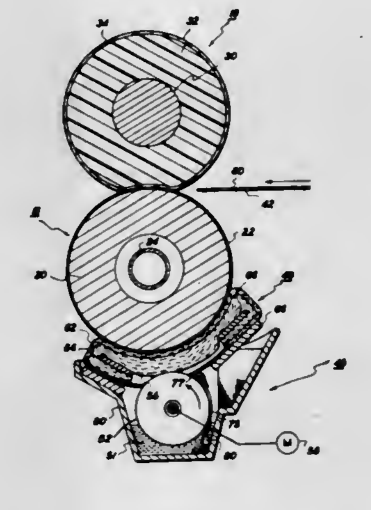
Charles A. Lee, Knoxville, Tenn., assignor to International Paper Company, New York, N.Y.
Filed Jan. 27, 1971, Ser. No. 110,018
Int. Cl. C23f *7/00*
U.S. Cl. 118—203 **5 Claims**



A system for uniformly applying adhesive to a base material comprising a plurality of spaced-apart filaments which are continuously moving forwardly in contact with an applicator roll disposed above a reservoir of liquid adhesive with a portion of the roll surface disposed beneath the surface of the adhesive so that the roll picks up a layer of adhesive on its surface as it is rotated and transfers adhesive to the base material, including a metering bar cooperating with the applicator roll to define a metering nip in which the thickness of the adhesive layer on the applicator roll surface is uniformly established, the metering bar being cooled sufficiently below ambient temperature to cause condensation of moisture on the bar and preclude build-up of solidified adhesive on the bar thereby preventing accumulation of adhesive such as would disrupt the uniformity of the adhesive layer established in the metering nip. The system also includes doctor blade means having a deformable doctoring surface for removing residuary adhesive from the roll surface in a region ahead of the region where the roll surface enters the liquid adhesive.

3,718,116
OIL DISPENSING APPARATUS

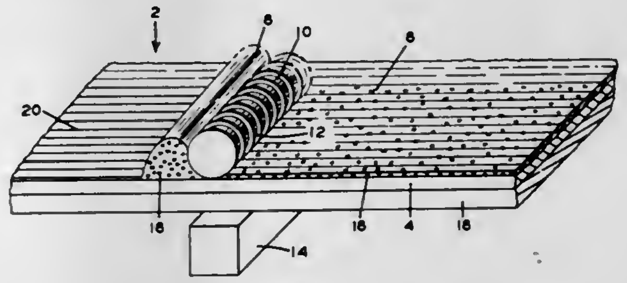
Raghulinga R. Thettu, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.
Filed July 20, 1971, Ser. No. 164,369
Int. Cl. B05c *11/00*
U.S. Cl. 118—266 **5 Claims**



Apparatus for lubricating the heated fuser roll in a heated pressure xerographic fusing system. The apparatus includes an applicator roll for providing a film of oil to a wick assembly having a main wick contacting the fuser roll and an auxilliary wick with one end and main wick contacting the applicator roll and the other end the bottom of an oil pan supply to dispense sufficient oil when the applicator roll is inoperative.

3,718,117
GROOVED ROD COATER

Walter J. Lewicki, Jr., Lancaster, Pa., assignor to Armstrong Cork Company, Lancaster, Pa.
Filed April 26, 1971, Ser. No. 137,132
Int. Cl. B05c *3/18*
U.S. Cl. 118—414 **3 Claims**

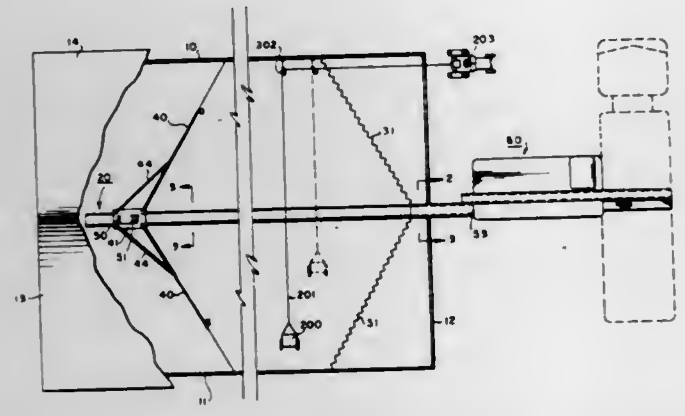


A coating apparatus is provided for placing a uniform coating of particulate-containing material. A grooved rod is held against the sheet to be coated by action of a magnet on the back side of the sheet to be coated. The grooves in the rod permit the controlled application of a coating containing particles.

3,718,118
POULTRY HANDLING SYSTEM

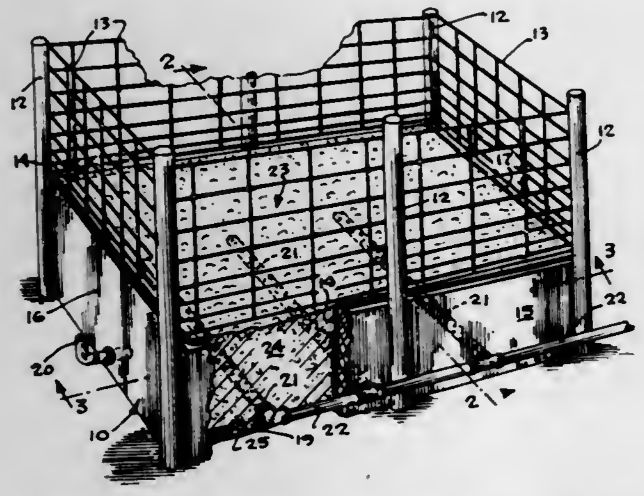
David R. Bibler, Route 5, Russellville, Ark.
Filed Aug. 2, 1971, Ser. No. 167,951
Int. Cl. A01k *31/18, 31/04*
U.S. Cl. 119—16 **14 Claims**

Disclosed is a system for collecting live broilers from a broiler house and depositing them in transport cages for removal to slaughter. The apparatus includes an endless belt conveyor disposed in a conduit in the floor of the broiler house exiting through a tunnel. A chaser fence crowds the birds onto the conveyor which deposits them on an enclosed elevator conveyor outside the house. The elevator conveyor deposits the birds in waiting transport cages without ever catching or individually handling each bird. The conduit in the floor of the broiler house is also used for conducting ventilating air through the broiler house and for removing litter.



3,718,119
SELF-CLEANING ANIMAL ENCLOSURE STRUCTURE

Howard Jackson Stevenson, P.O. Box 33, Jacksonville, Ill.
Filed Nov. 26, 1971, Ser. No. 202,188
Int. Cl. A01j *1/00*
U.S. Cl. 119—28 **7 Claims**

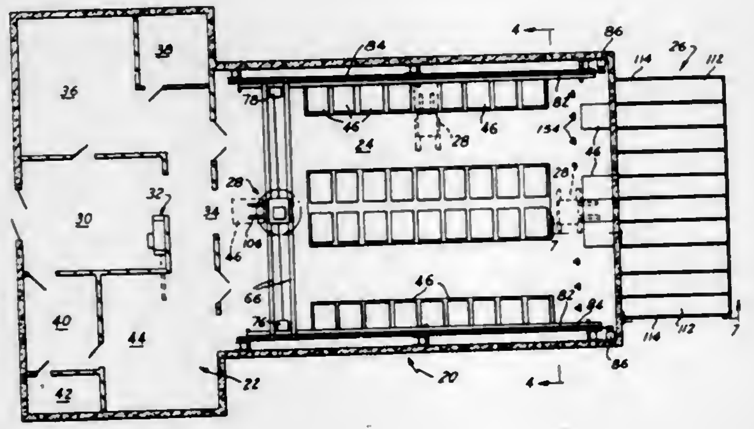


An enclosure structure for animals, such as livestock and poultry, which does not require removal of body waste material from the enclosure having a floor structure comprising a bed of loosely packed inert particulate material, such as sand, with an upper aerated layer containing aerobic bacteria and a lower water-permeated layer containing anaerobic bacteria; wherein the aerobic bacteria initially act on the body waste material deposited on the floor of the enclosure to decompose the waste substantially into products which filter down into the lower layer of the bed where the anaerobic bacterial substantially decompose the products. Means are provided for controlling the depth of the water in the bed and for aerating the upper layer of the bed.

3,718,120
AUTOMATED KENNEL

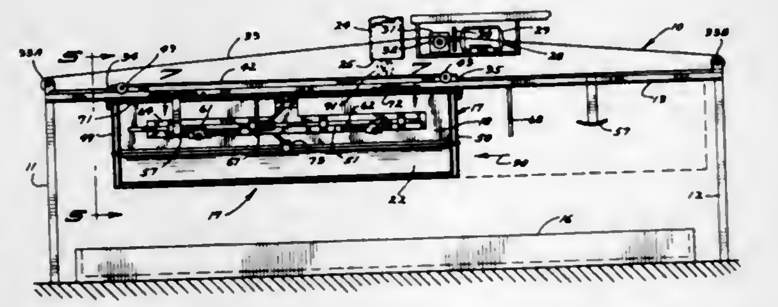
Karl W. Schwarz, Boonton; Allan S. Borkowski, and Joseph W. Hafesh, both of Fort Lee, all of N.J., assignors to Modern Animal Care, Inc., Fort Lee, N.J.
Filed Nov. 9, 1971, Ser. No. 197,098
Int. Cl. A01k *1/00*
U.S. Cl. 119—16 **14 Claims**

An automated kennel is provided which has a receiving area for animals, a storage area for animals and an exercising area. The storage area has a plurality of discrete locations for storing animals. A plurality of movable compartments is provided, each of which is provided to house an animal in the storage area. Transfer means are provided for moving the compartments to the receiving area to receive and remove the animal, to the storage area for storing the animal at one of the discrete locations and to the exercising area to enable an animal to run into the area. The exercising area has a movable wall for gently returning the animal to the compartment after a predetermined period and control means are provided which are connected to the transport means for automatically transporting the animals to the various areas of the kennel. In addition monitoring means are provided throughout the system so that the animals can be watched and physiologically monitored simultaneously.



3,718,121
BUNK FEEDER FOR CATTLE

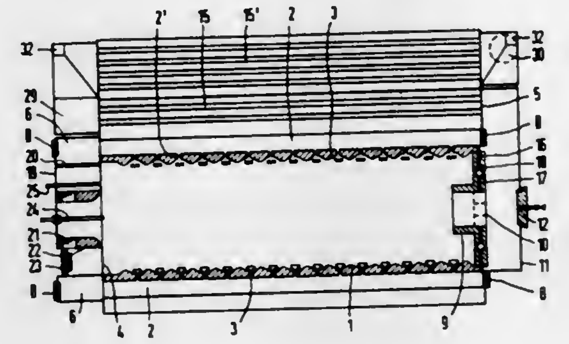
Layton H. Anderson, R.R. No. 2, New Auburn, Wis.
Filed Dec. 22, 1971, Ser. No. 210,788
Int. Cl. A01k *05/02*
U.S. Cl. 119—52 B **6 Claims**



Livestock feeding apparatus comprising frame means having generally horizontally disposed feeder supporting rails and defining a generally elongated feeding area of predetermined length beneath said rails. Feed carrier means mounted on the rails and arranged to move reciprocatorily above said feeding area between a pair of limit points at opposed ends of said supporting rails. The carrier means includes a feed retention bin having a length which is less than one-half the length of said feeding area and has a controllably openable bottom wall. Feed delivery means are provided having a discharge opening above the retention bin and arranged to deliver feed into the retention bin, and drive means are provided for reciprocatorily moving the retention bin between opposed positions at either end of the frame means. Locking means are provided coupled to the retention bin and adapted to open and close the bottom wall in response to motion of the retention bin along its reciprocatory path. The bin has latch tripping means adapted to open the bottom wall of the bin as the bin approaches the limit points of its reciprocatory travel, with means being provided to close the bottom wall as the bin continues movement toward the limit point. The bottom wall of the bin has a pair of hinged segments, and hence the structure may be permitted to remain in open disposition when not in use.

3,718,122
FIRING CHAMBER FOR THE COMBUSTION OF GASEOUS, LIQUID OR FINE-GRANULAR FUEL

Jacobo Agrest, Avda. Belgrano 355, Buenos Aires, Argentina
Filed March 15, 1971, Ser. No. 123,948
Claims priority, application Argentina, March 30, 1970, 227746
Int. Cl. F22b *7/12*
U.S. Cl. 110—149 **7 Claims**

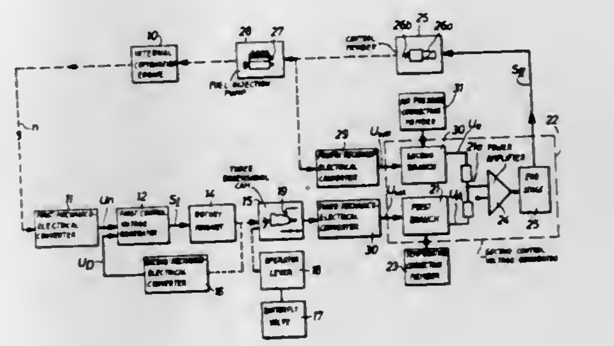


A combustion vessel structure for the combustion of fluid, i.e., gaseous, liquid or fine-granular fuel, preferably for steam generators, has its supply lines for fuel and for a partial amount of the combustion air located on one axial end side of a substantially cylindrical combustion chamber so that during operation a whirling or tornado flow is maintained in the combustion chamber. A gas outlet for the waste air is located at the opposite end side of the combustion chamber so that the combusted air is discharged under utilization of forces occurring in the tornado flow. An inner wall of wavy configuration extends axially through the combustion chamber. Further nozzles for the supply of additional combustion air enter tangentially into the troughs of the waves. The nozzle outlets for the additional air are disposed near the bottoms of the waves and terminate at most at the height of the wave crests.

3,718,123
APPARATUS FOR REGULATING THE AIR-FUEL MIXTURE IN AN EXTERNALLY IGNITED INTERNAL COMBUSTION ENGINE OPERATING ON INJECTED FUEL

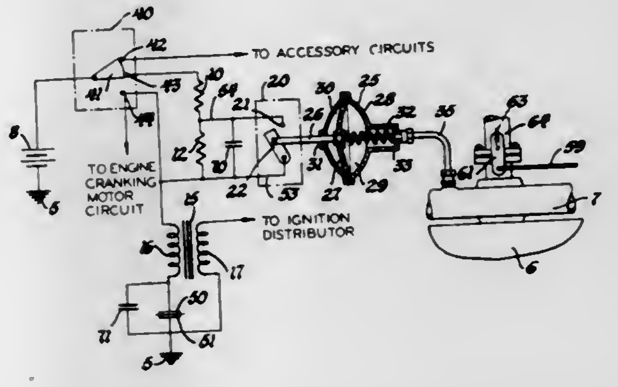
Konrad Eckert, Stuttgart-Bad Cannstatt, Heinrich Knapp, Leonberg-Silberberg, and Gerhard Engel, Stuttgart, Germany, assignors to Robert Bosch G.m.b.H., Stuttgart, Germany
Filed Nov. 30, 1971, Ser. No. 203,345
Claims priority, application Germany, Dec. 3, 1970, P 20 59 473.4
Int. Cl. F02d *1/04, 1/06;* **F02b** *3/00*
U.S. Cl. 123—140 CC **13 Claims**

The fuel rack of a fuel injection pump is regulated as a function of the engine r.p.m., the position of the arbitrarily operated butterfly valve and other operational variables. For this purpose an electric signal representing a desired value is derived from the angular and axial positions of a three-dimensional cam (which assumes its position in response to an electric signal characterizing the actual engine r.p.m. and in response to a mechanical signal characterizing the actual position of the butterfly valve) and is compared with an electric signal representing an actual value derived from the actual position of the fuel rack. The electric signal resulting from said comparison is applied to a control member which is displaced accordingly and which, by virtue of its connection with the fuel rack, causes a corresponding movement of the latter. Electric correcting signals representing physical magnitudes, such as engine temperature and atmospheric pressure, vary the desired and/or actual value signals prior to their comparison.



3,718,124
VACUUM ACTUATED IGNITION SPARK ENERGY LEVEL CONTROL CIRCUIT

Harvey A. Burley, Warren, Mich., assignor to General Motors Corporation, Detroit, Mich.
Filed Oct. 4, 1971, Ser. No. 186,033
Int. Cl. F02p *3/02*
U.S. Cl. 123—148 DC **3 Claims**

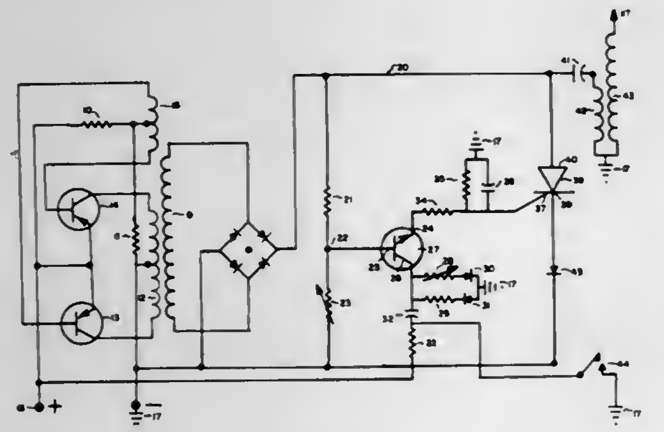


A vacuum actuated ignition spark energy level control circuit for increasing the ignition spark energy level upon engine deceleration. The stationary contact and a normally open movable contact, operable to an electrical circuit closed condition, of an electrical switch are connected across at least a portion of the ballast resistance connected in series with the ignition coil primary winding while the engine is in the running mode. A pressure responsive electrical switch operating device, in communication with the intake manifold of the associated internal combustion engine, is operatively connected to the movable contact of the electrical switch for operating the movable contact to the electrical circuit closed condition upon engine deceleration to reduce the value of ballast resistance connected in series with the ignition coil primary winding.

3,718,125
CAPACITOR DISCHARGE IGNITION SYSTEM

Thad W. Posey, 2402 Apple Hill Rd., Alexandria, Va.
Filed April 5, 1971, Ser. No. 130,950
Int. Cl. F02p *3/06*
U.S. Cl. 123—148 E **3 Claims**

An improved capacitor discharge ignition system which produces controlled multiple ignition sparks for each opening of the distributor breaker points. Upon applying a direct current potential across the input terminals of a conventional DC to DC inverter circuit, the inverter power transistors begin oscillating, thereby driving the primary of the inverter transformer which produces a high voltage potential in the secondary windings. A diode bridge circuit rectifies this potential which is applied to a storage capacitor in series with the primary winding of a conventional ignition coil. When the storage capacitor reaches a predetermined voltage potential the silicon controlled rectifier control transistor is forward biased due to the voltage at the junction of a fixed resistor and variable resistor which are in series and connected across the high voltage supply. Upon opening of the distributor breaker points, a capacitor in series with the collector of the control transistor begins to charge causing a current flow through the gate cathode junction of the silicon controlled rectifier sufficiently to forward bias the anode cathode junction of the SCR. The storage capacitor discharges through the SCR and primary of the ignition coil causing an ignition spark to be produced. This discharge of the storage capacitor causes the base potential of the control transistor to drop to zero volts thereby raising the collector emitter resistance which reduces the SCR gate current flow below trigger level, and due to the zero potential between the anode and cathode electrodes of the SCR. the SCR turns off. Immediately the storage capacitor starts to recharge and again upon reaching a predetermined voltage potential, the circuit repeats as stated above to produce another ignition spark, provided the previously mentioned capacitor in series with the control transistor's collector has not reached a charged state which would prevent sufficient SCR gate trigger current. The capacitor's RC time constant is controlled by a variable resistor which may be adjusted to produce from one to as many ignition sparks as desired, depending on the frequency of the ignition sparks as determined by the variable resistor associated with the base electrode of the control transistor and the duration of the opening of the breaker points. Upon closing of the breaker points, the control transistor's collector capacitor is discharged through the breaker points and a fixed resistor thereby resetting the circuit for the next ignition cycle.



3,718,126

IGNITION TIMING REGULATING DEVICE FOR INTERNAL COMBUSTION ENGINES

Kazuo Oishi; Tokuhiro Kurebayashi; Noriyoshi Ando; Naboru Yamamoto, all of Kariya; Tadahide Toda; Hidetaka Nohira, and Takashi Katoh, all of Shizuoka-ken, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota-shi and Nippondenso Kabushiki Kaisha, Aichi-ken, both of, Japan

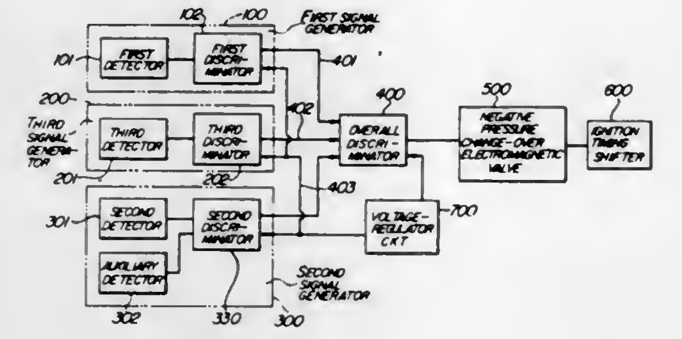
Filed July 14, 1970, Ser. No. 54,679

Claims priority, application Japan, July 21, 1969, 44/57566; Oct. 20, 1969, 44/83726

Int. Cl. F02p *5/04*

U.S. Cl. 123—117 R **27 Claims**

An ignition timing regulating device for internal combustion engines comprising a logical operation circuit, which receives discriminating output signals produced by comparing individual electric detection signals representing corresponding variables selected from the engine speed, vehicle speed, engine load and engine temperature condition with respective preset values and also an electric detection signal representing the gear position of the transmission as the inputs, and generates a single output signal, and an ignition timing shifting means to shift the spark timing in accordance with the output signal from the afore-said logical operation circuit.



3,718,127

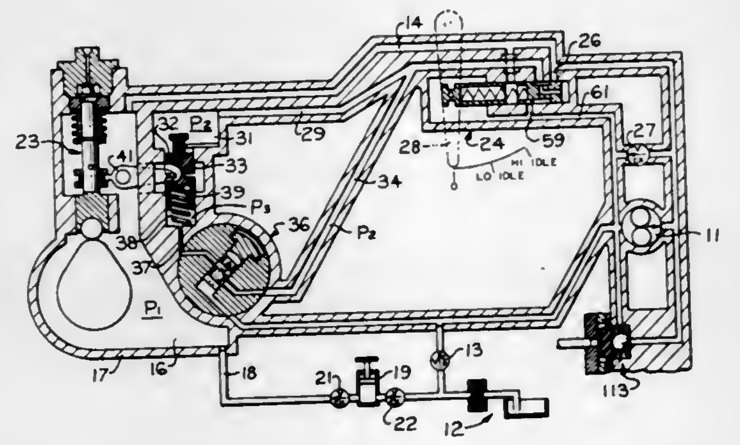
HYDRAULIC GOVERNOR

Marvin A. Gates, Chillicothe, and John H. Parks, Peoria, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Sept. 18, 1970, Ser. No. 73,309

Int. Cl. F02d *1/04*

U.S. Cl. 123—140 FG **12 Claims**



A hydraulic engine governor wherein a throttle control valve also serves to establish a stable reference pressure independent of the system pump pressure for insuring stable governor operation. Stable reference pressure as determined by the throttle setting of the valve and a control pressure regulated by the centrifugal force exerted on a modulating valve as a result of the engine speed respectively, actuate the opposite ends of a piston to vary its position in accordance with the pressure differential. The piston position in turn regulates the amount of fuel injected into the engine to thereby provide a speed governing action. Provision is made for sealed communication for reference and control pressure to and from the rotary centrifugal modulating valve. The throttle valve features a control lever mechanism having minimized exposed control parts and which yet serves to retain the valve in throttle positions set by the operator.

3,718,128

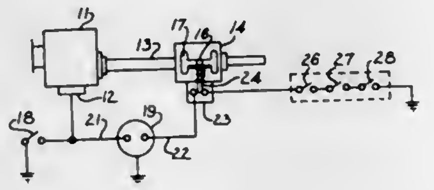
IGNITION INTERLOCK SYSTEM

Kurt Botker, Thurmont, Md., assignor to North American Philips Corporation, New York, N.Y.

Filed Aug. 20, 1971, Ser. No. 173,531

Int. Cl. F02n *11/08, 11/10*

U.S. Cl. 123—179 K **11 Claims**



An interlock circuit grounded at one side and having one wire connected to the ignition magneto of a gasoline engine. A second wire is connected to a switch on the transmission to actuate the circuit to be a short circuit across the magneto when the engine is not running, except when the transmission is in neutral. The circuit automatically disables itself after the engine starts.

3,718,129

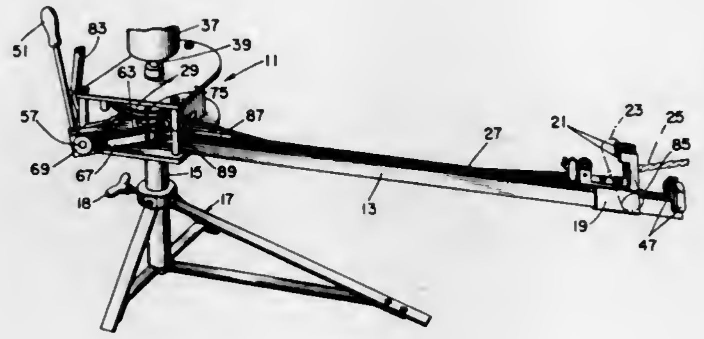
APPARATUS FOR STARTING ROPE-PULL ENGINES

Kenneth R. McKee, 13761 Gladstone St., Sylmar, Calif.

Filed Nov. 10, 1971, Ser. No. 197,215

Int. Cl. F02n *17/00, 3/02*

U.S. Cl. 123—179 P **15 Claims**



Apparatus for starting small, internal combustion, manually started engines. The apparatus comprises a base frame from which a track extends, ending in a brace which abuts the engine to be started, thereby preventing relative movement between the engine and the apparatus. A carriage having structure for gripping the engine starting handgrip is mounted on the track and may be moved away from the engine and toward a motor-driven pulley on the base frame by means of a cord, extending between the carriage and the pulley, and wound upon the pulley. The pulley may be connected to the drive motor through a normally open clutch. The clutch is actuated to the open position by means of a safety lever which must be actuated by the operator before the pulley will pull the carriage away from the motor to be started. As the carriage reaches a position adjacent the frame upon which the pulley is mounted, it actuates a cam adjacent the end of the track to force the clutch into the disengaged position against the action of the safety lever. The rewind spring of the engine's starter, acting through the starting rope, then causes the carriage to move back toward the engine and return to the initial position. There, the carriage actuates a push-bar at the opposite end of the track which pulls the cam away from the clutch-disengaged position, causing reengagement of the clutch for the commencement of another cycle of the operation, if the safety lever is still actuated.

3,718,130

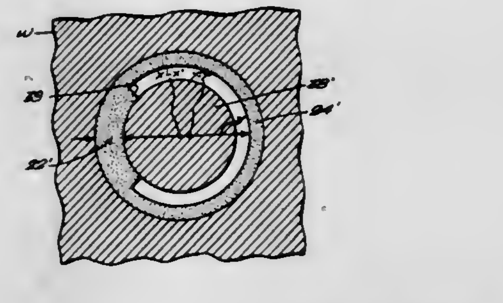
FREE CORE GRINDING DRILL

Frederick Donald Wing, 145 Beacon Lane, Jupiter Inlet Colony, Jupiter, Fla.

Filed Dec. 28, 1970, Ser. No. 101,507

Int. Cl. B28d *1/14*

U.S. Cl. 125—20 **4 Claims**



A core drill designed to insure a core will be generated sufficiently smaller in diameter than the normal inside diameter of the drill, and therefore a free or loose core, to assure easy removal or drop out of the core from the drill. This is accomplished by providing a drill of any predetermined outer diameter and an inner bore providing a smaller inner diameter having longitudinal walls parallel with but offset relative to the longitudinal walls of the outer diameter, therefore, in operation, the running inside diameter rotates eccentrically to the true running outside diameter on a common axis to generate a core having a smaller diameter than the inside diameter of the core drill.

3,718,131

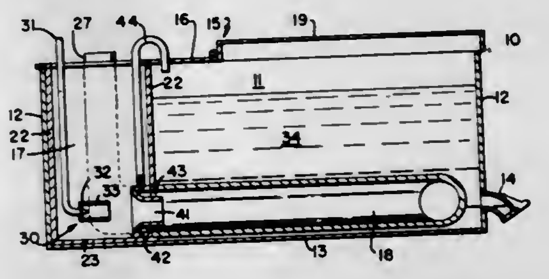
VACUUM COLLAR FOR ROOFING KETTLES AND THE LIKE

Ewald A. Busse, 2302 Flores St., San Mateo, Calif. 94403, and Glen W. Raker, 2648 Graceland Ave., San Carlos, Calif. 94062

Filed Feb. 7, 1972, Ser. No. 224,155

Int. Cl. E01c *19/45;* **F24h** *1/00*

U.S. Cl. 126—343.5 A **10 Claims**



Roofing kettles or the like, for heating masses of bituminous material, provided with means for reducing the smoke, fumes and vapors given off in operation are disclosed, which means comprise various embodiments of the invention. Embodiments of the invention suitable for retrofitting existing kettles, as well as the embodiment of the invention in kettles as originally built in various forms are described.

3,718,132

ELECTROTHERAPY MACHINE

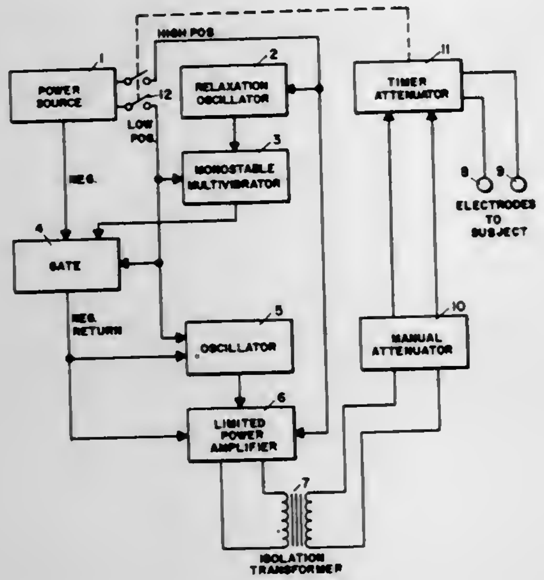
William J. Holt, Garland, Tex., and Roger Boy de la Tour, Los Angeles, Calif., assignors to Neuro Systems Inc., Garland, Tex.

Continuation-in-part of Ser. No. 629,232, April 7, 1967, abandoned. This application March 26, 1970, Ser. No. 22,809

Int. Cl. A61n *1/00*

U.S. Cl. 128—1 C **7 Claims**

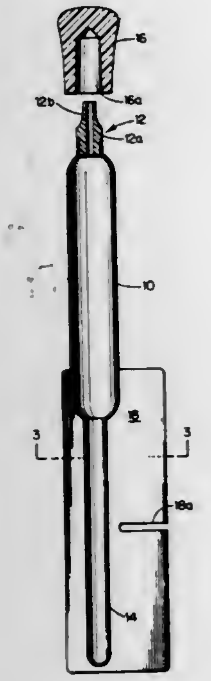
A machine for inducing sleep and other therapy effects by means of repetitive electrical pulses wherein potential danger to the treated subject is avoided by the generation of trains of rapid alternately positive and negative pulses whose vectorial sum is equal to zero, thus avoiding the application of net direct currents. Trains of pulses are applied to the subject through a



transformer to avoid shock hazard. A timer attenuator allows gradual rise in current over a fixed time period to a fixed level, maintenance of the fixed current level for a variable time period which may be set, and gradual decline in current over a fixed time period.

3,718,133
CONTAINER UNIT FOR LIQUID SAMPLES

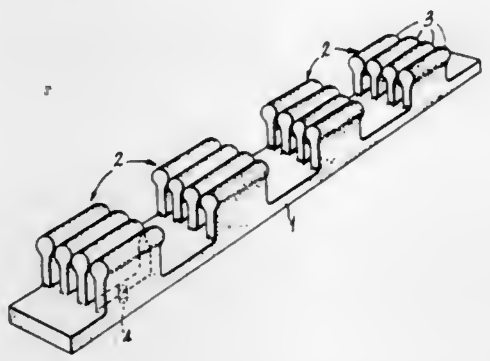
Wesley G. Perry, Wayland, and James F. Marten, Cohasset, both of Mass., assignors to Damon Corporation, Needham Heights, Mass.
Filed Jan. 12, 1971, Ser. No. 105,930
Int. Cl. A61b *10/00*
U.S. Cl. 128—2 F **9 Claims**



This invention relates to a disposable container unit for liquid samples and is particularly useful for the collection of blood specimens. It includes an elongated compressible bulb member having an integral nozzle attached thereto. An elongated storage volume having a closed and an open end and a small cross sectional area is also provided, the open end being in communication with the bulb member. Preferably but not necessarily the longitudinal axis of the storage volume, the bulb and the nozzle are coaxial. If the container unit is held vertically upward, liquid in the bulb will not flow freely into the storage volume because of its small cross sectional area. Similarly, if the storage volume contains liquid and is turned upside down, the liquid will not flow from it into the bulb.

3,718,134
IMPLANTABLE ELECTRODE CONNECTOR DEVICE

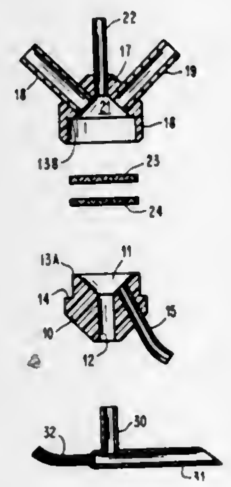
Giles Skey Brindley, London, England, assignor to National Research Development Corporation, London, England
Filed April 13, 1971, Ser. No. 133,692
Claims priority, application Great Britain, April 17, 1970, 18,482/70
Int. Cl. A61b *5/00;* **A61n** *1/02;* **A61f** *1/00*
U.S. Cl. 128—2.1 E **5 Claims**



This proposal concerns a prosthesis, for a paraplegic with severed spinal cord, which operates by picking up motor signals from the still active nervous system and transmitting the same to stimulate spinal roots in the otherwise inactive part of the system, thereby bridging the lession. More particularly for this purpose, the invention proposes an implantable electrode connector device of flexible electrically insulating material having a base from which an array of leaves extend in a successive face-to-face array in the manner of a book, the leaves being resilient and tending to adopt a closed book configuration. In use of such a device, selected spinal roots are connected in the inter-leaf spaces with electrodes conveying appropriate motor signals.

3,718,135
PNEUMOTACHOGRAPH

Louis Diamond, and William T. Lipscomb, both of Lexington, Ky., assignors to The University of Kentucky Research Foundation, Lexintgon, Ky.
Filed March 1, 1971, Ser. No. 122,599
Int. Cl. A61b *5/08*
U.S. Cl. 128—2.08 **6 Claims**

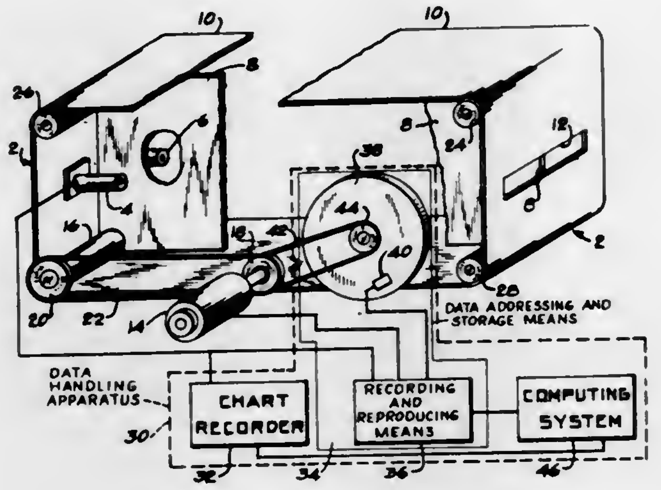


A pneumotachograph suitable for measuring flow rates of respiratory gases in small animals and comprising essentially a

flow-resisting element which can be placed in series with a subject's airway. The pressure drop across the resistive element is proportional to the rate of airflow and is linear over the range of flows which one normally would expect to encounter in small animals (0–2 liters/min.).

3,718,136
REGIONAL LUNG MEASURING DEVICE

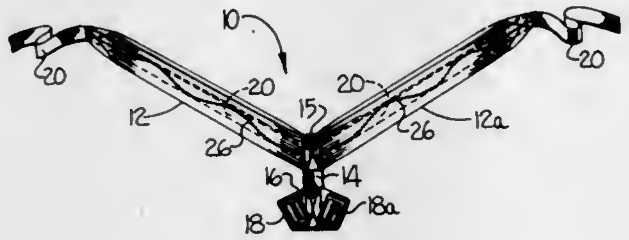
Alvin S. Blum, 700 Palermo Ave.,
Coral Gables, Fla. 33134
Filed Oct. 9, 1968, Ser. No. 766,066
Int. Cl. A61b *5/08*
U.S. Cl. 128—2.08 **7 Claims**



A regional lung measuring device for measuring volume, ventilation and perfusion, and a data handling apparatus for addressing and storing data, displaying data, and computing ratio information. The measuring device includes fixed radiation detectors, and a moving radiation shield with an aperture therein for defining the size of a lung region. The data handling apparatus includes a data addressing and recording means, a chart recorder, and a computing system for computing ratio information from the stored data and for automatically displaying the ratio information in graphic form.

3,718,137
CLAVICLE BRACE

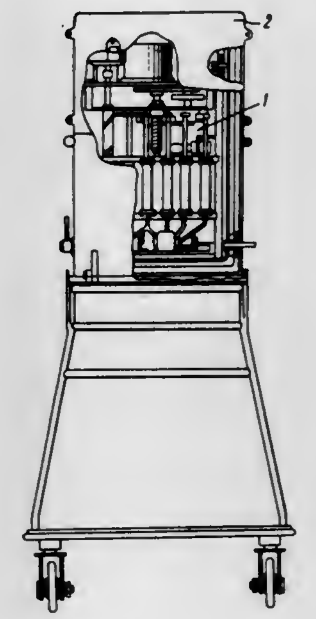
John F. Gaylord, Jr., Matthews, N.C., assignor to Medical Specialties, Inc., Charlotte, N.C.
Filed Jan. 13, 1971, Ser. No. 106,155
Int. Cl. A61f *5/04*
U.S. Cl. 128—87 R **4 Claims**



A clavicle brace for supporting the shoulder region of the body in a fixed position without biting into the body of the wearer. The brace comprises a back strap and a pair of upwardly extending shoulder straps connected at the upper end of the back strap. The shoulder straps include a contoured, non-biting, porous core of a resilient foam material which distributes the forces from the shoulder straps over a broad area of contact. Since the core is porous, ventilation to the surface of the skin beneath the straps is permitted.

3,718,138
RADIOACTIVE SOLUTIONS INJECTOR FOR LYMPHATIC SYSTEMS

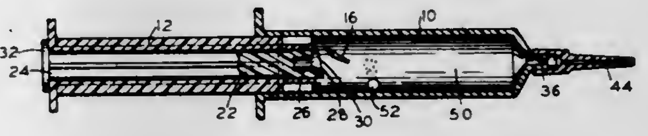
Nickolai Nikolaevich Alexandrov, and Arkady Dmitrievich Strukov, both of Minsk, U.S.S.R., assignors to Nauchno-Issledovatelsky Institut Onkologii I Meditsinskoi Radiologii MZ BSSR, Minsk, U.S.S.R.
Filed March 24, 1970, Ser. No. 22,324
Int. Cl. A61m *05/00*
U.S. Cl. 128—214 R **2 Claims**



An apparatus for injecting radioactive solutions into the lymphatic system, comprising at least one syringe for discharging the contents thereof; a conduit for communicating the interior of the syringe with the patient's lymphatic vessel, a system of auxiliary syringes and multiway valves used to alternately communicate the interior of the first syringe with the auxiliary syringes and with a patient's lymphatic vessel; the apparatus being also provided with a remote control system controlling the rate of procedure of injecting the radioactive solutions.

3,718,139
SYRINGE

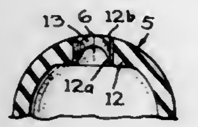
George W. Hanford, 304 Oneida St., Syracuse, N.Y.
Filed Aug. 21, 1970, Ser. No. 65,842
Int. Cl. A61m *1/00*
U.S. Cl. 128—235 **3 Claims**



A medicament applicator of the syringe type having a plunger sleeve slidable in the syringe barrel, the inner end of which has an integral severable circular closure, and a plunger slidably mounted in the sleeve and recessed to contain a solid medicament, the recess having an oval cutting edge to shear the closure from the plunger sleeve upon initial inward movement of the plunger, to expose the solid medicament to a solution container in the syringe barrel, whereupon further inward movement of the sleeve and plunger, the mixture is ejected.

3,718,140
NURSING BOTTLE NIPPLE

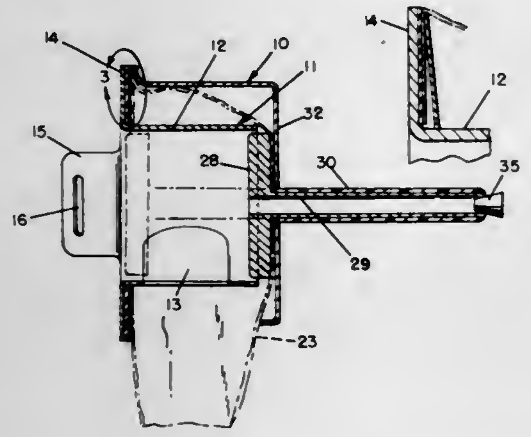
Akira Yamauchi, Sasayama-cho, Taki-gun, Hyogo-prefecture, Japan
Division of Ser. No. 23,681, March 30, 1970, Pat. No. 3,651,973. This application Oct. 13, 1971, Ser. No. 188,841
Int. Cl. A61j *9/00*
U.S. Cl. 128—252 **4 Claims**



An improved nursing bottle nipple particularly adaptable for use with a nursing bottle assembly of the collapsible milk bag type. In such an assembly, the nipple and milk bag full of milk are secured by a fastening ring overlaying the mouth end of a milk bag and bottle housing wherein the open mouth end of the bag is folded outwardly over the housing mouth. The improvement in the nipple structure resides in a novel fluid-passing outlet portion of non-return, self-closing character regardless of the attitude of the nursing bottle assembly. More particularly, the fluid-passing outlet includes a small generally hemispherically convex membrane of thinner material than the rest of the bulbous end body portion of the nipple, which membrane constitutes a miniature form of nipple recessed within and generally not extending beyond the outer surface of the bulbous end portion of the nipple, and is punctured in a Y-shape or X-shape to form a valve of the self-closing character when not in nursing use. The convex membrane has a thicker radially flaring peripheral margin connecting it with a substantially thickened portion of the bulbous end body portion of the nipple, which collectively contribute to both reenforce the non-return type outlet as well as to preclude inward collapse of the convex, nipple-like membrane even under increased negative pressure within the interior of a bottle assembly when in use therewith.

3,718,141
COLOSTOMY AID

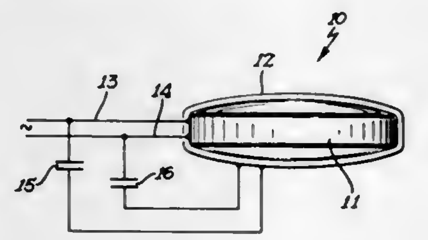
Edward A. Goetz, 1736 Voorhees Ave., Manhattan Beach, Calif.
Filed Feb. 2, 1971, Ser. No. 111,873
Int. Cl. A61f *5/44*
U.S. Cl. 128—283 **2 Claims**



This invention consists of a stainless steel vertically disposed inner housing having a tubular member with a rectangular opening in the wall thereof. The aforesaid tubular member is provided with a flange with two opposed rectangular lugs on the bottom thereof that are contoured to the abdomen of a person. An outer housing having a second vertically disposed tubular member considerably larger in diameter than that of the first mentioned tubular member encompasses the first mentioned tubular member. The second mentioned tubular member has its wall cut away to expose the aforesaid rectangular opening in the wall of the first mentioned tubular member. The second mentioned tubular member has an integrally formed horizontally disposed top having a round opening in the center thereof and two opposed rectangular lugs integrally formed on the bottom of the aforesaid vertically disposed wall, the aforesaid lugs being of the same size and contour as that of the first mentioned lugs. The aforesaid lugs in both the lower and the upper rectangular members have matching rectangular openings therein for the reception of a metal snap fastener having an elastic belt that encompasses the body of the person on which this invention is placed. A clear rectangular plastic drain tube has one end encompassing the first mentioned tubular member and is held in place by the second mentioned tubular member. A gasket is located between the lugs of the two members and a gasket spring and plunger, having a vertically disposed tubular member, is located in the center of the device. The aforesaid tubular member has a plastic enema tube extending outward from the top thereof.

3,718,142
ELECTRICALLY SHIELDED, GAS-PERMEABLE IMPLANTABLE ELECTRO-MEDICAL APPARATUS

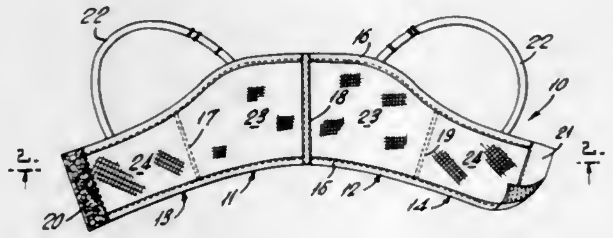
Pieter M. J. Muller, Minneapolis, Minn., assignor to Medtronic, Inc., Minneapolis, Minn.
Filed April 23, 1971, Ser. No. 136,890
Int. Cl. A61n *1/34*
U.S. Cl. 128—419 P **10 Claims**



A thin film of metal, deposited on an implantable cardiac stimulator, acting as a shield to prevent interference with the electronic circuitry of the stimulator, the interference produced by any outside apparatus which might induce RF interference on electrodes from the stimulator to the heart, or through the living tissue to the stimulator body itself. Also, before implantation, because of a variety of very well-known reasons, a static charge that may have been built up on the stimulator is avoided because of the deposited shielding.

3,718,143
BREAST SUPPORT

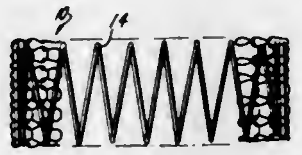
Anthony M. Pagano, 6 Gates Avenue, Ossining, N.Y., and Dolores E. Fiedler, 47 East 67th Street, New York, N.Y.
Filed March 11, 1971, Ser. No. 123,224
Int. Cl. A41c *3/00*
U.S. Cl. 128—499 **8 Claims**



A breast support useful among other things to minimize postpartum breast engorgement with its resulting discomfort which includes a body encircling structure completely overlying and conforming to the entire anatomy of the breasts and formed of an elastic material for applying substantially uniform pressure to the breasts to minimize venous and glandular engorgement.

3,718,144
HAIR CURLERS

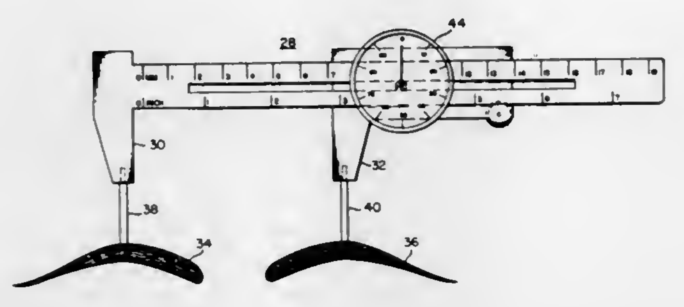
Murray Jennis, Laurelton, N.Y., assignor to H. Goodman & Co., Kearny, N.J.
Filed June 10, 1971, Ser. No. 151,704
Int. Cl. A45d *2/02*
U.S. Cl. 132—39 **11 Claims**



Hair curlers commonly have a hollow cylindrical form around which the hair is rolled, and many hair curlers have bristles projecting from the form. The described hair curlers have a cylindrical wall of undulating wire convolutions knit together in succession. One described form of curler involves additional knit wire convolutions folded inside each end of the cylindrical wall. Another described form of curler has each end of the knit cylindrical wall embedded in an annulus. The ends of the knit wire are guarded against exposure in both forms. The described rollers are supple in that they can readily assume what may loosely be called a banana shape, they are well ventilated, they can be made boilable for sterilization, and they can be penetrated by pins or used with clips and other fasteners for holding hair wound on the curler.

3,718,145
EYEBROW STENCILLING METHOD AND APPARATUS

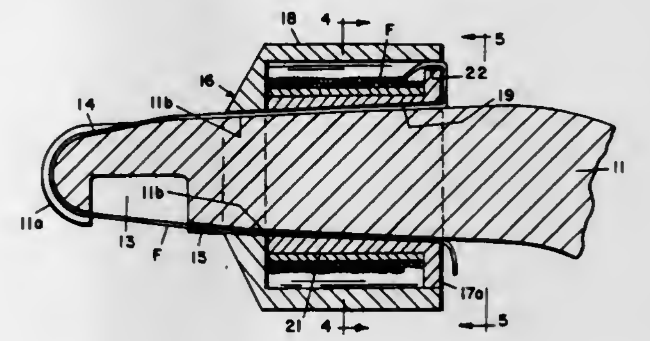
Frederick D. Chateau, P.O. Box 31441, Los Angeles, Calif. 90031
Filed Feb. 23, 1971, Ser. No. 118,122
Int. Cl. A45d *24/06*
U.S. Cl. 132—88.5 **7 Claims**



Eyebrow make-up is applied quickly and accurately by the use of a guide which has eyebrow stencil openings having an eyebrow shape which complements a person's facial configuration. Eyebrow templates are initially selected to provide proper configuration and coloring to complement the customer's features, coloring and personality. These templates are mounted on calipers for adjustable separation, are then held over the eyebrows, and the distance between the eyebrow templates is determined from the calipers. An eyebrow stencil having attached temples is selected, with the proper separation and eyebrow style to match the selected templates and the eyebrow spacing distance previously determined.

3,718,146
DENTAL FLOSS HOLDER

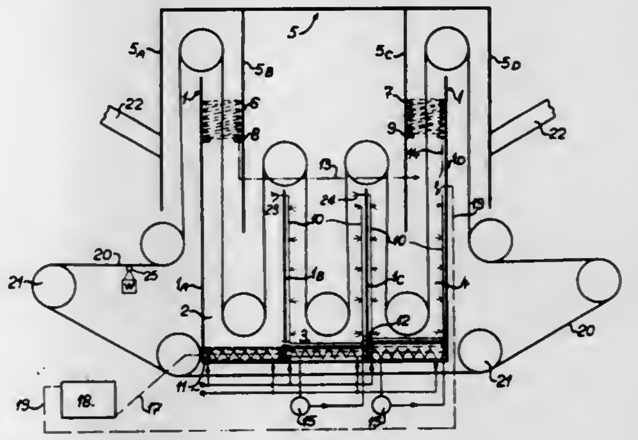
Robert E. Myers, 18506 Prince William Lane, Houston, Tex. 77058
Filed Mar. 8, 1972, Ser. No. 232,707
Int. Cl. A61c *15/00*
U.S. Cl. 132—92 **7 Claims**



A casing with an open-ended tapered bore is slidable on an elongated tapered handle to a locked or wedged position. A supply of floss in the casing extends through the bore in one direction, then across an open recess in the tapered end portion of the handle, and then in the other direction through the bore, so that portions of floss in the bore may be wedgingly locked against the handle to retain the floss tightly stretched across the recess, when the casing is slid to its locked position. The casing contains a rotatable spool on which the floss supply is carried.

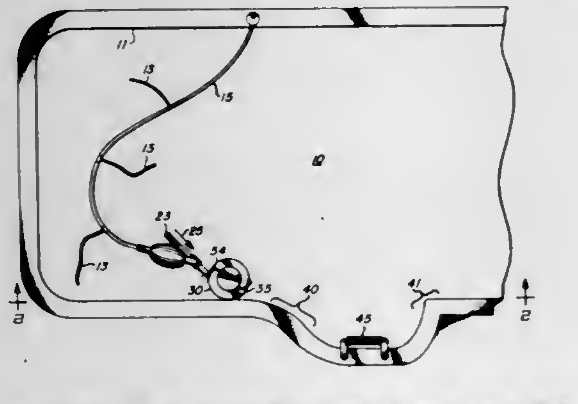
3,718,147
INSTALLATION FOR DEGREASING METAL ARTICLES

Rene V. Laroche, Fribourg, Switzerland, assignor to Aluminium Suisse SA, Chippis, Switzerland
Filed Feb. 16, 1971, Ser. No. 115,810
Claims priority, application Switzerland, Feb. 17, 1970, 2221/70; Feb. 2, 1971, 1476/71
Int. Cl. B08b *3/02*
U.S. Cl. 134—60 **1 Claim**



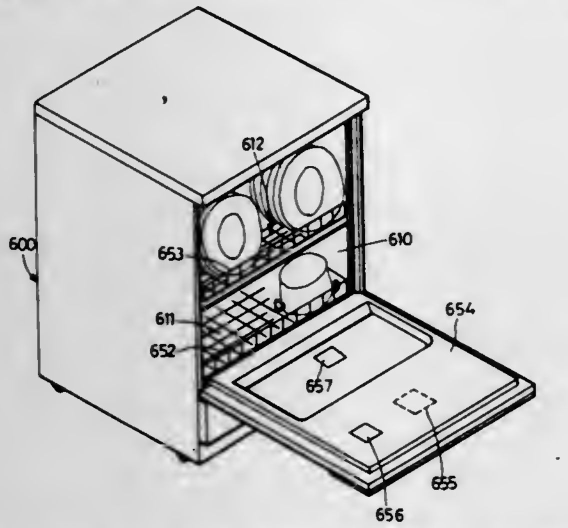
An installation for degreasing metal articles comprises means for driving articles to be cleaned successively through at least two chambers comprising heating means in their lower parts, the first chamber being a condensation chamber, and the other chamber(s) each comprising means for spraying a solvent. Condensers are located at the inlet to the first chamber and the outlet to the last chamber. Means for regenerating and recycling solvent comprise three circuits:a first circuit for each spraying chamber comprising means for pumping solvent from the bottom of the chamber to feed the spraying means ; a second circuit formed by overflows between adjacent chambers to enable a flow of solvent from the final chamber to the first chamber, and a first return conduit connecting the first chamber and the final chamber, said first return conduit comprising a distiller comprising level compensating means by the external supply of solvent and being adapted to deliver distilled solvent to the final chamber; and a third circuit comprising means for recuperating condensation from the condensers and second return conduits for the delivery of condensation from the recuperation means to the final chamber ; the second circuit having a by-pass formed by at least one spraying nozzle at the outlet of each chamber except for the final chamber, each last mentioned spraying nozzle being fed by solvent taken from the adjacent following chamber.

3,718,148
POOL CLEANING DEVICE
Michael C. Gibellina, 8350 E. Cherry Lynn, Scottsdale, Ariz.
Filed Dec. 16, 1970, Ser. No. 98,577
Int. Cl. B08b *3/02*, *9/08*
U.S. Cl. 134—167 R **2 Claims**



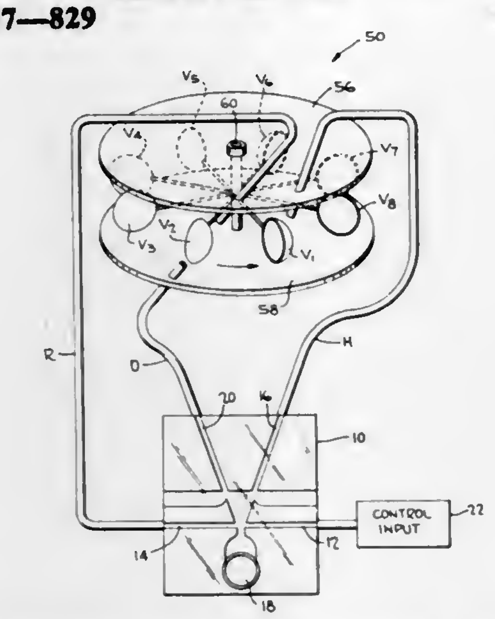
A rotating platform is provided with water jets directing water therefrom so as to have a horizontal component of velocity tangential to the platform resulting in the rotation of the platform. An inflexible supply conduit is connected at one end thereof to the platform and is provided with a water jet at its opposite end to urge the platform into contact with the pool side while simultaneously providing water to the jets mounted on the platform. A flexible conduit is connected to the pool pump and to the inflexible conduit to supply the latter with water under pressure for operation.

3,718,149
DISH-WASHER
Lamberto Mazza, Pordenone, Italy, assignor to Industrie A. Zanussi S. p. A., Pordenone, Italy
Filed Jan. 22, 1971, Ser. No. 108,898
Claims priority, application Italy, Feb. 4, 1970, 20222 A/70
Int. Cl. B08b *3/02*
U.S. Cl. 134—57 D **2 Claims**



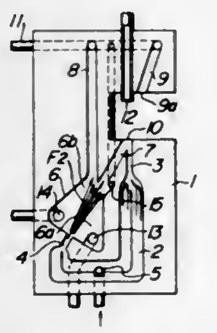
In a dish-washing machine of the type having two separate washing zones in which delicate tableware and cooking utensils are respectively charged, there being two detergent dispensers, the second of which is capable of supplying detergent only to the cooking utensil washing zone and is operated as a result of the rise of the washing temperature in the zone for the cooking utensils.

3,718,150
FLUID STEPPING MOTOR
Raymond W. Warren, McLean, Va., assignor to the United States of America as represented by the Secretary of the Army
Filed June 30, 1971, Ser. No. 158,322
Int. Cl. F15c *3/00*
U.S. Cl. 137—829 **4 Claims**



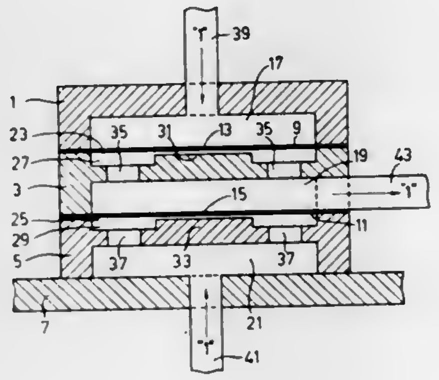
A fluid stepping motor for providing a rotary mechanical output for a fluidic digital logic system. A rotor having a plurality of vanes radially disposed a pivotable shaft is driven in a stepping fashion by fluid impulses issuing from a drive conduit connected to an output channel of a bistable fluid amplifier. After impinging upon one of said plurality of vanes, the fluid stream issuing from the drive conduit enters a receiver conduit that is connected to a control channel of the fluid amplifier causing it to switch its output to a hold conduit. The hold conduit is positioned in the rotor so as to establish an equilibrium position for an advancing vane. The vane is held in that position until a signal is applied to the other control channel of the bistable amplifier, whereupon the foregoing process is repeated. Each time a pulse is applied to the control input of the system, the rotor will advance one step and provide an output indication at the central shaft. The control input may be provided by any conventional pulsed device.

3,718,151
GAS CONTROLLED LIQUID PROPORTIONING FLUIDIC DEVICE
Kazuma Matsui, Toyohashi, and Hideo Tsubouchi, Kariya, both of Japan, assignors to Nippondenso Kabushiki Kaisha, Aichi-ken, Japan
Filed April 30, 1971, Ser. No. 138,919
Claims priority, application Japan, May 18, 1970, 45/42251; Dec. 27, 1970, 45/126114
Int. Cl. F15c *1/14*
U.S. Cl. 137–823 **6 Claims**



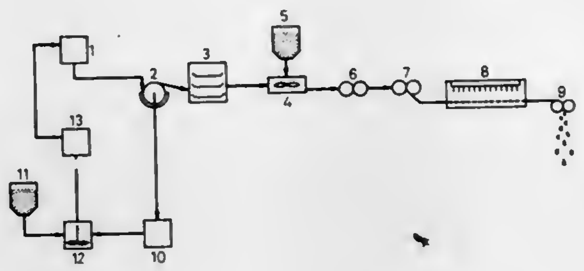
Injection nozzle means comprising means for forming a first liquid flow and a second liquid flow which are directed so as to join with each other, said second liquid flow being passed through a deflecting chamber, means for introducing a pulse signal of compressed gas into the deflecting chamber whereby the second liquid flow is deflected into and out of confluence with the first liquid flow in accordance with the pulse signal.

3,718,152
FLUID LOGIC ELEMENT
Hillebrand J. J. Kraakman, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Jan. 5, 1971, Ser. No. 104,031
Claims priority, application Netherlands, Feb. 19, 1970, 7002383
Int. Cl. G05d *11/00;* **G06d** *1/00*
U.S. Cl. 137—114 **4 Claims**



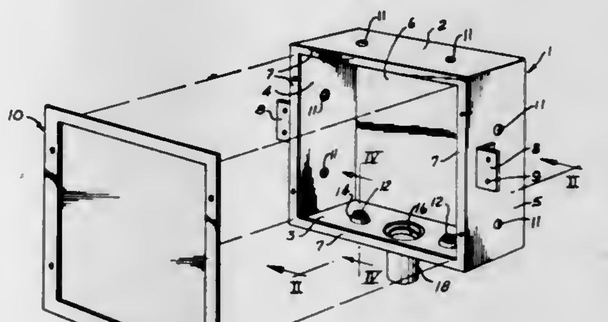
A fluid responsive logic element comprising two inputs and an output. The communications between each of the inputs and the output includes a check valve co-operating with a stop. The check valves when viewed from the output have opposite senses of operation. When in the neutral positions of the two check valves the communication between the associated input and output is open.

3,718,153
PROCESS FOR PREPARING SHEET-LIKE MATERIAL FOR SMOKING
Masao Kobari, Tokyo, Hiroshi Hagiwara, Yokohama, and Kensuke Uchiyama, Tokyo, Japan, assignors to The Japan Monopoly Corporation, Tokyo, Japan
Filed Sept. 15, 1971, Ser. No. 180,652
Claims priority, application Japan, Sept. 28, 1970, 45/84,103; Nov. 4, 1970, 45/96,454
Int. Cl. A01g *31/00;* **A24b** *3/14*
U.S. Cl. 131—140 C **10 Claims**



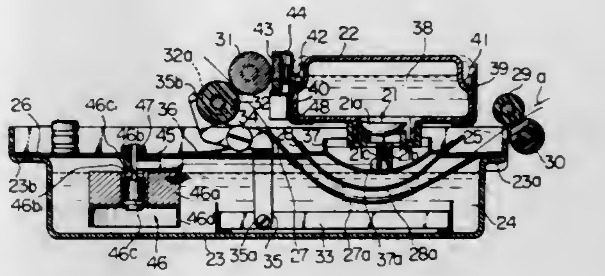
A process is disclosed for preparing sheet-like material for smoking which includes the steps of: culturing a fragment of a plant body of genus Nicotiana in a liquid medium under aerobic conditions to derive tobacco cells suspended in the liquid, isolating said tobacco cells from the cultured liquid, drying slightly the fresh tobacco cells at a temperature below 80° C. or mixing the fibrous materials and/or inorganic materials, so as to reduce the moisture content of the tobacco cells or the mixture thereof to 30–60%, forming the resulting moist powder into a sheet-like material and drying the same. The product has excellent physical properties and the cigarettes made therefrom have light and good organoleptic properties.

3,718,154
WASHING MACHINE OUTLET BOX
Constantine R. Doumany, Dallas, Tex., assignor to Conrad Industries, Inc., Dallas, Tex.
Filed Jan. 7, 1971, Ser. No. 104,593
Int. Cl. E03c *1/00*
U.S. Cl. 137—360 **2 Claims**



A washing machine outlet box having a waterproof trough formed in the bottom thereof to prevent leakage. The bottom of the box has a downwardly extending neck around a drain opening formed therein and upwardly extending surfaces around openings through which pipes extend. The neck around the drain opening extends downwardly into a drain pipe and the neck and the pipe are dented to lock them together.

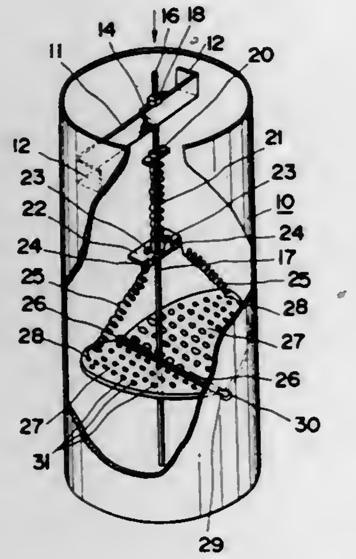
3,718,155
DEVELOPER LIQUID SUPPLYING METHOD AND DEVICE FOR LIQUID DEVELOPMENT ELECTROPHOTOGRAPHY
Shigeru Suzuki, Yokohama; Tadaaki Kanno, Tokyo, and Tadatoshi Sakamaki, Kawasaki, all of Japan, assignors to Kabushiki Kaisha Ricoh, Tokyo, Japan
Filed Nov. 14, 1969, Ser. No. 876,846
Claims priority, application Japan, Dec. 27, 1968, 43/370
Int. Cl. G03d *3/00*
U.S. Cl. 137—433 **1 Claim**



A developer liquid supplying method and a device therefor wherein a developer liquid prepared in advance at a certain concentration level required to keep the concentration of the developer liquid in the developer liquid tank at a fixed level is supplied automatically only when the developer liquid in the developer liquid tank decreases and otherwise the developer liquid for supply is intercepted from the developer liquid in the developer liquid tank.

3,718,156
AUTOMATIC AIR FLOW SMOOTHING APPARATUS

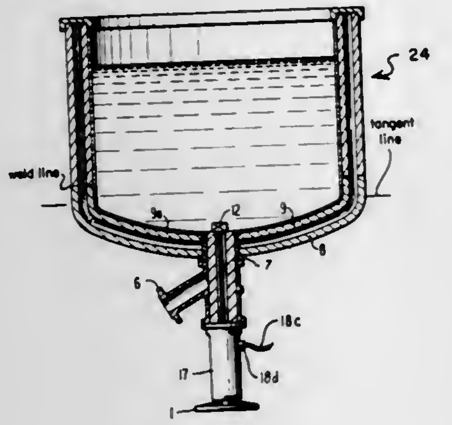
Akira Fujii, 8-24, Matsuzono-cho, Nishinomiya, Japan
Filed Jan. 27, 1971, Ser. No. 110,064
Int. Cl. F16k *17/06, 17/08*
U.S. Cl. 137—512.1 **6 Claims**



The present invention relates in general to an automatic air flow smoothing apparatus assuring a constant output air flow and more particularly to an automatic air flow smoothing apparatus, assuring a constant output air flow achieved by a suitable built-in automatic flow regulating means, despite an eventual change in the pressure of the input air flow.

3,718,157
RAM-VALVE LEVEL INDICATOR

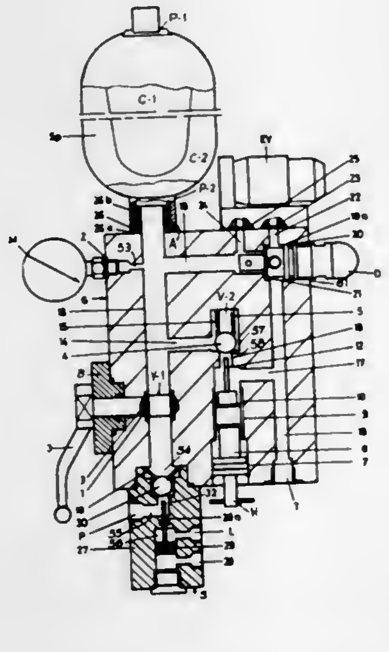
Frank H. Siebentritt, Lebanon, N.J., and Esteban Silvera, Bronx, N.Y., assignors to North Branch Industries, Inc., North Branch, and William T. Hough, Basking Ridge, N.J., fractional part interest to each
Filed June 1, 1971, Ser. No. 148,338
Int. Cl. F16k *37/00*
U.S. Cl. 137—551 **18 Claims**



In a preferred embodiment, a ram-valve having a conduit extending about centrally along its longitudinal axis, with a liquid level indicator for measuring the vessel contents, with the level indicator mounted on top of the distal end of the ram-valve, making possible the measurement of the contents at levels well below the weld and tangent lines of the vessel above which most prior art level indicators are located, thereby avoiding prior art vessel weak points coincident with insertion of an indicator through the glass-lined double-walled vessel.

3,718,158
ACCUMULATOR CONTROL SYSTEM

Otmar Schon, Scheidterberg, Germany, assignor to Greer Hydraulics Inc., Los Angeles, Calif.
Filed Oct. 13, 1971, Ser. No. 188,794
Claims priority, application Germany, Oct. 28, 1970, P 20 52 892.1
Int. Cl. F16l *55/04*
U.S. Cl. 137—593 **6 Claims**

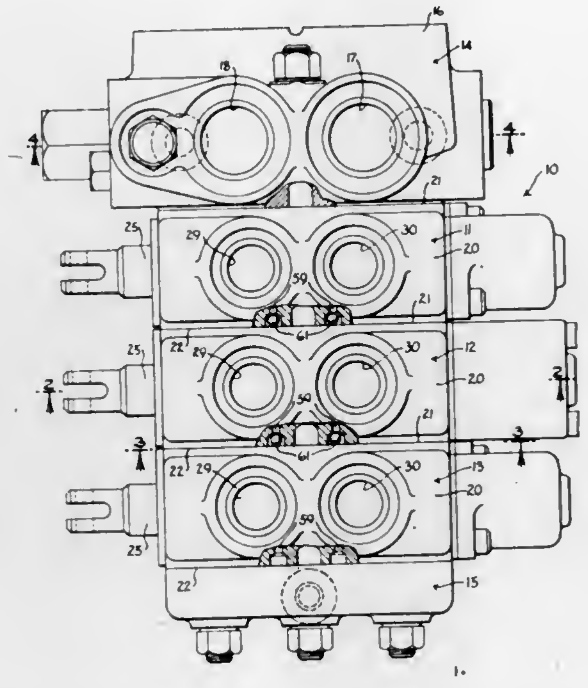


A pressure accumulator control system comprising a mounting block having a port to which the liquid port of the accumulator which is desirably mounted on the block may be connected, a pressure port and a discharge port, said block having a passageway connecting the first port to the pressure port with a manually operable shutoff valve in said passageway, a second passageway in communication with said first port, an automatically operable valve mounted on said block controlling communication between said first port and said discharge port, a pressure relief valve also mounted in said discharge passageway and a manually operated relief valve controlling flow between a relief passageway connecting said first passageway and the discharge passageway, said pressure port having an associated one-way valve with means to control the opening of said valve.

3,718,159
CONTROL VALVE

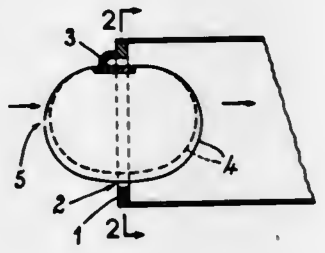
Francis H. Tennis, Oconomowoc, Wis., assignor to Hydraulic Industries, Inc., Hartland, Wis.
Filed Jan. 20, 1971, Ser. No. 108,127
Int. Cl. F16k *11/10*
U.S. Cl. 137—596.12 **27 Claims**

A control valve comprising a valve element shiftable to each of a pair of working positions to selectively communicate a service passage with either pressure fluid supply or return passages, and having means providing for control of the rate of fluid flow through the service passage. The rate of flow through a selected service passage of a sectional valve of this invention is controlled by a pressure compensating valve mechanism in the inlet section having a plunger which tends to move to a bypass open position under the influence of fluid pressure at the control valve inlet, and which tends to be moved in the bypass closing direction under the influence of fluid pressure at the service passage. A control passage through which service passage pressure is imposed upon the compensating plunger includes transfer grooves in the face of one housing section at the junction between each control section and an adjoining housing section.



3,718,160
DEVICE FOR CONTROLLING AIR FLOW IN VENTILATION PIPES

Pierre Charles Jules Jardinier, Gournay-sur-Marne, and Jack Paul Robert Simonnot, Lesigny, France, assignors to Societe d'Etudes et de Recherches de Ventilation et d'Aeraulique, Villiers-sur-Marne, France
Filed Apr. 1, 1971, Ser. No. 130,325
Int. Cl. F15d *1/02*
U.S. Cl. 138—46 **7 Claims**



This invention relates to a device which, without making use of any source of energy other than the motive pressure of air circulating in a pipe, enables the flow of air in this said pipe to be stabilised to a constant value; the said device, by virtue of its design, being able without any supplementary means to smooth out the effect of violent fluctuations of pressure, at the same time retaining good response sensitivity to progressive changes of pressure of low amplitude, said device having

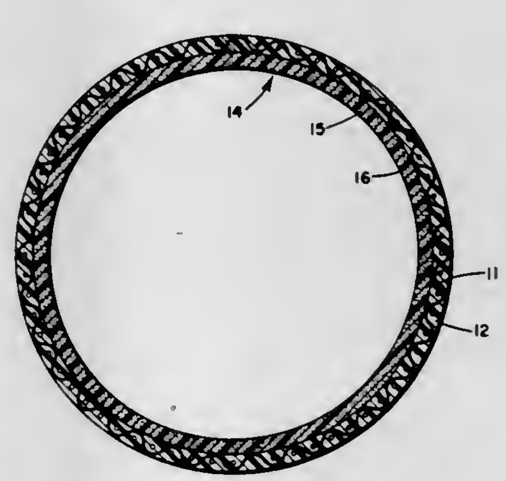
at least one chamber of which part of, or the whole of the walls can undergo elastic deformation,

a seating associated with this chamber in such a way as to provide an air passage between this seating and the outside walls of the chamber,

means which, when such a device is fitted in a pipe in which is maintained a motive pressure capable of assuring air circulation, enable a pressure equal to that upstream of the device to be present inside the chamber.

3,718,161
CRACK-RESISTANT PIPE

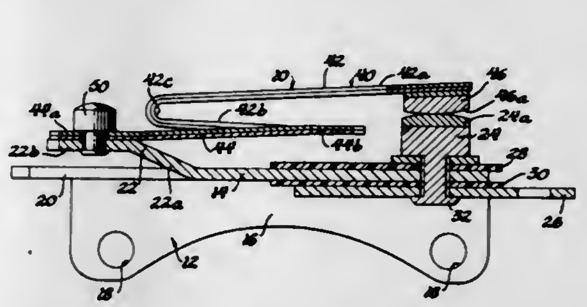
Charles S. Woodson, Parkersburg, W. Va., assignor to The Youngstown Sheet and Tube Company, Youngstown, Ohio
Continuation of Ser. No. 815,196, April 10, 1969. This application June 23, 1971, Ser. No. 156,036
Int. Cl. F16l *9/14*
U.S. Cl. 138—153 **2 Claims**



This patent discloses a plastic pipe and method of making same, having an outer shell of reinforced thermo-setting resin and an inner shell of thermo-setting and thermo-plastic resins.

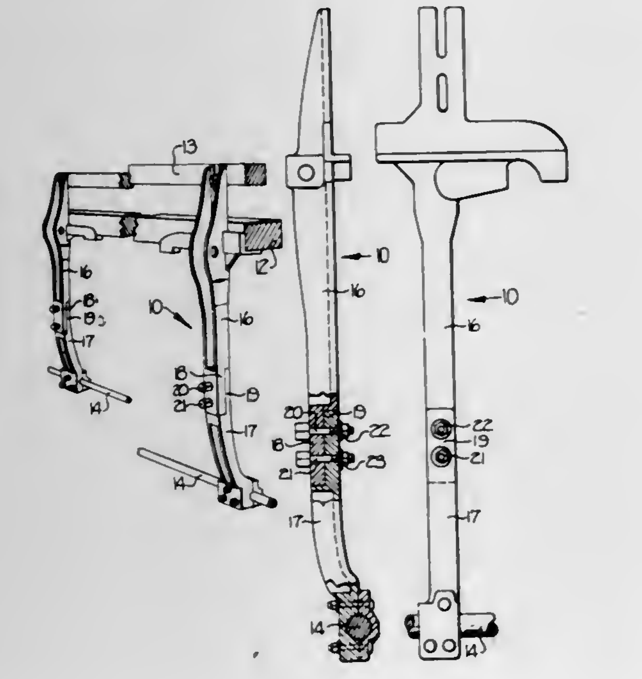
3,718,162
CIRCUIT BREAKER

Gene L. Dafler, New Lebanon, and Lorand W. Magyar, Dayton, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.
Filed Nov. 5, 1971, Ser. No. 196,010
Int. Cl. H01h *61/08*
U.S. Cl. 337—94 **3 Claims**



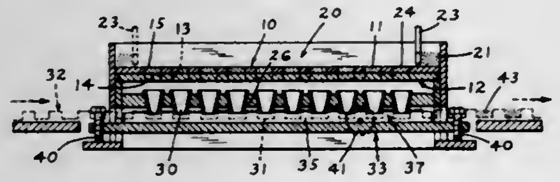
In a preferred form, this disclosure relates to an overload circuit breaker having a metal base with an upwardly extending tang thereon, a stationary contact carried by, but insulated from the base, a bimetal strip including a primary U-shaped portion having one leg carrying a mobile contact adjacent its free end and overlying said stationary contact and a secondary portion supported in cantilever fashion by the tang and having its free end connected with the other leg of the U-shaped primary portion. The bimetal strip is normally self-biased toward a first position in which the mobile contact engages the stationary contact to provide a conductive path therethrough, but is movable toward a second position in which the mobile contact is disengaged from the stationary contact when a current in excess of a predetermined magnitude is passed therethrough for a predetermined interval of time. The tang on the base is bendable to adjust the spring pressure of the bimetal strip so that the predetermined time interval prior to opening of the contacts when an overload of current is passed therethrough can be readily calibrated.

3,718,163
TWO-PIECE TEXTILE LOOM SWORD
Odie Edward Walker, Jr., Lancaster, S.C., assignor to Springs Mills, Inc., Fort Mills, S.C.
Filed Aug. 12, 1971, Ser. No. 171,277
Int. Cl. D03d *49/60*
U.S. Cl. 139—188 **2 Claims**



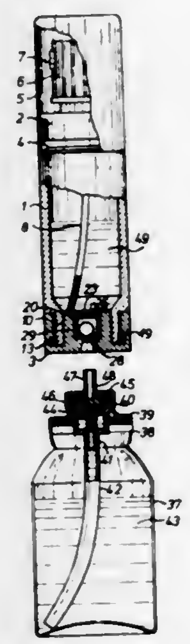
A textile loom sword for use in a textile loom to support the loom lay and characterized by ease in replacement in the event of breakage. The sword comprises an elongate body of a predetermined configuration formed from two members having mating opposite ends for assembly of the two members into a unitary body, and shear bolts passing through the mating ends of the body members for securing the members together to form a unitary body. The shear bolts are more easily breakable than the body members so that when excessive forces are applied to the loom sword, the shear bolts will break in lieu of the body members.

3,718,164
POWDER FEEDING DEVICE
Donald F. Stewart, Florham Park, N.J., assignor to Allied Chemical Corporation, New York, N.Y.
Continuation of Ser. No. 880,030, Nov. 26, 1969, abandoned.
This application Nov. 17, 1971, Ser. No. 199,757
Int. Cl. B65b *1/04, 3/04*
U.S. Cl. 141—1 **7 Claims**



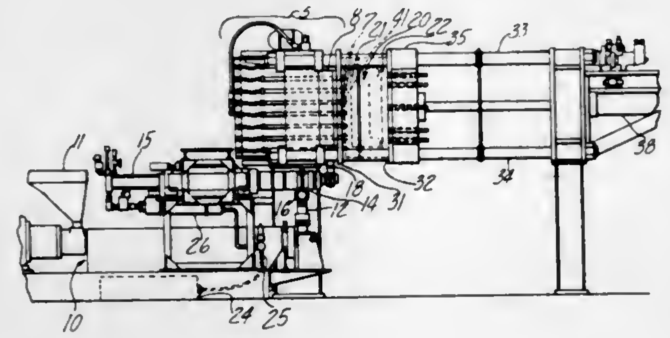
A device for feeding a measured volume of powder into a receiver without alteration of the bulk density and suited to high production rate.

3,718,165
REFILLABLE AEROSOL DISPENSER
Gisela Grothoff, 7 Nollenlinde, 466 Gelsenkirchen-Buer, Germany
Filed Dec. 8, 1970, Ser. No. 97,474
Claims priority, application Germany, Dec. 8, 1969, P 19 61 486.9
Int. Cl. B65b *1/04, 3/04*
U.S. Cl. 141—20 **11 Claims**



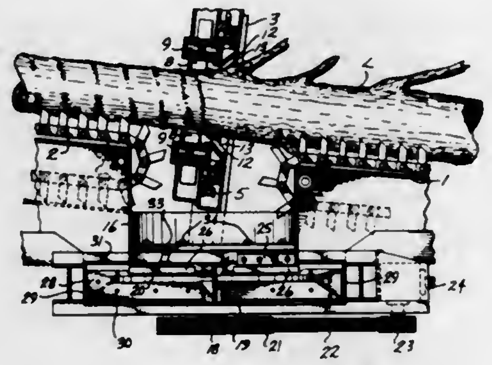
A refillable aerosol dispenser comprises a container for a mixture of liquid and a gaseous propellant for dispensing the same. The container has an upper wall and a bottom wall. A dispensing valve is provided in the upper wall for dispensing the mixture when operated, and a separate inlet valve is provided in the bottom wall and operates independently of the dispensing valve for admitting gaseous propellant into the container.

3,718,166
MANIFOLD AND ADJUSTABLE NOZZLE ASSEMBLY FOR MOLDING MACHINES
John Gordon, Cranford, N.J., assignor to Midland-Ross Corporation
Continuation-in-part of Ser. No. 774,648, Nov. 12, 1968, abandoned. This application Oct. 2, 1970, Ser. No. 77,620
Int. Cl. B65b *1/04*
U.S. Cl. 141—236 **17 Claims**



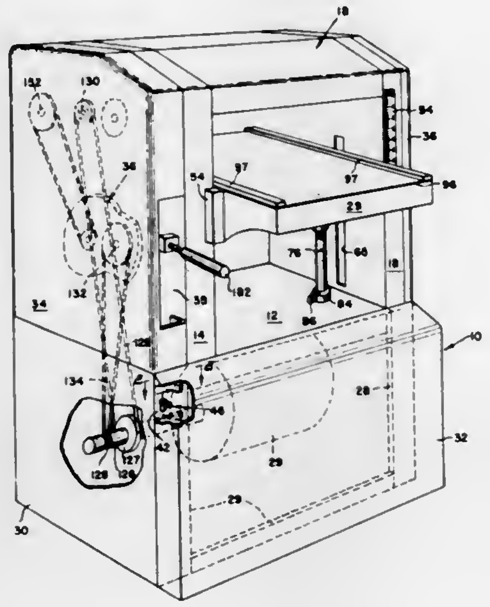
A manifold and nozzle assembly within injection-molding equipment comprising, e.g., an extruder, an accumulator, a manifold, and a plurality of nozzles wherein the nozzles are universally pivotable with respect to the manifold. This invention is especially directed to sleeve structure by which the nozzles are attached to and pivotally supported by the manifold, and to nozzles of the type comprising a shutoff valve.

3,718,167
LIMB STUB-CUTTING MECHANISM
Peter J. Cervenak, Seattle, Wash., assignor to Nicholson Manufacturing Company, Seattle, Wash.
Division of Ser. No. 84,056, Oct. 26, 1970, which is a division of Ser. No. 627,067, March 30, 1967, Pat. No. 3,536,265. This application Jan. 24, 1972, Ser. No. 220,328
Int. Cl. A01g *23/02*
U.S. Cl. 144—2 Z **3 Claims**



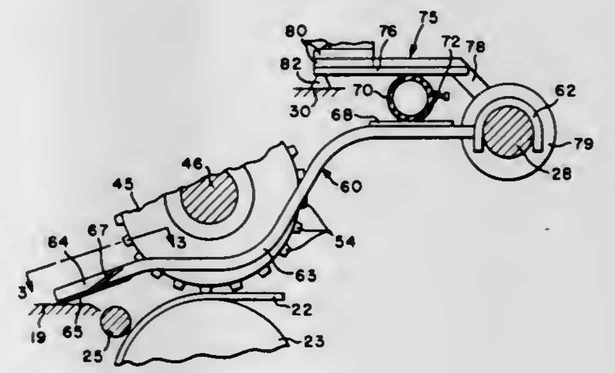
The rotary ring of a log barker has a flaring mouth carrying bits in radial planes for cutting limb stubs. Hooked ends of swinging arms rotate around a log as it is moved lengthwise to scrape off the bark.

3,718,168
PLANER
Emerson R. Berends, Tupelo, Miss., assignor to Rockwell Manufacturing Company, Pittsburgh, Pa.
Filed Jan. 22, 1970, Ser. No. 4,815
Int. Cl. B27c *1/02*
U.S. Cl. 144—117 R **25 Claims**



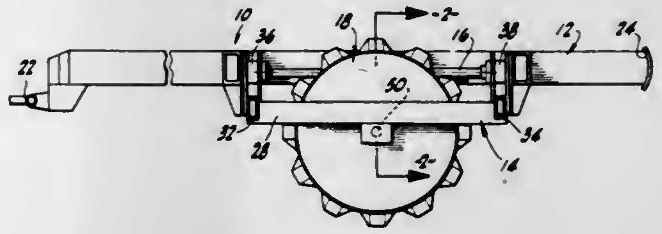
A planing machine in which the workpiece supporting table is provided with an uninterrupted low friction, abrasion resistant surface over which a workpiece is smoothly advanced through the region of the cutters. The drive system for the machine includes a single motor from which the cutter head is directly driven and the infeed and outfeed rollers are driven through an intermediate variable speed drive assembly enabling an operator to vary the speed at which a workpiece is fed through the cutting regions. The motor and drive components are housed within closure panels which are retained on the machine frame by fastener assemblies that permit the panels to be quickly and easily removed from the frame. A cutter guard and chip breaker assembly is pivotally supported at the outfeed end of the machine to enable an operator to gain ready access to the cutter head and feed rollers if necessary. An eccentrically mounted limit bar at the infeed end of the machine provides an adjustable maximum depth of cut limiting means for conditioning the planer to operate within the power limitations of the selected motor by properly adjusting the setting of the limit bar.

3,718,169
CHIPPING APPARATUS
Irving L. Plough, Everett, Wash., assignor to The Black Clawson Company, Hamilton, Ohio
Filed April 7, 1971, Ser. No. 131,870
Int. Cl. B27b *31/00;* **B27l** *11/00*
U.S. Cl. 144—242 R **8 Claims**



Pieces of scrap veneer are fed by a conveyor belt across an anvil and into a rotating chipper head. The pieces are held against the anvil by a plurality of laterally spaced pivotal fingers having wide flat tip portions overlying the anvil. An inflatable air bag extends over the fingers and underneath a pivotally supported adjustable weight member for resiliently urging the finger tip portions against the anvil. When the tip portion of one or more of the fingers rises to a predetermined height, the weight member is lifted with the finger so that the holddown force on the veneer does not exceed a predetermined maximum limit.

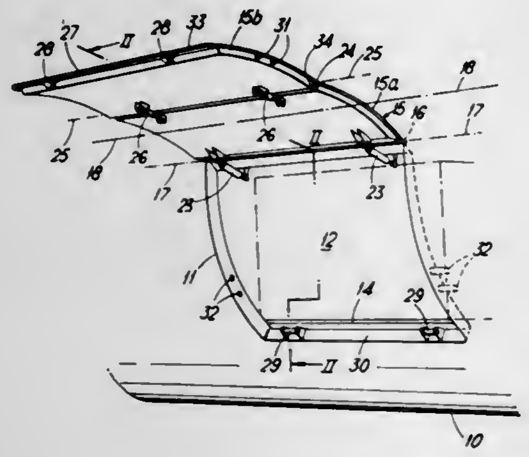
3,718,170
AXLE CUSHIONING ASSEMBLY FOR WHEELS ON CONSTRUCTION EQUIPMENT
Fred Joseph Caron, Citrus Heights; James Oliver Caron, Sacramento, and George Carrol Gray, Fair Oaks, all of Calif., assignors to Caron Compactor Co., West Sacramento, Calif.
Filed Aug. 12, 1970, Ser. No. 63,122
Int. Cl. B60b *9/12*
U.S. Cl. 152—49 **5 Claims**



An axle cushioning assembly for absorbing the shock load forces transferred between the wheels and axles of construction equipment. Elastomer sleeves are positioned between an inner sleeve mounted on the axle and an outer concentric barrel mounted to the wheel. Annular retainer means compressably holds the elastomer sleeves in position and provides relief openings permitting limited yieldable extrusion or deformation of the elastomer material under wheel loading.

3,718,171
DOORS

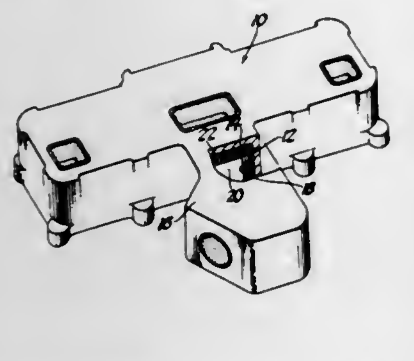
Roy Charles Godwin, Ringwood, England, assignor to British Aircraft Corporation Limited, London, England
Filed Sept. 30, 1971, Ser. No. 185,255
Claims priority, application Great Britain, Oct. 10, 1970, 48,262/70
Int. Cl. E05d *15/08*
U.S. Cl. 160—210 **3 Claims**



A door assembly having, a door frame and a door hinged to one edge of the frame. The door comprises two parts hinged together for limited relative rotation, and an actuator effective with the door in the closed position operatively connecting the two parts so as to vary the effective depth of the door. The edge of the door remote from the main hinge and the corresponding edge of the door frame being provided with engageable hook means. The relative positions of the hook means being such that when the two parts of the door are set for maximum depth the hook means are disengaged from each other, whilst when the two parts of the door are set to a lesser depth the hook means engage each other to positively lock the door in a closed position.

3,718,172
METHOD OF FORMING A THERMALLY INSULATED COMPOSITE ARTICLE

Hal H. Rice, and James C. Holzwarth, both of Birmingham, Mich., assignors to General Motors Corporation, Detroit, Mich.
Filed July 16, 1971, Ser. No. 163,324
Int. Cl. B22d *19/08;* **F16l** *9/16*
U.S. Cl. 164—75 **16 Claims**



A method of forming a thermally insulated composite article having an inner core surrounded by a cushioning layer and an outer shell. The core member, including at least one continuous inner surface defining a fluid passage therethrough, is either cast or formed from a block of erosion resistant high impact material. The inner surfaces of the core are then coated with a granulated or powdered material which is fused forming an impervious layer and the outer core surfaces are covered with a layer of refractory cushioning material. Finally a metal shell is applied over the cushioning layer to complete the composite article.

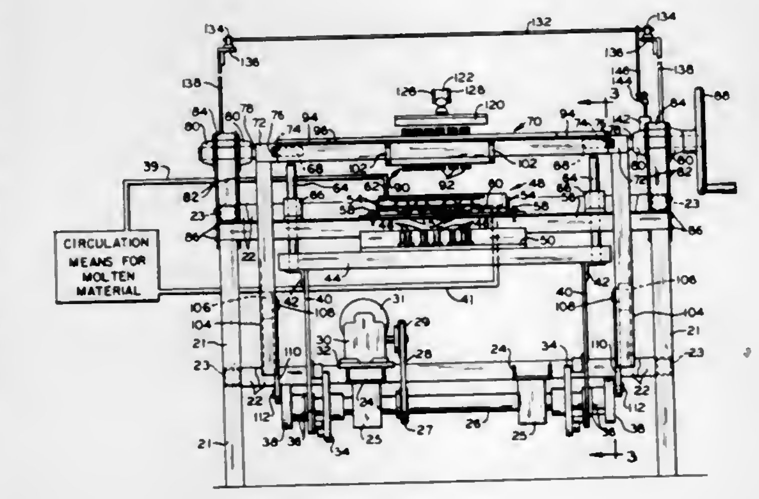
3,718,173
METHOD OF REMOVING ALUMINA SCUM FROM A CONTINUOUS-CASTING MOLD

Roland B. Snow, Mount Lebanon Twp., Allegheny County, Pa., assignor to United States Steel Corporation
Filed Aug. 26, 1971, Ser. No. 175,331
Int. Cl. B22d *11/00*
U.S. Cl. 164—82 **9 Claims**

A method of removing alumina scum from the mold of an aluminum-killed continuously cast steel by adding calcium carbide to the molten metal, reacting the calcium carbide with alumina in the molten metal to form a liquid calcium aluminate, and removing the calcium aluminate from the steel.

3,718,174
BATTERY ELEMENT CASTING MACHINE

Donald R. Hull, Perrysburg, and Robert D. Simonton, Fremont, Ohio, assignors to Dynalite Corporation, Perrysburg, Ohio
Filed Sept. 15, 1970, Ser. No. 72,442
Int. Cl. B22d *23/04, 39/00*
U.S. Cl. 164—154 **26 Claims**

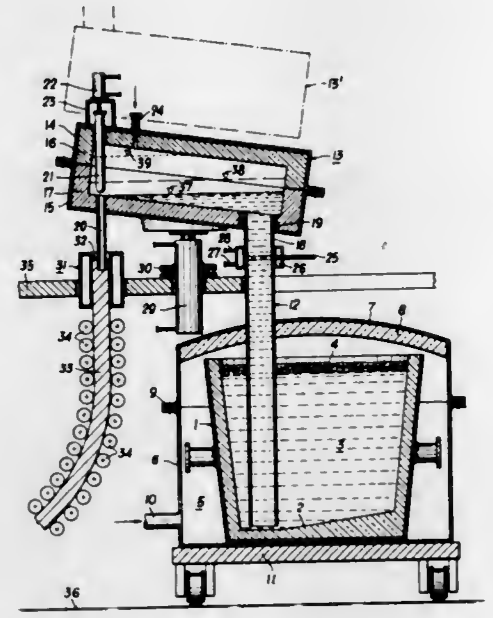


A machine for casting on connecting straps to the lugs of battery plates incorporating a clamping fixture within a traveling invertible carriage which operates in conjunction with an elevator for raising and lowering the battery plates therein with respect to a casting mold. The mold is of a nature that allows it to be filled with a precise quantity of molten metal by a process of overflowing of the wells to be filled, and subsequently permitting recession of the excess molten metal. A deoxidizing flame is directed upon the surface of the mold and molten metal to condition the metal to receive the lugs and is removed immediately prior to the immersion of the lugs in the molten metal.

3,718,175
PLANT FOR CONTINUOUS CASTING WITHOUT DEEP CASTING STREAM PENETRATION

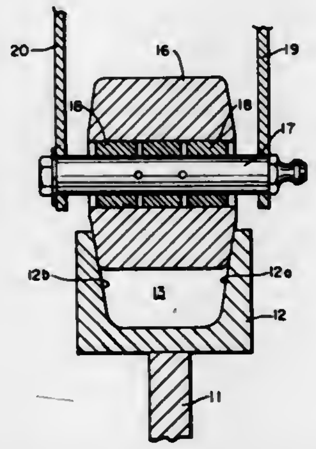
Rudolf Rinesch, Linz, Austria, assignor to Vereinigte Osterreichische Eisen-und Stahlwerke Aktiengesellschaft, Linz, Austria
Filed April 6, 1970, Ser. No. 25,897
Claims priority, application Austria, April 15, 1969, A3607/69; Aug. 14, 1969, A7831/69
Int. Cl. B22d *11/10*
U.S. Cl. 164—254 **15 Claims**

The invention proposes a plant for continuously casting liquid metals comprising a casting mould, a tundish arranged above the casting mould, adapted to be gastightly sealed and evacuated, and provided with a draining tube extending below the metal level in the mould, a supply ladle for liquid metal, and pneumatic means for conveying the metal from the supply ladle into the tundish, a chamber which is connected with a pneumatic pressure conduit and arranged below the tundish, into which chamber the supply ladle charged with liquid metal is inserted, an ascending pipe line starting from the bottom of the ladle, penetrating the lid of the chamber and leading into the tundish, the length of said ascending pipe line being dimensioned that the level difference between the metal in the tundish and the metal in the supply ladle exceeds 1.4 m, i. e. the height of the ferrostatic column at atmospheric pressure, and the length of the draining tube being dimensioned that the level difference between the metal in the tundish and the metal in the mould does not exceed 1.5 m. This plant is of great advantage because by releasing the atmospheric ferrostatic pressure the metal flows into the casting mould practically without exerting any pressure so that the solidifying casting shell is prevented from being damaged. The invention permits also of subjecting the steel to a highly effective vacuum treatment.



3,718,176
SPREADER WHEEL

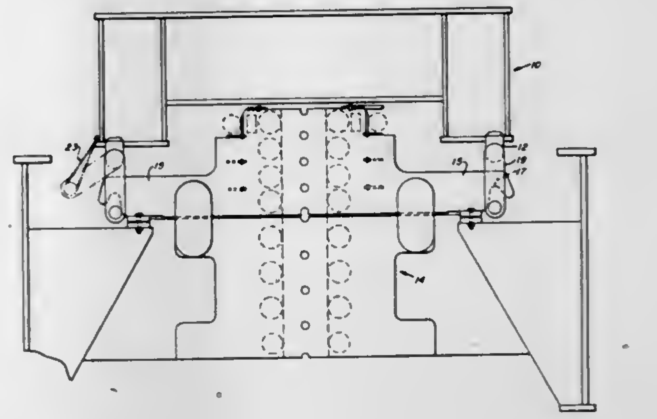
Harry M. Jacob, Flemington, N.J., and John C. Lorenzen, Inspiration, Ariz., assignor to Inspiration Consolidated Copper Company, New York, N.Y.
Filed Feb. 11, 1971, Ser. No. 114,496
Int. Cl. B22d *11/06*
U.S. Cl. 164—278 **2 Claims**



In a continuous casting bar machine, a spreader wheel exerts lateral outward pressure against the sides of the casting groove in a casting wheel to minimize shrinking or reduction of groove width.

3,718,177
REMOVABLE MOLD ASSEMBLY WITH QUICK CHANGE MECHANISM

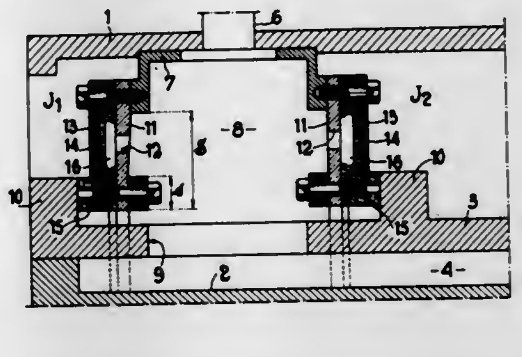
George J. Wagner, Jr., McDonald, Pa., assignor to United States Steel Corporation
Filed Aug. 27, 1971, Ser. No. 175,480
Int. Cl. B22d *11/08*
U.S. Cl. 164—282 **5 Claims**



A continuous-casting mold support frame which has engageable and disengageable means for connecting a guide roll rack thereto to enable the latter to be quickly and easily removed and replaced. A hinged lifting member is suspended from the mold support frame, and released to the lifting position beneath guide roll rack lifting lugs when removal of the guide roll rack is desired.

3,718,178
SEALING MEANS FOR A MACHINE FOR CENTRIFUGALLY CASTING PIPES

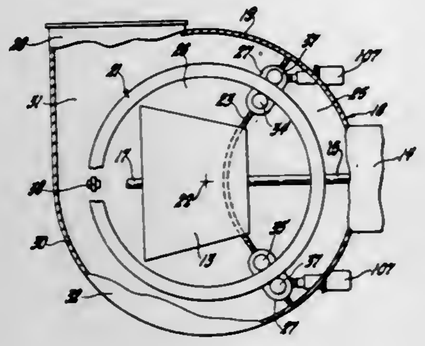
Robert Numa Paul Negre, Fumel, France, assignor to Societe des Fonderies de Pont-A-Mousson, Nancy, France
Filed Sept. 9, 1971, Ser. No. 178,986
Claims priority, application France, Sept. 9, 1970, 7032688
Int. Cl. B22d *13/02*
U.S. Cl. 164—297 **5 Claims**



Sealing means for a machine for centrifugally casting pipes. The sealing means comprise a diaphragm interposed between the outer fixed case of the machine and a sleeve which is connected to the rotary mould to rotate with the latter and defines an annular space for cooling water. The diaphragm is integral with the case and with a sealing ring in rubbing contact with the sleeve and has an orifice putting the water jacket, defined by the case, sleeve and diaphragm, in communication with a pressure-compensating chamber on the other side of the diaphragm relative to the water jacket.

3,718,179
REGENERATOR SEAL

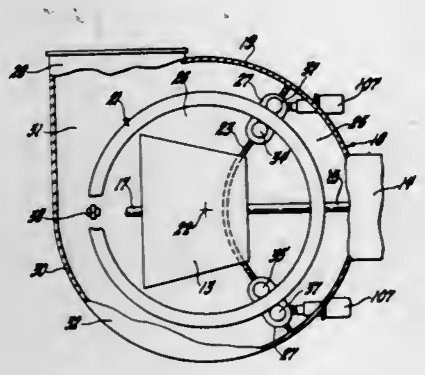
Jack P. Hart, Hinsdale, Ill., assignor to General Motors Corporation, Detroit, Mich.
Division of Ser. No. 879,729, Nov. 25, 1969, Pat. No. 3,638,716. This application Nov. 11, 1971, Ser. No. 197,675
Int. Cl. F28d *19/04*
U.S. Cl. 165—9 **2 Claims**



A rotary regenerator of the drum matrix type includes main seals engaging the matrix where it passes through the bulkhead of the regenerator. Each main seal includes a frame closely encircling the matrix with particular means for connecting the main seal to the bulkhead. The connecting means includes a support bar fixed to the bulkhead having a segmented flange extending from the bulkhead and a seal bar forming part of the main seal having the flange overlapping the flange of the support bar. The two flanges are coupled together so as to be relatively expansible in response to diverse temperature conditions in operation of the regenerator. This disclosure incorporated by reference to the parent application, now U.S. Pat. No. 3,638,716

3,718,180
REGENERATOR SEAL

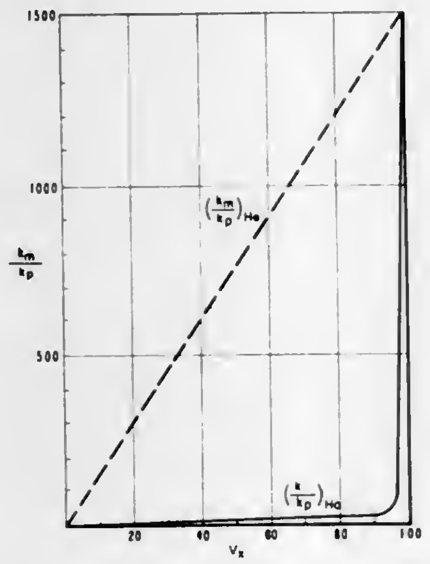
Jack P. Hart, Hinsdale, Ill., assignor to General Motors Corporation, Detroit, Mich.
Division of Ser. No. 879,729, Nov. 25, 1969, Pat. No. 3,638,716. This application Nov. 11, 1971, Ser. No. 197,676
Int. Cl. F28d *19/04*
U.S. Cl. 165—9 **2 Claims**



A rotary regenerator of the drum matrix type includes main seals engaging the matrix where it passes through the bulkhead of the regenerator. Each main seal includes a frame closely encircling the matrix with particular means for connecting the main seal to the bulkhead. The frames include side shoes biased by springs against the outer or end faces of the matrix rims. Also, the seal assemblies include bumper stops backed up by bridled springs which allow controlled yielding of the stops if the matrix shifts laterally because of shocks from the vehicle in which the regenerator is mounted. This disclosure incorporated by reference to the parent application, now U.S. Pat. No. 3,638,716.

3,718,181
PLASTIC HEAT EXCHANGE APPARATUS

Thomas A. Reilly, Reading, Pa.; Charles F. Reitz, and Robert D. Smith, both of Wilmington, Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.
Filed Aug. 17, 1970, Ser. No. 64,221
Int. Cl. F28f *21/06*
U.S. Cl. 165—180 **11 Claims**



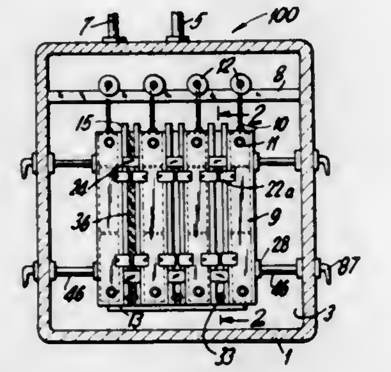
Hollow plastic filaments, useful in heat exchange systems, which are made from plastic compositions containing 5 to 45 percent by weight of filler particles having substantially higher thermal conductivity than the plastic and a diameter greater than 2.0 microns, will have high thermal conductivity and appreciable mechanical strength if the particles are chosen such that the ratio of the particle diameter to the wall thickness of the filament is between 0.001 and 0.5 and if the particles are dispersed within the plastic homogeneously enough to produce the desired mechanical stability and heterogeneously enough to take advantage of the high thermal conductivity of such a dispersion.

3,718,182
APPARATUS FOR THE PRODUCTION OF CAST POLYMER SHEETS

Carlo Rossetti, c/o Rostero S.A., Acacias, 12, Av., Geneva, Switzerland
Continuation-in-part of Ser. No. 880,500, Dec. 11, 1969, Pat. No. 3,551,541, which is a continuation of Ser. No. 534,525, March 15, 1966, abandoned. This application July 15, 1970, Ser. No. 55,184
Int. Cl. F28f *3/00*
U.S. Cl. 165—166 **8 Claims**

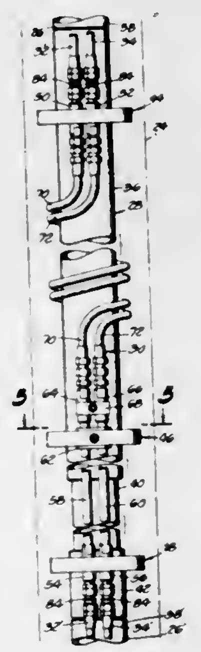
Hollow metal plates, each formed with an interior flow passageway for circulating a fluid heat transfer medium, are

used in apparatus for producing cast polymer sheets which includes a casting chamber. The plates are made of iron or preferably of a light metal, such as aluminum and aluminum alloys, and are constructed of a frame, plates and dividers secured together by epoxy resin to form a sealed flow passageway. Means are arranged to equalize the pressure in the flow passageway and the pressure in the casting chamber of the apparatus.



3,718,183
SUBSEA BUMPER SUB HYDRAULIC BYPASS SYSTEM

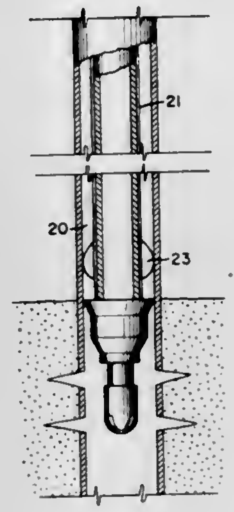
Lyle B. Scott, South Gate, Calif., assignor to Byron Jackson Inc., Long Beach, Calif.
Filed July 12, 1971, Ser. No. 161,756
Int. Cl. E21b *7/12*
U.S. Cl. 166—.5 **8 Claims**



Apparatus for conveying hydraulic fluid under pressure past a telescoping slip joint type subsea bumper sub including three conduit support collars with the first support collar and the second support collar rigidly mounted to a first section of the bumper sub and with the third support collar rigidly mounted to a complementary second section of the bumper sub. A rigid conduit is mounted in fluid conveying relation to the third support collar and mounted in reciprocating relation with the second support collar. A flexible conduit is mounted to the first support collar in fluid conveying relation and connected to the rigid conduit in fluid conveying relation. The flexible conduit means is formed and shaped to continually exhibit a coil configuration disposed about the bumper sub between the first collar and the second collar.

3,718,184
INSULATION FOR A WELLBORE

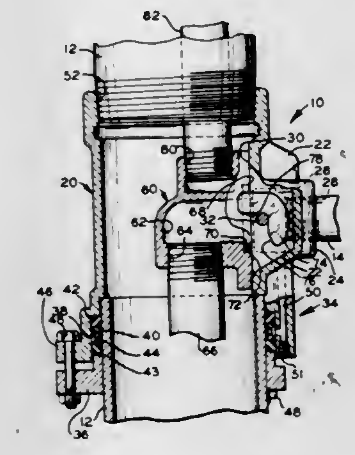
Jack H. Bayless and Walter L. Penberthy, Jr., Houston, Tex., assignors to Esso Production Research Company
Continuation of abandoned application Ser. No. 12,494, Feb. 2, 1970, which is a division of application Ser. No. 754,887, Aug. 23, 1968, now Patent No. 3,525,399. This application Sept. 21, 1971, Ser. No. 182,496
Int. Cl. E21b *43/24*
U.S. Cl. 166—57 **11 Claims**



Apparatus for thermally insulating a well for use in a thermal process for oil recovery. The apparatus is a tubular conduit mounted within the well and having a coating of foam consisting essentially of an alkali metal silicate. The insulated tubing may be fabricated on the surface or within the wellbore.

3,718,185
WELL CASING SIE CONNECTOR

William Wellstein, P.O. Box 430, Fostoria, Ohio
Filed Sept. 14, 1971, Ser. No. 180,357
Int. Cl. E21b *33/03*
U.S. Cl. 166—85 **12 Claims**



A well casing section having a radially extending housing having a side delivery duct, and a removable inner connector member provided with an elbow duct aligned with and sealingly connected to the side duct in the casing section along parallel flat surfaces substantially aligned with the wall of the casing. This connection is made by means of hooks on the inner member which engage pin means in the casing section.

Opposite ends of the casing section are provided with fastening means such as threads and/or compression fittings. The compression fitting may be pressurized by the fluid in the ducts of the connector of this invention by providing in the outer member or casing section, a small duct extending from the side duct to the periphery of the compression fitting.

3,718,186

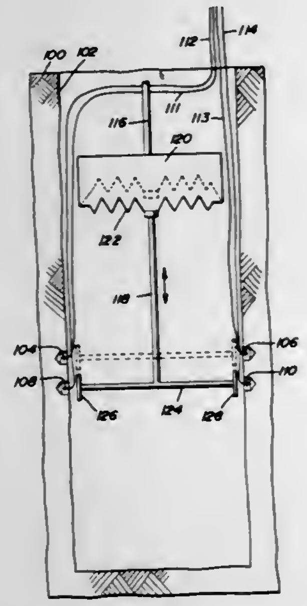
METHOD AND APPARATUS FOR FORMING AND/OR AUGMENTING AN ENERGY WAVE

Clarence W. Brandon, Tulsa, Okla., assignor to Orpha B. Brandon, Tulsa, Okla.; Nat A. Hardin; Catherine H. Newton; Hazel H. Wright, Forsyth, Ga. and Harvey B. Jacob, part interest to each

Division of Ser. No. 728,852, May 13, 1968, Pat. No. 3,503,446, which is a continuation of Ser. No. 511,957, Dec. 6, 1965, abandoned, which is a continuation-in-part of Ser. No. 389,233, July 6, 1964, abandoned, which is a division of Ser. No. 833,122, Aug. 3, 1959, Pat. No. 3,141,099, which is a continuation of Ser. No. 431,388, May 21, 1954, abandoned, which is a continuation-in-part of Ser. Nos. 241,647, Aug. 13, 1951, Pat. No. 2,796,129, and Ser. No. 296,038, June 27, 1952, Pat. No. 2,866,509. This application March 17, 1970, Ser. No. 20,1967. The portion of the term of this patent subsequent to March 31, 1987, has been disclaimed.

Int. Cl. E21b *43/26*

U.S. Cl. 166—248 **50 Claims**



A method in which an energy wave at a controlled frequency is superimposed on another energy wave transmitted through some medium to increase the energy level and heat the medium through which the energy waves are propagated. One of the energy waves is generated from an electrical current source connected to electrodes in contact with the wave transmitting medium.

3,718,187

METHOD OF INJECTION WELL STIMULATION

Harry W. Milton, Jr., Findlay, Ohio, assignor to Marathon Oil Company, Findlay, Ohio

Filed Feb. 8, 1971, Ser. No. 113,720

Int. Cl. E21b *33/138, 43/22*

U.S. Cl. 166—274 **21 Claims**

Stimulation of injection walls in a heterogeneous reservoir (i.e., characteristically having differing permeability streaks) is improved by temporarily or permanently sealing off the highly permeable streaks with plugging agents and then stimulating the well with a micellar dispersion. This process provides a more uniform profile of the relative permeability of water flowing in the reservoir.

3,718,188

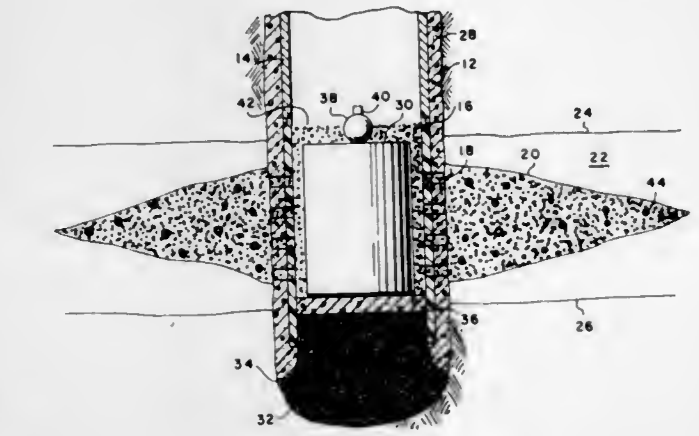
METHOD AND SYSTEM FOR WELLBORE PROTECTION WHEN EXPLOSIVELY STIMULATING EARTH FORMATIONS

William L. Hill, Dallas, Tex., assignor to Sun Oil Company, Dallas, Tex.

Filed Jan. 8, 1971, Ser. No. 104,883

Int. Cl. E21b *43/26*

U.S. Cl. 166—299 **10 Claims**



A method for explosively fracturing an earth formation includes the placement of a shock absorbent liner in the wellbore adjacent the formation to prevent wellbore damage when an explosive is detonated in the wellbore and formation.

3,718,189

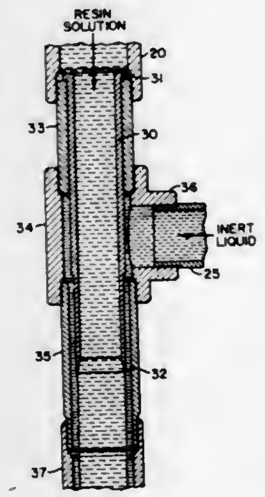
CONSOLIDATION OF INCOMPETENT FORMATIONS

William M. Terry, Houston, Tex., assignor to Esso Production Research Company

Filed July 30, 1969, Ser. No. 845,978

Int. Cl. E21b *43/25, 43/16*

U.S. Cl. 166—305 **1 Claim**



A method for the injection of two or more reactive liquids, a resin and a catalyst for example, into a well in sequence wherein at least one of the reactive liquids is surrounded by an annular stream of an inert, substantially immiscible liquid of lower viscosity as it moves downwardly in the wellbore.

ERRATUM

For Class 172—159 see:
Patent No. 3,718,103

3,718,190

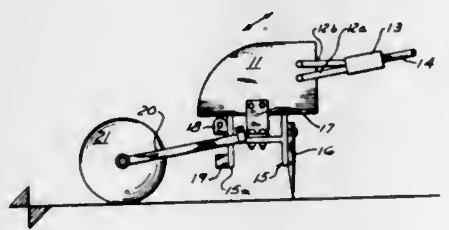
LANDSCAPING IMPLEMENT

Allan A. Perlick, 1635 N.E. Fourth Place, Fort Lauderdale, Fla.

Filed Oct. 21, 1970, Ser. No. 82,663

Int. Cl. A01b *5/00*

U.S. Cl. 172—173 **4 Claims**



A multi-purpose landscaping implement able to perform simultaneous functions of rolling, raking, pulverizing, and leveling of soil attachable for use on a hydraulic shovel lift or the like of a landscaping vehicle. The amount of weight required for the rolling operation is reduced by using a portion of the weight of the working vehicle.

3,718,191

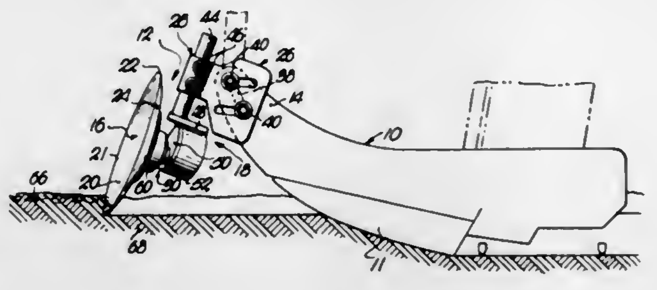
CLEARING ATTACHMENT FOR PLANTER SHOES

Donald E. Williams, Garden City, Kans., assignor to Acra-Plant, Inc., Newton, Kans.

Filed Aug. 25, 1970, Ser. No. 66,756

Int. Cl. A01b *49/02, 35/22*

U.S. Cl. 172—196 **6 Claims**



A circular, concavo-convex plate having a sharp, outer edge is attached to a seeder, planter, drill or other seeding implement and rotates in a plane oblique to the course of travel of the implement when the plate engages extraneous surface trash material on the field, whereby the material is shaved and scraped from the topsoil and ejected to one side of the planting row as the implement is advanced, exposing a smooth, clear strip of topsoil into which a groove may be readily formed by the implement in preparation for the receipt of seeds. Alternate forms of structure are provided for attaching the plate in a manner to permit varying the attitude of the plate with respect to the topsoil.

3,718,192

IMPLEMENT TOOL ARM CONTROL

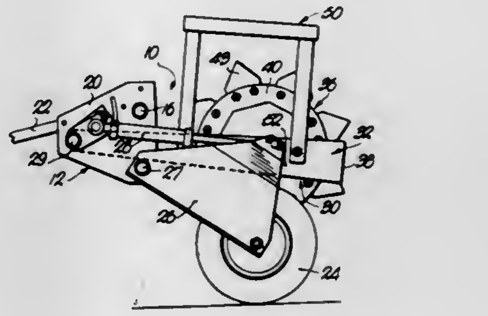
Chester D. Rogers, Olathe, Kans., assignor to Jacobsen Manufacturing Company, Racine, Wis.

Filed Nov. 20, 1970, Ser. No. 91,468

Int. Cl. A01b *35/28*

U.S. Cl. 172—624 **5 Claims**

A towable turf maintenance implement has a heavy, vertically swingable front frame provided with vertically spaced, upper and lower cross pipes common to a series of fore-and-aft extending arms therebetween that are pivoted to the frame forwardly of the pipes for independent vertical swinging. Each of the arms is longitudinally, forwardly tapered and formed from sheet material, and each supports a ground-engaging tool adjacent the rear widened end thereof. During advancement of the implement, the weight of the swingable frame is borne equally by all of the arms through the upper cross pipe until compacted soil or ground contours cause certain of the arms and tools to rise relative to the remaining arms, at which time the entire weight of the frame is borne by the relatively raised arms.



3,718,193

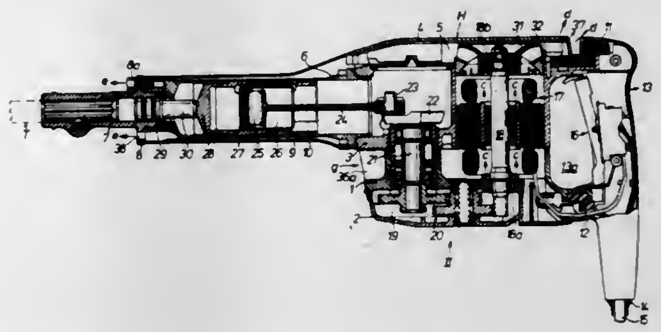
COOLING SYSTEM FOR PORTABLE IMPULSE TRANSMITTING MACHINES

Karl Wanner, Echterdingen, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

Filed Feb. 18, 1971, Ser. No. 116,545

Int. Cl. B25d *13/00*

U.S. Cl. 173—117 **11 Claims**

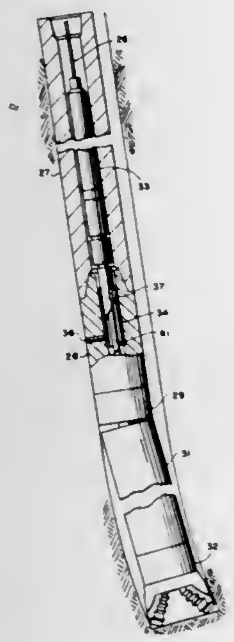


A portable impulse transmitting machine wherein an impeller assembly receives motion from an electric motor and serves to drive a tool into concrete, rock or like formations with attendant heating of the motor and impeller assembly. The housing of the machine forms part of the cooling system for the motor and the impeller assembly and accommodates a radial fan which is driven by the motor. A first portion of the housing has a plastic jacket which surrounds the impeller assembly and defines an annular passage one end of which is adjacent to the pressure side of the fan and the other end of which communicates with the atmosphere by way of one or more outlets. A second portion of the housing surrounds the motor and the fan and is provided with one or more inlets for admission of atmospheric air and with one or more channels which connect the inlets with the first end of the passage and draw substantial quantities of atmospheric air along the motor in response to rotation of the fan. A portion of the air which cools the motor is caused to flow through the passage to be expelled by way of the outlets and the housing is provided with additional outlets adjacent to the pressure side of the fan to permit escape of the remaining portion of air which is delivered by the channels.

3,718,194
METHOD AND APPARATUS FOR ORIENTING A BOREHOLE DEVICE

Donald R. Hering and James M. Lindsey, Houston, Tex., assignors to Sperry-Sun Well Surveying Company, Sugar Land, Tex.

Filed Nov. 4, 1970, Ser. No. 86,877
Int. Cl. E21b *47/022, 47/12*
U.S. Cl. 174—45 **42 Claims**



This invention relates to an orienting tool which is positioned in a drill pipe and provided with a conductor cable to the surface. A pendulous instrument in the tool provides a measurement for indicating the high side of the tool in the wellbore. Instrument measurements are transmitted by the conductor cable to the surface for surface read-out. A surface indicator provides the read-out in a manner which is indicative of degrees of rotation of a reference on the tool to the right or left of the high side of the hole. The tool may then be rotated and subsequent readings taken to determine the position of the tool until the bit is oriented, whereupon drilling proceeds. Such readings can be taken continuously throughout the drilling operation.

3,718,195
CORE DRILLING WITH AIR CONTAINING POLYMER IN OIL

Frank H. Clements, Andrews, Tex., assignor to Amoco Production Company, Tulsa, Okla.

No Drawing. Filed Oct. 26, 1971, Ser. No. 192,482
Int. Cl. E21b *49/02*
U.S. Cl. 175—58 **3 Claims**

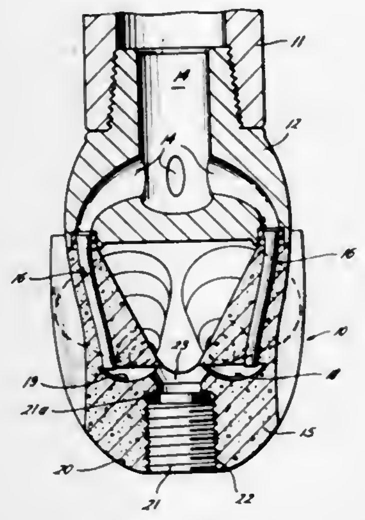
Polyisobutylene in oil is added to a gas circulated through a well during core-drilling operations. The polymer prevents jerking of the core barrel and the resulting core breakage and loss, which occurs when oil without the polymer is used.

3,718,196
GUIDE AND PROTECTOR ARRANGEMENT INCORPORATING FILL-UP FLOAT VALVE MEANS

Howard I. Lorenz, and Eugene P. Rosser, both of Houston, Tex., assignors to Nobel Drilling Corporation, Tulsa, Okla.

Filed Jan. 21, 1971, Ser. No. 108,449
Int. Cl. E21b *9/00*
U.S. Cl. 175—307 **15 Claims**

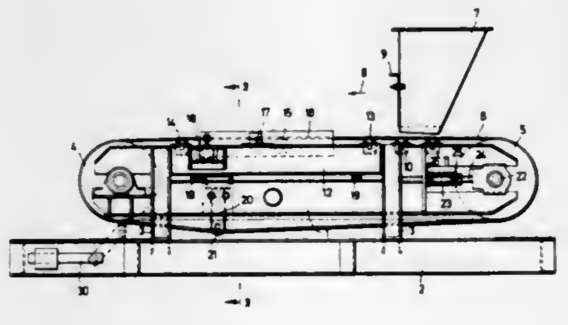
A guide and protector arrangement for the lower end of a tubular drill string with drilling means thereon which are to be lowered in a well bore including molded jacket means for protecting the drilling means, the jacket means including passage means therein for communicating fluid between the well bore and the interior of the string and fill-up float valve means adapted to be removably positioned within the jacket means for controlling the fluid flow between the well bore and the passage means in the jacket means.



3,718,197
CONVEYOR BELT WEIGHING DEVICE

Hans Barten, Porz-Eil, Rudolf Barnewald, Sinnersdorf, and Werner Hanich, Bergheim, Germany, assignors to Klockner-Humboldt-Deutz Aktiengesellschaft, Cologne, Germany

Filed May 16, 1972, Ser. No. 253,883
Int. Cl. G01g *11/14*
U.S. Cl. 177—16 **4 Claims**

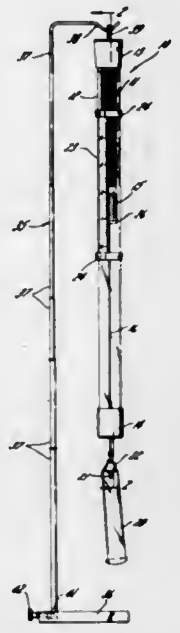


A conveyor belt weighing device suitable for dosing bulk material is provided with an endless conveyor belt guided over two horizontally spaced drums, one of which is a driving drum. The other drum is slidably adjustable lengthwise of the conveyor belt and subjected to the action of helical springs so as to keep the conveyor belt under tension, whereby an indicator attached to one of the springs is movable relative to a fixed scale and permits a direct reading of the tension in said conveyor belt. A weighing member is arranged in the range of the upper strand of the conveyor belt, and the lower strand of the conveyor belt is engaged by two rollers arranged end to end, each having a length of about half the width of the conveyor belt and extend transversely of the belt in a vertical plane parallel to the axes of the drums and at such an angle to each other than the edges of the conveyor belt are disposed in a horizontal plane which is spaced below the center portion of the conveyor belt so as to form a sturdy guide device for the conveyor belt.

3,718,198
WEIGHT LOSS SPRING BALANCE

Clifford C. Hach, Ames, Iowa, assignor to Hach Chemical Company, Ames, Iowa

Filed May 30, 1972, Ser. No. 257,925
Int. Cl. G01g *3/02*
U.S. Cl. 177—232 **4 Claims**

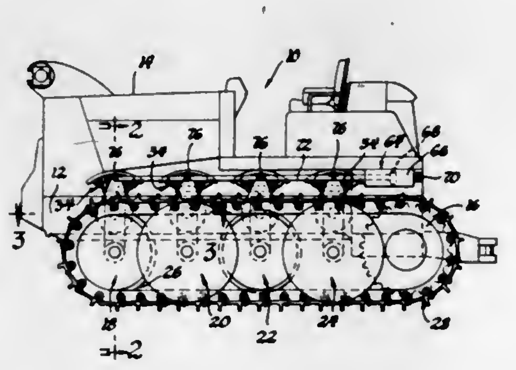


A spring balance in which a coil spring is suspended in a transparent cylindrical tube between a cap assembly, to which the spring is adjustably attached for calibration, and a strand slidably fitted in a bottom guide plug on the tube. The strand carries a hook to hold an object to be weighed, and the cap is suspended by a telescoping rod removably fitted in a weighted base. A scale plate is slidably secured on the outside of the tube, and a reference mark and vernier scale is formed on a cylindrical block which slides loosely in the tube at the bottom of the spring.

3,718,199
SUSPENSION SYSTEM FOR CRAWLER TRACTOR

Janis Mazzarins, Macedonia, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed July 2, 1971, Ser. No. 159,195
Int. Cl. B62d *55/16*
U.S. Cl. 180—9.2 R **4 Claims**

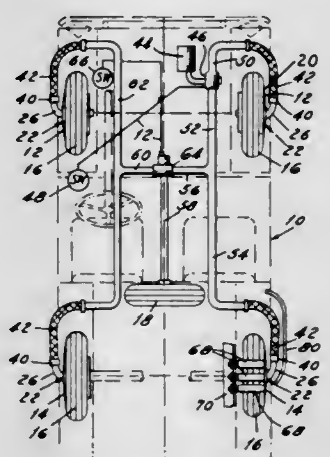


A suspension system for resiliently supporting a crawler tractor that includes a plurality of wheel strut assemblies located at each side of the tractor. Each of the wheel strut assemblies have a housing that supports a wheel carrier for oscillatory movement about a longitudinal axis that extends transversely to the tractor and also for vertical movement.

3,718,200
SUSPENSION DEVICE

Lawrence A. Gant, 20348 Anita Ave., Harper Woods, Mich. 48236

Original application Mar. 5, 1968, Ser. No. 710,456, now Patent No. 3,528,679, dated Sept. 15, 1970. Divided and this application Sept. 1, 1970, Ser. No. 68,791
Int. Cl. B60g *17/00*
U.S. Cl. 180—74 **3 Claims**

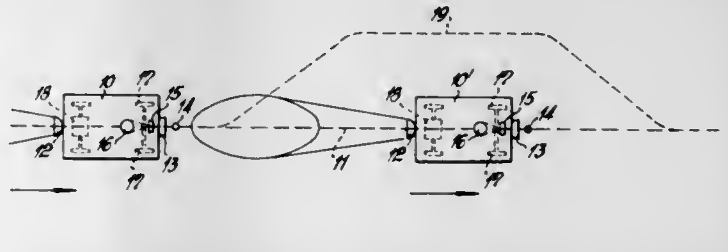


A suspension device to improve vehicle mobility comprising means disposed above a vehicle tire to limit and cushion its extreme vertical displacement by contact therewith. Interruption of the vertical movement compresses the tire thereby cushioning and dampening its passage.

3,718,201
ARRANGEMENT FOR AUTOMATICALLY CONTROLLING THE MOVEMENT OF MOTOR VEHICLES

Richard Schleupen, Grossingersheim, and Ferdinand Grob, Stuttgart, Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Oct. 7, 1970, Ser. No. 78,674
Claims priority, application Germany, Oct. 9, 1969, P 19 50 863.5
Int. Cl. B60k *27/06*
U.S. Cl. 180—98 **8 Claims**



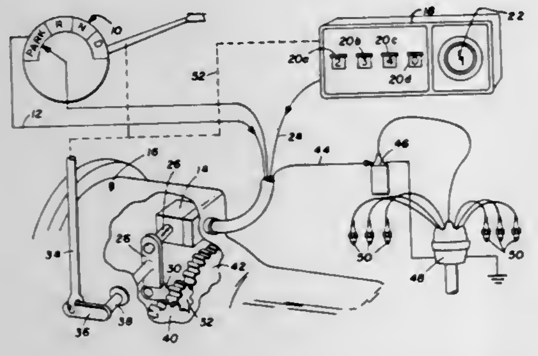
Vehicles moving along a predetermined conductor path have a frequency modulated spotlight on their rear ends and, on their front ends, a frequency selective receiver comprising a photocell, which, when shone upon, produces a signal that either stops the vehicle or shunts it onto a detour path to avoid a collision.

3,718,202
VEHICLE ANTI-THEFT SYSTEM

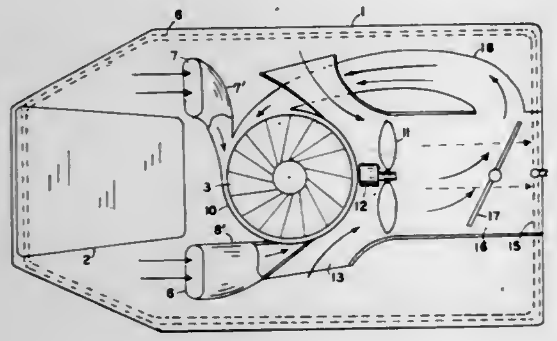
Donald J. Brock, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed May 20, 1970, Ser. No. 38,954
Int. Cl. B60r *25/06*
U.S. Cl. 180—114 **15 Claims**

A system is disclosed which includes an encoder panel adapted to be mounted in an accessible location to enable the entering of a code sequence therein by an operator. A decoder circuit is remotely disposed in a secure location adjacent a lock mechanism and is responsive to the encoder panel to generate an electrical energizing signal only upon detection of a predetermined code which is entered into the encoder panel. Structure is connected to the decoder circuit which operates the lock mechanism only upon generation of the electrical energizing signal. In the preferred embodiment of the invention, the encoder panel is located in the passenger compartment of a vehicle. The decoder circuit is located in an area of the vehicle of difficult accessibility, such as within the vehicle transmission. The drive train of the vehicle is locked by the lock mechanism until a predetermined code is entered into the encoder panel. Circuitry may also be provided to prevent ignition of the vehicle motor until the predetermined code is entered into the encoder panel.



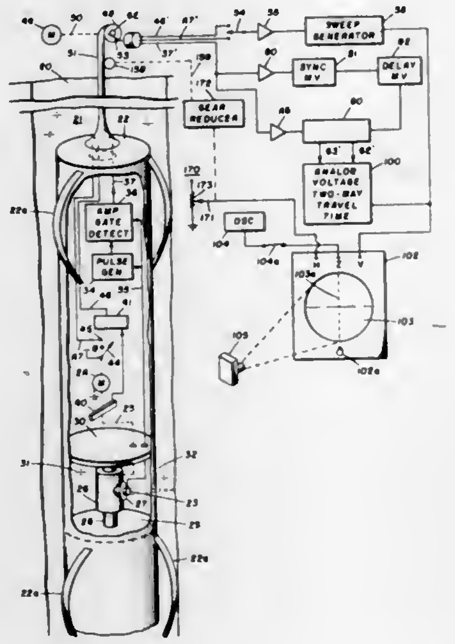
3,718,203
GROUND EFFECT VEHICLE WITH INTEGRATED FORWARD THRUST MEANS
Walter R. Lehman, 64 Spruce Street, Hicksville, N.Y.
Filed Aug. 30, 1971, Ser. No. 176,006
Int. Cl. B60v *1/08, 1/14*
U.S. Cl. 180—120 **3 Claims**



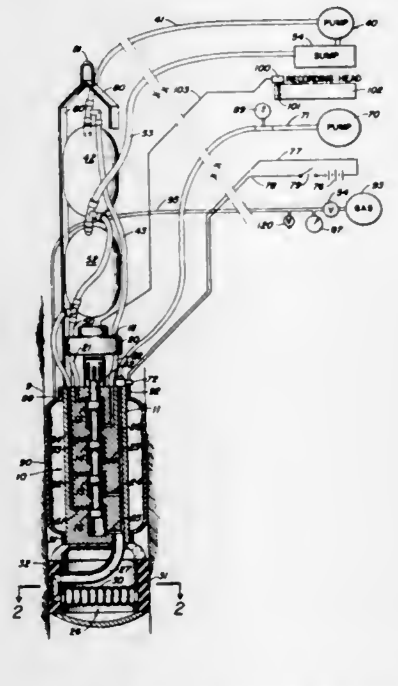
An air cushion vehicle is provided which utilizes a single motor to provide the air cushion and forward thrust. Front mounted air intakes are connected as inputs to a fan. The fan is driven by air by a propeller which also provides forward thrust through a rear port. When the craft is moving forward the air from the front intakes drive the fan so as to provide a portion of the air cushion. A control vane is provided adjacent to the rear port for controlling the air from the propeller. This vane determines the amount of air fed to the fan and to the rear port. The vane may also be used for steering purposes.

3,718,204
DISPLAY OF BOREHOLE WALL CONFIGURATION
Goethe M. Groenendyke, Dallas, Tex., assignor to Mobil Oil Coropration, New York, N.Y.
Filed Jan. 18, 1971, Ser. No. 107,384
Int. Cl. G01v *1/36*
U.S. Cl. 181—.5 BE **24 Claims**

The specification discloses a borehole tool having a directional acoustic transducer which is rotated while logging and operated periodically to transmit acoustic pulses to the borehole wall and to detect reflected acoustic energy. Reflection signals are employed to produce an analog voltage having amplitude variations which are dependent upon the pulse travel time or distance between the transducer and the borehole wall. The analog voltage, in one embodiment, is combined with a sawtooth wave beam sweep of an oscilloscope and applied to one of the deflection plates to move a spot across the screen at a rate which varies as a function of distance between the transducer and the wall of the borehole. The electron beam is turned ON periodically at equally spaced time intervals during each beam sweep to produce trace patterns which are recorded in side-by-side relationship. Spots at the same time intervals across the trace patterns form clearly defined caliper traces having excursions indicative of the size of the borehole at different depths.

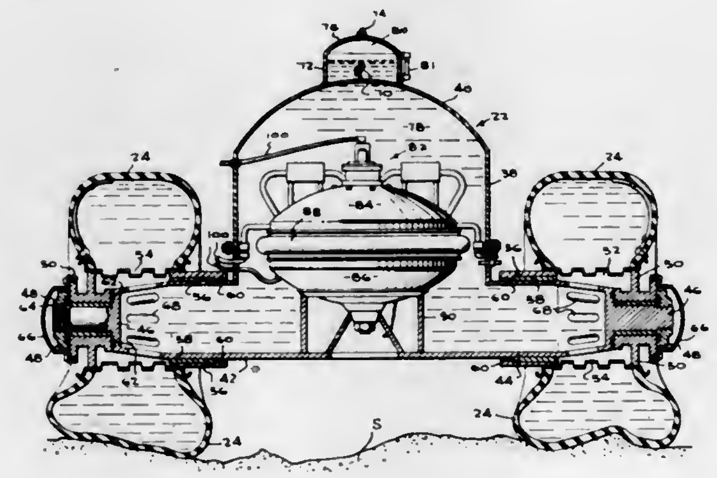


3,718,205
BORE HOLE SEISMIC TRANSDUCER
Delbert W. Fair, 2221 E. Hartford, and Graydon L. Brown, 1528 Autumn Rd., both of Ponca City, Okla.
Filed June 22, 1970, Ser. No. 48,252
Int. Cl. G01v *1/14;* **F01b** *7/04;* **F15b** *5/00*
U.S. Cl. 181—.5 H **7 Claims**



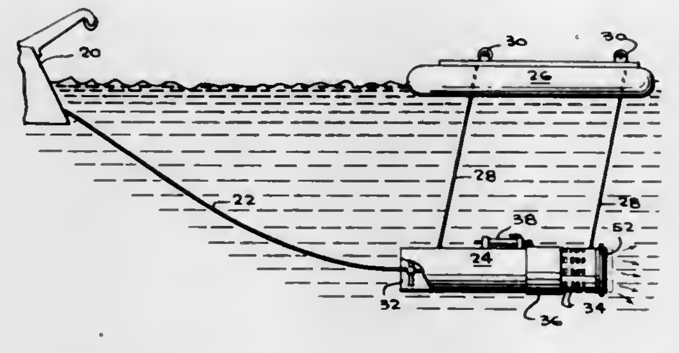
A vibrational seismic source device adapted to be lowered in a well bore. The vibrator essentially comprises a volume booster operating an expandable bellows-type source connected between two pistons biased against opposite walls of the bore hole. The volume booster is driven by a hydraulic amplifier which in turn is controlled by a servo hydraulic valve. The hydraulic vibratory system is centered and retained in the well bore by utilizing a packer arrangement totally surrounding the vibrator and adapted to be expanded against the bore hole. A high pressure, high volume hydraulic source is provided up hole and operationally connected to the servo valve, volume booster, and biasing means.

3,718,206
AMPHIBIOUS SEISMIC EXPLORATION VEHICLE AND METHOD
John J. Babb, and Marvin G. Bays, both of Jackson, Miss., assignors to Delta Exploration Company, Inc., Jackson, Miss.
Filed Jan. 18, 1971, Ser. No. 107,247
Int. Cl. G01v *1/14*
U.S. Cl. 181—.5 VM **27 Claims**



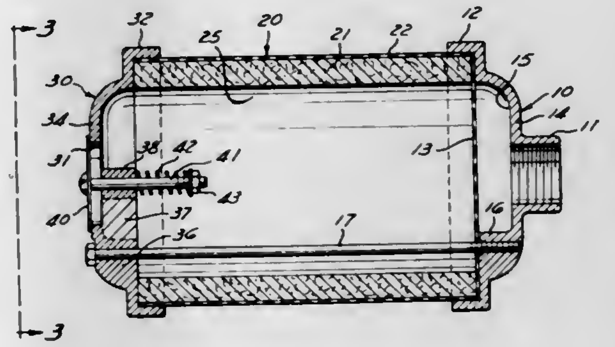
A seismic signal providing vehicle is provided in the form of pneumatic tires rollingly supporting a hollow metal casing with a body of liquid on the interior of the casing communicating with the interior of the tires and an expandible acoustic signal transducer being positioned in the body of liquid in the casing for activation for transmitting a pressure pulse to the surface of the tires from which the signal is radiated into the environmental surroundings of the tires either on dry land or under water.

3,718,207
METHOD AND APPARATUS FOR PROVIDING UNDERWATER SEISMIC ENERGY SIGNALS
John J. Babb, Jackson, Miss., assignor to Delta Exploration Company, Inc., Jackson, Miss.
Filed Dec. 10, 1969, Ser. No. 883,809
Int. Cl. G01v *1/38*
U.S. Cl. 181—.5 H **12 Claims**



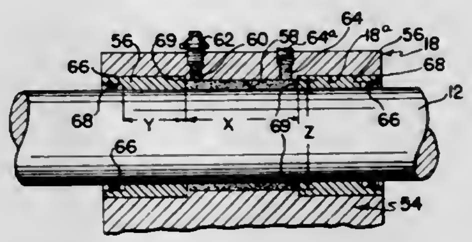
A seismic energy source provided in the form of a hollow cylindrical member supporting a drum plate on its rear end and connected to a tow line on its forward end for movement through a body of water with rapid-actuating valve means on the rear of the cylindrical member which, when closed, entraps a large mass of water the inertia of which resists continued movement of the cylindrical member; a piston and cylinder assembly is connected to the tow line by a piston rod so that the momentum of the towing vessel moves the piston with respect to the cylinder to pressurize a pressure accumulator to a desired pressure at which point a release coupling between the rod and the tow line is activated to permit the rod to be forcefully urged at a high speed rearwardly to strike the drum plate to provide a seismic signal.

3,718,208
EXPANSION CHAMBERED, PRESSURE RELIEF MUFFLER
Stephen J. Gibel, 5846 Edgerton Road, North Royalton, Ohio
Filed July 15, 1971, Ser. No. 162,785
Int. Cl. F01n *1/10, 7/16, 7/18*
U.S. Cl. 181—50 **6 Claims**



Muffler for air-exhausts and the like in which sound is muffled by passage of the air from a relatively unrestricted domed expansion chamber through a disseminator into a silencing chamber and thence diffused through porous side of the silencing chamber. The end of the silencing chamber opposite the disseminator is provided with a pressure relief means.

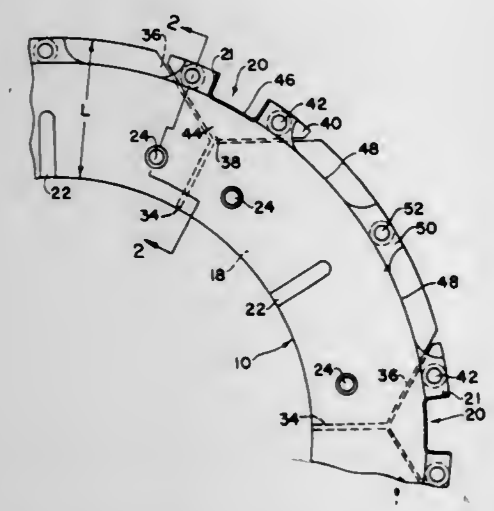
3,718,209
LUBRICATING MECHANISM
Ernest P. Moslo, 12700 Lake Avenue, Lakewood, Ohio
Filed Dec. 10, 1970, Ser. No. 96,722
Int. Cl. F16n *1/00;* **F16c** *33/72*
U.S. Cl. 184—5 **13 Claims**



A lubricating mechanism for lubricating relatively movable members which are movable linearly relative to one another, and comprising a recess or chamber formed in one of the members and opening onto the other of the members, with bearing means arranged between the members and defining in part the chamber, and sealing means coacting with the bearing means for sealing a lubricant in the bearing means and in the chamber. A passageway communicates with the chamber and extends to the exterior of the movable member for inserting the lubricant, into the chamber. Another passageway communicates with the chamber to exteriorly of the movable member and is closed by removable means so that old lubricant can be forced out of the recess and replaced by new lubricant when and if so desired. The bearing means comprises spaced bearings with the lubricant chamber disposed intermediate the bearings, and with the length of the chamber being at least approximately one and one half times the effective length of one bearing. The arrangement is such so as to provide a substantially maintenance free, long service life lubricating mechanism for machine components, and is especially useful in connection with injection molding machines, although it may also be readily used in other types of machines.

3,718,210
ROTATING BRAKE DISC SUBASSEMBLY WITH SEGMENTED BERYLLIUM CORE

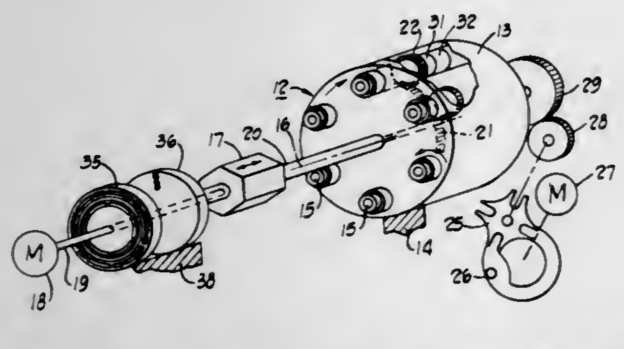
Joseph Frank Dernovshek, Akron, and Peter D. Bermingham, Suffield, Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio
Filed June 24, 1970, Ser. No. 49,242
Int. Cl. F16d *65/12*
U.S. Cl. 188—218 XL **13 Claims**



Brake discs which have a pair of annular steel plates and segmented beryllium filler plates between the annular steel plates. The steel plates have sintered metallic outer faces and are riveted together on opposite sides of the beryllium plates. The beryllium filler plates extend from the center of one key slot to the center of the adjacent key slot and each of the filler plates is sloped at its outer end so that the adjacent filler plates define a V-shaped notch centered with the key slot. Triangular steel inserts are riveted to the steel plates at the key slots. The triangular inserts serve to transmit torque across a broad area to the beryllium filler pieces by wedging action between the sides of the inserts and the sloped portions of the filler plates.

3,718,211
ELECTRIC COUPLING CONTROL

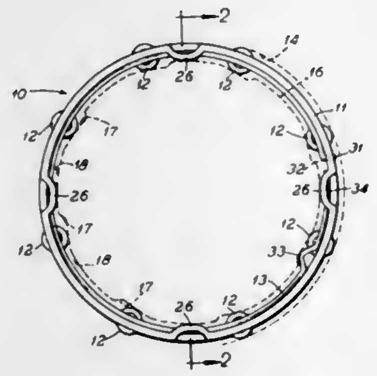
Karl P. Schubert, Mayfield Hts., and George R. Rienerth, Fairview Park, both of Ohio, assignors to Acme-Cleveland Corporation, Cleveland, Ohio
Filed Sept. 15, 1971, Ser. No. 180,651
Int. Cl. F16d *67/02*
U.S. Cl. 192—12 D **17 Claims**



An electric coupling control for a multiple spindle automatic machine is disclosed with the machine having an indexable spindle carrier with a plurality of rotatable spindles. An electric clutch and brake unit is provided for each spindle and the clutch or the brake is selectively energized through a brush and commutator assembly so that selectively either the clutch or the brake may be engaged for a particular spindle for each spindle position of the spindle carrier. The foregoing abstract is merely a resume of one general application, is not a complete discussion of all principles of operation or applications, and is not to be construed as a limitation on the scope of the claimed subject matter.

3,718,212
PHASED ROLLER CLUTCH

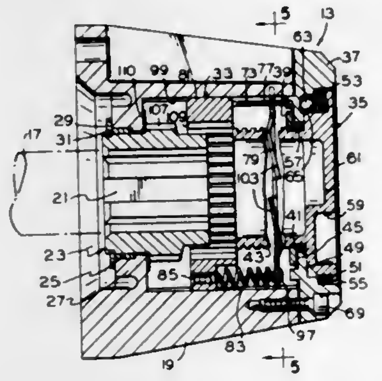
John E. Havranek, Schaumburg, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.
Filed Dec. 1, 1971, Ser. No. 203,601
Int. Cl. F16d *41/06*
U.S. Cl. 192—45 **10 Claims**



A phased roller clutch for providing an overrunning coupling between a cammed race and a smooth race is provided with a split ring energizing spring so constructed and arranged that one end of the spring is wedged between the cage and the cammed race during overrunning operation of the clutch to prevent displacement with respect to the cammed race. A clutch consisting of cage, rollers and energizing spring can be preassembled as a unitary assembly for insertion between a pair of races without requiring that the spring end be separately connected to the cammed race. Integral means is provided for centering the clutch assembly on the cammed race, and means is provided for preventing axial displacement of the spring from the roller assembly.

3,718,213
WHEEL HUB CLUTCHING MECHANISM

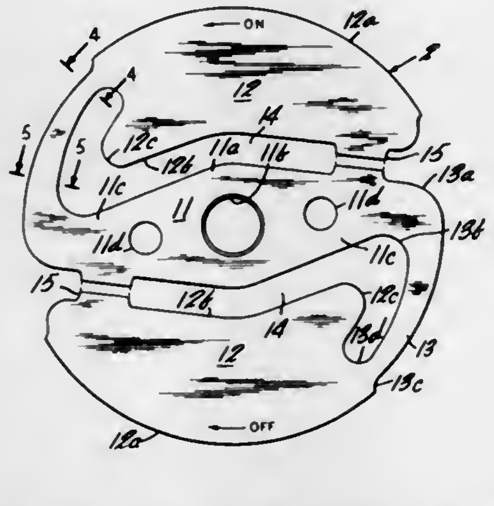
Frank Hegar, Oregon City, and Timothy E. Fleskes, Portland, Oreg., assignors to Warn-Belleview, Inc., Portland, Oreg.
Filed Feb. 24, 1971, Ser. No. 118,294
Int. Cl. F16d *11/04*
U.S. Cl. 192—67 R **13 Claims**



A wheel hub clutching mechanism has a dial which, when turned to a "free" position, moves an actuator nut to place springs under tension to move a clutch out of mesh with a shaft driven pinion. When the dial is moved to a "lock" position, it moves the actuator nut to place the springs under compression to move the clutch into mesh with the pinion. The dial has a threaded portion which drives the nut along a splining rod which insures correct indexing of the nut relative to the dial.

3,718,214
CENTRIFUGAL CLUTCH

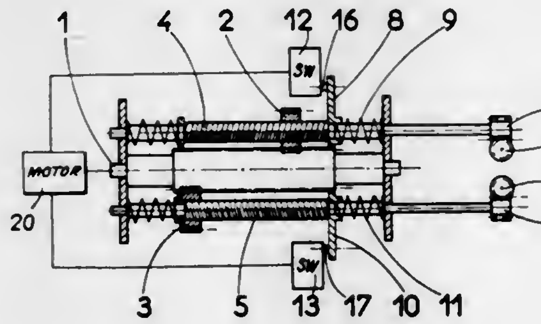
Albert K. Newman, Noroton, Conn., assignor to Textron Inc., Providence, R.I.
Filed May 4, 1971, Ser. No. 140,079
Int. Cl. F16d *7/30*
U.S. Cl. 192—105 CD **7 Claims**



A centrifugal clutch has a soft steel low carbon drum and a one-piece cast rotor comprising an iron bar portion with a central hub portion, two segment shaped weight portions each having a circumferential extent of at least 90° and a radial extent of at least 25% of the overall diameter of the rotor and integral thin spring portion connecting opposite ends of the cross bar with the weight portions respectively, each spring portion extending a circumferential extent of the order of 30° to 50° and spaced radially inwardly out of engagement with the drum. The weight portions have centrifugal forces which engage the drum when the rotor is rotated at or above a critical speed to drive the drum.

3,718,215
DEVICE FOR LIMITING THE NUMBER OF REVOLUTION OF A ROTATING SHAFT

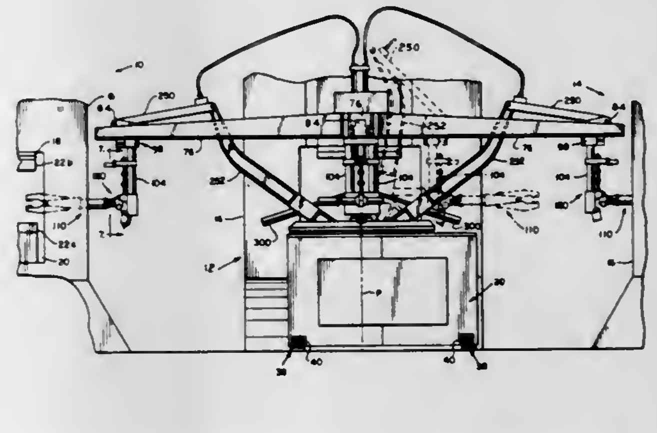
Robert Mimeur, Sallanches, France, assignor to Ets. Carpano & Pons SA, Cluses, France
Filed Jan. 18, 1971, Ser. No. 106,961
Claims priority, application France, Jan. 19, 1970, 7001743
Int. Cl. F16d *71/00;* **H01h** *3/16*
U.S. Cl. 192—141 **3 Claims**



A spline shaft rotatably driven by driving means meshes with two pinions having internally threaded bores engaging on two elongate members, partially screw threaded along their length, so that the pinions move along the elongate members in opposite directions upon rotation of the spline shaft. The pinions actuate stopping means after a certain number of revolutions of the spline shaft in a given direction. The elongate members are manually rotatable to adjust the starting positions of the pinions, and set the desired number of revolutions. Spring means urge the pinion towards the threaded parts of the elongated members if a pinion engages a non-threaded part of the member as a result of failure of the stopping means or over-adjustment of the starting position.

3,718,216
FORMING PRESS SYSTEM AND WORKPIECE HANDLING AND TRANSFER APPARATUS THEREFOR

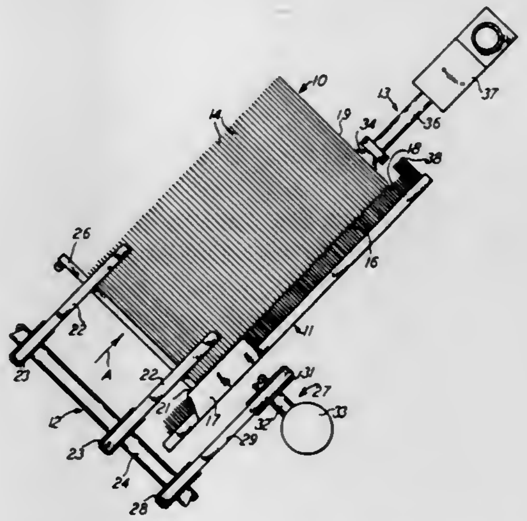
Walter W. Wilson, Levittown, Pa., assignor to E. W. Bliss Company, Canton, Ohio
Filed Apr. 1, 1969, Ser. No. 812,268
Int. Cl. B65g *29/00*
U.S. Cl. 214—1 BC **4 Claims**



A forming press system wherein the presses are positioned in groups about a central point and transfer of workpieces between presses is accomplished by a rotating handling apparatus.

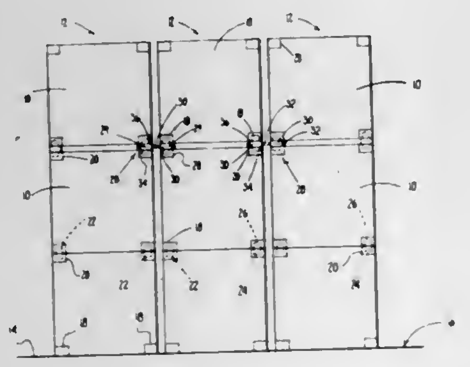
3,718,217
APPARATUS FOR FEEDING SIGNATURES

Anton R. Stobb, Rudolph C. Stobb, and Walter J. Stobb, all of R.D. 1, Pittstown, N.J. 08867
Filed Aug. 22, 1969, Ser. No. 852,297
Int. Cl. B65g *59/02*
U.S. Cl. 214—8.5 A **8 Claims**



Method and apparatus for feeding signatures which are folded and disposed in a stack. The folded edges cause the stack to be longer along the folded edge, and there is a problem of handling the stack with the protruding folded edges. The method and apparatus utilize friction means, such as brushes or tapes of friction material, either of which is disposed along the bed supporting the stack, and the folds are supported on the friction means to retard movement of the folds as the stack is moved along the bed. The friction means may be either stationary or it may be moving at a lesser speed than the speed of the stack which is subjected to a conveyor, or the friction means may be moving in the direction opposite to that of the conveyor, all for retarding the movement of the folded edges and thereby square up the stack. Also, gripper means are employed for singly removing the signatures from the stack.

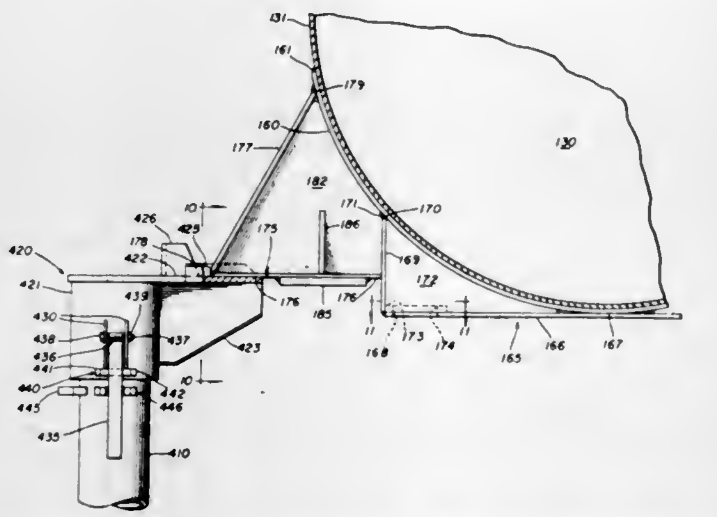
3,718,218
SHIPPING AND STORAGE CONTAINER INTERLOCK
Charles J. Shields, Oakland, Calif., assignor to States Steamship Company, San Francisco, Calif.
Filed Oct. 13, 1971, Ser. No. 188,926
Int. Cl. B65g *1/14*
U.S. Cl. 214—10.5 R **20 Claims**



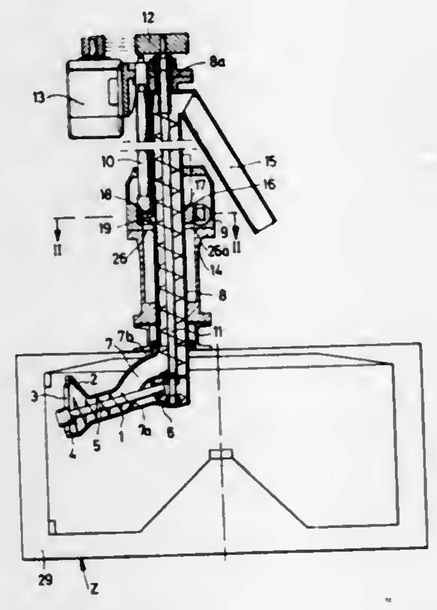
A horizontal connection between at least two adjacent stacks of vertically stacked cargo containers having means between the containers in each stack positioning, aligning and interlocking such containers. A horizontal stack interlock member is disposed on top of at least one container in each stack at like stack elevations and is releasably secured to its supporting container. The interlocking member is rotatable about a vertical axis through a limited arc and includes at least one protrusion for horizontal alignment with the protrusion in the interlocking member on the adjacent container stack. A rigid toothed rack between the two members engages the protrusions and thereby horizontally interlocks the containers in the adjacent stacks. By rotating the interlocking members through the vertical axes, the toothed rack can be released from the protrusions to break the connection between the stacks.

3,718,219
SYSTEMS FOR STORING AND TRANSPORTING LADINGS
Ira C. Eddy, Mansfield, La., and William A. Taylor, Sharpsville, Pa., assignors to General American Transportation Corporation, Chicago, Ill.
Division of Ser. No. 817,907, April 21, 1969, Pat. No. 3,595,408. This application Dec. 17, 1970, Ser. No. 100,246
Int. Cl. B65g *67/02*
U.S. Cl. 214—38 D **11 Claims**

There is disclosed herein systems for storing and for transporting tanks for containing ladings, and the components thereof, including a tank having a first bolster disposed adjacent to one end thereof and a second bolster disposed adjacent to the other end thereof, a stationary support station including a first pair of spaced-apart support posts disposed on opposite sides of a longitudinal axis and a second pair of spaced-apart support posts disposed on opposite sides of the longitudinal axis and spaced from the first pair of support posts, the first and second support posts carrying first and second support structure respectively, the first and second support structures being shiftable between receiving positions and supporting positions, the tank bolsters and the support posts and the support structures being arranged so that the tank bolsters can be positioned upon the support structures when the support structures are in the supporting positions thereof, a road vehicle including a frame provided with road wheels and having a first body bolster disposed adjacent to one end thereof and a second body bolster disposed adjacent to the other end thereof, the tank bolsters and the body bolsters being arranged so that the tank bolsters can be positioned respectively on the body bolsters, the support posts in each pair of support posts being spaced-apart a distance to receive the road vehicle therebetween with the tank mounted thereon when the support structures are in the receiving positions thereof, and lifting means on the frame for causing relative vertical movement between the tank and the support structures.

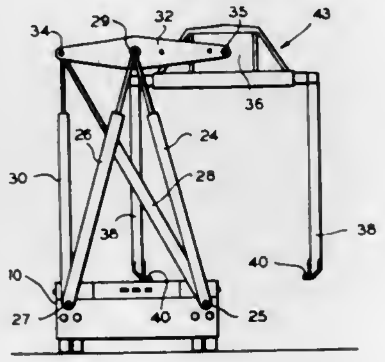


3,718,220
DEVICE FOR THE PEELING AND EXTRACTING OF SOLID MATERIAL FROM A CENTRIFUGE
Hans-Joachim Titus, Von-Hees-Strasse 5, 6148 Heppenheim-Bergstrasse, Germany
Filed July 2, 1970, Ser. No. 51,890
Claims priority, application Germany, July 2, 1969, P 19 33 545.6
Int. Cl. B65g *65/38;* **B04b** *11/00*
U.S. Cl. 214—17 DB **11 Claims**



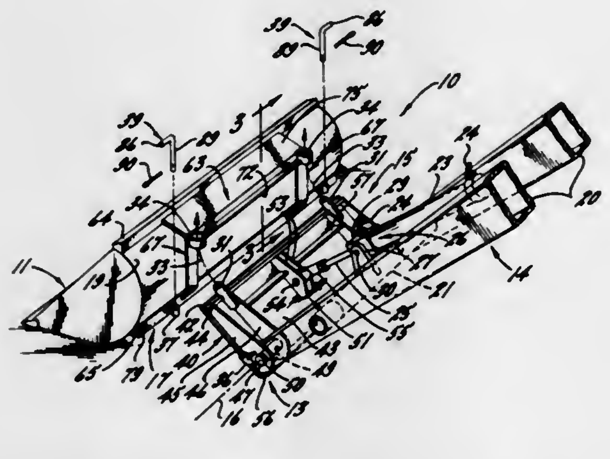
A device for the peeling and extracting of solid material from a centrifuge, especially from a vertical centrifuge, during centrifuge operation, the device including a vertical well housing mounted on the centrifuge cover, a vertical extraction tube extending through the housing and into the centrifuge, a sideways extending pickup duct with a peeling head connected to the lower end of the extraction tube, and screw conveyors inside both the pickup duct and the extraction tube. The extraction tube is guided inside the well housing for rotational motion and for vertical motion, so that the peeling head can be approached and retracted from the centrifuge drum wall and moved vertically therealong. Hydraulic cylinders provide the rotational and vertical motions.

3,718,221
LOAD TRANSFER MECHANISM
Peter J. Visser, Niles, Mich., assignor to Clark Equipment Company, Buchanan, Mich.
Filed Oct. 7, 1971, Ser. No. 187,362
Int. Cl. B60p *1/48*
U.S. Cl. 214—77 R **10 Claims**



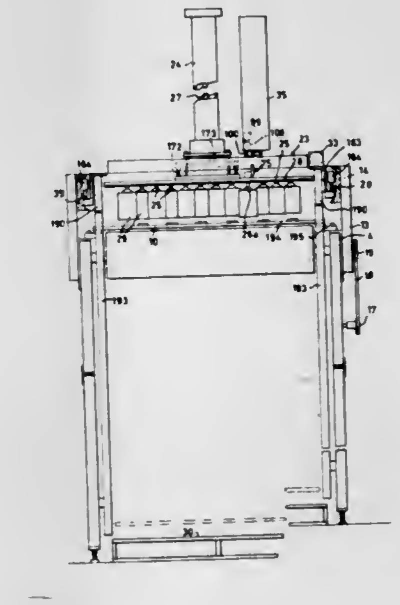
A transfer mechanism for transferring a load from one side of the mechanism to the other. A pair of main linear actuators is located at each end of the mechanism. The lower ends of the main actuators at each end are pivotally connected adjacent opposite sides of the mechanism. The upper ends of the main actuators are pivotally connected to an intermediate location on a transverse elongated boom arm which is located at each end. There is also a pair of auxiliary actuators at each end of the mechanism. These actuators likewise each have their lower ends pivotally connected adjacent the sides of the mechanism while the upper ends are connected to one end of each of the boom arms respectively.

3,718,222
COUPLING FOR DETACHABLE IMPLEMENTS
Phillip W. Foster, c/o Lee Blacksmith, Lee, Ill.
Filed Dec. 11, 1970, Ser. No. 97,248
Int. Cl. E02f *3/70*
U.S. Cl. 214—145 **1 Claim**



A coupling for detachably connecting a farm implement with a movable boom includes a first part with a frame mountable on the free end of the boom for rotation relative thereto and for bodily movement therewith through a predetermined arc. A pair of spaced apart mounting posts extend outwardly of the edge of the frame and are moved with the latter through that arc to fit within a pair of collars mounted on the back of the implement. Once the posts are inserted into the collars, a pressure fluid cylinder mounted on the boom and connected to the frame is actuated to rotate the latter clockwise drawing the back of the implement against the frame. This aligns a portion of a connector mounted on the frame with a cooperating portion of the connector mountable on the implement. Thereafter, a pin inserted through the connector portions holds the connector together to prevent the posts from being withdrawn from the collars.

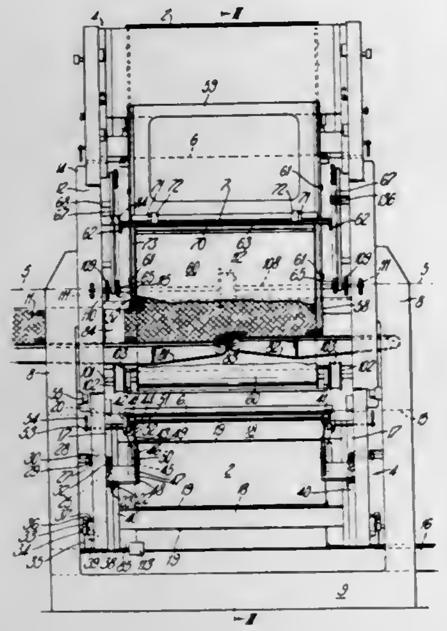
3,718,223
METHOD OF PALLETIZING CANS
Konrad Emil Meissner, Lafayette, Calif., assignor to Filper Corporation, San Ramon, Calif.
Original application Dec. 4, 1969, Ser. No. 881,978, now Patent No. 3,662,902, dated May 16, 1972. Divided and this application Mar. 30, 1971, Ser. No. 117,923
Int. Cl. B65g *57/04*
U.S. Cl. 214—152 **3 Claims**



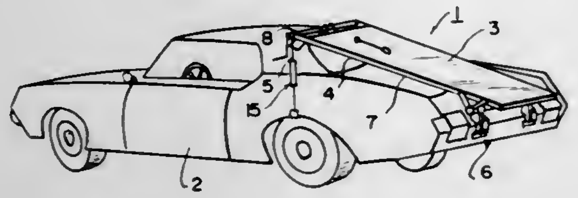
An air-actuated palletizer for cans having a vertically reciprocable platen with vacuum cup for connection with cans on a conveyor carried against a pattern forming bar over which the cans are elevated by said cups and moved to a loading position for lowering said cans onto a pallet supported stack. A system of air-actuated valves controls the movements, including a valve actuated by movement of one of the cans releasably connected with and suspended from one of said cups.

3,718,224
MACHINE FOR UNLOADING TRAYS OF ARTICLES
James George Edward Hillman, 2 Evelyn Street, London, England, assignor to Milins Machine Company Limited, London
Continuation of Ser. No. 702,981, Feb. 5, 1968, Pat. No. 3,595,413. This application June 8, 1971, Ser. No. 150,980
The portion of the terms of this patent subsequent to July 27, 1988, has been disclaimed.
Claims priority, application Great Britain, Feb. 6, 1967, 5,607/67
Int. Cl. B65g *47/52*
U.S. Cl. 214—302 **15 Claims**

Apparatus for discharging a stream of cigarettes or other rod-like articles from a succession of containers carrying batches of the articles includes means for contacting the upper surface of each batch of articles while the stream of articles is being withdrawn to maintain the upper surface of the batch substantially flat and horizontal, so that the succeeding batch of articles can be dropped into position on the article remaining from the previous batch through a gap which is substantially uniform in height across the width of the batch.



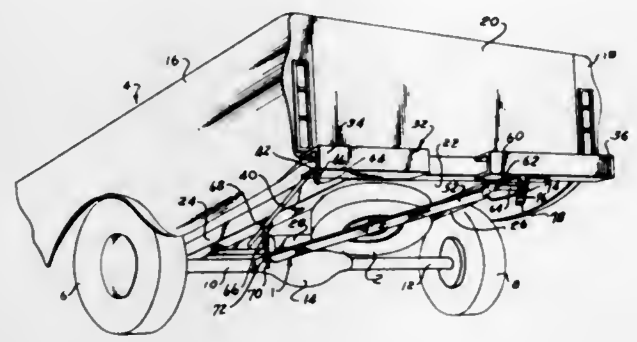
3,718,225
VEHICLE CARRIER ASSEMBLY
John B. Duren, 126 W. Main Street, Osage, Iowa
Filed March 11, 1971, Ser. No. 123,208
Int. Cl. B60r *9/00*
U.S. Cl. 214—450 **5 Claims**



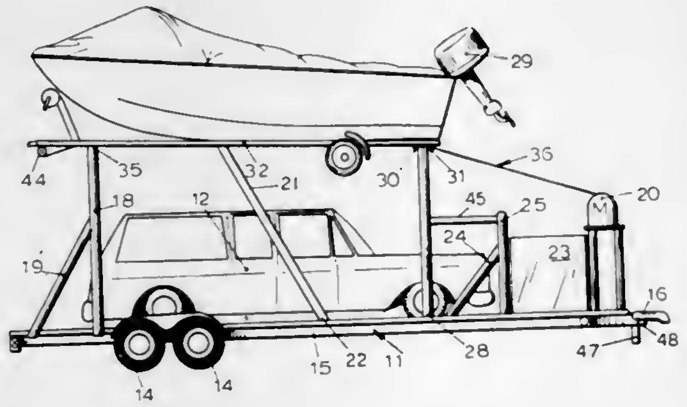
A carrier assembly for transporting a vehicle or other object of an automobile or the like wherein the carrier includes a slideable platform to lift the object into transporting position. The platform is slideably mounted in a frame adapted to be attached to the transporting vehicle in a sloped orientation to readily effect reciprocating movement of the platform from the ground to the transported position and vice versa. A hand crank and cable is attached to the frame to control the desired movement of the platform upwardly or downwardly. The crank and cable can also be used to secure a vehicle or other object to the carrier platform and at the same time secure carrier platform to the carrier frame.

3,718,226
SPARE TIRE MOUNT FOR PICKUPS
Walter E. Penley, 1104 Emerson Lane, Denton, Tex. 76201
Filed Dec. 8, 1971, Ser. No. 205,844
Int. Cl. B60r *9/00*
U.S. Cl. 214—451 **15 Claims**

A carrier for supporting a spare tire and wheel assembly beneath the chassis frame of a vehicle adapted to permit lineal movement of the assembly from beneath the vehicle and rotational movement of the assembly to orient the assembly in a vertical position. The wheel assembly is carried by a support bar having one end detachably secured to the rear bumper of the vehicle and another end slidably disposed on a guide bar. The guide bar has one end secured to the chassis frame of the vehicle and another end secured to the rear bumper of the vehicle.



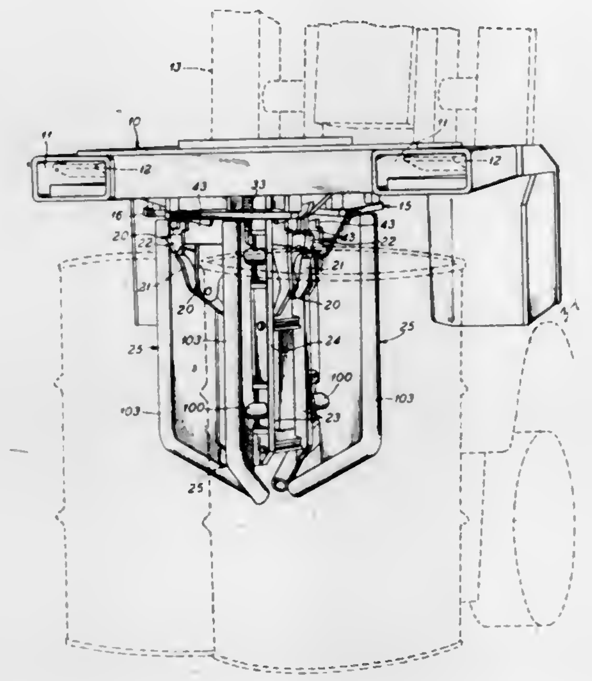
3,718,227
A COMBINATION BOAT-AUTOMOBILE TRAILER
Merle E. Swift, 161 Lynnwood, North East, Pa.
Filed Feb. 11, 1971, Ser. No. 114,617
Int. Cl. B60p *3/08*
U.S. Cl. 214—512 **6 Claims**



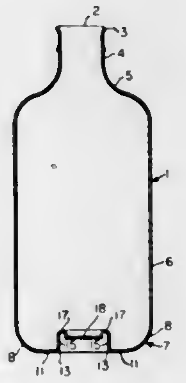
A semi-trailer is disclosed for supporting both a boat, a boat trailer and an automobile. The trailer has a frame with a hoist on it adapted to carry a boat and boat trailer in an elevated position and to carry an automobile on the trailer below the boat.

3,718,228
MULTIPLE DRUM CLAMPING UNIT
Harold E. Lund, Northbrook, Ill., and John F. E. Ericson, North Seminole, Fla., assignors to Marvel Industries, Inc., Evanston, Fla.
Filed Nov. 18, 1971, Ser. No. 200,076
Int. Cl. B66f *9/06*
U.S. Cl. 214—620 **10 Claims**

Multiple drum clamping attachment for lift trucks or other lifting devices, gripping and lifting one or a plurality of drums and depositing the drums in upright positions. Clamping jaws extend radially from the center of the attachment, each pair of which clamping jaws engages beneath and within the bead of a drum upon lowering movement of the attachment into engagement with the top of the drum and come into clamping engagement with the bead of the drum as elevated. The drums are maintained in generally vertical positions during lifting and lowering thereof by straightening abutments, extending generally radially from the center of the attachment on opposite sides of the clamping jaws. Each pair of straightening guides is adapted to engage the side of a drum on opposite sides of the clamping jaws and to extend downwardly along the drum beneath the center of gravity of the drum, to hold the drum from tilting during upward lifting movement of the drum.

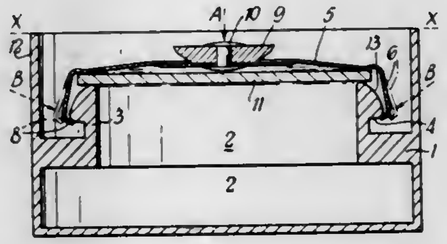


3,718,229
NONEVERTING BOTTOM FOR THERMOPLASTIC BOTTLES
Nathanial Convers Wyeth, Mendenhall, Pa.; Ronald Newman Roseveare, and Keith Stewart Carmichael, both of Wilmington, Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.
Filed Oct. 26, 1971, Ser. No. 192,059
Int. Cl. B65d *1/02*
U.S. Cl. 215—1 C **6 Claims**



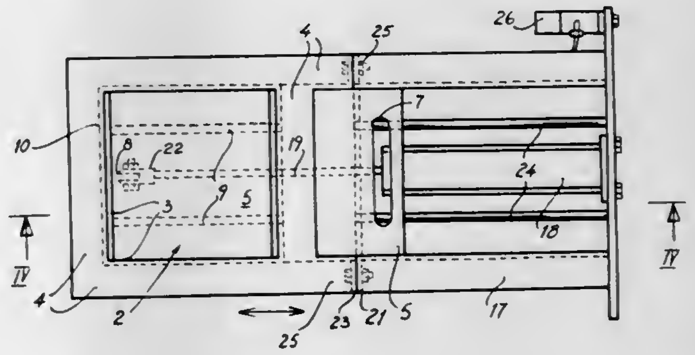
A generally cylindrical, biaxially oriented thermoplastic bottle for bottling liquids under pressure, such as beer, soda and aerosols, having a noneverting bottom under conditions of bottling and use. The bottom of the bottle in the unpressurized state comprises a shell of thermoplastic material having a configuration defined as a series of sequentially connected geometric shapes rotationally symmetrical about the central axis of the bottle starting with (*a*) about a 90° portion of a circle connected to the generally cylindrical section of the bottle, forming the annular bottom edge, connected to (*b*) a straight line forming a flat section which is the bottom seating area of the bottle, connected to (*c*) about a 90° portion of a circle forming an annular toroidal knuckle turning into (*d*) a straight line forming a re-entrant cylinder connected to (*e*) about a 180° portion of a circle forming a recessed annular toroidal knuckle ending with (*f*) a straight line forming a recessed disc in the bottom center of the bottle. To further improve eversion resistance, the bottom of the bottle can include a reinforcing ring attached to the recessed annular toroidal knuckle. Under an autogenous pressure, the bottle dimensions remain practically the same except that the flat bottom seating area moves outward and the bottle now stands on the annular toroidal knuckle that turns upward into the re-entrant cylinder.

3,718,230
CHILD-PROOF CONTAINERS
Peter Henry James, London, England, assignor to Quartz Investments Limited, Nassau, Bahamas
Filed May 13, 1971, Ser. No. 143,043
Claims priority, application Great Britain, May 14, 1970, 23,515/70
Int. Cl. B65d *43/10*
U.S. Cl. 220—60 A **9 Claims**



A child-proof container for medications and other potentially injurious substances which comprises an unbreakable body having a mouth fitted with a snap action or other safety closure cap and also comprises a wall which closely surrounds the fitted cap so that the plane of its free edge is above the mouth and fitted cap when the container is standing upright on a horizontal surface.

3,718,231
CLOSURE ASSEMBLY FOR A BULK CONTAINER
Liam O'Connor, Castleisland, Ireland, assignor to Liam O'Connor and Company Limited, Tonbwee, Castleisland, Ireland
Filed Dec. 16, 1970, Ser. No. 98,751
Claims priority, application Ireland, Dec. 22, 1970, 1693
Int. Cl. B65d *43/12*
U.S. Cl. 220—41 **6 Claims**



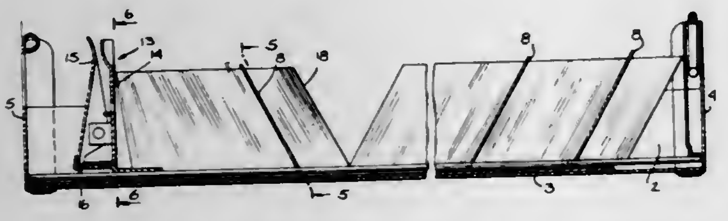
The invention relates to a power operated closure assembly, such as a hydraulically operated slide plate door, for the outlet of a bulk storage container for granular material. The drive unit of the closure assembly is detachable and the closure assembly is so arranged that with the drive unit detached the closure assembly may be operated manually. Removal of the drive unit facilitates maintenance and repair of the closure assembly.

3,718,232
FILE TRAY CONTROL PLATE SYSTEM

George E. Moore, and Joseph D. Horlacher, both of Jamestown, N.Y., assignors to Watson Manufacturing Company, Inc., Jamestown, N.Y.

Filed April 6, 1971, Ser. No. 131,690
Int. Cl. B65d *57/00*

U.S. Cl. 220—22.3 **7 Claims**



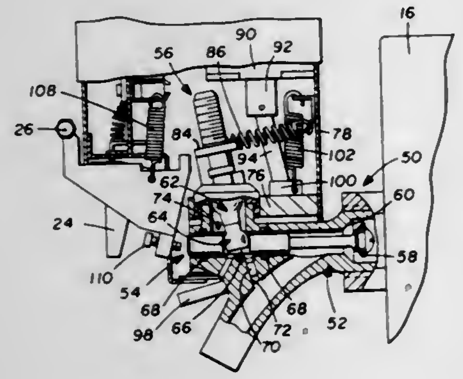
A drawer or tray is disclosed for filing and referencing cards or checks or other records. In order to make the cards or other records conveniently available for filing and viewing, the tray includes an adjustable control plate arrangement whereby an infinitely adjustable viewing space or working Vee may be created where desired in the stored cards. The control plate arrangement includes control plates slidably mounted on a longitudinal rod in the tray bottom which provides a position lock for each plate to adjustably hold the plate in a particular viewing position within the drawer.

3,718,233
BEER DISPENSING SYSTEM

John J. Nordhoff, Plano, Tex., assignor to Magnetico International, Inc., Dallas, Tex.

Filed March 5, 1971, Ser. No. 121,427
Int. Cl. B67d *5/08*

U.S. Cl. 222—70 **10 Claims**



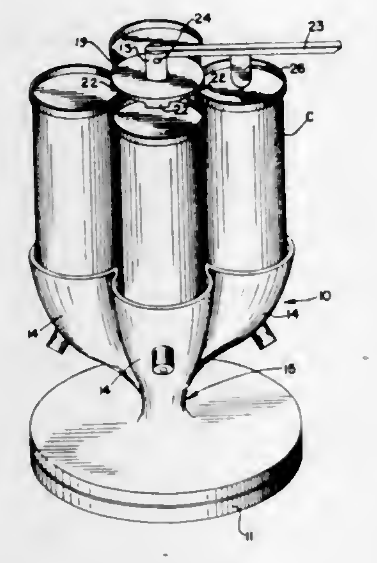
A beer dispensing system includes at least one tap for automatically dispensing either the exact quantity of beer necessary to fill a glass or the exact quantity of beer necessary to fill a pitcher, and a computer for recording each dispensing operation of the tap. The tap comprises a modified Perlick valve, a bell crank coupled to the actuating lever of the valve, and a solenoid for operating the bell crank to open the valve. Electronic timing circuitry is provided for energizing the solenoid for predetermined periods of time and thereby dispensing the desired quantities of beer. The tap further comprises an add-a-head lever for manual actuation to open the valve a slight amount and thereby dispense foam.

3,718,234
RACK FOR PRESSURIZED PRODUCT DISPENSING CONTAINER

Richard B. Bagguley, Dolton, Ill., assignor to Continental Can Company, Inc., New York, N.Y.

Filed April 23, 1971, Ser. No. 136,947
Int. Cl. B65d *83/14*

U.S. Cl. 222—135 **6 Claims**



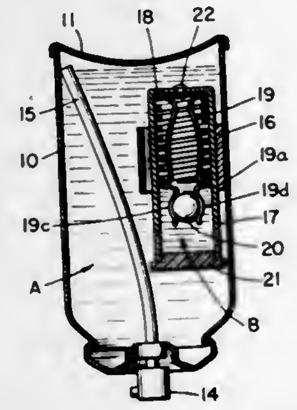
Racks for supporting pressurized product dispensing containers. The racks include means for tilting the dispensing valve on the containers to a dispensing position upon relative axial movement of the rack and container.

3,718,235
SPRING TRIGGER ASSEMBLY FOR MIXING DUAL LIQUIDS

Philip J. Cronan, 1933 S. Bedford, Los Angeles, Calif. 90035

Filed Dec. 13, 1971, Ser. No. 207,369
Int. Cl. B67d *5/60*

U.S. Cl. 222—145 **5 Claims**



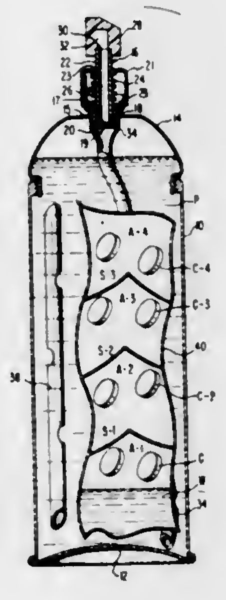
A spring trigger assembly is provided for placing, first and second liquids in first and second containers normally separated, into communication with each other for mixing. The assembly itself is included in the second container and comprises a coiled compression spring, a spring trigger means, and an inertia means cooperating with the spring trigger means to hold the compression spring in a compressed state and, when shaken loose from the spring trigger means, to release the compression spring so that it can expand to thereby open the second container and provide communication between the liquids.

3,718,236
PRESSURIZED CONTAINER WITH NON-RIGID FOLLOWER

Ellis M. Reyner, New Brunswick, N.J., and Margaret E. Reyner, 1050 George St., New Brunswick, N.J. 08901; said Ellis M. Reyner assignor to said Margaret E. Reyner

Filed Dec. 4, 1969, Ser. No. 882,034
Int. Cl. B67d *5/42*

U.S. Cl. 222—386.5 **30 Claims**



In a container for a flowable product which is dispensed through an outlet in the container controlled by a valve or closure, a plurality of expansible chambers or compartments serially arranged and separated from each other by disruptable partitions. One compartment has a pressure generating agent which, through the addition of a delaying agent, begins to generate pressure in the compartment after the container is assembled and charged with the product to be dispensed. The generated pressure causes the compartment to expand and force the product out of the container through the outlet of the container, when the valve of the container is opened. Expansion of the compartment also disrupts the associated partition to place the adjacent compartment in communication with the first compartment. Chemical reagent in the second compartment reacts with or is activated by the pressure generating substance in the first compartment to further generate gas causing continued expansion of the compartments for dispensing the product under pressure. This expansion of the compartment in turn disrupts a second partition to communicate a third compartment to activate a chemical reagent in the third compartment to further generate gas and pressure for dispensing the product in the same manner. Other features and embodiments of the invention will appear subsequently in the specification and drawings.

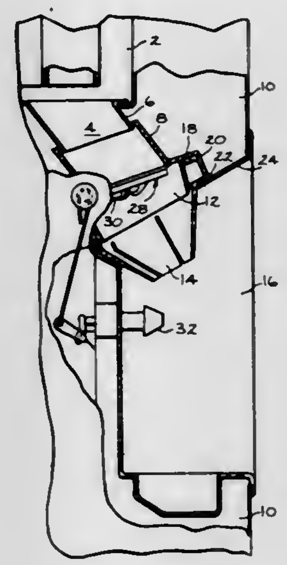
3,718,237
CLOSURE MEANS FOR THROUGH-THE-DOOR ICE SERVICE FOR HOUSEHOLD REFRIGERATORS

Joel A. Gitelson and Howard D. F. True, Jr., Fern Creek, Ky., assignors to General Electric Company, Louisville, Ky.

Filed Dec. 15, 1971, Ser. No. 208,371
Int. Cl. B67d *3/00*

U.S. Cl. 222—505 **6 Claims**

Through-the-door ice services employed in household refrigerators include a slanting ice conveying passageway having an inlet adapted to receive ice from a freezing unit and an outlet in a service area outside the door. Since the inlet to the passageway is exposed to freezing temperatures, whereas the passageway outlet is exposed to ambient temperatures, satisfactory operation of dispensers of this type depend to a great extent on the proper operation of the passageway closure member. The closure member provided herein effectively seals the passageway, and it can be removed and disassembled into its component parts without interfering with the operation of its drive mechanism.

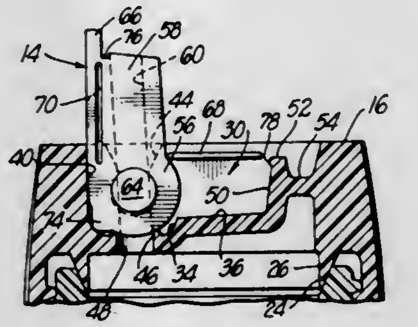


3,718,238
SAFETY DISPENSING CLOSURE

Robert E. Hazard, North Kingstown, and Woodrow S. Wilson, Slatersville, both of R.I., assignors to Polytop Corporation, Slatersville, R.I.

Filed July 27, 1970, Ser. No. 58,355
Int. Cl. B67d *3/00*

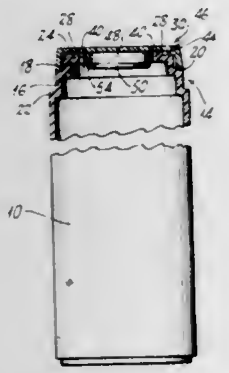
U.S. Cl. 222—536 **4 Claims**



A "safety" dispensing closure of the rotatable spout type can be constructed utilizing a closure top and spout structure such that the spout is recessed within the closure in a closed position and utilizing a recess structure within the top for use in engaging the spout so as to rotate it to an open position and utilizing a plurality of coacting detent means which lock the spout in a closed position against accidental or unadvertent movement.

3,718,239
DISPENSER WITH TURN CAP

Raymond J. Cochran, Fairfield, Conn., assignor to Fairfield Plastics Incorporated, Fairfield, Conn.
Filed Feb. 23, 1971, Ser. No. 118,136
Int. Cl. B65c *47/00*
U.S. Cl. 222—548 **3 Claims**

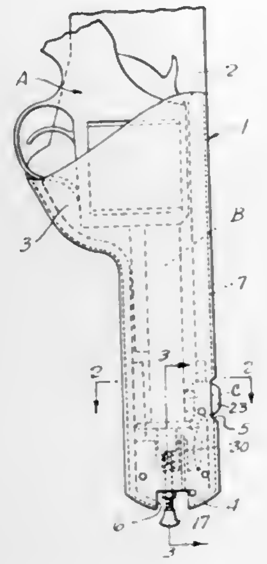


A small dispenser of the type intended to be held in the hand, for discharging various substances such as powdered talc or other fine particulate material, granulated substances and the like, as well as certain viscous substances. The dispenser comprises a plastic container or small jar having a transverse top wall provided with a large central opening and with a plurality of discharge openings (or a single opening) disposed radially outward of the central opening. Turnably mounted on and engaged with the transverse top wall is a captive cap having similar dispensing openings (or single opening) adapted to be registered with the corresponding openings or opening of the transverse container wall when the cap is properly rotatably positioned. The cap has a centralized depending bearing and retainer skirt which is adapted to fit into the large central opening of the transverse wall of the container, said skirt having a detent bead or shoulder means around its bottom rim. One of the parts, preferably the cap, is of resilient or yieldable plastic substance, whereas the other is preferably of a more rigid plastic composition, the arrangement being such that the cap can be press or snap fitted to the container by forcing the depending skirt thereof with its detent bead into and through the large central opening of the transverse container wall at the top. To facilitate such snap type assemblage, the central opening of the transverse wall is made tapered or with sloping edges which tend to cam inwardly the detent bead of the depending skirt of the cap as the latter is forced downward onto the container, whereby the detent bead is radially compressed or reduced in size and forced completely past the bottom edge of the large wall opening. Upon this occurring, the detent bead radially expands to its original shape, whereby it effectively locks the cap to the container top while permitting the cap to be turned with respect thereto. At the underside of the cap there is a stop lug which is received in a movement-limiting slot of the transverse wall, the slot being so arranged that for one stopped or limited position of the cap the discharge openings thereof are out of registration with those of the top wall of the container. For the other limiting position, the discharge openings of both parts are in registration, enabling dispensing of the contents of the container to be effected. The assemblage of the cap to the container is very quickly and economically effected, without requiring separate fastenings of any kind, or additional operations to be performed on either the container or the cap.

3,718,240
HOLSTER WITH PISTOL RETAINING MECHANISM

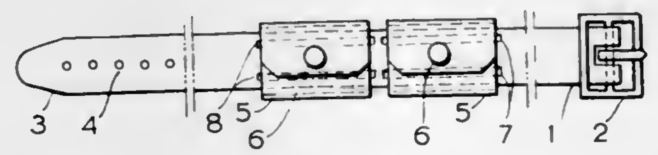
Phillip C. Rose, 210 Dewey St., Morgantown, W. Va.
Filed Oct. 28, 1971, Ser. No. 193,497
Int. Cl. F41c *33/02*
U.S. Cl. 224—2 B **6 Claims**

A pistol holster has a mechanism therein for retaining a pistol inserted in the holster by engaging the pistol sight and which mechanism will release the pistol upon a slight downward movement of the pistol barrel or a manual downward movement of a muzzle rest retaining screw extending from the holster.



3,718,241
SAFETY BELT

John D. Forsythe, 1543 Dougall Avenue, Windsor 12, Ontario, Canada
Filed Dec. 28, 1970, Ser. No. 101,855
Int. Cl. A45f *5/02*
U.S. Cl. 224—5 A **1 Claim**



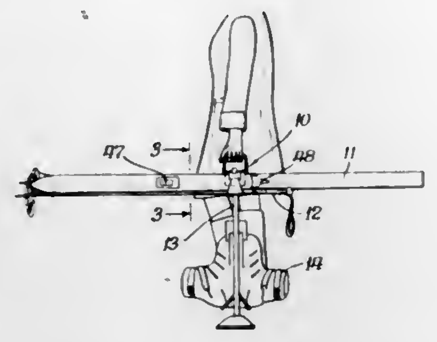
This invention consists of a safety belt, made of a non-conductive material, to which are attached two or more loops for holding the electric cord of a power tool when in use. The loops can be opened and closed by snap fasteners, for the rapid insertion and removal of the said cord, and when the belt is worn in the usual manner around the waist of the person using the power tool, the loops are located in the back of the person thus always keeping the electric cord out of the way of the user.

3,718,242
SKI CARRIER

Ronald H. Larson, Route 4, Box 340 C, Antioch, Ill.
Filed June 4, 1970, Ser. No. 43,415
Int. Cl. A45f *5/10*
U.S. Cl. 224—45 S **2 Claims**

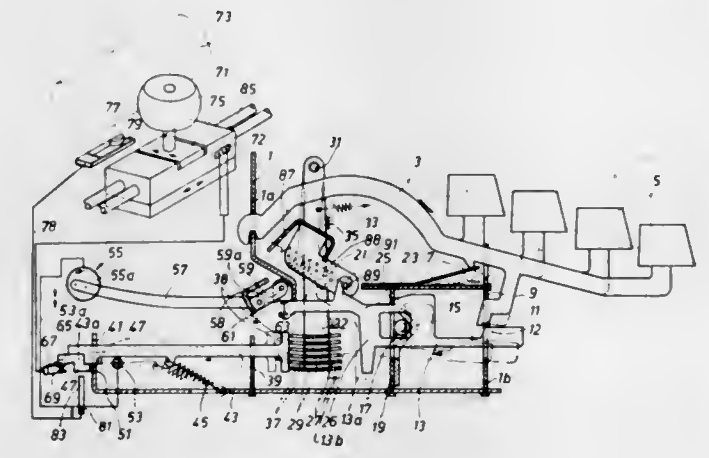
A ski carrier adapted to carry, in addition to a pair of skis, a ski boot carrier and a pair of ski poles. The carrier has a U-shaped frame which functions as a bail-type handle, from which a pair of panels are hung, each panel having a resilient strap by which a ski, or a ski and a ski pole, are secured to the panel. The panels, when not in use, swing into or adjacent the frame to form a small pocket-size package. A hook depending from one of the panels serves to support a ski-boot carrier, a clasp on the frame can be used to support the frame from the skier's belt to free one of his hands, and means are provided

for hanging the ski carrier with skis secured thereto, from a wall hook. The carrier may be retained on the skis when the skis are secured to a ski rack on a car in either co-planar or parallel relationship to one another.



3,718,243
APPARATUS FOR STORING TYPING COMMANDS GIVEN IN TOO RAPID SUCCESSION BY KEYS

Kurt Chvatlinsky, Wilhelmshaven, Germany, assignor to Olympia Werke AG., Wilhelmshaven, Germany
Filed Nov. 10, 1971, Ser. No. 197,322
Claims priority, application Germany, Nov. 13, 1970, P 20 55 838.7
Int. Cl. B41j *23/02*
U.S. Cl. 197—16 **17 Claims**

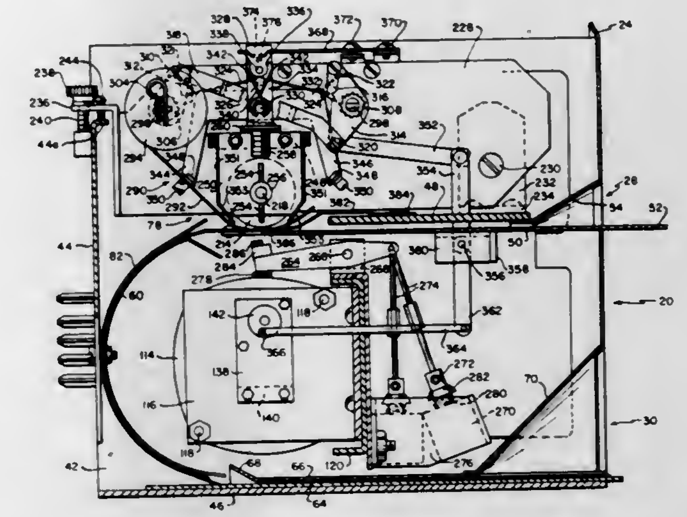


Code bars having first and second opposite edges with coded projections, are located between spring-biassed interposers and storing slides. When a key releases a selected first interposer, it engages corresponding first code projections of corresponding code bars and displaces the same so that storing members are displaced in accordance with the second coded projections. A typing operation is carried out under the control of the storing members, while the first selected interposer is driven back to its position of rest, and out of the locking means, so that a second selected interposer, whose key was operated during the printing operation, and which was blocked in a waiting position by the locking means, can enter the locking means and cause another printing operation.

3,718,244
APPARATUS FOR READING PRE-PROGRAMMED CARDS AND PRINTING THEREON

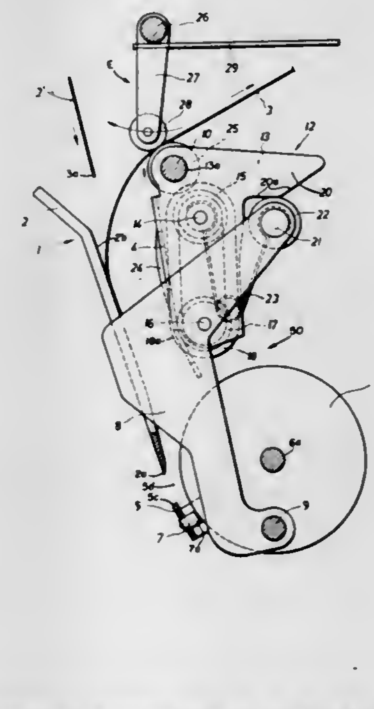
Raymond J. Bukowski, Chicago, and Raymond L. Brija, Villa Park, Ill., and Florian F. Yanikoski, Braintree, Mass., assignors to Motiongraph, Inc., Chicago, Ill.
Filed Feb. 26, 1970, Ser. No. 14,608
Int. Cl. B41j *13/00*
U.S. Cl. 197—127 **24 Claims**

Apparatus for transporting, reading and printing a sales order card having index registration indicia thereon, a program area having order data selectively disposed thereon, and a printing area to receive printed indicia thereon, including card guide means adapted to selectively transport a card through the apparatus, a scanning head adapted to detect the position of the card and produce output signals responsive to order data on the card, and printing means responsive to signals from the scanning head to selectively print indicia on the printing area of the card.



3,718,245
SHEET INSERTING APPARATUS FOR A TYPEWRITER

Wolfgang Priebel, Aistaig, and Arthur Frobel, Oberndorf, Germany, assignors to Olympia Werke AG, Wilhelmshaven, Germany
Filed Dec. 21, 1970, Ser. No. 99,770
Claims priority, application Germany, Dec. 22, 1969, P 19 64 141.9
Int. Cl. B41j *13/00*
U.S. Cl. 197—127 **10 Claims**



A sheet inserting apparatus is attached to a typewriter and has holding means movable between an open end position, in which a sheet can be inserted, and a closed end position in which the sheet is pressed against the platen of the typewriter. Transporting means are connected with the holder means for movement in timed relation, and drive the inserted sheet in an intermediate position of the holder means, to a correct position for being typed upon, before the sheet is clamped against the platen.

3,718,246

MULTIPURPOSE GROUPING DEVICE FOR AN ENCASING-UNCASING MACHINE

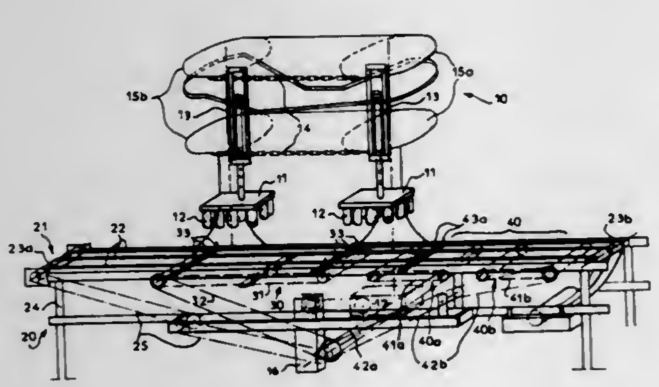
Edgar J. Dardaine, Mesnil-sur-l'Estree, and Jean-Luc Berry, Sorel-Moussel, France, assignors to E. P. Remy & Cie, Dreux, France

Filed Feb. 24, 1971, Ser. No. 118,380

Claims priority, application France, June 3, 1970, 7020392

Int. Cl. B65g *47/26*

U.S. Cl. 198—34 **7 Claims**



Device for grouping bottles to be gripped by gripping heads comprising a conveyor travelling at a constant speed higher than that of the heads, a guiding device provided with retaining members arranged equidistantly with a pitch L equal to that of the gripping heads and adapted to move at a speed V equal to that of the gripping heads and selecting means arranged upstream of the said guiding device and provided with retaining members arranged equidistantly with a pitch l and adapted to move at a speed

$$v=V\frac{l}{L}$$

3,718,247

MACHINE FOR THE HELICAL MOVEMENT OF CYLINDRICAL OBJECTS

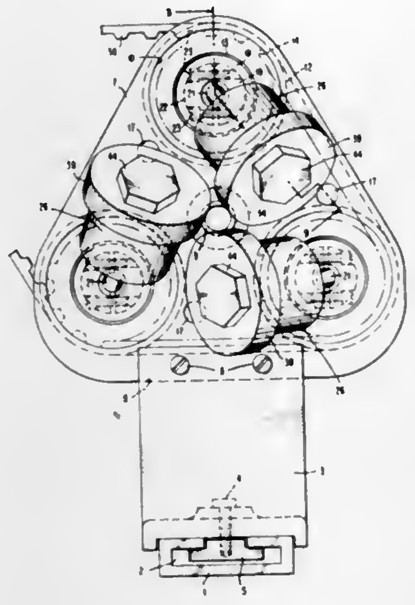
Hans C. Dreher, Dallas, Pa., assignor to General Cigar Co., Inc., New York, N.Y.

Filed Dec. 22, 1970, Ser. No. 100,578

Int. Cl. B65g *13/02;* **B65h** *51/26;* **F16c** *1/02*

U.S. Cl. 198—127 **9 Claims**

In a machine, cylindrical objects are helically moved by passing them longitudinally through an elongated guide to a set of three skewly positioned rollers connected by flexible shafts to sprockets which have their axes parallel to and equally spaced around the axis of the cylindrical objects in the elongated guide and are driven from a common source of power so that all the rollers rotate at the same rotational speed in the same rotational direction. The cylindrical surface of each object in the series passing through the guide is contacted by the three rotating rollers to impart both rotational and translational motion to each cylindrical object. The machine is particularly useful in helically wrapping cigar bunches with a ribbon of tobacco sheet.



3,718,248

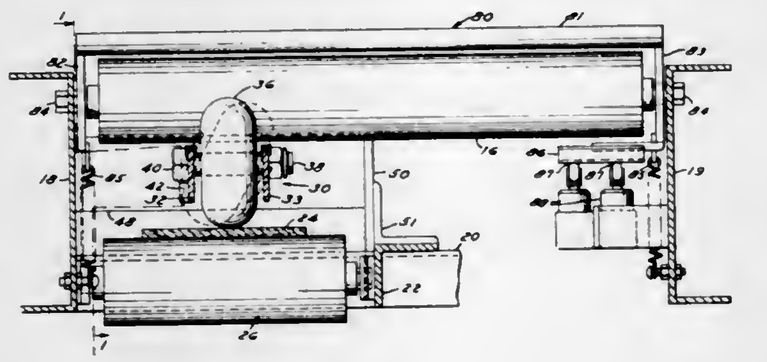
ACCUMULATION ROLLER CONVEYOR

Donald C. Muller, Whittier, Calif., assignor to Jervis B Webb Company, Detroit, Mich.

Filed Oct. 27, 1971, Ser. No. 193,095

Int. Cl. B65g *13/02*

U.S. Cl. 198—127 **18 Claims**



A conveyor having article carrying rollers arranged in successive groups and an endless driving belt moving below the rollers. Each roller group is independently driven by a drive transmitting unit consisting of one or more driving wheels carried by a frame mounted on a pivotal axis extending longitudinally of the driving belt. Each drive transmitting unit is movable between a driving position in which each driving wheel thereof is rotated by the moving belt and imparts rotation to a pair of adjacent article carrying rollers peripherally engaged by the the driving wheel; and, a non-driving position in which each driving wheel loses engagement with the carrying rollers and a braking force is applied thereto. Electrical or mechanical arrangements control the positions of the drive transmitting units enabling articles to be stopped and accumulated on the groups of rollers and to resume conveying movement in succession, and the direction of article movement is reversible.

3,718,249

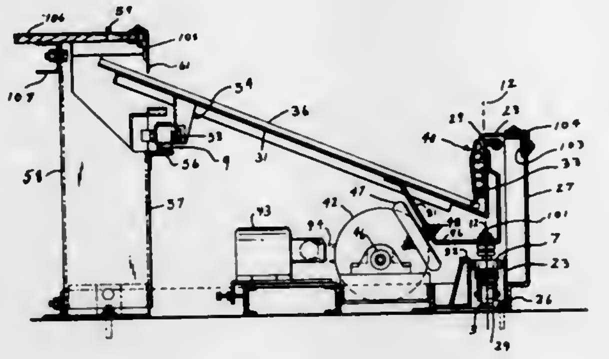
CAROUSEL FOR BAGGAGE AND OTHER ARTICLES

Gildard H. Hess, San Leandro, Calif., assignor to Stanray Corporation, Chicago, Ill.

Filed April 12, 1971, Ser. No. 133,220

Int. Cl. B65g *15/00, 23/00*

U.S. Cl. 198—181 **3 Claims**



A conveyor of the carousel type for baggage and other articles consisting of a continuous chain having elongated links supported on self aligning caster wheels the chain assuming a pre-designed shape by means of guide wheels mounted on the links in contact with guide rails. Drive means operably engaging and propelling the chain the pallets carrying an endless rubber bumper at the lower end of the pallets to provide a continuous circumferential bumper stop for the luggage. The stainless steel plates carried by the pallets being connected thereto by spring mounted means.

3,718,250

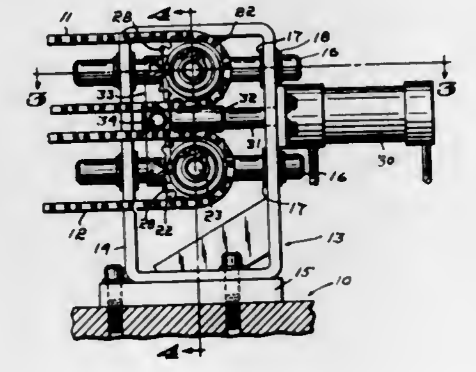
CONSTANT TENSIONING DEVICE FOR THE CHAINS OF CONVEYORS

Delbert B. Bosworth, Portland, and Joseph R. Fournier, Saco, both of Maine, assignors to United Industrial Syndicate, Inc., Portland, Maine

Filed April 29, 1971, Ser. No. 138,504

Int. Cl. B65g *15/30*

U.S. Cl. 198—208 **9 Claims**



A device is disclosed for tensioning a pair of vertically spaced conveyor chains. The device has upper and lower pairs of laterally spaced guide rods and sprocket shafts, one for each pair of guide rods and having transverse bores through which they extend. A chain supporting sprocket is rotatably mounted on each shaft. Each shaft also has a block mounted thereon between the guide rods. Each device also includes a fluid pressure operated unit of the piston-cylinder type with its stem pivotally connected to the middle of a pressure applying member whose extremities are in engagement with the block. With a predetermined fluid pressure delivered to the unit, either one or both of the sprockets is urged in a chain-tightening direction.

3,718,251

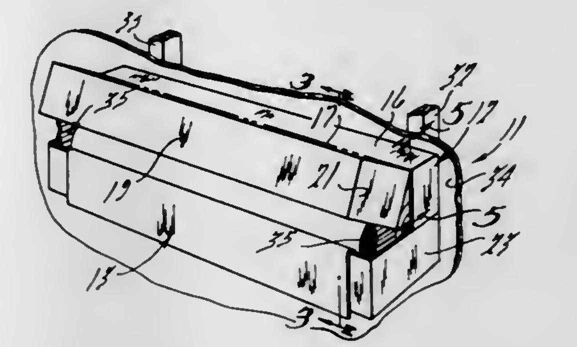
BAG DISPENSER

Karl F. Barnett, Bloomfield Hills, Mich., assignor to Cadillac Products, Inc., Warren, Mich.

Filed May 15, 1970, Ser. No. 37,665

Int. Cl. B65d *79/00*

U.S. Cl. 206—47 R **2 Claims**



A combined package and dispenser for rolled goods such as plastic bags. A roll of goods is enclosed within a container and the container has die cut openings on one face to pass the heads of nails driven into a wall for supporting the container upon the wall. The bags or other goods may be drawn through an opening in the container. A pair of combined end plates and roll supports are positioned in the container at opposite ends of the roll. These end plates reinforce the ends of the container, rotatably support the roll and determine a fixed axis of rotation for the roll.

3,718,252

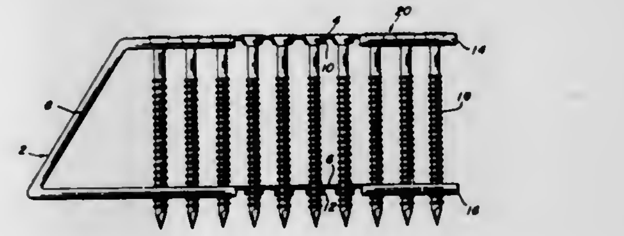
PACKAGE OF SCREWS

Gerald M. Roeder, Pittsburgh, Pa., assignor to United States Steel Corporation

Filed Dec. 16, 1971, Ser. No. 208,789

Int. Cl. B65d *73/02*

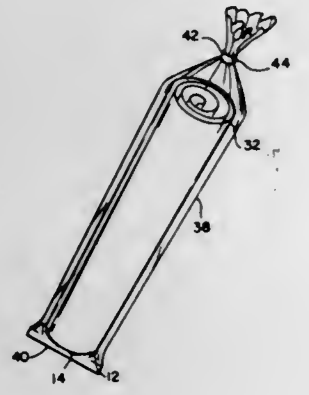
U.S. Cl. 206—56 DF **5 Claims**



A screw package is provided formed of at least two stiff friable membranes arranged in spaced parallel relation each having aligned holes therein. The holes in one of the membranes being shaped to receive the head of a screw and the holes in the other membrane being adapted to receive the tip of a screw. A screw is inserted longitudinally through each pair of aligned holes with its head resting in the shaped hole of one of the membranes and its tip projecting through the other membrane. The heads of the screws are secured in position by a fluid bonding agent which is applied in the fluid state and then hardened. The membranes are sufficiently friable to permit the screws to be singly removed from the membranes as the screw is driven to apply it by the rotating motion of a driving means, such as a screwdriver.

3,718,253
BAG PACKAGE AND METHOD

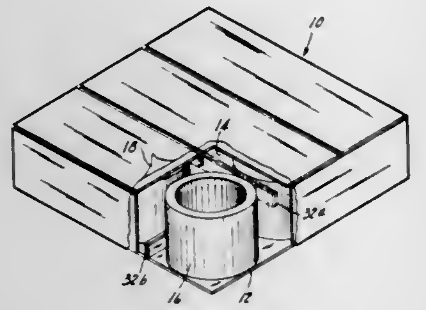
Jesse J. Smith, Garden City, Kans., assignor to Packaging Products & Design Corp.
Filed Jan. 8, 1971, Ser. No. 104,861
Int. Cl. B65d *85/62*
U.S. Cl. 206—57 A **7 Claims**



A bag package and method for packaging plastic bags wherein a plurality of generally tubular bags are disposed in a flat side-to-side stack and the plurality of bags is then folded intermediate the ends of the bags; then the folded stack is rolled into a spiral shaped roll with the folded portions of the bags disposed in spiral form at one end of the roll; then the roll is placed in a container which loosely holds the roll with the said folded portions communicating with an open end of said container, whereby one bag at a time may be dispensed from the container by slidably pulling the folded area of one of said bags from the spiral shaped stack of bags in the container.

3,718,254
PACKAGE FOR TRANSPORTING AND STORING LINERS FOR FOUNDRY RISERS

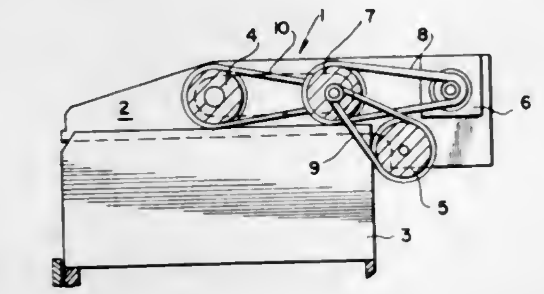
Herman P. Stephenson, Greendale, Wis., assignor to Thiem Corporation, Milwaukee, Wis.
Filed March 8, 1971, Ser. No. 121,937
Int. Cl. B65d *71/00*
U.S. Cl. 206—65 S **10 Claims**



A package including a base formed from a corrugated sheet having end walls at each end and dividers at equally spaced intervals intermediate the end walls for separating rows of riser liners from each other, a cover formed from a corrugated sheet having end walls at each end and dividers at equally spaced intervals intermediate the end walls for separating rows of riser liners from each other, the cover being mounted on the riser liners transverse to the base to isolate each riser liner from each other, and a thin film of heat shrinkable material completely enclosing said cover and base and being heat shrunk into tight engagement with the cover and base to hold the liners in fixed position in the package.

3,718,255
BRUSH FOR ASSISTING IN SEPARATION OF SHEETS

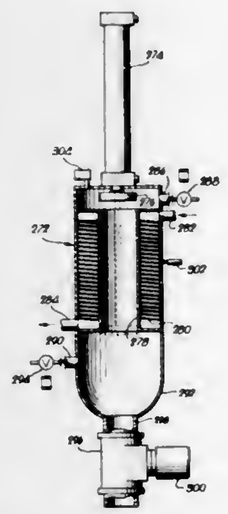
John H. Lanahan, Whitesboro, and William W. Abraham, Utica, both of N.Y., assignors to Mohawk Industrial Laboratories, Inc., Vernon, N.Y.
Continuation-in-part of Ser. No. 811,826, April 1, 1969, Pat. No. 3,586,166. This application Nov. 17, 1970, Ser. No. 90,356
Int. Cl. B07c
U.S. Cl. 209—80.5 **10 Claims**



The invention relates to a method and device for facilitating the separation from a plurality of edge-aligned parallel cards, such as edge-notched cards, those cards which are to be removed therefrom. To facilitate separation of cards from a group from which they are removable, a cylindrical brush is rotated in contact with aligned edges of a plurality of cards which support one another in substantially vertical orientation. A suitable brush comprises an arbor having at least one cylindrical segment which includes one or more brush elements. A card separating device includes means to move from a plurality of edge-aligned cards certain "selected" cards from the remaining, "rejected," cards thus effecting a separation of selected cards. The brush according to the present invention facilitates this separating motion. The brush bristles contact all of the edge-aligned cards and are sufficiently resilient to deflect on contacting a stationary card and sufficiently stiff to enter into the space between adjacent cards to facilitate card separation.

3,718,256
PARTICLE SEPARATOR AND METHOD

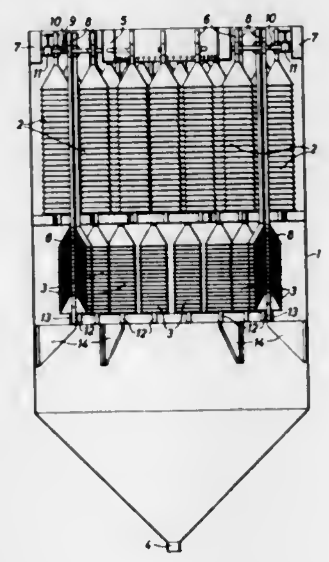
Arthur S. King, 1710 Baltimore, Prairie Village, Kans.
Division of Ser. No. 727,835, May 9, 1968, Pat. No. 3,585,122, which is a continuation-in-part of Ser. No. 613,616, Feb. 2, 1967, abandoned. This application Dec. 21, 1970, Ser. No. 100,221
Int. Cl. B01d *43/00*
U.S. Cl. 210—71 **7 Claims**



Particles are removed from fluids, such as water, previously subjected to electrostatic fields. When subjected to an initial electrostatic treatment, the fluid undergoes a reduction in surface tension and neutralization of charged, dissolved particles therein. Subsequent field treatments effect nucleation or coagulation of dissolved impurities and break molecule clusters to aid the nucleation or coagulation action. Suspended and nucleated or coagulated matter is removed from the fluid after the electric field treatments by discharging the fluid against an electrically conductive surface at ground potential maintained at a temperature different from that of the fluid. This causes the suspended and nucleated or coagulated matter to be deposited from the fluid and thus readily permits separation and removal.

3,718,257
PROCESS AND APPARATUS FOR THE CLARIFICATION OF LIQUIDS

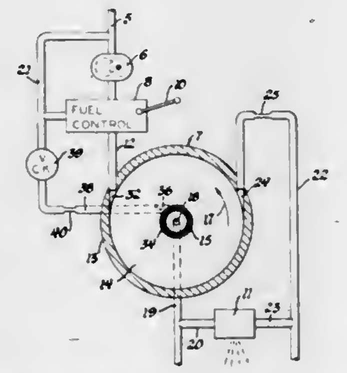
Niels Breinholt Bach, Vestervig, Denmark, assignor to Mirrless Watson Company Limited, Kent, England
Filed June 21, 1971, Ser. No. 154,750
Claims priority, application Great Britain, July 1, 1970, 31,810/70
Int. Cl. B01d *21/04*
U.S. Cl. 210—73 **10 Claims**



The invention relates to a modified POLY-CELL or "cone tree" clarifyer in which a second series of cone trees is disposed below the normal series to reduce the liquids content of the sludge removed from the sludge zone of the clarifier.

3,718,258
CONTAMINANT SEPARATION

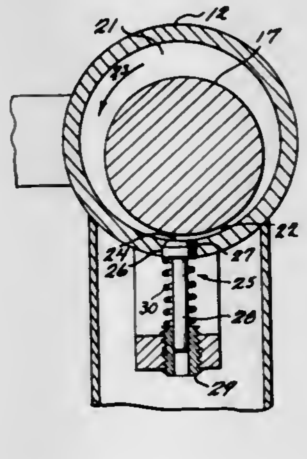
Cecil H. Sharpe, Brownsburg, Ind., assignor to General Motors Corporation, Detroit, Mich.
Continuation-in-part of Ser. No. 752,820, Aug. 15, 1968, abandoned. This application Oct. 21, 1970, Ser. No. 82,574
Int. Cl. B01d *35/22*
U.S. Cl. 210—98 **8 Claims**



A fuel system for a gas turbine engine adapted to handle dirty fuel includes a separating device of a centrifuge-filter type through which fuel is supplied from a fuel pump to combustion apparatus. The centrifuge-filter has a swirl chamber with a tangential inlet, a central annular screen, and outlets both outside and inside of the screen. It discharges a large portion of the fuel substantially clean and a small portion bearing the dirt. The clean fuel flow to small diameter ports of fuel nozzles and, at higher fuel flow rates, through a resistance valve or valves to large area ports of the fuel nozzles. The dirty fuel flows to the large flow ports of the nozzles, by-passing the fuel control. An outlet line from adjacent the outer surface of the screen acts to clean the screen by discharging the finer dirt which tends to accumulate at low flow rates. The separating devices may be arranged in tandem.

3,718,259
MECHANICAL SEPARATOR FOR VISCOUS FLUIDS

Henry Harrison, Locust Valley, N.Y., assignor to Bernd Kalski, Gingerland, Island of Nevis, British W. Indies, a part interest
Filed June 22, 1971, Ser. No. 155,598
Int. Cl. B01d *43/00, 17/00*
U.S. Cl. 210—109 **13 Claims**



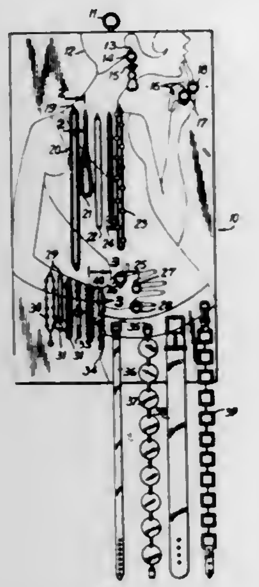
A device for separating fluids of disparate viscosities includes a main flow passage for the fluids defined between a pair of opposed surfaces, a reduced portion defined by said surface for constricting flow in a direction transverse to the main flow passage, a pump for forcing the fluids through said main flow passage, a motor for producing relative movement between said surfaces transverse to the direction of the main flow passage and at least one valve disposed adjacent said reduced portion and spring biased into the closed portion until the pressure in this area, which is proportional to the viscosity of the fluid passing through the area, reaches a predetermined value.

There may be several valves adjacent the reduced portion and they may be set to open at various pressures. In addition, the passage may be defined by a cylindrical shaft eccentrically mounted within a cylindrical tube, by a pair of generally parallel opposed flat plates with a ridge raised on one plate, by a non-cylindrical shaft within a cylindrical tubing or by a cylindrical shaft within a noncylindrical tubing. More than one reduced portion may be produced by any but the first set of elements.

3,718,260
DISPLAY DEVICE

Sandra Sharp, 333 West End Avenue, New York, N.Y.
Filed Jan. 29, 1971, Ser. No. 110,913
Int. Cl. A47f *7/00*
U.S. Cl. 211—13 **1 Claim**

A display device particularly suitable for holding and retaining personal articles of clothing and jewelry. The display device permits the easy selection of these articles while a person is dressing. The device consists of a silhouette or board or flat surface having an image of a part of an animal figure, such as a human figure, and includes a plurality of article removing holders, such as hooks, pegs and the like, located preferably at the ear, hand, neck, wrist and waist of the figure so as to receive personal articles customarily worn on these portions



of the body. Each peg may hold a multiplicity of articles, such as several earrings, up to five or six chains, bracelets and the like.

3,718,261

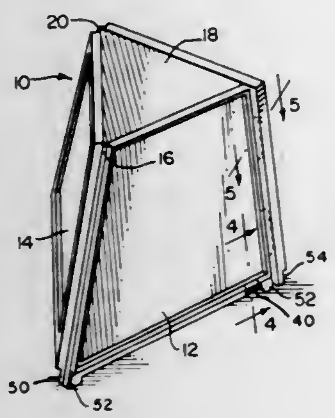
SELF-LOCKING WRITING IMPLEMENT HOLDER

Cecil B. Woofter, Newton, Iowa, assignor to The Vernon Company, Newton, Iowa

Filed June 24, 1971, Ser. No. 156,195

Int. Cl. A45c *11/36, 11/34*; **A47f** *7/03*

U.S. Cl. 211—69.1 **5 Claims**



A plastic, integrally formed writing implement holder comprising a triangular base plate and three trapezoidal side panels joined together along hinge lines. Aligning tabs are formed on opposite sides of the base plate adjacent to its apex, and locking tabs are formed along the free vertical edge of one of the side panels. The aligning tabs are inserted into horizontally extending slots adjacent the lower edge of two of the side panels and then the locking tabs are inserted into vertically extending slots adjacent to the free edge of one of the side panels. Camming surfaces on the locking tabs momentarily deform at least one of the side panels when the implement holder is snapped together. The inherent resiliency of the holder causes it to return to its unstressed condition and enhances the locking action. The erected support is triangular in shape, when viewed in horizontal cross section, and the interior face of the base plate has shallow compartments formed therein to assist in retaining writing implements in an upright position. When viewed in front, rear or side elevation, the holder assumes the shape of a foreshortened pyramid.

3,718,262

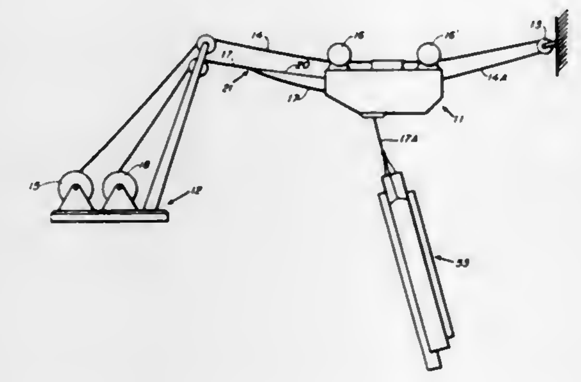
TWO CABLE TENSION-CONTROLLED CARRIAGE

Hilton H. Lysons, Seattle, and Charles N. Mann, Snohomish, Wash., assignors to the United States of America as represented by the Secretary of Agriculture

Filed Feb. 24, 1971, Ser. No. 118,343

Int. Cl. B66c *21/00*

U.S. Cl. 212—110 **3 Claims**



A carriage for moving cable traversing hoist application with complete operation and control derived from the tension and movement of the two running cables without additional control lines or internal power sources. A tension-controlled clamp is engaged to hold the carriage in position on the cable from which it is suspended. With the carriage supported completely by the suspension cable, one running cable is freed for use as a hoist. A device in the carriage pulls a portion of this cable through the carriage, lowering it to allow attachment or removal of the load.

3,718,263

TRAVERSING HOIST ARRANGEMENT

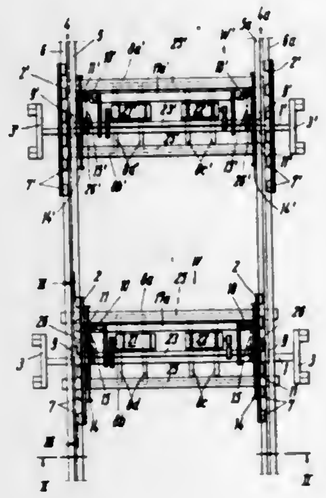
Heinz Strecke, Lindenbaumstrasse 13, 565 Solingen, Germany

Filed Dec. 24, 1970, Ser. No. 101,369

Claims priority, application Germany, Dec. 30, 1969, P 19 65 450.3; June 15, 1970, P 20 29 454.6

Int. Cl. B61b *3/02*; **B66c** *19/00*; **E01b** *25/22*

U.S. Cl. 212—128 **16 Claims**



A pair of transversely spaced elongated parallel rails are provided each having an inwardly directed track and an outwardly directed track. At least two carriages are mounted on these rails with each carriage having on each side two or more wheels. The wheels of one carriage are spaced apart transversely to such an extent that they will roll on the inner tracks of the rails, and the wheels of the other carriage are spaced apart transversely to a greater extent so as to roll on the outer tracks of the rails, with the arrangement being such that the carriages can pass one another on the rails.

3,718,264

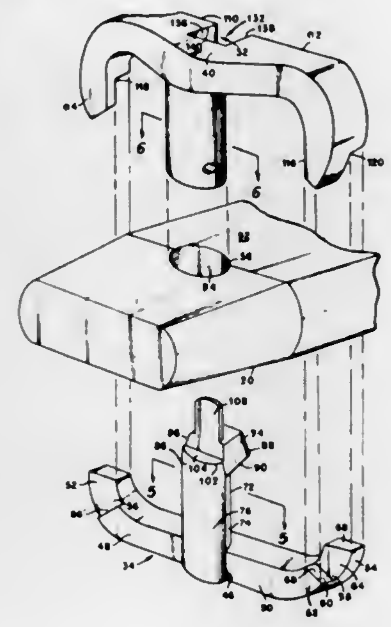
RETAINER FOR DRAFT KEY OF RAILWAY CAR LIKE COUPLING

William A. Norman, Jr., 1705 River Shores Drive, Knoxville, Tenn.

Filed Oct. 26, 1971, Ser. No. 191,999

Int. Cl. B61g *7/14, 9/00*

U.S. Cl. 213—50.5 **10 Claims**



A retainer for preventing inadvertent withdrawal of the draft key from its position in the coupling of a railway car or the like. The retainer includes two separable yokes which when mated one with the other define a pin means and a wear and bearing surface which hold the key against withdrawal. The two yokes are formed so as to mutually interlock and secure themselves against removal from their position with respect to the key and to cooperatively develop the features of the retainer.

3,718,265

LIFT TRUCK FOR HOT VESSELS, PARTICULARLY FOR STEEL-MILL CONVERTERS

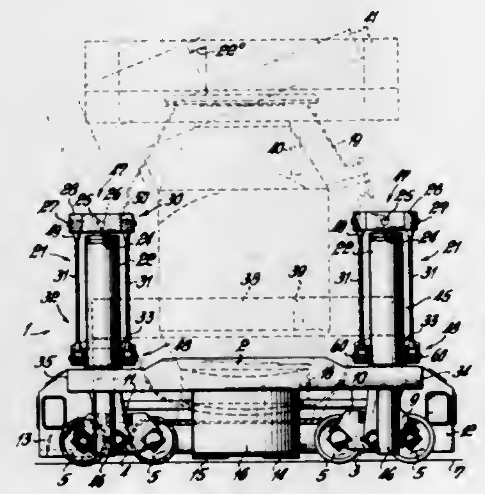
Werner Trost, Duisburg, Germany, assignor to Demay Aktiengesellschaft, Duisburg, Germany

Filed Jan. 21, 1971, Ser. No. 108,468

Claims priority, application Germany, Feb. 24, 1970, P 20 08 396.9

Int. Cl. B65g *7/00*

U.S. Cl. 214—1 D **10 Claims**



The lift truck has an undercarriage with driving means for moving the truck along tracks and carrying hydraulic actuators operable to lift the undercarriage at track intersections to change the direction of movement of the truck. Two pairs of piston-cylinder hydraulic actuators are mounted on the undercarriage and each actuator includes a cylinder supported on the undercarriage to extend vertically upwardly therefrom and a piston movable upwardly in the associated cylinder and carrying an enlarged piston head. Pairs of tie rods are supported on each piston head through universal or gimbal type Cardan joints for universal swinging movement, and the lower ends of the tie rods are also provided with the same general type of joints. The tie rods associated with each pair of actuators support a respective stirrup so that, when the pistons are extended, the associated stirrups are lifted. These stirrups engage beneath a reinforcing ring or the like on a hot vessel, such as a steel-mill converter, and are operable to lift the vessel upwardly to engage the vessel in a tilting cradle or support in which the vessel is then locked. The gimbal or Cardan type connections of the tie rods to the piston heads and to the stirrups provide for adjustment of the tie rods and stirrups to the orientation assumed by the converter when the latter is being inserted into a tilting support.

3,718,266

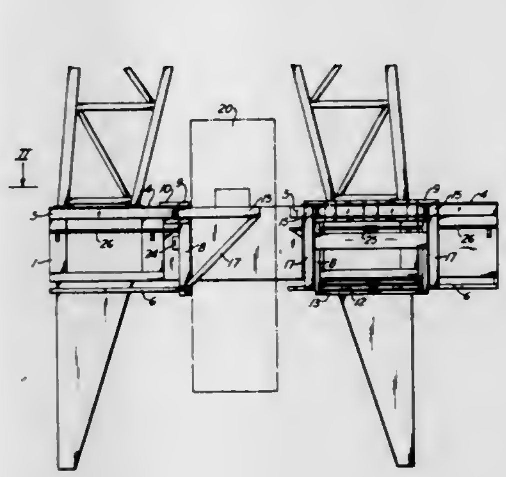
OIL WELL DERRICK SUBSTRUCTURE WITH CARRIAGES FOR BLOWOUT PREVENTERS

Robert B. Donnally, Tulsa, Okla., assignor to Lee C. Moore Corporation, Tulsa, Okla.

Filed April 15, 1971, Ser. No. 134,128

Int. Cl. E21b *33/06*

U.S. Cl. 214—2.5 **7 Claims**



The framework of an oil well derrick substructure has a slot extending from one side inwardly past the well center line, with track means secured to the framework and extending along at least one side of the slot from its inner end to its outer end and then laterally along the adjoining side of the framework. Supported by the track means is a carriage that extends outwardly for supporting a blowout preventer stack. The carriage can be moved along the track means back and forth between a position at the inner end of the slot to a position outside of the slot beside the outside of the framework, whereby a blowout preventer stack can be moved from outside the framework to a position over the well and vice versa.

3,718,267

ARTICLE STACKING MACHINE

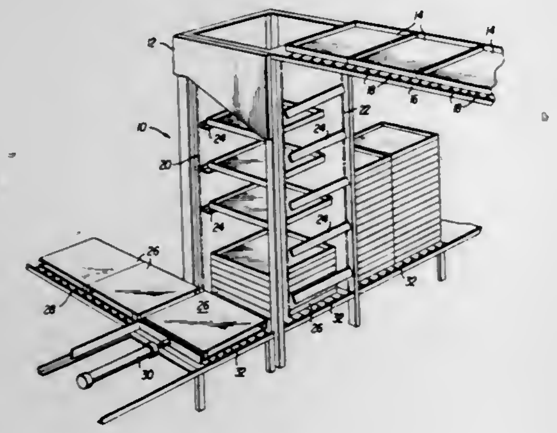
Adoniram C. Hiebert, 3007 Innerdale Court, Randallstown, Md., and Richard E. Lowry, 1823 Swansea Road, Baltimore, Md.

Continuation-in-part of Ser. No. 821,234, May 2, 1969, abandoned. This application March 16, 1971, Ser. No. 124,669

Int. Cl. B65g *57/14*

U.S. Cl. 214—6 FA **8 Claims**

An article stacking machine including a pair of continuously moving horizontally spaced vertically extending conveyors having a plurality of hingedly mounted article supports, a feeding conveyor for moving articles one at a time to a position above the vertically disposed conveyors and therebetween, a pair of pivotally mounted plate members for receiving the articles one at a time from the feeding conveyor and lowering the articles one at a time onto the article support members of the vertically disposed conveyors, a supporting structure between the vertically disposed conveyors and at the



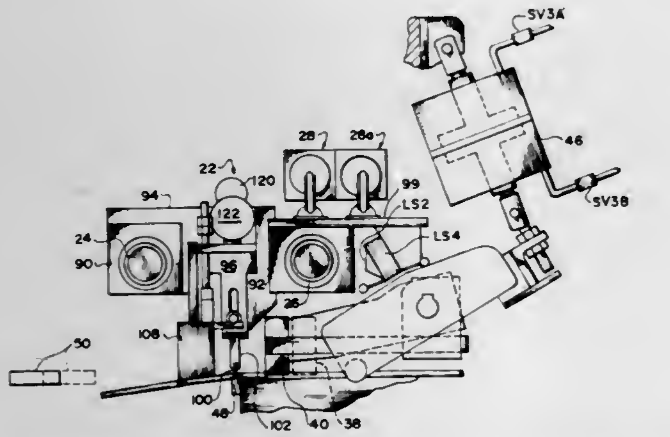
lower portion thereof for holding a stack base support member thereon during the stacking process, and an automatic pushing element for moving a formed stack from between the vertically disposed conveyors and simultaneously replacing the formed stack with an empty stack base support member while said vertically extending conveyors continuously receive articles and continuously move the articles toward the stack base support member.

ERRATA

For Classes 214—1 BC thru 224—45 S see:
Patents Nos. 3,718,216 thru 3,718,242

3,718,268
MACHINE FOR FEEDING, SCORING, AND BREAKING SMALL DIAMETER GLASS TUBING

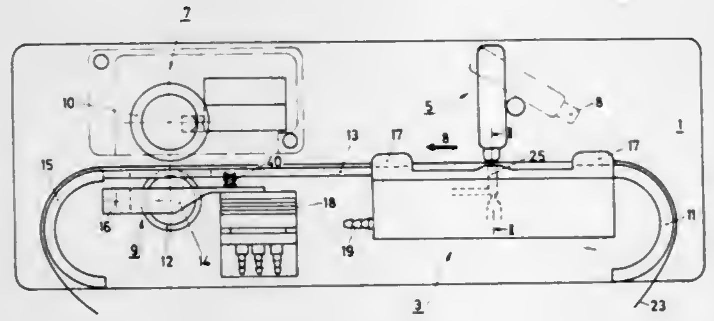
Thomas A. Insolio, Bristol, Conn., assignor to The Fletcher-Terry Company, Forestville, Conn.
Filed July 12, 1971, Ser. No. 161,724
Int. Cl. B26f *3/00*
U.S. Cl. 225—2 **10 Claims**



The tubing to be cut is placed on a flat bed, relatively long-lengths of tubing being arranged in side-by-side relationship so as to fill the entire width of the bed. Tube feeding means is provided above the bed to feed the tubing across an anvil at the downstream end of the bed and up against a measuring bar or stop. The stop is spaced a predetermined distance downstream of the anvil, being adjustable to permit cutting the tubing to the desired length. A scoring wheel and break-off shoe are provided in a carriage, which carriage traverses the bed over the anvil while the tube feeding means clamps the tubing. The feeding and clamping function are automatically provided for and control circuitry is utilized to control these functions as well as to successively complete a predetermined sequence of these feeding and scoring and clamping functions.

3,718,269
DRIVING DEVICE PROVIDED WITH CONTROL SYSTEM

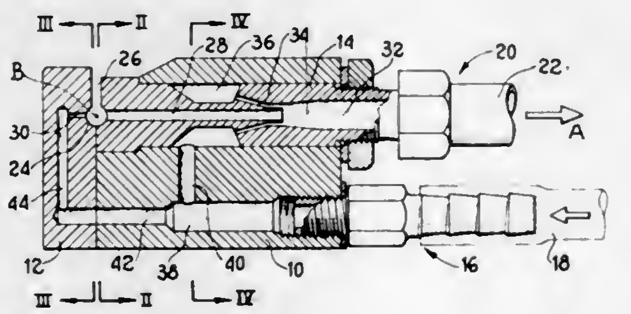
Hans H. Glaettli, 252 Seestrasse,
CH 8700 Kusnacht, Switzerland
Filed Apr. 16, 1970, Ser. No. 29,201
Claims priority, application Switzerland, Apr. 24, 1969,
6,219/69
Int. Cl. B65h *23/18*
U.S. Cl. 226—33 **25 Claims**



A driving device with a control system and designed for tape or disk stored information media utilizing a fluidic sensing means for controlling actuation means for engaging and/or disengaging the drive of the information medium.

3,718,270
DEVICES FOR PICKING-UP, SUCKING AND DRAGGING TEXTILE FILAMENTS AND YARNS

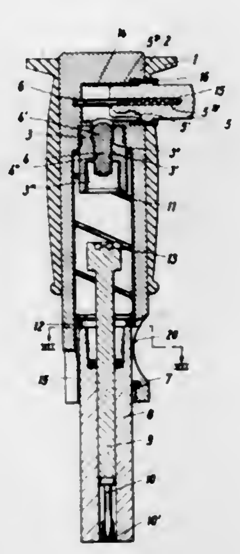
Paolo Parmeggiani; Domenico Nicita, and Bruno D'Alo', Milan, Italy, assignors to Snia Viscosa Societa'Nazionale Industria Applicazioni Viscosa, Milan, Italy
Filed Dec. 1, 1970, Ser. No. 93,972
Claims priority, application Italy, Dec. 4, 1969, 25357 A/69
Int. Cl. B65h *17/32*
U.S. Cl. 226—97 **2 Claims**



A device for pneumatically sucking and dragging the cut ends of textile filaments and yarns traveling at high speeds includes a passage wherein filaments or yarns travel in front of a suction orifice and a related removal duct to which a subatmospheric pressure is imparted. On the other side of the passage and coaxial with the orifice a nozzle is provided to form a superatmospheric pressure air stream incident to the filaments or yarns in cooperation with the suction orifice.

3,718,271
DRIVING DEVICE FOR DRIVING BOLTS OR OTHER DRIVEPINS INTO FIXED STRUCTURAL OR BUILDING ELEMENTS OR THE LIKE

Fritz Schneider, Burgbernheim, Germany, assignor to Impex-Essen GmbH, Ansbach, Germany
Filed Oct. 5, 1970, Ser. No. 77,898
Claims priority, application Germany, Oct. 10, 1969, P 19 51 121.8
Int. Cl. B25c *1/14*
U.S. Cl. 227—10 **10 Claims**

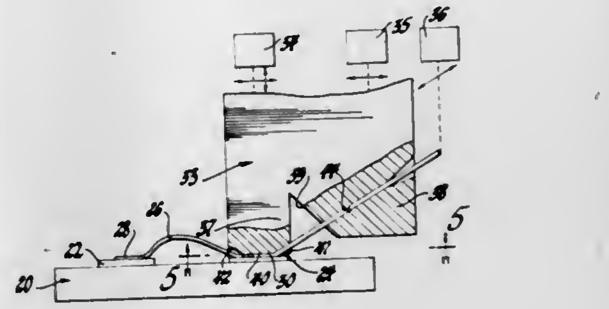


A device for driving bolts or studs into structural elements comprises a tubular housing having a closed upper end and an open lower end. A socket fixed in the upper end of the housing includes a passage and a firing chamber communicating therewith. A firing pin axially slidable in the passage can be selectively projected by means of a rotatable pushbutton shank, interposed between the upper end of the housing and the socket, which has a plurality of circumferential recesses of different depths each arranged to engage the head of the firing pin to extend the lower end of that pin into the chamber. A barrel longitudinally movable in the housing against a spring force surrounds a piston carrying a cartridge which upon engagement by the firing pin, in response to a hammer blow upon the top of the housing, is detonated to thrust the piston outwardly together with a driving pin seated in the lower end of the barrel; the intensity of the thrust depends on the selected recess engaging the firing pin.

3,718,272
BONDING TIP

Richard E. Eltzroth, and Larry K. Fewell, both of Kokomo, Ind., assignors to General Motors Corporation, Detroit, Mich.
Division of Ser. No. 36,323, May 11, 1970, Pat. No. 3,689,983.
This application May 1, 1972, Ser. No. 249,399
Int. Cl. B23k *21/00;* **B23p** *3/02*
U.S. Cl. 228—3 **3 Claims**

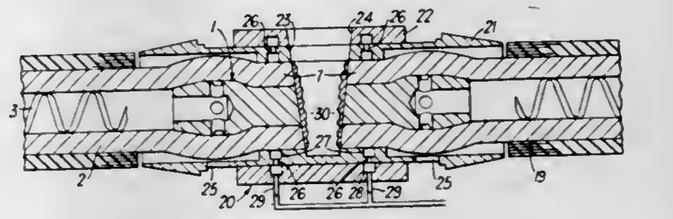
A bonding tip and method is disclosed for making an extremely strong tailless wire bond on a contact pad of a semiconductor device without significantly reducing the connected unbonded wire cross-section immediately adjacent the bond. One form of the tool includes an elongated member having a flat bonding surface on one end and a pair of oppositely disposed grooves which intersect opposite edges of said bonding surface. The connected unbonded wire adjacent a final bond of an interconnection is aligned with one of the grooves and separated from the bonded portion while the tip is in pressing engagement therewith by pulling thereby removing



a preselected part of the bond under a groove producing a tailless bond.

3,718,273
KIT OF PARTS FOR USE IN JOINTING ELECTRIC CABLES

John Stephen Cleaver, Faversham, Peter Guilford, Erith, Frederick James Kimpton, Bexleyheath, Thomas John Page, Beckenham, and Norman Richard Steinberg, London, England, assignors to British Insulated Callender's Cable Limited, London, England
Original application Apr. 4, 1969, Ser. No. 813,523.
Divided and this application May 22, 1972, Ser. No. 255,560
Claims priority, application Great Britain, Apr. 11, 1968, 17,484/68; June 10, 1968, 27,499/68, 27,500/68; Nov. 11, 1968, 53,371/68, 53,372/68
Int. Cl. B23k *1/20*
U.S. Cl. 228—15 **8 Claims**

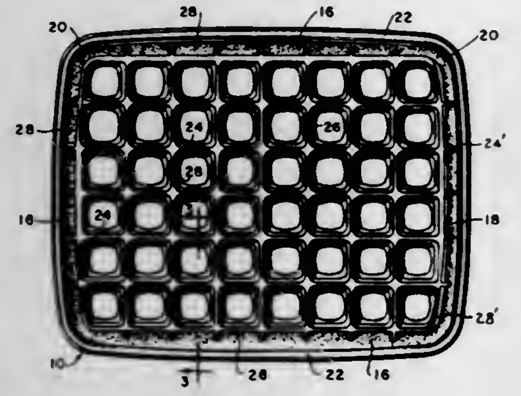


A kit of parts for use in making a welded joint between hollow stranded conductors in oil-filled electric cables comprises a pair of mandrels and a ferrule. Each mandrel has a solid neck and a head having a diameter larger than that of the neck and there is a bore opening to the end of the head remote from the neck and at least one passage between the bore and the circumferential surface of the head. The ferrule has a central aperture for introduction of welding metal and, between that aperture and each end of the ferrule at least one outlet hole for the withdrawal of impregnant during welding.

3,718,274
HIGH STRENGTH OPEN BOTTOM PACKAGING TRAYS

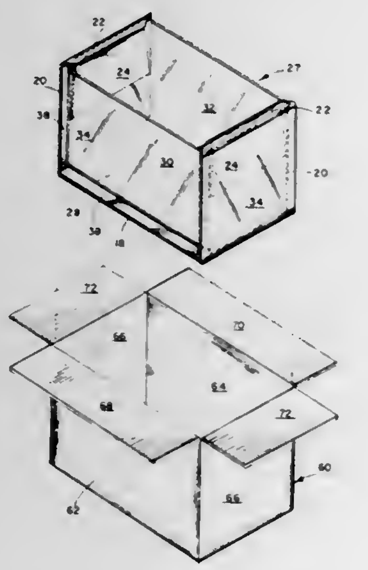
Richard F. Reifers, New Canaan, Conn., and Kenneth D. Bixler, Hunington, N.Y., assignors to Diamond International Corporation, New York, N.Y.
Continuation-in-part of Ser. No. 111,578, Feb. 1, 1971, abandoned. This application April 24, 1972, Ser. No. 246,600
Int. Cl. B65d *1/00, 65/00*
U.S. Cl. 229—2.5 **20 Claims**

A tray of molded pulp or the like is provided for the packaging of meat, poultry or fish in conjunction with an over-wrapped transparent film. The tray bottom is formed of a plurality of inverted V or U-shaped ribs joining or intersecting in two directions and defining open windows therebetween, the height of each inverted V-shaped rib being on the order of several times the thickness of the remainder of the tray, and the total volume of the inverted V-shaped ribs being approximately equal to the volume of a bottom of an imperforate bottom tray of the same size.



3,718,275
PROTECTIVE SHIPPING AND DISPLAY WRAPPER FOR AN AQUARIUM

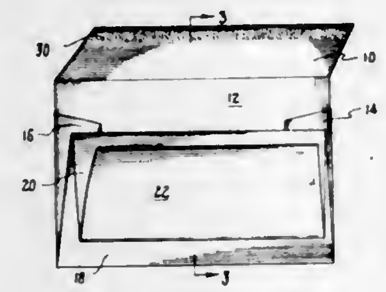
Allan H. Willinger, New Rochelle, N.Y., assignor to Metaframe Corporation, Maywood, N.J.
Filed Sept. 28, 1971, Ser. No. 184,493
Int. Cl. B65d *5/58*
U.S. Cl. 229—14 C 12 Claims



A protective shipping and display wrapper for an aquarium, the aquarium having a base, a front wall, a rear wall, and a pair of opposite side walls interconnected to define an enclosure open opposite the base. The protective wrapper comprises a blank, and a plurality of spaced parallel scored folding lines extending integrally in the blank for dividing the latter into a plurality of panels displaceable generally pivotally relative to one another into detachable embracing relation with both the base and the opposite side walls of the enclosure, yet leaving the front and rear walls of the enclosure exposed for observation. The blank includes a pair of opposite end flaps which may be pivotally inserted through the opening in the aquarium into press-fit association with the front and rear walls of the aquarium.

3,718,276
ENVELOPE

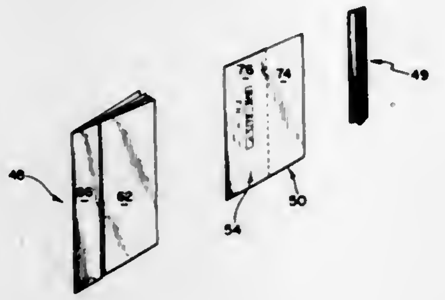
Don W. Vandergrift, Roanoke, and David E. Secrist, Troutville, both of Va., assignors to Double Envelope Corporation, Roanoke, Va.
Filed May 27, 1971, Ser. No. 147,513
Int. Cl. B65d *27/08*
U.S. Cl. 229—72 3 Claims



A combination envelope especially for use to deliver processed photographic negatives and prints from the processor to the customer, the envelope having a separable pocket for later use in filing the negatives.

3,718,277
PRINTED FOLDER INCLUDING MAILABLE ARTICLE

John K. Volkert, 545 Thornwood Lane, Northfield, Ill.
Filed Aug. 24, 1971, Ser. No. 174,321
Int. Cl. B65d *27/06*
U.S. Cl. 229—73 11 Claims

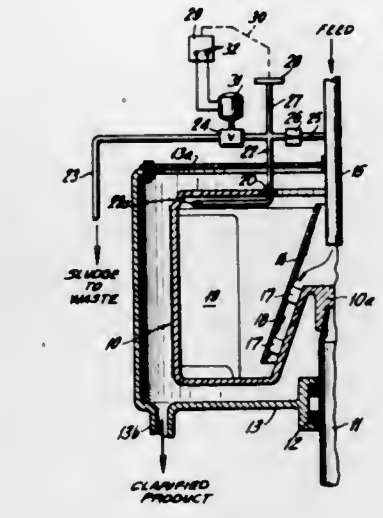


A folder for distributing printed material and a return envelope to a recipient is provided, the folder being formed in such a way that the return envelope becomes readily available when a portion of the folder, as formed, is removed, as by tearing or cutting.

3,718,278
BASKET CENTRIFUGE WITH SELF-TRIGGERING SLUDGE DISCHARGE

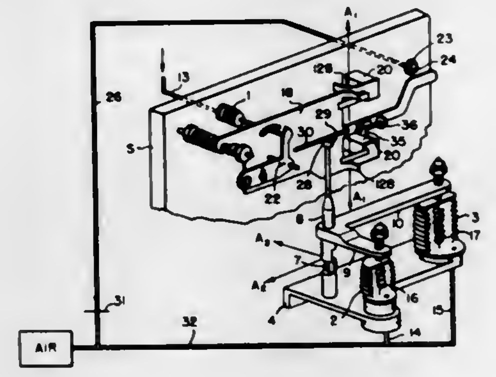
John R. Conklin, Poughkeepsie, N.Y., assignor to The De Laval Separator Company, Poughkeepsie, N.Y.
Filed Jan. 22, 1971, Ser. No. 108,755
Int. Cl. B04b *11/00*
U.S. Cl. 233—19 A 3 Claims

A stationary skimming tube has its inlet orifice located at substantially the maximum radius of the sludge-accumulating space in the centrifugal bowl of a basket centrifuge. A sludge discharge pipe leading from the skimming tube has a normally closed valve; and located upstream from this valve is a restricted passage for discharging skimmed material from the tube. Means are provided for opening said valve in response to a pressure increase in the skimming tube resulting from sludge entering the restricted passage from the inlet orifice of the tube.



3,718,279
FORCE BALANCE INSTRUMENT FOR COMPUTING

Norman Roy Westfall, Ogden, N.Y., assignor to Sybron Corporation, Rochester, N.Y.
Filed May 28, 1971, Ser. No. 147,991
Int. Cl. G06d *1/12*
U.S. Cl. 235—200 WB 12 Claims



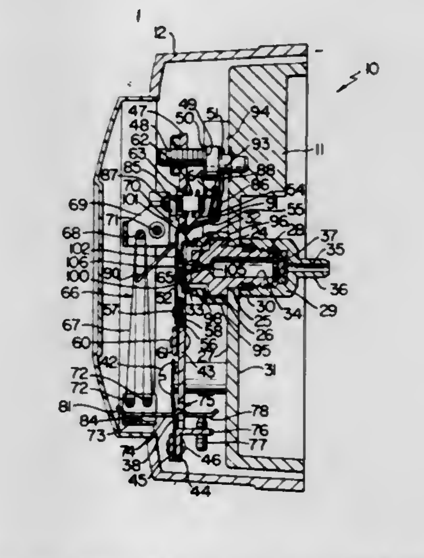
A mechanical computer wherein thrust of a first bellows is force-balanced by a deflectable lever against the thrust of a second bellows, and third bellows varies the moment arm of the thrust of the second bellows on the lever. This moment arm is prevented from becoming zero by providing an arm on said lever through which the thrust of the third bellows beings to provide a moment in the same sense as the moment of the thrust of the first bellows.

The moment of the thrust of the second bellows is applied to the first lever through a second lever at a point of the first lever determined by the thrust of the third bellows. As the second lever has to deflect in two different directions simultaneously, it is provided with a flexure pivot having a stiff elastic rod allowing universal flexing, and also may have a relatively limber elastic flat strip arrangement fixing the rod's center of flexing.

3,718,280
FLUID PRESSURE TRANSMITTER AND SYSTEM THEREFOR

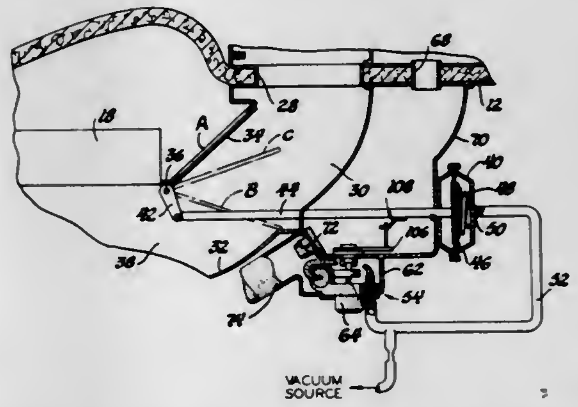
William J. Russell, Malvern, Pa., assignor to Robertshaw Controls Company, Richmond, Va.
Filed March 3, 1971, Ser. No. 120,549
Int. Cl. B01f *3/02*
U.S. Cl. 236—44 R 30 Claims

A fluid pressure transmitter having a flapper valve lever pivotally carried by a frame and having an end thereof for controlling a valve seat whereby the position of the end of the lever relative to the valve seat determines the degree of fluid flow through the valve seat. A first spring is carried by the frame and is operatively interconnected to the flapper lever to tend to move the end thereof in one direction relative to the valve seat. An actuating lever is pivotally carried by the frame and has opposed ends. A condition responsive device is operatively interconnected to one of the ends of the actuating lever to pivot the actuating lever in relation to the condition sensed thereby and a second spring is interconnected to the other end of the actuating lever and to the end of the flapper lever to control movement of the end of the flapper lever relative to the valve seat in relation to pivoting movement of the actuating lever by the condition responsive device. A conduit means is utilized to convey the fluid flow from the valve seat to a position remote from the condition responsive device so that the condition responsive device will not be responsive to the characteristics of the fluid flow through the valve seat.



3,718,281
THERMOSTATIC VACUUM POSITIONER

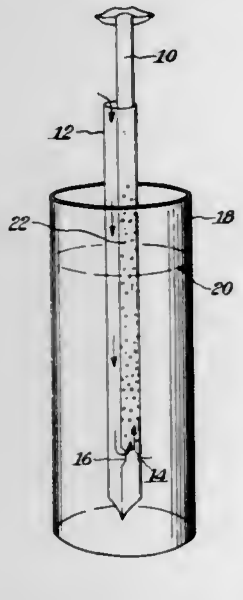
Paul Beatenbough, Medina; Ward H. Hutchins, and Gary E. Richards, both of Lockport, all of N.Y., assignors to General Motors Corporation, Detroit, Mich.
Filed Dec. 9, 1971, Ser. No. 206,263
Int. Cl. F25b *29/00*
U.S. Cl. 237—2 A 3 Claims



An automatic temperature control system for air conditioning the passenger compartment of an automobile utilizing a spirally wound bimetal to sense the temperature of air which is drawn through an opening in the dashboard and through an ambient temperature compensating heat exchanger. The center of the spiral bimetal is supported by a shaft while the peripheral end of the bimetal coacts with an air bleed valve assembly which is connected to a vacuum pressure source and a vacuum motor to position an air damper for producing desirable air temperatures in the passenger compartment. The air bleed valve is movable with respect to the bimetal in response to settings of a dash mounted control adapted to be manually set for a temperature desired in the passenger compartment. A feedback mechanism which operates in correspondence to the position of the damper rotates the interconnected shaft and bimetal to re-establish a desirable spacial relationship between the end of the bimetal and the air bleed valve assembly after a setting change of the control assembly.

3,718,282
DRINKING STRAWS

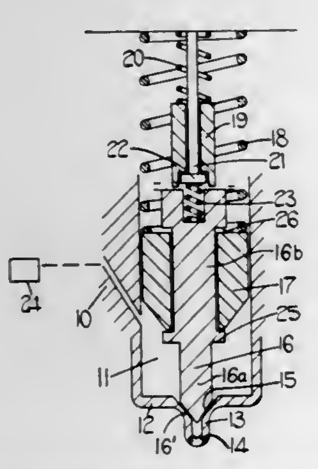
Adrian Pizzoferrato, Bronx, N.Y., assignor to The Raymond Lee Organization, Inc., New York, N.Y.
Filed Jan. 20, 1972, Ser. No. 219,300
Int. Cl. A47g *21/18*
U.S. Cl. 239—33 **3 Claims**



First and second drinking straws of different length and diameter are bonded together with the shorter straw being of larger diameter and the longer straw being disposed within the shorter straw. The straws have one set of aligned ends. A first relatively small opening extends through both straws in the bonded wall. The longer straw has an oppositely disposed large opening in its wall alone. Both openings are disposed adjacent the aligned ends.

3,718,283
FUEL INJECTION NOZZLE UNITS

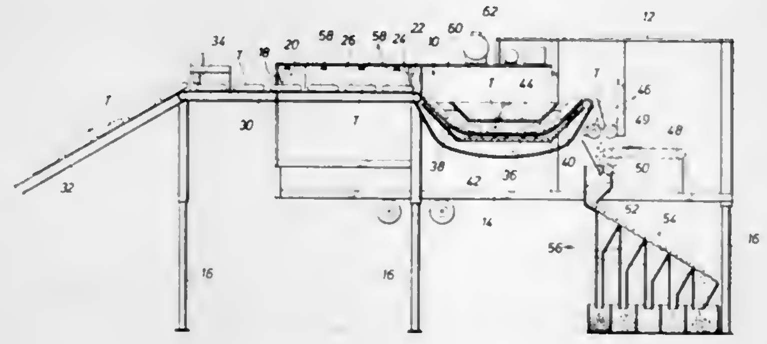
Ivor Fenne, Greenford, England, assignor to C.A.V. Limited, Birmingham, England
Filed Nov. 2, 1970, Ser. No. 85,874
Claims priority, application Great Britain, Nov. 12, 1969, 55,391/69
Int. Cl. B05b *1/30*
U.S. Cl. 239—533 **2 Claims**



A fuel injection nozzle unit which includes a valve member slidable under the action of fuel under pressure to allow a restricted flow of fuel through an orifice, the valve member being lifted further by the action of a piston to allow substantially un-restricted flow of fuel through the orifice.

3,718,284
METHOD OF AND APPARATUS FOR COMMUNITING RUBBER TIRES

Vernon C. H. Richardson, 5312 Brae Burn, Bellaire, Tex.
Filed April 26, 1971, Ser. No. 137,167
Int. Cl. B02c *11/08*
U.S. Cl. 241—23 **7 Claims**



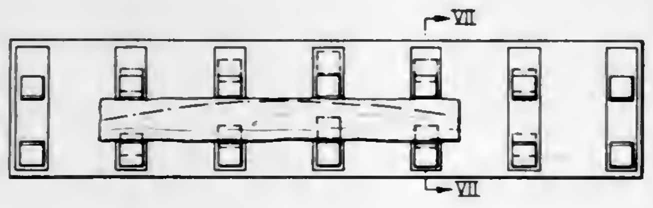
A method of and apparatus for reducing discarded automobile tires to a comminuted condition.

The apparatus comprises means for subjecting the tires in a whole condition to refrigeration to cause embrittlement of the material of the tires and including mechanism for crushing the embrittled tires to release reinforcing wires from the beads thereof and means for grinding the crushed material to a desired fineness.

The method of the invention includes subjecting the tires in a whole condition to refrigeration to cause embrittlement of the material, crushing the embrittled material to release the reinforcing wires of the beads and grinding the crushed material while in an embrittled state to a desired degree of fineness.

3,718,285
PRODUCTION OF LONG CHIPS AND PRODUCTS MADE FROM SAME

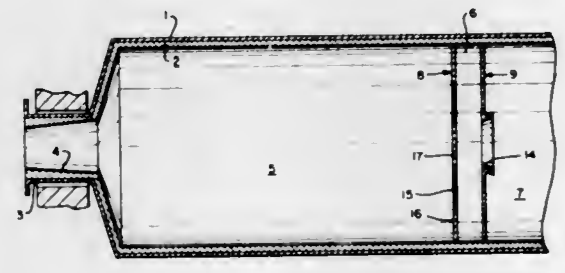
Erik Borje Bang, Kolonivagen 5, Vaxjo, Sweden
Filed Dec. 3, 1970, Ser. No. 94,730
Claims priority, application Sweden, Dec. 3, 1969, 16666/69
Int. Cl. B27l *11/08*
U.S. Cl. 241—28 **1 Claim**



Long chips or bundles of fiber are produced from wood by exposing the wood to shearing stresses obtained by forces produced by pressing jaws or similar means against the surface of the wood or by forces causing torsion in the wood around an axis parallel to the direction of fiber. Additionally the stresses may be caused by flexure around an axis perpendicular to the direction of fiber and/or by cutting parallel to the direction of fiber. Pressing perpendicular to the direction of fiber may also occur.

3,718,286
METHOD AND APPARATUS FOR GRINDING MINERAL MATERIALS

Gunnar Rindal Fagerholt, Copenhagen-Valby, Denmark, assignor to F. L. Smidth & Co., New York, N.Y.
Division of Ser. No. 790,020, Jan. 9, 1969, Pat. No. 3,633,832. This application Nov. 12, 1970, Ser. No. 88,972
Int. Cl. B02c *17/06*
U.S. Cl. 241—30 **7 Claims**

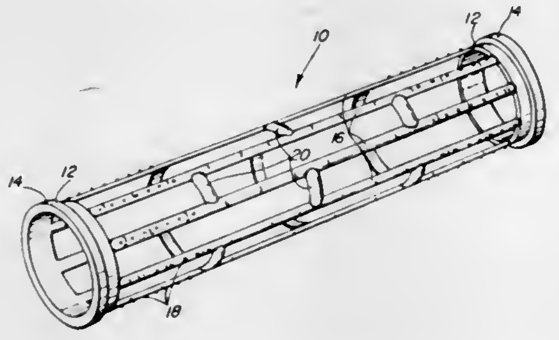


Method of grinding granular mineral materials in a rotating mill having at least one partially confined grinding zone. The material is fed through a constricted opening into one end of this grinding zone, atmospheric air being permitted to enter in the same way. The coarse material is gradually ground down into finely divided form and is discharged through a constricted opening into an adjoining collection zone and thence discharged from the mill. The rate of feed of the coarse material into the grinding zone and the rate of discharge of the ground material therefrom are so controlled that a pool of the finely ground material is maintained in the grinding zone which is so fluidized that it behaves like a liquid.

The apparatus is a tube mill having one or more grinding compartments. If there is only one grinding compartment a narrow collection compartment is located on the downstream side and if there are two grinding compartments the second one is on the downstream side of the narrow compartment. The wall of this compartment adjacent the grinding compartment includes a screen section, and the opposite wall a dam ring and overflow opening.

3,718,287
COLLAPSIBLE SPOOL

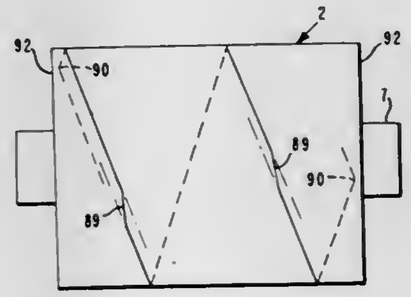
Michael P. Sottosanti, 84 Connecticut Avenue, Waterbury, Conn.
Filed April 30, 1970, Ser. No. 33,252
Int. Cl. B65h *75/20, 75/24*
U.S. Cl. 242—118.11 **6 Claims**



A collapsible spool useable for dyeing synthetic thread wound thereon and comprising a molded polyethylene spool of unitary construction and having continuous rings at end portions and an intermediate body portion comprising a plurality of equally circumaxially spaced similar axially elongated members joined at opposite ends to the end rings. The circumferential spacing between the elongated members is greater than the circumferential dimension thereof. The body portion also includes a plurality of short connecting members extending transversely between the elongated members and staggered axially to provide for discontinuity in radial planes and substantially uniform radial collapsibility throughout the length of the elongated members. The polyethylene softens sufficiently at conventional dye bath temperatures to permit thread shrinkage readily to collapse and permanently deform the spool intermediate body portion.

3,718,288
YARN PACKAGE

Uel Duane Jennings, Signal Mountain, Tenn., and Wayne Clifford Sparling, Newark, Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.
Division of Ser. No. 865,550, Oct. 13, 1969, Pat. No. 3,589,631. This application March 31, 1971, Ser. No. 130,036
Int. Cl. B65h *55/04, 54/28*
U.S. Cl. 242—178 **7 Claims**

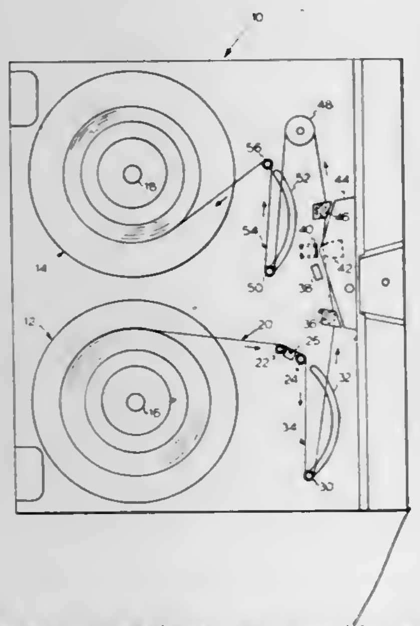


A process for winding yarn into a cylindrical-bodied substantially straight-ended package wherein the yarn is traverse wound in layers of helical coils on a bobbin by traversing the yarn axially through successive stroke lengths in repeating time periods to form a package and wherein two successive stroke lengths form a traverse cycle. The improvement includes the steps of progressively decreasing the stroke length to a first value then increasing the stroke length to a second value within 50 percent of the duration of each of the time periods, while varying the helix angle at least twice during a preponderance of the traverse cycles. The winding apparatus for accomplishing this includes a divided barrel cam with sliding portions that are moved axially in concert in a programmed sequence to disperse the yarn laydown at the reversals. Yarn packages of improved formation and stability are wound using the process and apparatus of this invention. The packages are formed of a plurality of layers of helical coils, wherein each coil includes successive helical and reversal portions and are characterized by having at least two inflections in the helical portions of a preponderance of the coils.

3,718,289
REEL SERVO SYSTEM

Benjamin Alaimo, Camarillo, Calif., assignor to Peripheral Equipment Corporation, Chatsworth, Calif.
Filed March 5, 1971, Ser. No. 121,323
Int. Cl. B65h *59/38, 63/02;* **G03b** *1/04*
U.S. Cl. 242—190 **10 Claims**

A system useful in magnetic tape transports for controlling a reel drive motor so as to provide steady tension on the tape. Magnetic tape transports generally utilize three separate motors to respectively drive the capstan and two reels. A separate servo system is usually provided for controlling the angular speed of each of the drive motors. In the case of a reel servo system, the system controls the angular speed of a reel drive motor to maintain steady tape tension in spite of (1) rapid changes in linear tape speed; e.g., start-stop operations and (2) slowly occurring changes in reel radius. A tape reservoir is formed by a spring urged tension arm which bears against the tape between the capstan and reel. The tension arm makes rapid positional changes in response to rapid tape speed changes to isolate the reel inertia from the capstan, for example, on starting. This positional change of the tension arm provides time for the reel to come up to speed and pay tape out at the tape speed established by the capstan. The tension arm makes gradual positional changes in response to variation in radius of the tape quantity on the reel. In accordance with the invention, a first electrical signal, produced in response to tension arm position, together with a second electrical signal indicative of capstan speed, is used to control the angular speed of the reel drive motor. The major portion of the range of possible tension arm position change is dedicated to allowing for rapid changes required in reel angular speed as a consequence of changes in capstan speed and a considerably smaller portion of this range is dedicated to changing reel angular speed in response to changes in tape quantity radius.



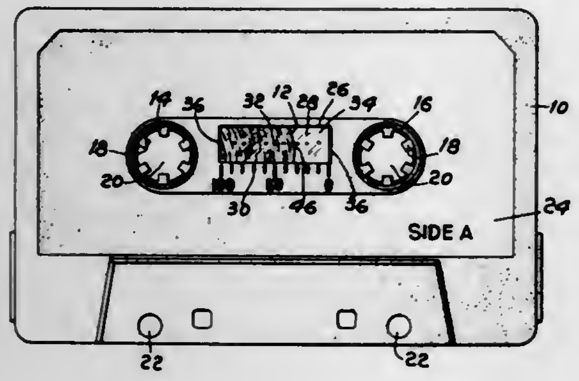
3,718,290
RECORDING TAPE SEGMENT INDICATOR

Ronald G. Wright, 4 Sylvan Way, West Caldwell, N.J.

Filed Jan. 27, 1971, Ser. No. 110,025

Int. Cl. G03b *1/04*; **G11b** *15/32, 23/04*

U.S. Cl. 242—199 **11 Claims**



A transparent window of a recording tape container or cassette has longitudinally spaced markings disposed directly over the tape supply winding indicating the location of internal pre-recorded tape segments. Precision measurements are made of the beginning or end of each segment with respect to the center of the supply reel and the end of the window. The tape recording is played in a standard cassette record player and the radial edge of the tape at the selected point is magnified and measured. Marks indicating the window ends and segments are placed on a magnified scale pattern which is photoreduced to normal size and printed repetitively on transparent plastic sheets. The sheets are cut to the size of the window which is inserted into the cassette opening with the marks, such as dots, positioned directly over the internal segment points on a repetitive basis for mass produced tape recordings.

3,718,291
FISHING REEL

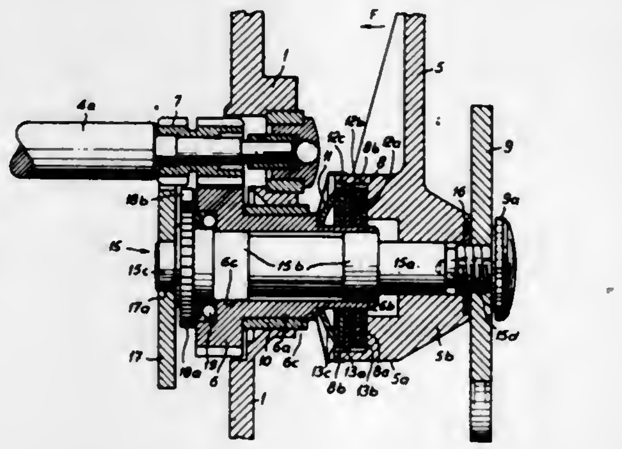
Jean-Paul Lemery, Cluses, France, assignor to Carpano & Pons, Cluses, France

Continuation of Ser. No. 786,703, Dec. 24, 1968, abandoned. This application April 9, 1971, Ser. No. 132,826

Claims priority, application France, Jan. 8, 1968, 68135212

Int. Cl. A01k *89/02*

U.S. Cl. 242—219 **9 Claims**



A fishing reel comprises a spool mounted between two connected together flanges and a crank for turning the spool projects outwardly from one of the flanges, the crank is provided with a bell-shaped housing therein and a variably set torque limiting device interconnecting the crank and spool is disposed in the housing. The torque limiting device comprises a disc clutch assembly having a plurality of friction washers disposed between bearing surfaces connected to both the crank and a gear system for rotating the spool. The torque limiting device is variably set by the user to effect slippage therein at any desired torque value resulting in relative rotation between the crank and the spool. In addition, the torque limiting device is contained in a cartridge and is removably mounted in the fishing reel assembly.

ERRATUM

For Class 242—75 see:
Patent No. 3,718,354

3,718,292
ANGULAR SENSING SYSTEM USING A PAIR OF STRAPPED-DOWN RATE GYROS

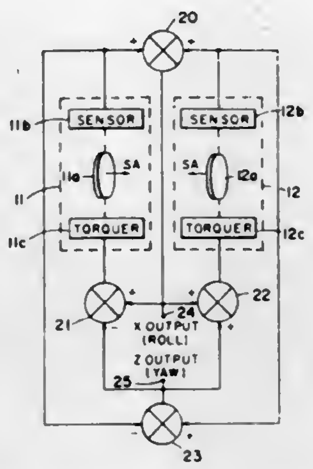
Ernst T. Evers-Euterneck, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army

Filed Jan. 7, 1971, Ser. No. 104,693

Int. Cl. F41g *7/00, 7/14, 9/00*

U.S. Cl. 244—3.11 **3 Claims**

An angular sensing system is disclosed in which two rate gyros are strapped-down to a transverse bulkhead of a missile, with their spin axes and input axes antiparallel, and their output axes parallel. Alignment loops for the gyros provide outputs resulting from inputs in the output axes and outputs resulting from inputs in the input axes of the gyros. The outputs are directly related to roll and yaw of the missile.



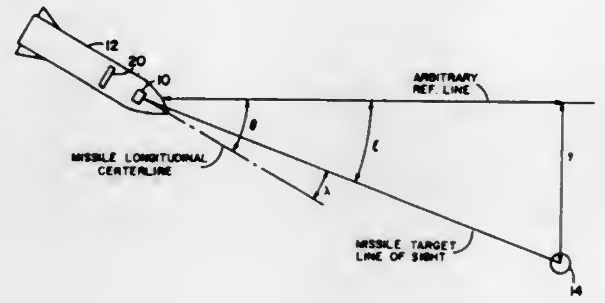
3,718,293
DYNAMIC LEAD GUIDANCE SYSTEM FOR HOMING NAVIGATION

Gilbert C. Willems, Madison, and Ray H. Farmer, Huntsville, Ala., assignors to the United States of America as represented by the Secretary of the Army

Filed Jan. 4, 1971, Ser. No. 103,411

Int. Cl. F42f *15/02;* **F41g** *7/00, 9/00*

U.S. Cl. 244—3.16 **2 Claims**



A system and method of guiding homing missiles toward low maneuverability targets. Dynamic lead navigation is implemented with a body fixed detector and a two-degree-of-freedom position gyroscope. The position gyro can be a part of the normal missile autopilot and need not represent an additional instrument. In flight toward a target, a target seeker, which yields a proportional output, measures the angle between the missile-target line-of-sight and the missile center line. An instrument gyro allows an attitude angle to be measured. The difference between these two angles is obtained, providing the missile-target look-angle or error signal for directing the missile toward the target.

3,718,294
WING ARRANGEMENT FOR A V/STOL AIRCRAFT

Gunter Krenz, Bremen, Germany, assignor to Vereinigte Flugtechnische Werke-Fokker GmbH, Bremen, Germany

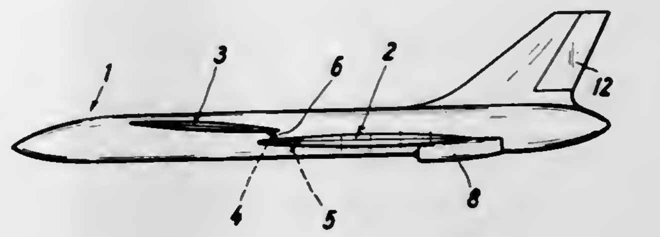
Filed Mar. 11, 1971, Ser. No. 123,161

Claims priority, application Germany, Mar. 14, 1970, P 20 12 243.4

Int. Cl. B64c *3/38, 15/00*

U.S. Cl. 244—46 **6 Claims**

A vertical/short takeoff and landing (V/STOL) aircraft with a delta wing which is provided with a power unit assembly to produce vertical and/or horizontal thrust. Means are provided which control the slight interference between power unit and airframe air flows. The delta wing may also have different sweepback in that it may be designed to have a leading edge which is kinked once or several times (double or multiple delta). The wing may have outwardly and/or inwardly curved leading edges.



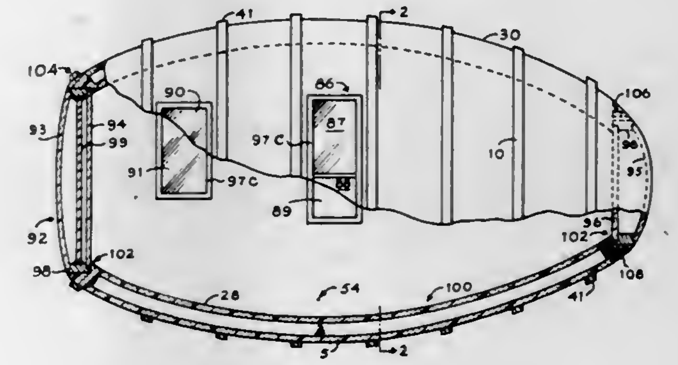
3,718,295
BARREL-CURVED, WRECK-RESISTANT CABIN

Alvin Edward Moore, 916 Beach Boulevard, Waveland, Miss.

Filed Dec. 29, 1970, Ser. No. 102,320

Int. Cl. B64c *1/00*

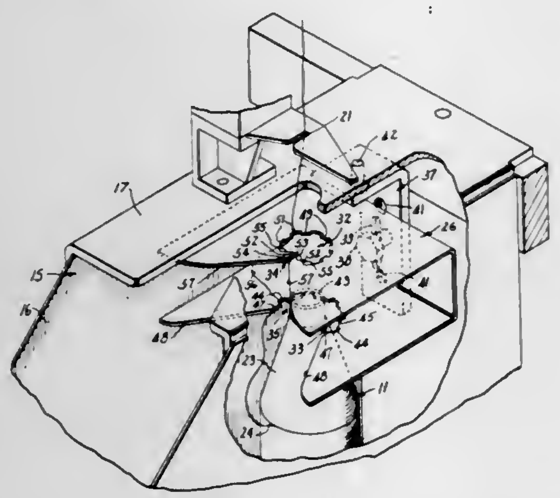
U.S. Cl. 244—119 **34 Claims**



A light-weight, shock-resistant vehicular cabin or other insulated, barrel-curved container, mainly constructed of elongated, stave-like members, each of which comprises: a pair of spaced side pieces (of wood, sheet metal or metallic mesh), having outer edges that curvingly slope from the greatest bulge of the container toward the forward and rearward ends of the cabin; firm, molded filler material (plastic — preferably foamed — or light-weight concrete or the like) between the side pieces; and a hollow element or elements in the filler, containing gaseous material (air or other gas, optionally pressurized, or gas-cell-containing foam plastic). The hollow elements may be: single, sealed, bent tubes, each being nearly the length of the cabin; cans in end-to-end relation; bent bamboo or straight bamboo sections; slender, plastic tubes; or small balloons. The gaseous material in the hollow elements may be: air or non-aerial gas at or above atmospheric pressure; or gas-cell-containing foam plastic, which optionally may be under internal, above-atmospheric pressure. Bonding material is between adjacent faces of the stave-like members, and preferably the assembled members are tautly encompassed by hoops or equivalent looped means — for example, tautly applied metallic mesh. The outer skin means may comprise rubber sheeting or other rubber coating. In the preferred vehicular form, windowed doors or hatches are provided.

3,718,296
BALLOON BREAKER FOR THREAD WINDERS

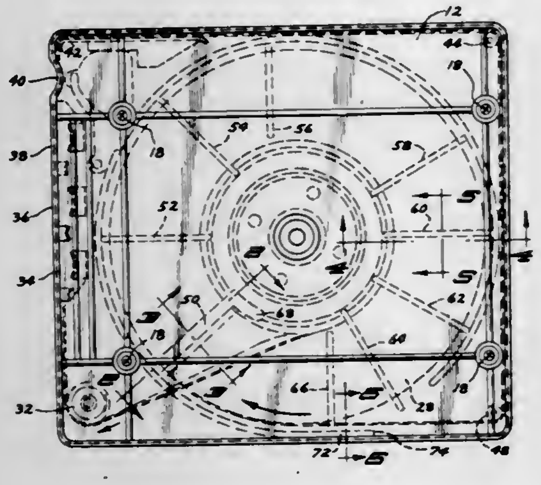
Robert J. Mahoney; Donald W. Dean, and Joseph Uzuanis, Jr., all of Rockford, Ill., assignors to Barber-Colman Company, Rockford, Ill.
Continuation of Ser. No. 31,117, April 23, 1970, abandoned.
This application Nov. 18, 1971, Ser. No. 199,860
Int. Cl. B65h *49/02*
U.S. Cl. 242—35.5 R **5 Claims**



This balloon breaker for a high speed winder is mounted in the pocket of the active bobbin and comprises a U-shaped stamping with parallel legs disposed horizontally and formed with upper and lower alined eyes which are open to respectively receive the running thread and the upper end of the supply bobbin as the latter is transferred to active position for restarting the winding. Inwardly projecting lugs spaced around the interior of each eye engage the ballooning running thread to produce a jerky action of the ballooning thread as it travels around the eyes.

3,718,297
CONTINUOUS LOOP MAGNETIC TAPE CARTRIDGE

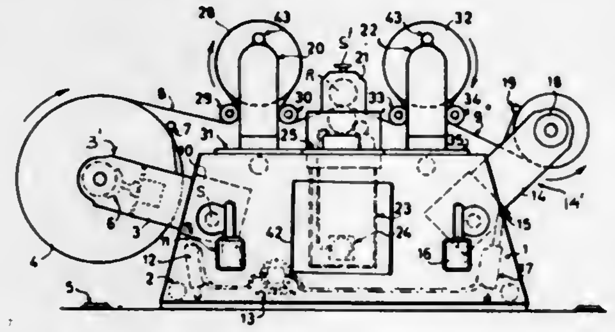
George R. Eagle, Edina, Minn., assignor to The Telex Corporation, Tulsa, Okla.
Filed Dec. 14, 1970, Ser. No. 97,618
Int. Cl. B65h *17/48*
U.S. Cl. 242—55.19 A **9 Claims**



A reel hub and turntable are journalled to one side of a cartridge housing for receiving and supporting one side of an endless coil of magnetic tape. Tape guide means are attached to the sides of the cartridge housing for guiding the tape from the inner periphery of the coil past a reading or writing head opening and then returning the tape to the outer periphery of the coil. A plurality of elongated rib members project from the inside surface of the side of the cartridge housing which is opposite the reel hub and turntable. The rib members are radially oriented with respect to the turntable's axis of rotation and are angularly spaced from one another around the axis of rotation. The rib members extend from the inner periphery of the coil of magnetic tape to the outer periphery thereof and act as a side wall for the coil of tape. The two ribs which flank the point where the tape is withdrawn from the inner periphery of the coil are shaped and positioned to act as abutments for limiting the tape withdrawal point to a predetermined angular range. The rib which is downstream from the tape withdrawal point has a mylar scraper attached thereto which bears against the side of the tape coil and prevents the withdrawn tape from being swept under the rib by forward rotation of the tape coil. The ribs which are upstream from the tape withdrawal point have notches formed in the radially inner ends thereof to restrain the inner coil of tape when it is axially displaced by reverse rotation of the tape coil.

3,718,298
PAPER STRIP PROCESSING EQUIPMENT

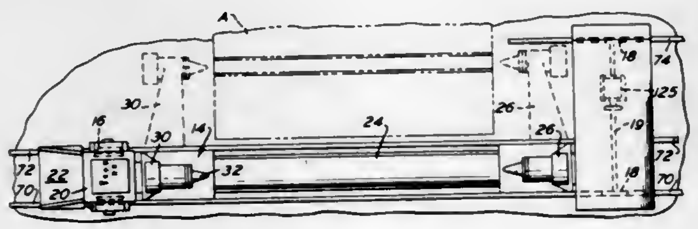
Raymond Louis Roger Lucas, c/o Off. Tech., 133 bis rue Mouneyra, Prechac, France
Filed Jan. 13, 1971, Ser. No. 106,052
Claims priority, application France, Jan. 23, 1970, 7002363
Int. Cl. B65h *19/30, 25/22*
U.S. Cl. 242—58.6 **6 Claims**



The invention relates to a paper strip processing equipment which comprises a supporting frame having a paper roll lifting mechanism at one end for automatically lifting a heavy roll of paper from the ground and a rewinding mechanism at its other end for rewinding the paper strip as it unrolls from the roll and passes through a number of processing stations mounted on the frame between the lifting mechanism and the rewinding mechanism.

3,718,299
ROLL OUT STAND

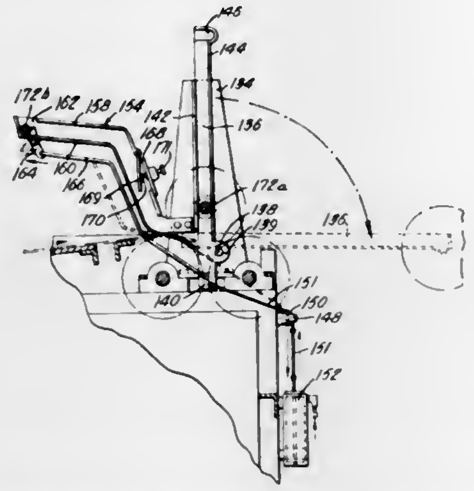
John H. Osgood, Cherry Hill, N.J., assignor to Harris-Intertype Corporation, Cleveland, Ohio
Filed Nov. 22, 1971, Ser. No. 200,942
Int. Cl. B65h *19/30*
U.S. Cl. 242—58.6 **19 Claims**



The roll out stand for a paperboard corrugator is an L-shaped vehicle which eliminates the need for manually pushing rolls into position for elevation by arms on the vehicle.

3,718,300
APPARATUS FOR ROLLING TUBULAR FABRICS

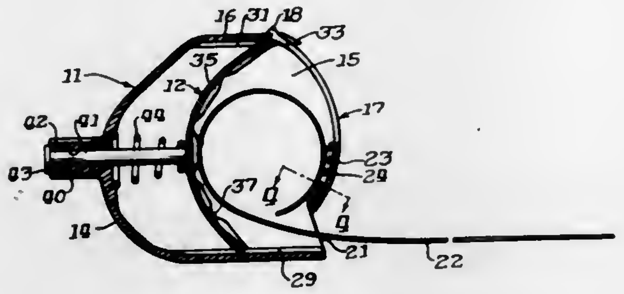
Edward I. Aronoff, 605 Dorais Street, St. Laurent, Quebec, Canada
Division of Ser. No. 695,605, Jan. 4, 1968, Pat. No. 3,561,306.
This application Nov. 9, 1970, Ser. No. 87,951
Int. Cl. B65h *17/08, 19/22*
U.S. Cl. 242—66 **2 Claims**



A fabric rolling device including a pair of driven rollers adapted to receive a core on which the fabric is to be rolled, a guide channel for guiding the ends of the core as the fabric is being rolled thereon, a branch channel guide device for a branch guide channel merging with the main guide channel including a retaining flap for withholding a second reserve core adapted to simultaneously feed the reserve core when the core on which the fabric has been rolled has been completed and removed.

3,718,301
FILMSTRIP CARTRIDGE

Robert B. Morton, Chicago, Ill., assignor to Bell & Howell Company, Chicago, Ill.
Filed June 1, 1971, Ser. No. 148,668
Int. Cl. C03b *23/02*
U.S. Cl. 242—71.1 **7 Claims**

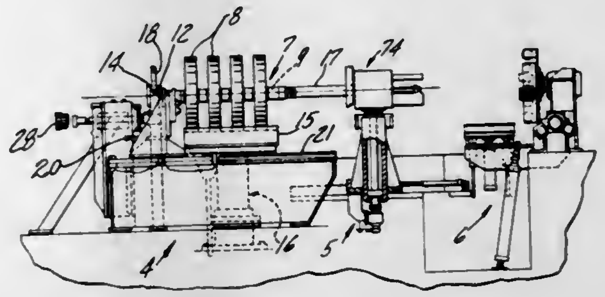


A filmstrip cartridge having a slidable pressure shoe positioned to form a roll of film starting with a predetermined small inside diameter and to maintain this small inside diameter while additional film is being fed into the cartridge only onto the outside diameter of the roll of film for increasing the length of film carrying capacity of a fixed sized cartridge.

3,718,302
COIL AND MANDREL SEPARATING MACHINERY

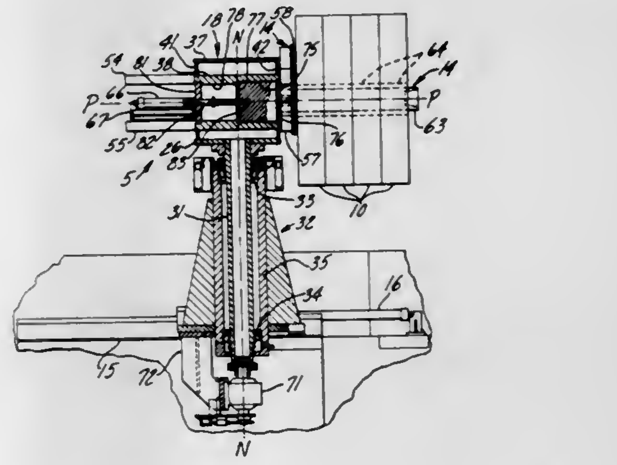
Robert E. Mount, Pine Brook; Gerrit De Gelleke, Parsippany, both of N.J., and Joseph Pundyk, New York, N.Y., assignors to Midland-Ross Corporation, Cleveland, Ohio
Filed Jan. 29, 1971, Ser. No. 110,946
Int. Cl. B21c *47/24*
U.S. Cl. 242—81 **14 Claims**

Disclosed herein is equipment for receiving, for example, assemblies of which each comprises a windup mandrel and slit coils carried thereon as used in the operation of a duplex foil-slitting and rewinding machine, removing the coils from the mandrel, and processing the coils into a compact package while retrieving the mandrel for use in further slitting and rewinding operations. The portion of the equipment of especial interest herein effects a change of coaxial spaced relationship of the coils on the windup mandrel to stacked or coaxial juxtaposed relationship. To accomplish such stacking, structure is provided for facilitating the removal of coil separating elements of the assembly which fit together about the main shaft of the mandrel, such as drive collars and various types of spacers.



3,718,303
TURNSTILE-TYPE COIL-GATHERING MACHINE

Robert E. Mount, Pine Brook; Gerrit DeGelleke, Parsippany, both of N.J., and Joseph Pundyk, New York, N.Y., assignors to Midland-Ross Corporation, Cleveland, Ohio
Filed March 18, 1971, Ser. No. 125,694
Int. Cl. B21c *47/24*
U.S. Cl. 242—81 **14 Claims**



A machine generally in the form of a pedestal with a revolvable cantilever-supporting probe for receiving slit coils of foil, paper, etc. or other annular articles which have central cylindrical openings differing in diameter such as to require the machine to include a probe of special diameter for each size of annular article handled. The machine is useful for collecting such articles in a compact package and includes facilities for shifting the coils from the probe to another coil-receiving apparatus.

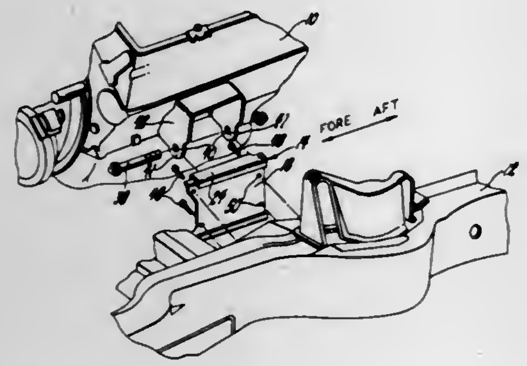
ERRATA

For Classes 244—3.11 thru 244—119 see:
Patents Nos. 3,718,292 thru 3,718,295

3,718,304
ENGINE MOUNT ASSEMBLY

John C. Schulz, Springboro, and Richard W. Lyday, Vandalia, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed March 23, 1972, Ser. No. 237,441
Int. Cl. F16f *15/00*
U.S. Cl. 248—9 **3 Claims**

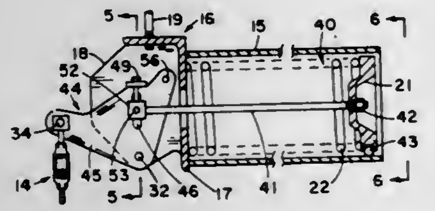


An engine mount assembly for resiliently supporting an engine on a frame of a motor vehicle includes a pair of mounting brackets and an insert. The insert and one of the brackets have cooperating rails preventing relative movement therebetween in two mutually perpendicular directions while rivets normally secure the insert and this one bracket against movement in a third direction perpendicular to the other two directions. Rubber is secured between the other bracket and the insert for yieldingly resisting relative movement therebetween to normally isolate engine vibrations and these members also have abutments which engage on predetermined relative movement therebetween in the stated third direction to transmit force to the rivets. Rubber secured between the insert and the stated one bracket operates to yieldingly resist movement therebetween in the stated third direction when the rivets are sheared.

3,718,305
CONSTANT SUPPORT DEVICE

Leonard S. Suozzo, 366 Maple Hill Drive, Hackensack, N.J.

Filed April 16, 1971, Ser. No. 134,728
Int. Cl. F16l *3/20*
U.S. Cl. 248—54 CS **3 Claims**

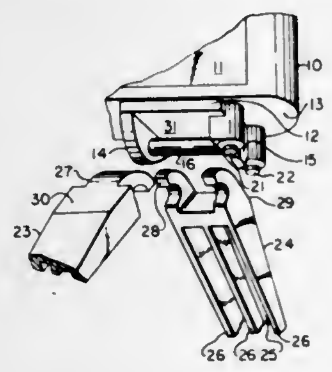


A device for exerting a substantially constant supporting force to a vertically movable load, such as piping, the device comprising a support including a tubular housing having an end wall; a spring mechanism within the housing and including a movable backing plate, a spring bearing at opposite ends against the backing plate and housing end wall, and rod means connected at one end to the backing plate and extending through the spring and the housing end wall; and a lever pivotal relative to the support and pivotally connected to the other end of the rod means and to a load-carrying unit about spaced parallel axes. The device also includes means interposed between the backing plate and the housing for minimizing friction therebetween, adjustable means connected to the lever and the rod means for readily varying the length of the load arm of the device, and adjustable preset means for conveniently and simply converting the device into a rigid support when the piping is in its "cold load" position at the time the device is assembled and prior to installation and at such times as the piping is out of normal service and is subjected to a maintenance procedure, such as hydrostatic testing, following initial operation.

3,718,306
SUPPORTING FEET FOR PANELS AND THE LIKE

I. Gillis Murray, Lyme, Conn., assignor to The Brewster Corporation, Old Saybrook, Conn.

Filed Oct. 22, 1970, Ser. No. 83,145
Int. Cl. F16m *13/00*
U.S. Cl. 248—188.8 **7 Claims**

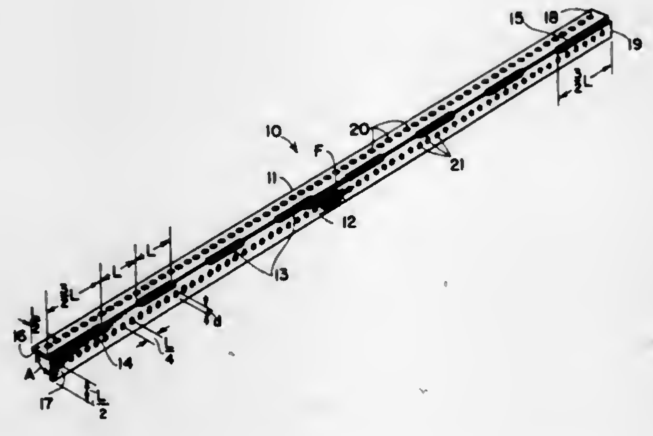


Supporting feet for panels and the like which comprise a pair of elongated members, each formed at one end thereof with means engaging a horizontally extending pin extending between a pair of flanges secured to the undersurface of a vertically extending structure for supporting the same in proper upright position.

3,718,307
MULTIPURPOSE SUPPORT BAR

Thomas Albanese, 116 Norlen St., Las Vegas, Nev. 89107

Filed Aug. 1, 1969, Ser. No. 846,723
Int. Cl. F16l *3/22*
U.S. Cl. 248—205 R **1 Claim**

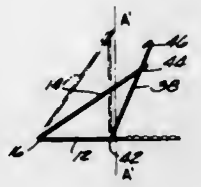


An elongated angle bar is formed by folding a strip about its longitudinal center line to form first and second members at right angles to each other. A series of slots of equal length and spaced at equal intervals are formed in the longitudinal center line and terminate at each end in somewhat longer slots so that end portions of the members may be bent out of the plane of the members to define tabs. These tabs serve to mount the bar in a number of different desirable positions. The members themselves include a series of holes for mounting various devices such as electrical outlet boxes, brackets for supporting plumbing pipes, and other equivalent structures.

3,718,308
BOOK HOLDER

Paul E. Hainault, Houghton, Mich., assignor to Board of Control of Michigan Technological University, Houghton, Mich.

Filed Sept. 18, 1970, Ser. No. 72,596
Int. Cl. A47b *97/04*
U.S. Cl. 248—460 **15 Claims**

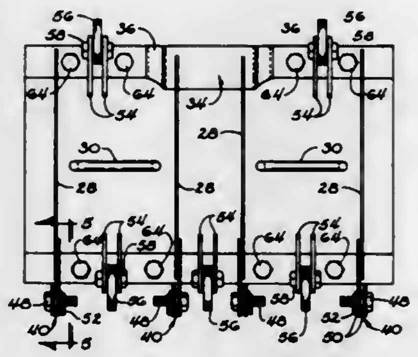


A book support includes a horizontal tension member and a compression member and has a hinged connection between the two about which they can pivot between a collapsed position wherein one overlies the other and an extended position wherein the later is generally upright and at an angle to the former. A second tension member is connected to both of the already mentioned members and is arranged to be extended in a taut condition between the two when they are pivoted to the extended position. The horizontal tension member has an end extending beyond the point of connection of the second tension member thereto, this end has a non-skid surface for engaging a book edge as the book is rested against the compression member.

3,718,309
PIPE COATING MOLD

Robert J. Harris, Marrero, La., assignor to H. C. Price Co., Bartlesville, Okla.

Filed Nov. 5, 1970, Ser. No. 87,227
Int. Cl. B22d *19/00*
U.S. Cl. 249—90 **14 Claims**



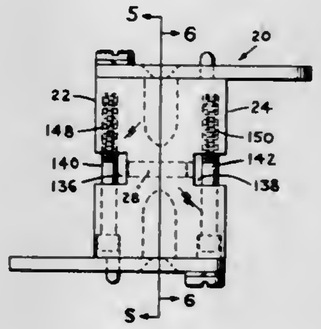
A breakaway mold for forming a sealing joint between two sections of coated pipe is configured to permit easy removal of the mold after the coating material has hardened. Two identical mold halves present the mold, and each half includes a central arcuate section and a pair of opposed, integral planar end sections which facilitate removal of the mold by assuring a shearing action between the mold and the molding material. Each mold half is also provided with outwardly extending flanges which mate with the flanges of the other mold half to provide a sealing surface at each side of the mold. Breakaway bolts on the mold flanges provide readily accessible means for moving the mold halves away from the molding material.

A special tool is provided to assure removal of one mold half after the other mold half has been previously broken away from the molding material. The tool includes an arcuate brace which is positioned in overlying relationship to the pipe and structure for engaging the previously removed mold half after the latter has been repositioned around the pipe. The second mold half can then be removed by applying a force against the first-removed mold half.

3,718,310
COMPACT MULTICAVITY WIPER BULLET MOLD

Robert J. Cerone, 397 Victor St., Saddle Brook, N.J. 07662

Filed Jan. 21, 1971, Ser. No. 108,266
Int. Cl. B41b *11/62*
U.S. Cl. 249—165 **9 Claims**

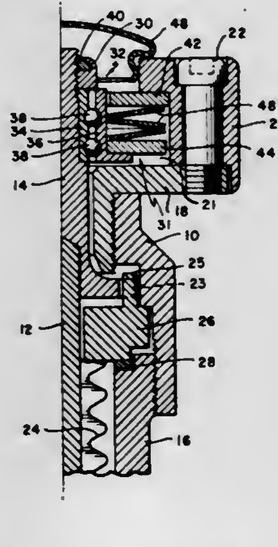


A bullet mold having complementary sections which form mold cavities on opposite sides of the mold assembly. Wiper plates are associated with the mold cavities on each side of the assembly. The complementary mold sections are adapted to be mounted on handles or other support means for rapid assembly and disassembly of the mold components, and aligning pins insure accurate positions of the mold sections to produce a finished mold product which conforms to predetermined dimensional requirements.

3,718,311
SELF-ADJUSTING STOP VALVE ACTUATING MECHANISM

John R. Braden, 315 Dewey Drive, Annapolis, Md. 21401

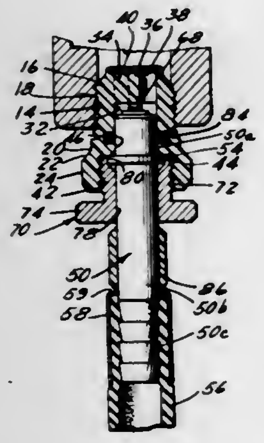
Filed Nov. 24, 1971, Ser. No. 201,785
Int. Cl. F16k *31/44*
U.S. Cl. 251—77 **6 Claims**



The invention is a high pressure stop valve with a nonrotating stem which utilizes a pre-loaded spring assembly for applying a closing force to the valve stem.

3,718,312
QUICK CONNECT AND DISCONNECT VALVED COUPLING

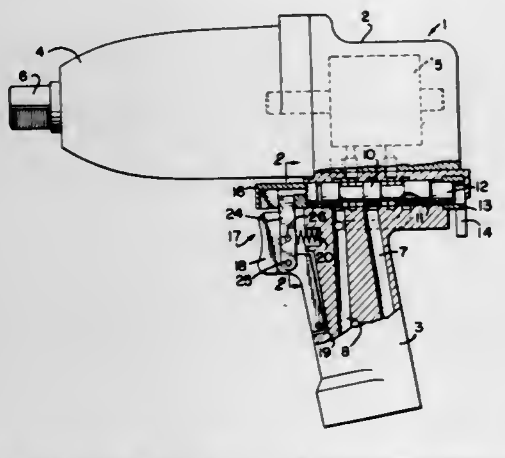
Leroy C. Payne, La Habra, Calif., assignor to Standard Pneumatic Motor Company, Whittier, Calif.
Filed May 3, 1971, Ser. No. 139,752
Int. Cl. F16l *29/00, 37/28*
U.S. Cl. 251—149.4 **4 Claims**



A pneumatic valve for quick connection and quick disconnection from pneumatic tools and the like. A normally closed valve having a movable valve member, including a valve stem, is disposed in a valve housing. An inlet bushing is screwed into a tapped opening provided therefor in the pneumatic tool and in which a connector nut, rotatably disposed on the valve body, is quickly screwed into and out of the inlet bushing, which has a web thereon engagable by the valve stem of the movable valve member for moving the valve member to the open position when the connector nut is screwed into the inlet bushing. An O-ring is located in a groove in the inlet bushing and provides an effective pneumatic seal between the connector nut and the inlet bushing when the nut is screwed into the connector. The inlet bushing normally is attached to the pneumatic tool and the valve body, with the valve member operably disposed therein, is easily and quickly disconnected from the inlet bushing and, hence, from the pneumatic tool by unscrewing the connector nut from the inlet bushing, the valve automatically closing when the valve is disconnected from the inlet bushing. The valve body with its valve member is as easily and quickly attached to the tool by screwing the connector nut into the inlet bushing, the valve then being automatically opened.

3,718,313
TRIGGER MECHANISM

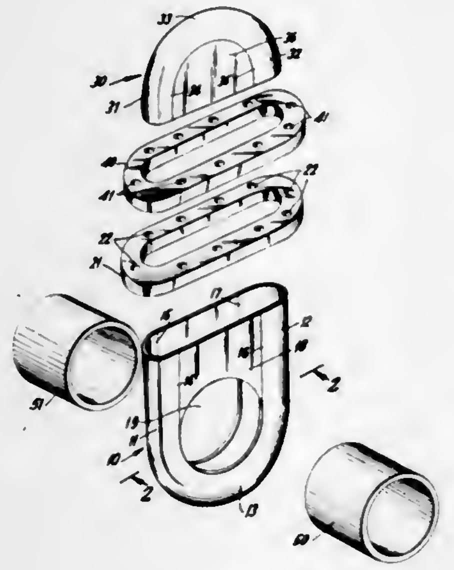
Stanley M. Miller, Hopewell, N.J., assignor to Ingersoll-Rand Company, New York, N.Y.
Filed Nov. 17, 1971, Ser. No. 199,544
Int. Cl. F16k *31/44;* **B23b** *45/04;* **B27c** *3/08*
U.S. Cl. 251—290 **3 Claims**



A valve operating trigger mechanism that operates a valve plunger in opposite directions from a central resting position when the valve plunger is rotated between alternate rotary positions.

3,718,314
GATE VALVE AND METHOD OF MAKING THE SAME

Arne Elkevik, 122 Washington Street, Merrick, L. I., N.Y.
Filed Sept. 24, 1970, Ser. No. 74,969
Int. Cl. F16k *27/10*
U.S. Cl. 251—329 **3 Claims**



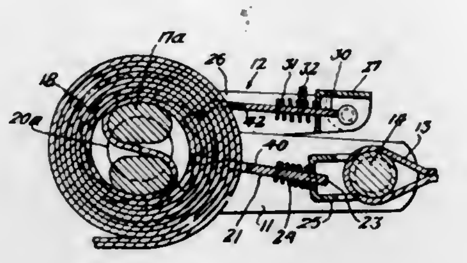
A gate valve body is formed from a U-shaped member wherein each leg and the bottom connecting portion of the U-shaped member have a substantially U-shaped cross-section. The arms of the U-shaped cross-section of each leg face each other. A filler plate having a concave bottom surface is extended across the front face of the U-shaped member downwardly from the free end of each leg and welded to a facing arm of each leg. A second similar filler plate is extended across the rear face of the U-shaped member and similarly welded. An attaching plate having a cut-out center portion is welded to the free ends of the legs of the U-shaped member and to the top surfaces of the filler plates.

The bonnet portion of the valve is formed from a second U-shaped member wherein each leg and the upper connecting portion of the U-shaped member have a substantially U-shaped cross-section. The arms of the U-shaped cross-section of each leg face each other. A semi-circular filler plate is positioned across the front face of the member to fill the opening between the legs and is welded to a facing arm of each leg. A similar filler plate is welded similarly to the rear face of the member. A second attaching plate having a cut-out inner portion is welded to the free ends of the legs of the U-shaped member and to the bottom surfaces of the filler plates. A hole is provided in the center of the connecting portion of the U-shaped member.

3,718,315
STRAP ADJUSTER DEVICES

John Richard Huber, Holicong, Pa., assignor to Eastern Rotorcraft Corporation, Doylestown, Pa.
Filed Jan. 4, 1971, Ser. No. 103,531
Int. Cl. A63b *21/04*
U.S. Cl. 254—164 **1 Claim**

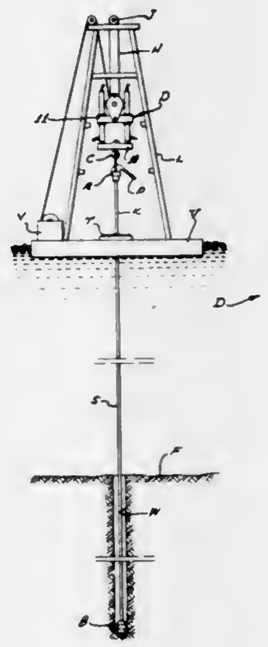
A strap adjusting and tensioning assembly includes a frame or body portion carrying a drum for holding the adjusted portion of the strap. Ratchet wheels are connected to the drum and a holding pawl member is mounted in the frame and is engageable with the ratchet teeth. A movable handle having a second pawl member mounted thereon is supported on the body for movement therewith. The handle pawl is formed with a portion which engages the wrapped strap when the strap is wrapped up to give a predetermined diameter after take up by movement of the handle. The frame pawl is shaped to be clear



of the wrapped strap surface to provide a condition where the wrapped strap diameter causes the handle pawl to disengage from the ratchet teeth while the frame pawl member remains in holding engagement with the teeth.

3,718,316
HYDRAULIC-PNEUMATIC WEIGHT CONTROL AND COMPENSATING APPARATUS

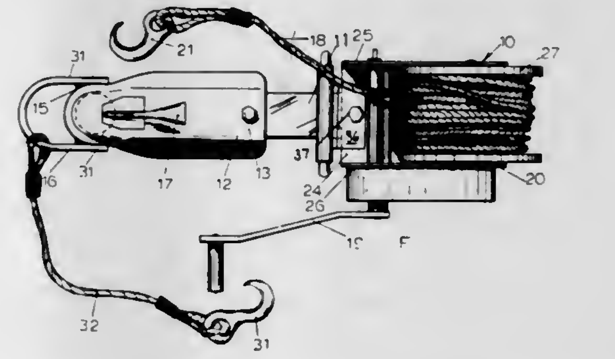
Edward Larralde, Santa Barbara, and Ronald E. Beaufort, Downey, both of Calif., assignors to Vetco Offshore Industries, Inc., Ventura, Calif.
Filed Sept. 4, 1970, Ser. No. 69,758
Int. Cl. B66d *1/48*
U.S. Cl. 254—172 **4 Claims**



Apparatus automatically compensating for relative vertical movement between a hoisting or supporting mechanism and a load carried thereby, which load, for example, may be a running string connected to a drill bit used in drilling a subaqueous well bore, the mechanism supporting the running string being mounted on a floating vessel anchored over the well bore. The compensating apparatus includes a cylinder and piston device containing a hydraulic fluid exerting a lifting or tensioning force on the running string, or other load, the pressure on the hydraulic fluid being maintained generally constant by a gaseous medium despite relative axial movement between the cylinder and piston portions of the device, that might result from heaving of the vessel due to wind and wave action, or the lowering of the running or drilling string as the bit drills the hole.

3,718,317
PORTABLE HAND WINCH AND ANCHORING AND STABILIZING MEANS

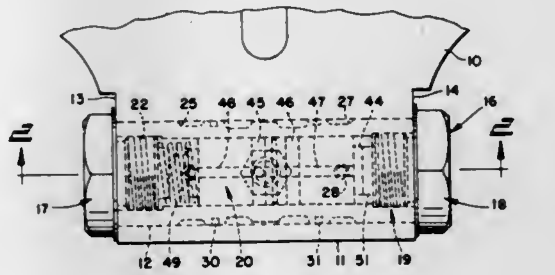
Elwyn P. Hilmer, 3028 Valmont Avenue, Boulder, Colo.
Filed Jan. 27, 1971, Ser. No. 110,061
Int. Cl. B66d *1/00*
U.S. Cl. 254—186 HC **4 Claims**



The specification discloses a combination ball and loop with a hand winch. The hand winch is provided with an anchor means. The anchoring means is made up of a bar and loop at the end of the bar. The winch is attached to one end of the bar and a female trailer hitch is mounted on the other end of the bar. A ball is attached to aU-shaped loop by means of a plate which closes the legs of the loop. The trailer hitch ball is supported on the plate. The ball is received in the female trailer hitch member. To stabilize the winch, a handle is attached to the bar and winch. The handle is used to hold the winch and bar from twisting laterally and to stabilize it while the crank is being turned. A cable is attached to the loop which may be used for anchoring the winch to a tree or other object.

3,718,318
VIBRATOR FOR FOUNDRY MOLDING AND LIKE MACHINES

Warren A. Blower, Brecksville, and Emil P. Jerse, Mentor, both of Ohio, assignors to The Sherwin-Williams Company, Cleveland, Ohio
Filed April 5, 1971, Ser. No. 131,099
Int. Cl. B01f *11/00*
U.S. Cl. 259—1 **9 Claims**



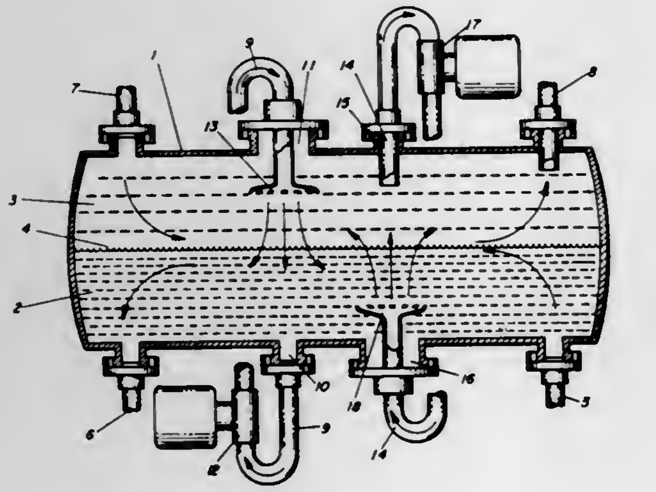
A vibrator for foundry molding machines which includes a through bore in the table or pattern stool or other part to be vibrated of the machine, a sleeve in the through bore, end caps threadedly engaged with the sleeve and bearing on the ends of the through bore to stress the sleeve, a ram in the sleeve, and sound attenuating inserts in the cap to reduce the noise level of the vibrator.

3,718,319

APPARATUS AND PROCESS FOR CONTACTING IMMISCIBLE LIQUIDS

Irving H. Weisman, Palisades Park, N.J., assignor to The United States of America as represented by the Secretary of the Army

Filed Nov. 16, 1971, Ser. No. 199,166
Int. Cl. B01f *15/00*
U.S. Cl. 259—4 **6 Claims**



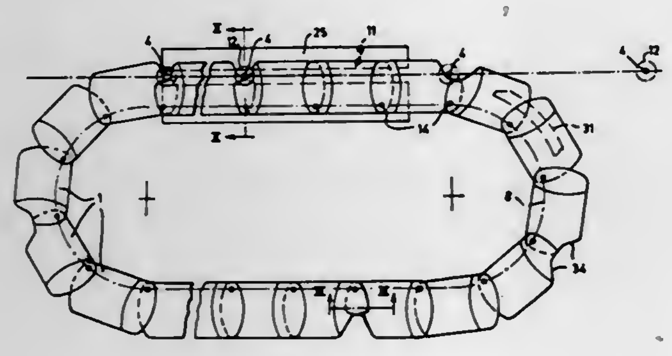
A process and apparatus for contacting a liquid phase of one density with another liquid phase of different density immiscible therewith. The apparatus includes a horizontal tank, wherein the two liquids form an upper layer and a lower layer, inlets and outlets for the two liquids, and an external recycling system, which removes liquid from each layer intermediate the inlets and outlets and discharges it into the other liquid layer.

3,718,320

AUTOMATIC SLOT SEALING SYSTEM FOR CONTINUOUS FURNACES

Gerard P. Jespers, Dusseldorf, Germany, assignor to Ferro Corporation, Cleveland, Ohio

Continuation-in-part of Ser. No. 26,518, April 8, 1970, abandoned. This application June 10, 1971, Ser. No. 151,876
Int. Cl. F27b *9/24*
U.S. Cl. 263—8 R **5 Claims**



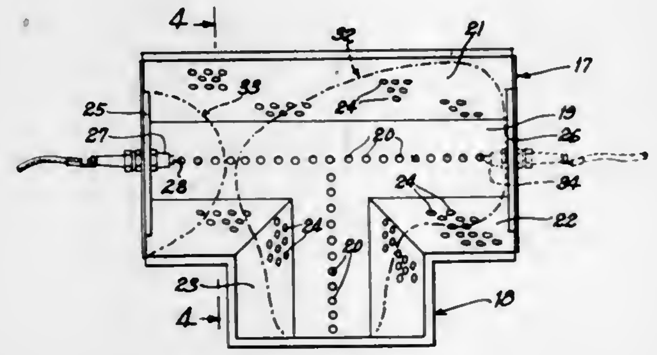
An automatic, continuously self-sealing device for preventing heat loss from a continuous heat treating furnace, through the slot therein which accommodates a continuous conveyor for supporting and carrying ware through said furnace.

3,718,321

COMBINED BURNER, FAN AND IGNITER

Erhard E. Alms, Barrington, Ill.

Continuation of Ser. No. 50,687, June 29, 1970, abandoned. This application Jan. 17, 1972, Ser. No. 218,450
Int. Cl. F23l *9/04*
U.S. Cl. 263—19 A **6 Claims**



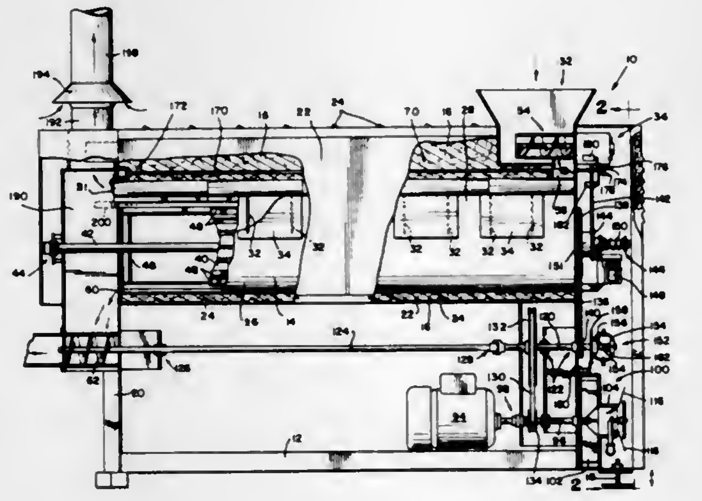
A combination burner, fan and igniter for an air heating device for use in a grain dryer or the like which combination takes cognizance of the non-uniform distribution of air from the fan around the burner to locate the igniter where it will be subject to the least heat from the burner. As a result, the life of the igniter is increased from approximately two weeks to a year or more.

3,718,322

HEAT TREATING SYSTEM FOR GRAINS AND LEGUMES

Robert F. Skelton, Bluffton, Ind., assignor to Mix-Mill, Inc., Bluffton, Ind.

Continuation-in-part of Ser. No. 27,683, April 13, 1970, abandoned. This application July 12, 1971, Ser. No. 161,560
Int. Cl. F27b *7/14*
U.S. Cl. 263—33 R **30 Claims**



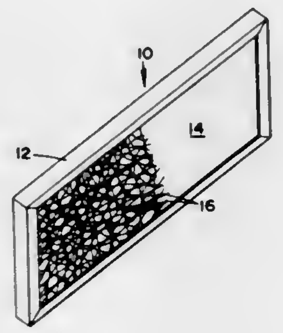
An apparatus for heat treating granular, organic materials and primarily, through not exclusively, intended for such treatment of whole soybeans, comprising a drum mounted for rotation within an elongated receiver, the drum being provided with radially outwardly and longitudinally extending fins forming a peripheral series of pockets traveling with the drum, a gas or electric heating element associated with the receiver and means for driving the drum to cause the granular material to be thrown rapidly and intermittently into close proximity to the heating element.

3,718,323

RADIANT LINING

Richard W. Ulbrich, 126 West Dixon Ave., Dayton, Ohio

Filed Feb. 1, 1971, Ser. No. 111,355
Int. Cl. F27b *3/02*
U.S. Cl. 263—40 R **19 Claims**



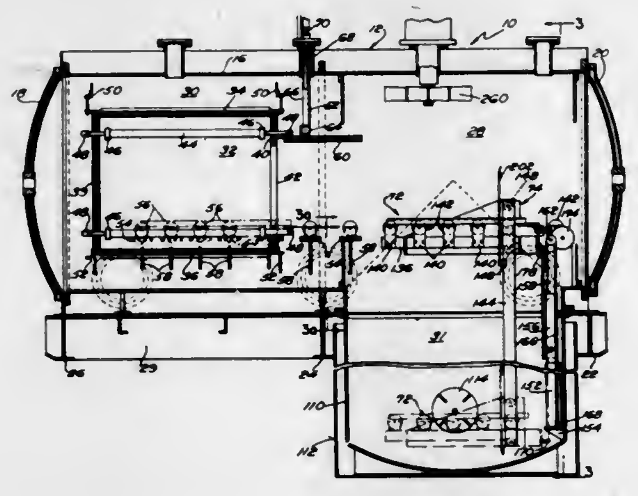
The radiant screen lining comprises a plurality of randomly oriented discrete strands of heat resistant metal pressed into a mat of appropriate density and thickness. The mat is applied to a variety of heating apparatus by suitable securing means and positioned therein to interfere with radiated heat so that each strand is heated and radiates its heat for utilization by the heating apparatus. The lining can be applied to the inner walls of an oven, furnace, fire box, and the like.

3,718,324

VACUUM FURNACE AND WORK CART FOR USE THEREIN

Herbert W. Westeren, Barrington; William H. Kimball, Providence; Vincent Scotto, Warwick, and Wallace S. Vanderford, Jr., Coventry, all of R.I., assignors to C. I. Hayes Inc., Cranston, R.I.

Division of Ser. No. 770,779, Oct. 25, 1968, Pat. No. 3,599,946. This application Nov. 12, 1971, Ser. No. 163,057
Int. Cl. C21d *1/12*
U.S. Cl. 266—5 R **9 Claims**



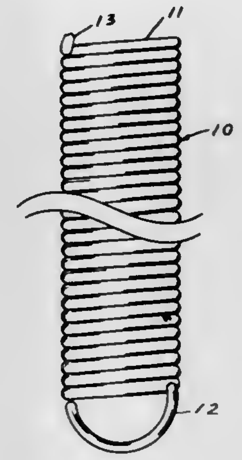
A high vacuum electric furnace for heat treating metallic articles having a work cart mounted for movement therein and including a heating chamber for receiving said work cart during the heat treating operation, said work cart having heat shielding means fixed thereto, and roller assembles located in said furnace over which said work cart moves for transfer to and from said heating chamber.

3,718,325

REPAIR CLAMP FOR SPRING

Donald L. Nystrom, 344 Dutch Rd., Fairview, Pa.

Filed July 17, 1970, Ser. No. 55,658
Int. Cl. F16f *1/12*
U.S. Cl. 267—74 **3 Claims**



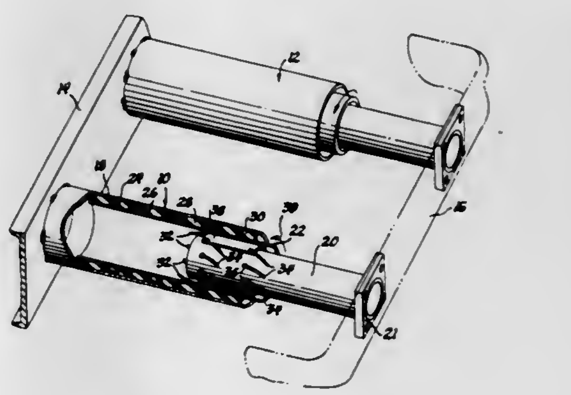
The specification discloses an adapter for a helical spring. The adapter is made up of a plug having an external spiral groove defined by a spiral ridge. The groove receives an end of the spring. The spring is clamped to the plug by means of a clamp such as a hose clamp. The plug has an eye bolt attached to it whereby the spring can be attached to a device to be supported.

3,718,326

TORSIONS IMPACT ENERGY ABSORBING DEVICE

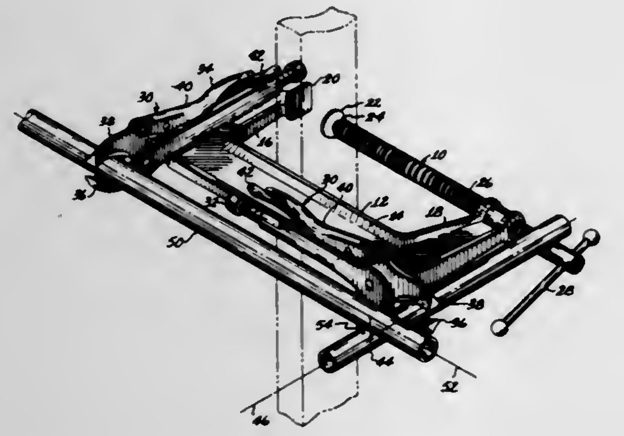
Theodore F. Ristau, Saginaw, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed July 26, 1971, Ser. No. 165,513
Int. Cl. B60r *19/08;* **F16f** *7/02, 7/12*
U.S. Cl. 267—140 **4 Claims**



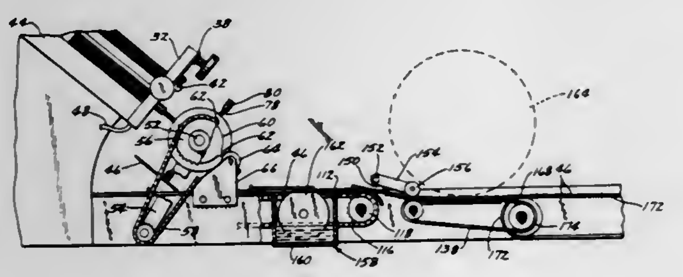
An impact energy absorbing device includes a pair of tubular members arranged for telescopic movement relative one another upon application of impact force thereto, a third tubular member attached to one of the pair of tubular members by annular elastomeric bushings press-fitted in radial compression between the walls of the respective tubular members, and a rotary motion producing mechanism in connection between the third tubular member and the other of the pair of tubular members to convert axial telescopic movement of the pair of tubular members into rotary movement of the third tubular member causing torsional energy storing as well as energy dissipating wind-up of the elastomeric bushings. Relief of the impact force permits the energy stored in the wound-up elastomeric bushings to restore the tubular members to their pre-impact relative positions in readiness for subsequent impacting.

3,718,327
PORTABLE VICE
Hector R. Nunez, 8618 S. Seventh Place, Phoenix, Ariz.
Filed Nov. 9, 1970, Ser. No. 87,920
Int. Cl. B25b *1/20*
U.S. Cl. 269—37 **8 Claims**



A portable vice is disclosed which is formed of a C-clamp that is adapted for rigid mounting to a structural member and is provided with auxiliary clamp means which cooperates with the C-clamp to supportingly position and hold a workpiece.

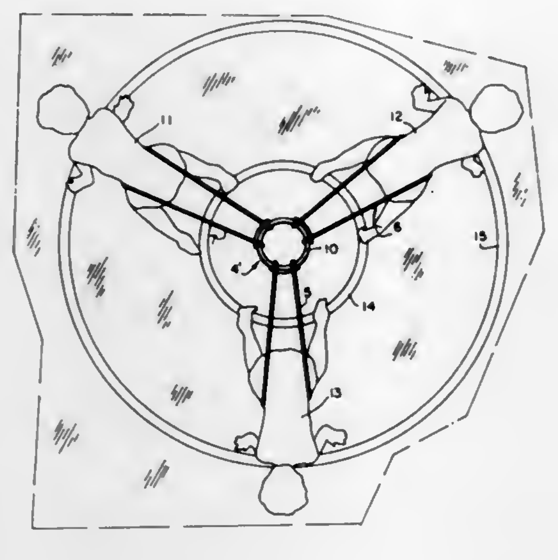
3,718,328
SHINGLING DEVICE
Alfred E. Comstock, Frontenac, Minn., assignor to Latta's Inc., Waterloo, Iowa
Filed Feb. 12, 1971, Ser. No. 115,009
Int. Cl. B65h *3/08, 3/30*
U.S. Cl. 271—20 **9 Claims**



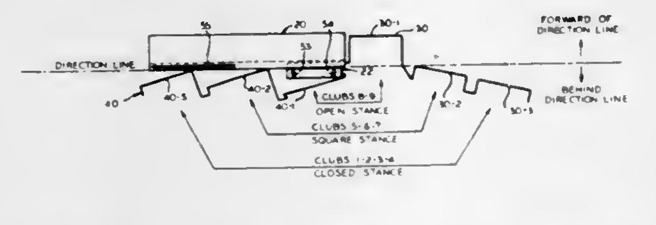
The shingling device includes a feeder, a rotating hub having grasping members thereon, a first conveyor, and a second conveyor adapted to move more slowly than the first conveyor. The grasping members are adapted to move by the feeder, grasp sheet members from said feeder, and deposit the sheet members on the first conveyor. The first conveyor carries the sheet members to the second conveyor and deposits them on the second conveyor. The sheet members stack up in shingle-like arrangement on the second conveyor because the second conveyor is moving substantially slower than the first conveyor.

3,718,329
ELASTIC AMUSEMENT OR EXERCISE DEVICE
William T. Sabo, 879 Kiowa Street, Allentown, Pa.
Filed Dec. 3, 1970, Ser. No. 94,787
Int. Cl. A63b *21/12, 21/28*
U.S. Cl. 273—1 R **4 Claims**

Three large rubber or other elastomeric bands in the form of three closed loops have respective ends tied together. In another form of the invention their ends are bound by a slip knot (or other knot) to a central flexible or rigid ring. For sport or for exercise, three players have at least a portion of their bodies (waist, feet, hands) engaged by the other respective ends of the bands. Each player then tries to pull away from the central connection and toward a specified goal so that he will be pulling against the pulls in opposing directions by the other players. The first player who is able to reach his goal wins.



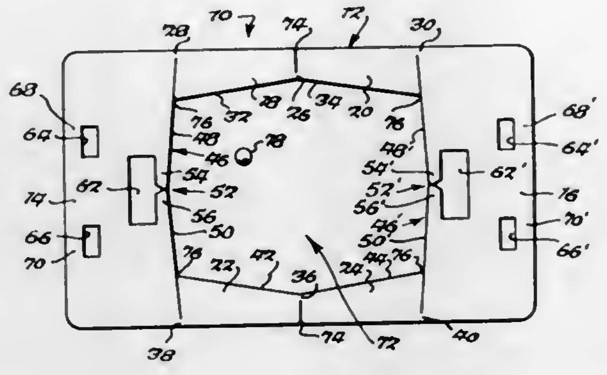
3,718,330
GOLF PRACTICE EQUIPMENT
Victor T. Gariti, 552 Burton Avenue, Highland Park, Ill.
Filed Feb. 16, 1972, Ser. No. 226,805
Int. Cl. A63b *69/36*
U.S. Cl. 273—187 R **10 Claims**



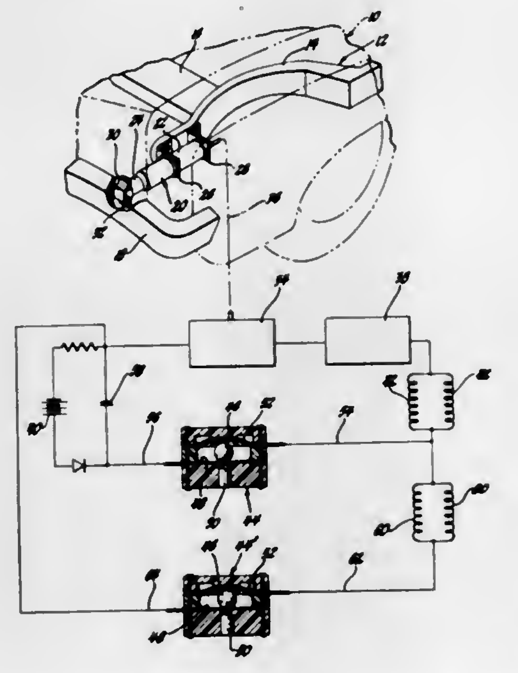
Equipment for practicing and recognizing golf stances and ball positioning includes two relatively adjustable members adapted to be placed on a floor or any outdoor surface, the members having extended therefrom a pair of foot guides for placement of the feet in a closed golf stance positioning or a square golf stance position or in an open golf stance position, the members being adjustable to properly locate the feet in accordance with the number of the club being used for practice or play. Also, the equipment may be employed to mark ball position relative to the foot off which the ball is played, and the ball position so marked may be used as a guide to properly locate the feet in relation to an actual ball lie.

3,718,331
GAME APPARATUS WITH AN ARTICULATED FRAME
Donald W. Scott, East Aurora, N.Y., assignor to Scott-Fisher Development Co., East Aurora, N.Y.
Filed Dec. 23, 1971, Ser. No. 211,352
Int. Cl. A63b *67/00;* **A63f** *9/00*
U.S. Cl. 273—119 R **8 Claims**

An articulated frame of polygonal configuration defining a playing area therein and comprising a plurality of pivotal links movable under the control of the player participants to engage and direct a movable object disposed in the playing area in a desired direction toward an opponent's goal.

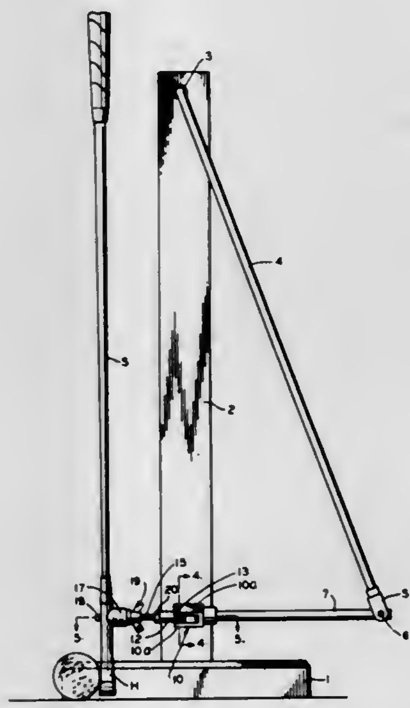


3,718,332
OCCUPANT RESTRAINT SYSTEM
Trevor O. Jones, Birmingham, Mich., assignor to General Motors Corporation, Detroit, Mich.
Filed Aug. 27, 1971, Ser. No. 175,576
Int. Cl. B60r *21/08*
U.S. Cl. 280—150 AB **8 Claims**



An inflatable occupant restraint cushion is inflated at predetermined levels in accordance with predetermined levels of intensity of impact forces applied to the vehicle. When the impact forces are at a low level, above a predetermined minimum and below a predetermined maximum, a low level system initiates low level inflation of the cushion at a predetermined rate greater than normal. When the impact forces exceed the predetermined maximum, a high level system initiates high level inflation of the cushion at the predetermined normal rate. The low level system includes an anticipatory sensor, such as a transducer actuated by the relative rate of movement of telescopic members of an energy absorbing bumper system, and a low level inertial sensor, mounted on the telescopic members or on the vehicle body, and connecting low level detonators across a source of power when the impact forces exceed the capability of the energy absorbing bumper system and there is the likelihood of the onset of vehicle deformation. The high level system includes the low level inertial sensor, and a high level inertial sensor, actuated by vehicle deformation resulting from impact forces exceeding the predetermined maximum, and connecting high level detonators across a source of power. The low level and high level detonators control selective actuation of flow control orifices to obtain the predetermined rates of inflation.

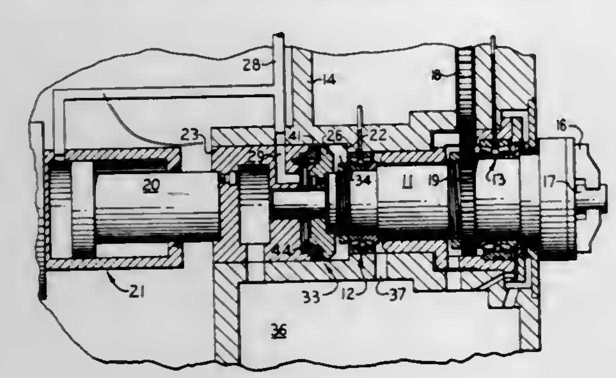
3,718,333
GOLF PUTTER GUIDE
Gerald C. Santoro, 11510 Winchester Drive, and Glenn R. Sibert, 11550 Winchester Drive, both of Chardon, Ohio
Filed Feb. 24, 1972, Ser. No. 228,966
Int. Cl. A63b *69/36*
U.S. Cl. 273—192 **10 Claims**



An upright pedestal supports a pendulum arm for swinging about a horizontal pivot. A generally horizontal link is connected at one of its ends to the lower end of the arm by a pivot parallel to the first pivot for swinging relative to, and with, the arm. A connecting device detachably connects a putter to the other end of the link in a manner such that the putter head is caused to rock about, and also transversely of, the longitudinal axis of the link concurrently and to follow a predetermined path of swing with its striking face in proper position transversely of the path during approach, at the instant of impact, and during the follow-through, portions of the swing. During the rearward swing from impact position, the device constrains the club head and shaft to rotate about the shaft axis in a manner to cause the striking face to rock through a progressively increasing angle to its impact position transversely across the path of swing in a direction away from the player, and thereby to "open up" the striking face and to cause the arms and wrists of the player to move more naturally during the backswing. During approach the action is reversed and the arm and wrist movements are yieldably biased to assure proper impact with the ball.

3,718,334
HYDROSTATIC BEARING SEAL ASSEMBLY
Jozef Kiwalle, Peoria, Ill., assignor to Production Technology Inc.
Continuation-in-part of Ser. No. 821,041, May 1, 1969, abandoned. This application March 18, 1971, Ser. No. 125,556
Int. Cl. F16j *15/16*
U.S. Cl. 277—27 **10 Claims**

A rotary seal assembly suitable for high pressure and high speed operation in a hydrostatic environment, including an axially fixed member defining an annular seal face, a relatively rotatable floating seal ring capable of being urged toward the fixed member and having a seal face opposite the seal face on the fixed member with mechanical bearings being employed between the seal ring and fixed member to maintain desired spacing between their seal faces. One embodiment includes a pair of such seal faces arranged on a seal ring and maintained in spaced apart relation from fixed seal faces by mechanical bearings.

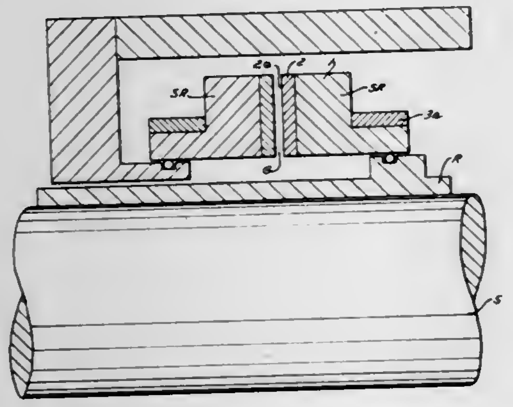


3,718,335

HYDROSTATIC RING SEAL CONSTRUCTION

Robert Dernedde, Frankenthal, Pfalz, and Heinz Freese, Mannheim, Germany, assignors to Klein, Schanzlin & Becker Aktiengesellschaft, Frankenthal, Pfalz, Germany

Filed July 30, 1970, Ser. No. 59,490
Int. Cl. F16j *15/16*
U.S. Cl. 277—26 **12 Claims**



A shaft is surrounded by and fixed with a first annular sealing member, and the latter in turn is surrounded by a pair of second annular sealing members. These second annular sealing members have juxtaposed axial sealing faces which define with one another a radial gap. Each of the second members includes an annular supporting portion, an annular sealing portion fixed with the supporting portion and having one of the axial sealing faces mentioned before, and an annular stabilizing portion. One of the portions is flanked at its opposite axial sides by the other two annular portions and is composed of a material the coefficient of thermal expansion of which is either larger or smaller than that of the other two annular portions.

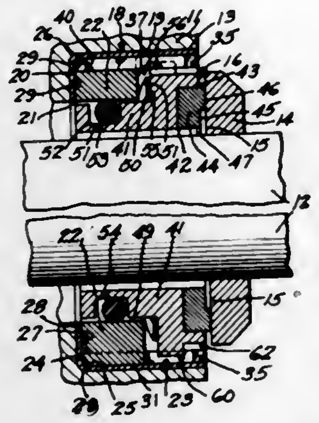
3,718,336

SHAFT SEAL AND METHOD OF MANUFACTURE

Richard H. Jackson, Downers Grove, and Dale J. Warner, Chicago, both of Ill., assignors to Gits Bros. Mfg. Co., Inc., Chicago, Ill.

Filed Jan. 22, 1971, Ser. No. 108,850
Int. Cl. F16j *9/00, 15/40*
U.S. Cl. 277—40 **1 Claim**

A mechanical shaft seal having a primary face seal and a secondary internal seal wherein the seal line of the secondary seal is balanced in axial alignment with the primary face seal. The seal is a take-apart seal having a housing with a brazed-in internal radial step, the housing receiving a stepped adapter having a circumferential groove therein for the secondary seal and an axial end face adapted to hold the primary face seal. The adapter is axially movable in the housing and is urged out of the housing by a spring.

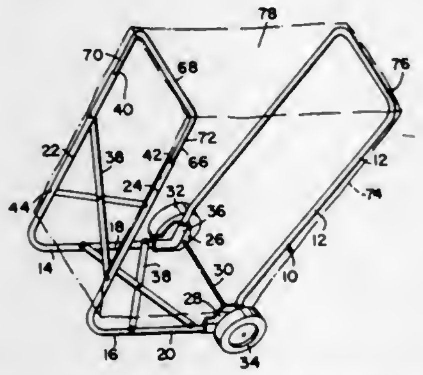


3,718,337

UNIVERSAL WHEELED CART

Mike Vosbikian, and James T. Vosbikian, both of Philadelphia, Pa., assignors to Hardware & Industrial Tool Co., Inc., Philadelphia, Pa.

Filed March 11, 1971, Ser. No. 76,105
Int. Cl. B62b *1/04*
U.S. Cl. 280—47.26 **4 Claims**



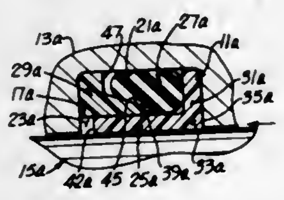
A lightweight wheeled cart comprising a generally U-shaped tubular body terminating forwardly in a pair of vertical receiving sockets and rearwardly in a U-shaped handle to define a carrying space therebetween, holding attachments adaptable for seating within the sockets and designed to connect to the sockets to permit the cart to be used with bags of various sizes.

3,718,338

SEALING ASSEMBLY

Henry A. Traub, Pacific Palisades, Calif., assignor to W. S. Shamban & Co., Los Angeles, Calif.

Filed Feb. 3, 1971, Ser. No. 112,274
Int. Cl. F16j *9/00, 15/32*
U.S. Cl. 277—165 **11 Claims**



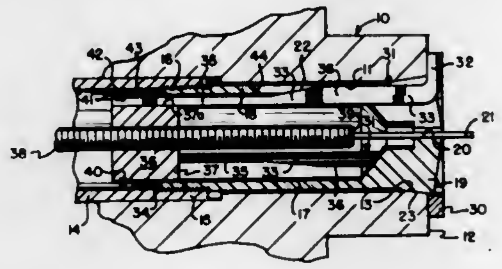
An assembly comprising a slipper ring having an axial segment and a radial segment, a resilient deformable seal ring surrounding at least a region of the axial segment, and an anti-extrusion ring. At least a segment of the anti-extrusion ring surrounds at least a portion of the axial segment. The seal ring is axially intermediate the anti-extrusion ring and the radial segment. The radial segment has a face adapted to confront fluid under pressure with the area of the face being greater than the area of the deformable seal which generally faces the fluid under pressure.

3,718,339

WORKPIECE STOP ASSEMBLY FOR CONTRACTING COLLET CHUCKS

Russell H. Dunham; Harry A. Moody, and Don H. Skahen, all of New Fairfield, Conn.; assignors to The Dunham Tool Company, Inc., New Fairfield, Conn.

Filed Oct. 16, 1970, Ser. No. 81,397. The portion of the term of this patent subsequent to Aug. 29, 1989, has been disclaimed.
Int. Cl. B23b *31/20*
U.S. Cl. 279—51 **12 Claims**



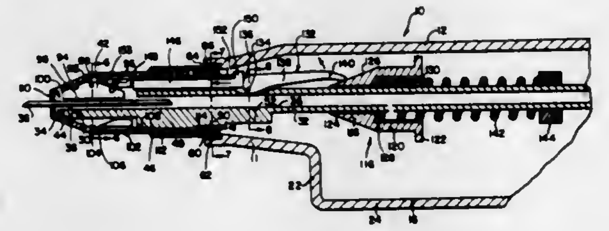
The application discloses a workpiece stop assembly for use in connection with contracting collet chucks. The stop assembly is received internally of the chuck and has a fixed position with respect to the spindle of the lathe or screw machine with which the chuck is associated. When a workpiece is received in the chuck, its inner end is seated against the workpiece stop before the collet chuck is actuated. The collet chuck is closed upon the workpiece by reason of an axial withdrawing movement of the chuck. Normally this can result in an undesirable axial shifting of the workpiece. However, the workpiece is prevented from axial displacement by reason of the workpiece stop, which remains fixed in its position while the chuck moves axially to grip the work. The workpiece stop assembly of the present invention is especially adapted for use in association with collet chucks intended for the gripping of workpieces of smaller diameter.

3,718,340

DRILL CHUCK

James M. Stewart, West Palm Beach, Fla., assignor to Stewart Research, Inc., West Palm Beach, Fla.

Filed Oct. 26, 1971, Ser. No. 192,528
Int. Cl. B23b *31/10*
U.S. Cl. 279—57 **16 Claims**



A drill chuck is provided having a chuck sleeve for controlling the position of a plurality of gripping jaws relative to a rotatable shaft for holding a workpiece and a camming mechanism for applying gripping force to the jaws. The camming mechanism comprises a hollow camming slide mounted on an intermediate portion of the shaft, cam means connected to the shaft forwardly of and engageable with the slide, resilient means for continuously urging the slide toward the forward end of the shaft to engage and actuate the cam means, and transmitting means connecting the jaws with the cam means to force the jaws inwardly and grip the workpiece at the forward end of the shaft upon actuation of the cam means.

ERRATUM

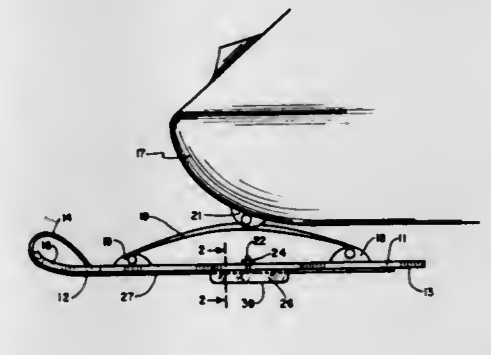
For Class 280—150 AB see:
Patent No. 3,718,332

3,718,341

SNOWMOBILE ANTI-SKID DEVICE

Russell C. Westberg, 10653 Johnson Road, Minneapolis, Minn.

Filed Sept. 17, 1971, Ser. No. 181,417
Int. Cl. B62b *17/00*
U.S. Cl. 280—28 **4 Claims**



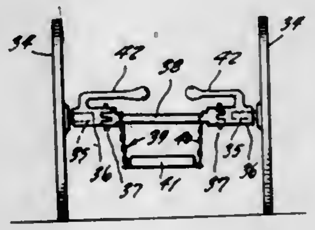
An anti-skid device for a snowmobile ski attached to the wear bar of each of the steering skis of the snowmobile to prevent the ski and snowmobile from sliding sideways in snow or on icy surfaces by preventing a lateral movement of the steering ski when the snowmobile is making a turn.

3,718,342

AMUSEMENT VEHICLE

Roy F. Freed, 3825 Airport Road, El Paso County, Colo.

Filed Nov. 13, 1970, Ser. No. 89,285
Int. Cl. B62k *9/11*
U.S. Cl. 280—87.01 **1 Claim**



The present invention relates generally to an amusement oriented vehicle comprising a pair of parallel spaced-apart wheels interconnected by a spindle about which the wheels rotate as an axis and including seat means carried by the spindle, said seat means being disposed between the two wheels and adapted to seat and carry a person.

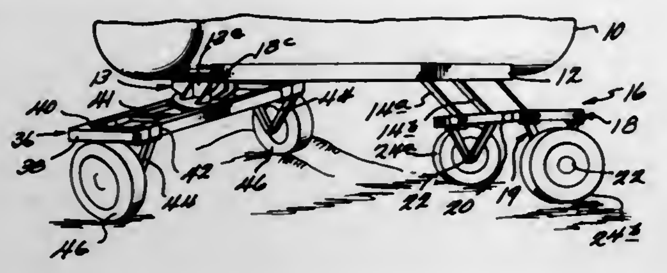
3,718,343

AMMONIA TRAILER IMPROVEMENTS

Franky D. Mills, Plainview, Tex., assignor to The Hamby Company, Plainview, Tex.

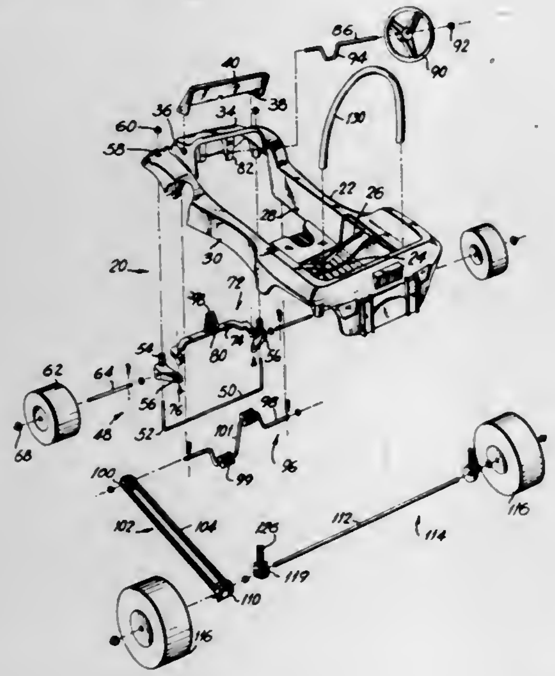
Filed Apr. 14, 1971, Ser. No. 134,019
Int. Cl. B62d *53/08*
U.S. Cl. 280—116 **3 Claims**

The front wheels of a trailer are carried by a rigid frame which is attached to the front end of the trailer frame by a fifth wheel unit which permits steering movement of the front wheel frame relative to the trailer frame. The front wheel frame is pivotable relative to the fifth wheel unit for tilting movement about an axis which is parallel to the direction of front wheel travel.



3,718,344
OCCUPANT-PROPELLED VEHICLE

Raymond J. Lohr, and Calvin S. Cook, both of Erie, Pa., assignors to Louis Marx & Co., New York, N.Y.
Filed Aug. 3, 1970, Ser. No. 60,540
Int. Cl. B62m *1/02*
U.S. Cl. 280—261 **7 Claims**

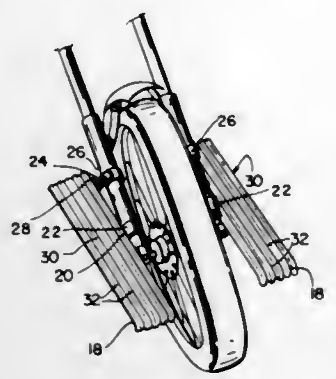


A miniature occupant-propelled surface vehicle. The vehicle includes a chassis formed of a body of sheet material which includes a seat as well as front and rear pairs of tubular portions and an intermediate pair of tubular portions. A front wheel assembly is operatively connected with the chassis at its front tubular portions, a rear wheel assembly is operatively connected with the chassis at its rear tubular portions, and an operator-actuated drive means is operatively connected with the chassis at its intermediate tubular portions. A transmission extends from the operator-actuated drive means to the rear wheel assembly for rotating the latter, and this transmission is situated at an elevation at least as high as the seat of the chassis. The chassis has an inner side wall portion extending upwardly from the seat at one side thereof and an outer side wall portion which is spaced from this inner side wall portion to define therewith a space through which the transmission extends to the rear wheel assembly.

3,718,345
STABILIZING APPARATUS

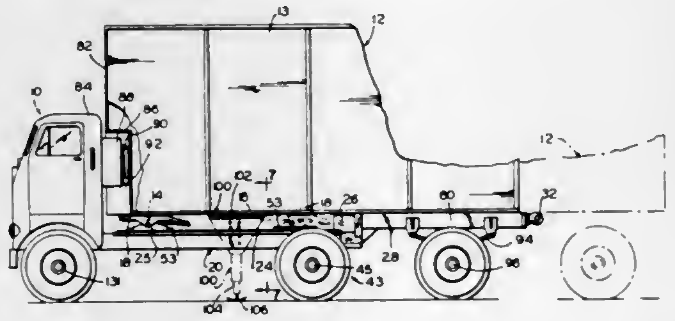
Robert D. Bringman, 18600 Burbank Boulevard, Apt. 204, Tarzana, Calif.
Filed Dec. 28, 1970, Ser. No. 101,689
Int. Cl. B62h *7/00*
U.S. Cl. 280—289 **15 Claims**

Stabilizing apparatus for the front end of a motorcycle has a pair of forwardly declining fins adjustably attached to the front forks. In another embodiment, a single fin is supported over and spaced from the front wheel. Pressure of relative wind on the fins produces downward force on the forks which tends to hold down the front end of a motorcycle.



3,718,346
TRUCK COMPRISING TRACTOR AND SEMI-TRAILER

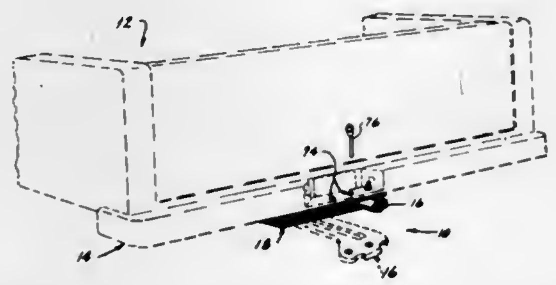
Kenneth W. Self; Norman B. Chew, both of Lake Oswego, Oreg., and Bill I. Twyman, Vancouver, Wash., assignors to Freightliner Corporation, Portland, Oreg.
Filed Aug. 27, 1970, Ser. No. 67,398
Int. Cl. B62d *53/00*
U.S. Cl. 280—415 B **11 Claims**



A vehicular assembly comprising a tractor and a semitrailer so detachably coupled together that they act as a unit, wherein the assembly has three zones of support, one of which is provided by a zero rate suspension means and the other two of which are provided by variable rate suspension means, whereby to maintain reasonably constant a desired pattern of load distribution between the three zones.

3,718,347
ADJUSTABLE SWING HITCH FOR VEHICLES

Frederick W. Mann, Waterville, Kans.
Filed Nov. 16, 1970, Ser. No. 89,858
Int. Cl. B60d *1/00*
U.S. Cl. 280—467 **5 Claims**



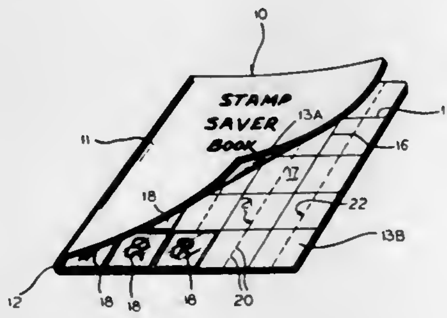
A hitch for vehicles includes a mounting and a hitch pivotal, extendable and translatable relative the mounting. A resilient lock secures the hitch. More particularly the hitch is adapted to mount on the rear of a vehicle with a hitch that is adapted to be translatably positionable on the mounting, and adapted to be rotatably and extendably positionable therefrom to be coupled with a trailer vehicle, or the like, then retracted to a locked position.

ERRATUM

For Class 280—47.26 see:
Patent No. 3,718,337

3,718,348
TRADING STAMP SAVER BOOKS

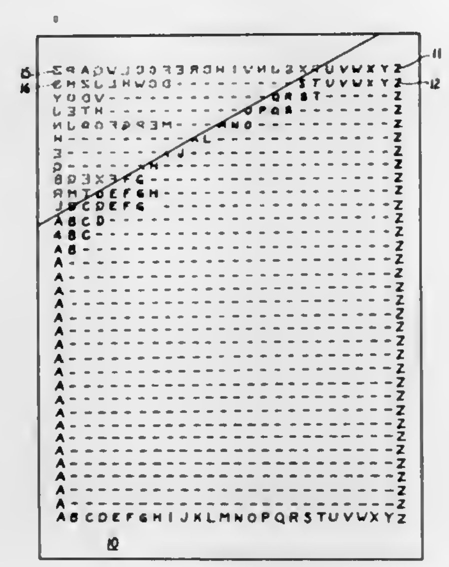
Joseph V. Bellanca, Tallahassee, Fla., assignor to McCain Manufacturing Corp., Chicago, Ill.
Filed April 1, 1971, Ser. No. 130,408
Int. Cl. B42d *15/00*
U.S. Cl. 283—8 **3 Claims**



A trading stamp saver book is characterized by a cover and folded signatures joined by glue. The signatures afford interior pages having spaces for the stamps. The pages are weakened by scores, whereby removal of the cover or a signature visibly mars the book and whereby the pages may be rent along the score lines at the redemption center to so mutilate the book and its contents as to prevent swindle.

3,718,349
CIPHER DEVICE AND METHOD

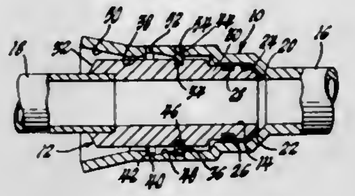
Albert W. Small, 5803 Greentree Road, Bethesda, Md. 20014
Filed Apr. 6, 1954, Ser. No. 421,459
Int. Cl. G09c *1/02, 5/00*
U.S. Cl. 283—17 **4 Claims**



1. A cipher device comprising a sheet having obverse and reverse surfaces, a plurality of plain text alphabets comprising characters on one surface thereof and a plurality of cipher test alphabets comprising characters on the other surface thereof each character of each alphabet on said one surface having a substantially registering character of an alphabet on said other surface.

3,718,350
SNAP RING COUPLING

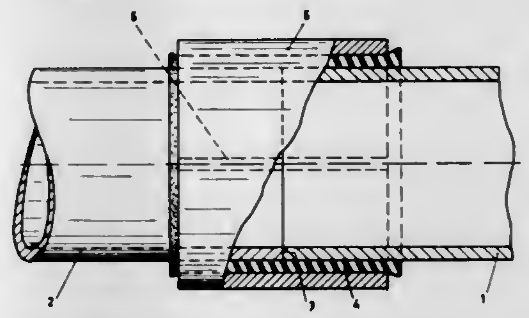
Lee F. Klein, North Tonawanda, N.Y., assignor to General Motors Corporation, Detroit, Mich.
Filed Sept. 27, 1971, Ser. No. 183,964
Int. Cl. F16l *21/00*
U.S. Cl. 285—39 **4 Claims**



A quick connect, snap ring coupling for conduits for fluids under pressure embodies a socket and plug which is inserted into the socket and which is in sealing relation with the socket when fully inserted therein. The plug carries a split retaining ring which is engagable in spaced apart annular shoulders in the socket for axial retention of the plug relative to the socket. The arrangement of the annular shoulders within the socket is such as to allow the plug to move axially outwardly with respect to a portion of the socket to an unsealed position to bleed the conduit of pressurized fluid after which the plug can be completely released from the socket.

3,718,351
PIPE FITTING

Hermanus Bakkerus, Voorburg, Netherlands, assignor to Nederlandse Organisatie voor Toegepast-Natuurwetenschappelijk Onderzoek ten behoeve van Nijverheid, Handel en Verkeer, The Hague, Netherlands
Filed Aug. 16, 1971, Ser. No. 171,845
Claims priority, application Netherlands, Aug. 20, 1970, 7012379
Int. Cl. F16l *21/06*
U.S. Cl. 285—236 **3 Claims**

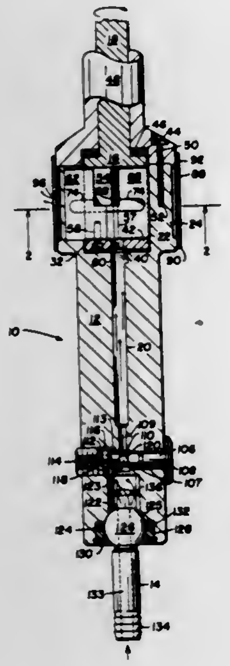


A pipe joint for connecting abutting ends of cast iron pipes comprising in a flexible sleeve, such as of rubber which is surrounded by one split socket, under stress, in particular out of cast iron, or a material that corresponds with its elasticity and has a resistance against corrosion that is comparable with that of the pipes to be connected.

3,718,352
BALL JOINT AIR SUPPLY CONNECTION

Oren Van Northcutt, Point, Tex., assignor to Dal-Air Tool Company, Point, Tex.
Division of Ser. No. 639,767, May 19, 1967, Pat. No. 3,498,186. This application Dec. 8, 1969, Ser. No. 882,904
Int. Cl. F16l *27/04*
U.S. Cl. 285—261 **2 Claims**

An air motor including an outer casing having a three lobed chamber defined in one end thereof which rotatably receives a cylindrical rotor. Air under pressure is fed through a ball joint connection inlet into one end of the chamber. Two pairs of perpendicularly disposed vanes are slidably disposed in slots in the rotor and radially extend from the rotor into unoccupied outer portions of the three lobed chamber. The vanes have relieved portions along the sides thereof to provide, along with the slots in the rotor, communication between the air inlet and the outer portions of the three-lobed chamber. Passage of air under pressure through the air inlet into the outer portions of the chamber acts upon the vanes to cause rotation of the rotor. A valve may be included in the outer casing to vary the passage of air in order to control the rotation speed of the rotor.



3,718,353
SUPPORT ARRANGEMENT

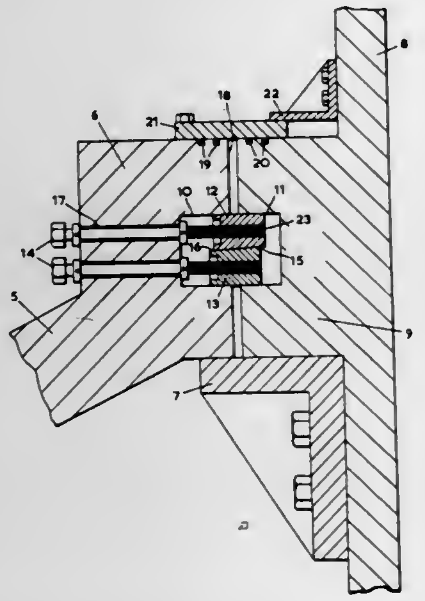
Anthreas Nicholas Charcharos, Whetstone, Leicestershire, England, assignor to British Nuclear Design Construction Limited, Leicestershire, England

Filed Oct. 23, 1968, Ser. No. 769,957

Claims priority, application Great Britain, Nov. 16, 1967, 52,180/67

Int. Cl. F16b *9/00*

U.S. Cl. 287—20.3 **2 Claims**



The invention provides a support arrangement for locating boiler or other service units in vertical bores in the pressure vessel wall of a nuclear reactor. The arrangement comprises two co-operating flanges (6) and (9) provided with grooves (10) and (11) respectively which are brought into alignment. The groove (10) houses pairs of wedge member segments (12), (13), which are moved radially outwardly of their groove by jacking screws (14) to a wedging position. Such an arrangement permits sealing between the unit and bore to be effected from the mouth end of the bore, thus permitting the seal to be readily renewed or serviced.

3,718,354
APPARATUS FOR SECTIONALLY DELIVERING A WEB FROM A STORAGE ROLL

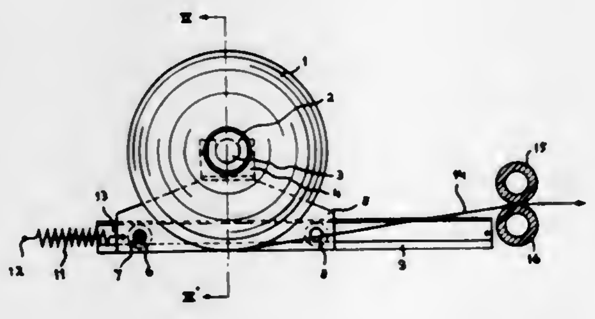
Conrardus Johannes Gerardus Lemmen, Baexem, Netherlands, assignor to O'ce-Vander Grinten N.V. Venlo, Netherlands

Filed March 9, 1971, Ser. No. 122,351

Claims priority, application Netherlands, March 10, 1970, 7003386

Int. Cl. B65h *23/08*

U.S. Cl. 242—75 **6 Claims**



An apparatus for delivering a web intermittently from a web storage roll so that successive sections of the web may be cut into sheets for use as needed is made to enable fast operation without over-tensioning the web at the start or over-accumulating it at the end of a web feeding operation, by providing a carriage on which the roll is rotatably supported and which is displaceable horizontally relative to the web feeding means, as by being mounted through wheels for free movement along horizontal rails, and applying to the carriage, as by springs or a special counterweight system, a force urging it in the direction away from the web-feeding means so as to counteract yieldably the tension applied to the web leading from the roll when the feeding means is operated. That tension displaces the carriage and roll toward the web feeding means until, by accompanying increases of the counteracting force and the unwinding rotation of the roll, an equilibrium position is reached; and when the web feeding is stopped the force applied to the carriage moves it and the roll back to their idle position.

3,718,355
SEAL

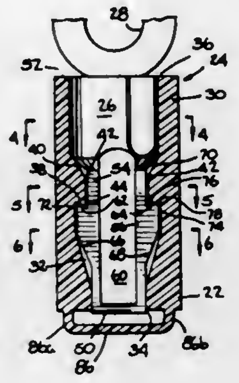
Richard S. Canter, 20 Clent Road, Great Neck, N.Y.

Continuation-in-part of Ser. No. 97,894, Dec. 14, 1970. This application Aug. 27, 1971, Ser. No. 175,669

Int. Cl. B65d *63/00*

U.S. Cl. 292—321 **16 Claims**

A tamper-proof seal comprising a strap-like body portion generally having sealing means at the ends of the body portion so that the body portion can be placed through a hasp or other locking means to provide a locking element. The body portion is then looped around and fastened by the sealing means at each end thereof to make a permanent tamper-proof seal. The sealing means comprises a socket portion and a plug portion having a frame construction. There is a lateral locking surface in each portion which provides a permanent seal, and there is provision by means of a resilient coupling to make the seal by deforming the lateral locking surface of the plug within the plug frame.



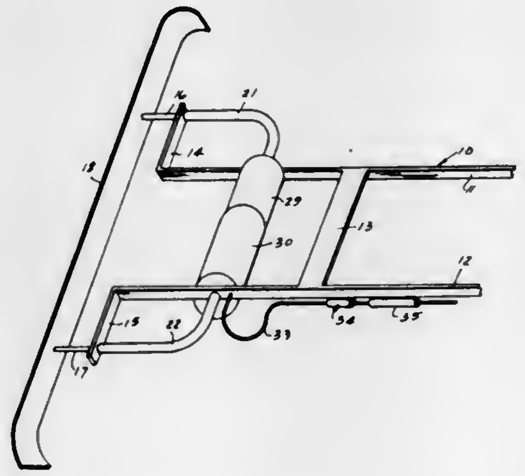
3,718,356
BUMPER AND BRAKE ACTUATOR ASSEMBLY

Aristides A. Gabella, 103 Evergreen Drive, La Porte, Ind.

Filed Oct. 6, 1971, Ser. No. 186,866

Int. Cl. B60r *19/02;* **B60t** *7/12;* **B61f** *19/04*

U.S. Cl. 293—5 **8 Claims**



An impact absorbing bumper assembly in which a bumper is combined with a cylinder which is arranged to be secured to the chassis of a vehicle, the cylinder having a piston arranged to reciprocate therein. One shaft is secured to one end of the cylinder and a second shaft is secured to the piston. A pair of tubular members is provided, each having right angle bends therein. One of the tubular members receives the free end of the one shaft and the other of the tubular members receives the free end of the other shaft. A plurality of discrete balls is positioned in each of the tubular members between the rods and the free ends of the shaft to transmit impact forces from the bumper to the shafts. The piston arrangement is such that it includes a variable orifice means to reduce the amount of fluid passing through the piston as the displacement of the piston within the cylinder increases. The bumper assembly may be combined with the braking system of the vehicle to apply pressurized fluid thereto and thereby apply the brakes upon impact.

3,718,357
RETRACTABLE SIDE BUMPER GUARD

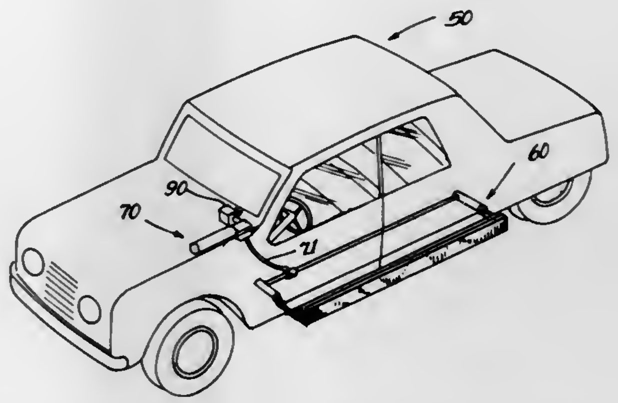
Adelbert F. Hertzell, 5024 Lee Street, Skokie, Ill.

Filed Oct. 26, 1971, Ser. No. 192,233

Int. Cl. B60r *19/04, 21/02;* **B61f** *19/04*

U.S. Cl. 293—9 **3 Claims**

A bumper guard assembly apparatus to be attached to an automobile comprising a bumper guard and means to move the bumper guard in one direction when the apparatus is in use and in an opposite direction when the apparatus is not in use, whereby the same need not be completely detached from the automobile at any time.



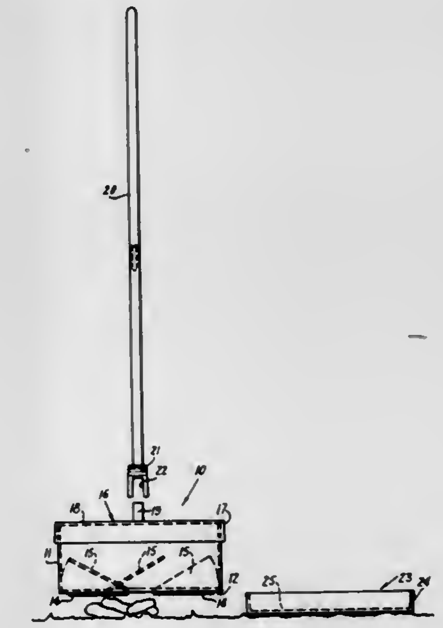
3,718,358
SANITARY COLLECTOR

Thaddeus Ayers, 11 Franklin St., Elmont, N.Y. 11003

Filed Jan. 25, 1972, Ser. No. 220,578

Int. Cl. A47f *13/06*

U.S. Cl. 294—19 R **5 Claims**



A sanitary collector for gathering animal excrement into a disposable container to permit it to be discarded. The disposable container is provided with vanes having projecting scraping edges for scraping the excrement from the ground or other surface upon revolving of the container. A detachable handle is provided for operating the container and a bottom cover is provided for closing the container with the excrement therein prior to disposing of the container.

3,718,359
GAFF HOOK

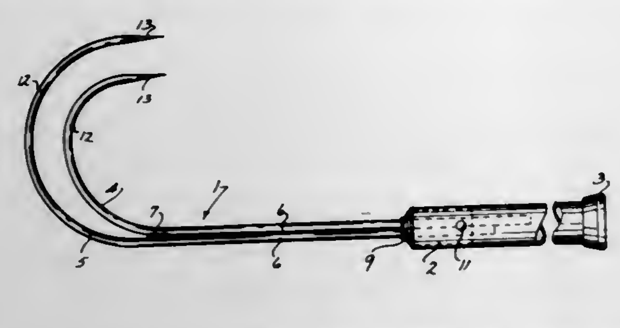
James W. Omdoll, Jr., P.O. Box 93, Palmyra, Wis.

Filed Nov. 30, 1970, Ser. No. 93,580

Int. Cl. B65g *7/12*

U.S. Cl. 294—26 **2 Claims**

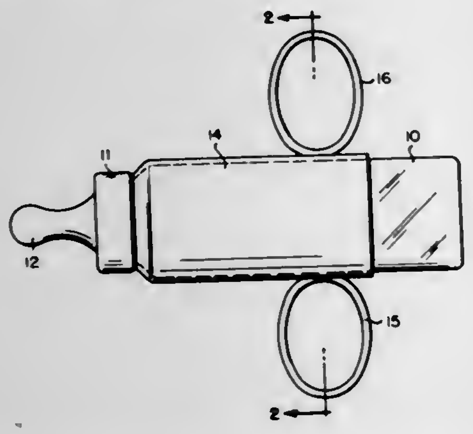
A gaff hook including a pair of tines with the tines having generally straight shanks which are secured together and mounted within a hollow sealed handle. The outer end of each tine is curved and terminates in a pointed tip. The curved ends of the tines lie in a common plane and the radius of curvature of one tine is different from that of the other tine so that the pointed tips are in spaced parallel relation, which enables the



tips to easily penetrate into the fish and yet provides stability to prevent twisting of the fish on the gaff hook.

3,718,360
BABY BOTTLE HOLDER

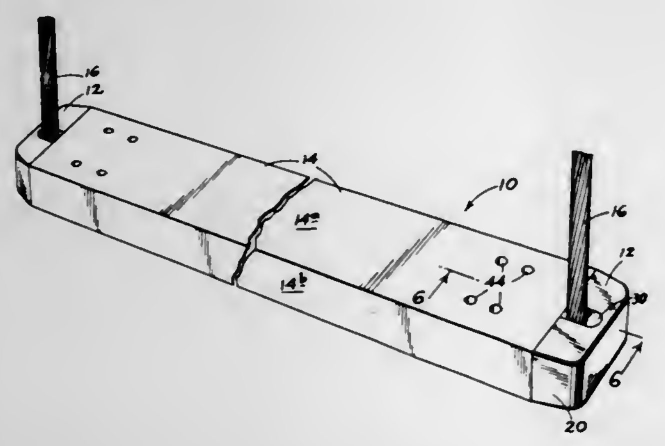
Frances M. Knutzen, Rt. 1, Box 1800, Port Richey, Fla.
Filed March 15, 1971, Ser. No. 124,223
Int. Cl. B61j *9/06*
U.S. Cl. 294—27 H **2 Claims**



This baby bottle holder comprises a sleeve in which the bottle fits, and having handles at both sides adjacent the bottom of the holder to provide balance when a bottle is in the holder. The handles are open to provide grips but the openings are not so large that a baby can slip its hands therethrough.

3,718,361
BEAM END CAP

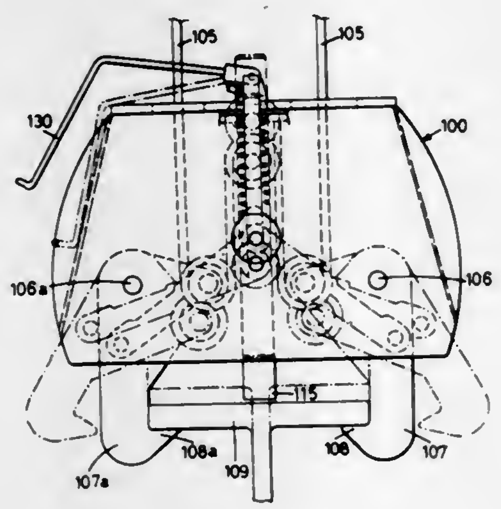
Eugene M. Marcotte, Vancouver, Wash., assignor to West Coast Rope and Rigging of Portland, Inc., Portland, Oreg.
Filed June 11, 1971, Ser. No. 152,151
Int. Cl. B66c *1/16*
U.S. Cl. 294—67 E **5 Claims**



An end cap for a load-handling device including an elongated beam and a cable extending along the underside of the beam and out from an end of the beam. The end cap secures the cable and protects the end of the beam. The cap includes a block member secured to the beam having one portion which fits against the underside of the beam and another portion which covers the end of the beam and is disposed outwardly therefrom. A cable-receiving groove is formed in the top of the block member and a rounded clamping member overlies the groove to clamp a cable in the groove and to train such cable in an arc around the end of the beam.

3,718,362
HOIST APPARATUS

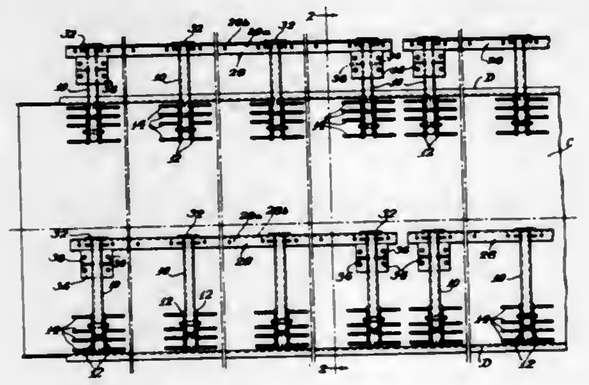
Erich Dagobert Butz, Kahlweg 46, 605 Offenbach am Main, Germany
Filed May 26, 1970, Ser. No. 40,572
Int. Cl. B66c *1/64*
U.S. Cl. 294—112 **11 Claims**



Invention relates to a lift hoist including automatically closing claws when the load is contacted, the claws are pivoted on a base plate connected to a suspension device and co-operating with a differential device, said differential device being attached to the claws and operatively associated to a displaceable piston contacting the load.

3,718,363
MODULAR HOME RACK FOR VEHICLES

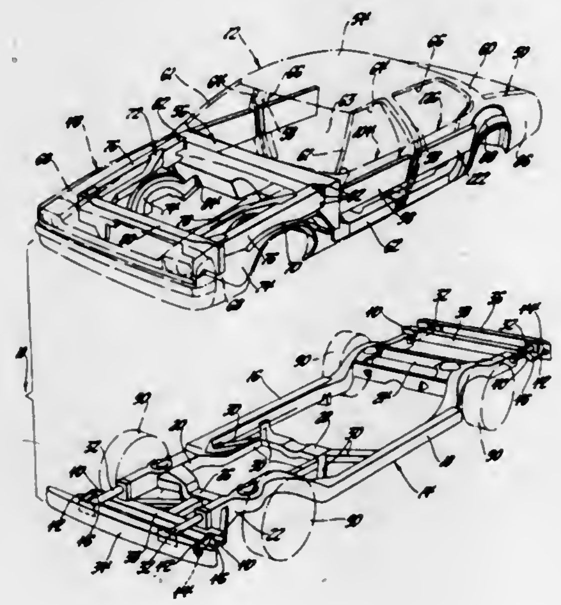
Barry E. Dupre, Lansing, Ill., assignor to North American Car Corporation
Filed July 2, 1971, Ser. No. 159,218
Int. Cl. B60p *1/00*
U.S. Cl. 296—14 **8 Claims**



A plurality of laterally extensible-contractible load supporting rack assemblies, positioned along each of the longitudinally marginal portions of a deck of a vehicle. The assemblies being arranged in sets or groups and each group being movable as a unit and the groups being adapted in extended position to project a substantial distance laterally of the vehicle and adapted to support one or more modular building units thereon for transporting the same.

3,718,364
VEHICLE BODY AND FRAME CONSTRUCTION

Raymond G. Fischer, Birmingham; Marvin H. Henckel, Farmington; Walter V. Corteg, Utica, and Gerald E. Frig, Sterling Heights, all of Mich., assignors to General Motors Corporation, Detroit, Mich.
Filed Oct. 26, 1971, Ser. No. 192,046
Int. Cl. B62d *21/00*
U.S. Cl. 296—28 R **3 Claims**

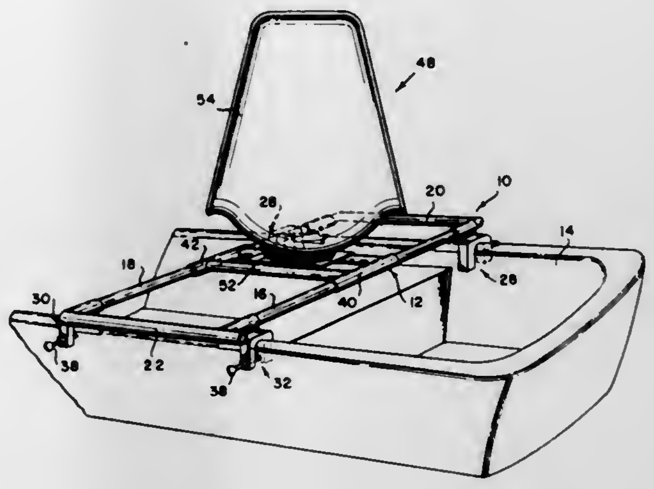


An improved frame and body construction for an automobile type vehicle including a frame having a pair of longitudinal horns adapted for energy absorbing deformation, a body front sheet metal portion adapted for energy absorbing collapse, a rigid cowl structure rearward of the front sheet metal portion, a pair of side door impact beams having substantial column rigidity pivotally supported on respective ones of the cowl and a center pillar of the body, and a rear sheet metal portion of the body defining a structurally rigid unit rearward of the passenger compartment. In a relatively high speed collision situation the impact forces on the vehicle are divided between the frame and the sheet metal in a predetermined proportion and distributed above and below the vehicle center of gravity to suppress pitching, the forces on the sheet metal being transferred to the cowl and by the impact beams to the rear sheet metal portion thereby to prevent rearward displacement of the cowl into the passenger compartment.

3,718,365
SEAT ATTACHMENT FOR BOATS

Curtis E. Gibson, Rte. 6, Box 446,
Natchez, Miss. 39120
Filed Mar. 17, 1971, Ser. No. 125,180
Int. Cl. A47c *1/00*
U.S. Cl. 297—349 **4 Claims**

A seat attachment for boats which includes a rectangular, tubular main frame having clamp means for detachably securing the frame to the sides of the boat. A sub-frame carrying a seat is sleevedly engaged with opposed



sides of the tubular main frame to permit sliding adjustment of the sub-frame longitudinally of the main frame.

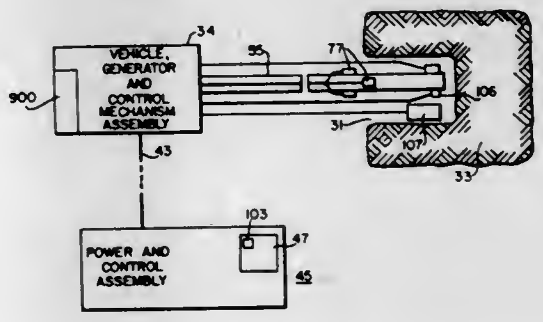
3,718,366
METHOD FOR CREATING PERMEABILITY IN SULFUR DEPOSITS

William L. Hill, Richardson, Tex., assignor to Continental Oil Company, Ponca City, Okla.
Filed Oct. 7, 1970, Ser. No. 78,977
Int. Cl. E21b *43/26, 43/28*
U.S. Cl. 299—4 **5 Claims**

Permeability of a subterranean sulfur containing formation is increased and production of sulfur by underground fusion mining of sulfur (wherein hot water is injected into the sulfur containing formation, molten sulfur is produced from a lower level, and excess water is removed through an outlying bleed well) is improved according to the method of this invention by fracturing between a production well and a water bleed well, injecting a fluid explosive into the fracture, and detonating the explosive.

3,718,367
CORPUSCULAR BEAM IN MINING AND EXCAVATION

Berthold W. Schumacher, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.
Filed Nov. 6, 1970, Ser. No. 87,474
Int. Cl. E21c *37/18*
U.S. Cl. 299—14 **7 Claims**


VEHICLE, GENERATOR AND CONTROL MECHANISM ASSEMBLY
POWER AND CONTROL ASSEMBLY
34
55
77
900
106
31
107
33
53
103
47
45

There is disclosed a method and apparatus for mining and excavating through rocky terrain without a mechanical tool or machine which must be made rugged enough to withstand the forces and impacts necessary to break rocks. The excavation is carried out with an electron beam which is projected against the rock. The beam is conducted from a generator through a long tube, which may be 20 feet long or more, and is emitted at the end of the tube. The generator and tube may be mounted on the turret of a vehicle so that the tube can swing in an arc of large angle in the plane of a rocky seam or at any angle transverse to this plane. The beam bores an opening in which the vehicle moves which may be in the direction of and/or at an angle to the beam.

There is also disclosed excavating apparatus, for example an auger, including a beam generator for breaking up the terrain in which the excavation takes place ahead of the pick-up edge of the auger.

3,718,368
PLOUGH DRIVE UNIT FOR LONGWALL MINING

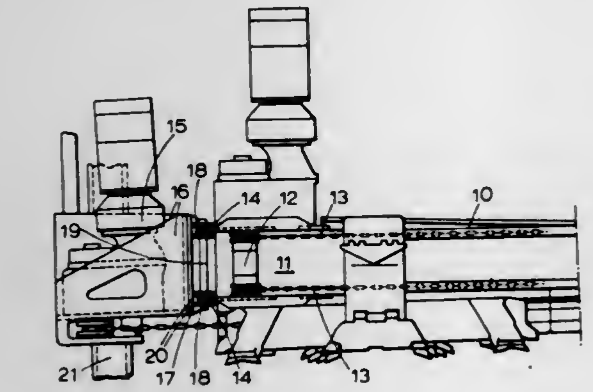
Christoph Rassmann, 4628 Lunen; Willy Heyer, 463 Bochum-Gerthe, and Dieter Stuckmann, 4714 Selm, all of Germany, assignors to Gewerkschaft Eisenhutte Westphalia, Westfalia, Germany

Filed Sept. 8, 1971, Ser. No. 178,615

Claims priority, application Germany, Nov. 14, 1970, G 70 42 204.7

Int. Cl. E21c *27/35*

U.S. Cl. 299—34 **5 Claims**



A mineral mining installation with a scraper chain conveyor guiding a plough alongside a mineral face. The conveyor has a drive station at one end having a frame with side wall members accommodating a drive drum for the chains of the conveyor. The side wall members are received between apertured vertical webs forming part of a further frame supporting the plough drive means. The side wall members and the webs are detachably interconnected with bolts. The further frame is generally L-shaped with a vertical wall adjoining the webs and a horizontal wall bearing the plough drive means and being slidably guided on a bracing beam.

3,718,369
CUTTING DRUMS FOR MINERAL MINING MACHINES

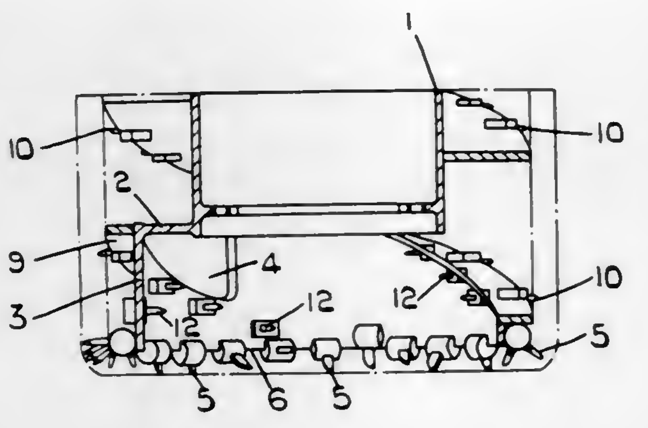
Forrest Symington Anderson, Carluke, Scotland, assignor to Anderson Mavor Limited, Lanarkshire, Scotland

Filed Sept. 13, 1971, Ser. No. 179,663

Int. Cl. E21c *27/24*

U.S. Cl. 299—59 **5 Claims**

The invention relates to cutting drums for mineral mining machines, such as the type of machine used in mineral mining to drive a roadway and to cut a stable for advancing a longwall face. The drum which is mounted on a mineral mining machine for rotation on an axis normal to the direction of movement of the machine along a mineral face comprises a hub portion and a hollow cylindrical portion extending from a flange on the end of the hub portion, the cylindrical portion having cutting picks mounted around the free end portion thereof and series of cutter picks mounted in the form of at least one helix internally of the cylindrical portion which forms a trepanner cutter and at least one helical flange with cutting picks thereon extending radially from the free end of the cylindrical portion to the opposite end of the hub portion. The drum is movable in an arc from a lowered position to a raised position and movable into the mineral face to cut a circle of mineral by a trepanner action and movable along the face to cut mineral from the face.



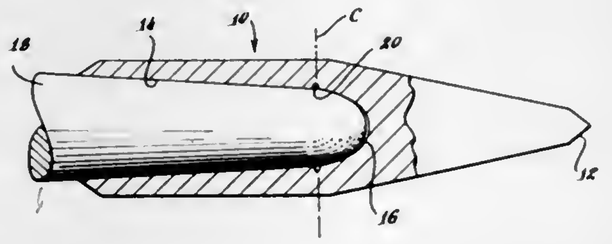
3,718,370
INTERCHANGEABLE JACK HAMMER TIPS

Richard John Caserta, Trumbull, Conn., assignor to James Caserta

Filed Mar. 23, 1971, Ser. No. 127,109

Int. Cl. E21c *37/26*

U.S. Cl. 299—91 **3 Claims**



The life of jack hammer interchangeable tips having smooth wall shank receiving sockets in their upper ends is greatly increased by interrupting the straight line of the inner surface of the wall defining the socket at a point adjacent the lower end of the shank after it has been fully inserted in the socket of a removable tip.

3,718,371
FLUID BEARING TRACK STRUCTURE AND COMPONENTS THEREOF

Cecil A. Lasch, Jr., Cupertino, Calif., assignor to Industrial Modular Systems Corporation, Santa Clara, Calif.

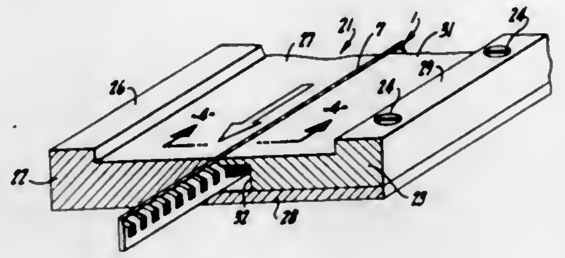
Filed Aug. 25, 1971, Ser. No. 174,808

Int. Cl. B65g *53/04*

U.S. Cl. 302—31 **19 Claims**

An improved fluid bearing track structure for supporting and transporting articles on a fluid bearing, components of such track structure, and a method for fabricating such track structure. The track structure includes as a novel component thereof a flexible insert strip having directional fluid passages therein for directing a supporting fluid against an article to be transported over the upper surface of the track structure. The insert strip is frictionally or otherwise held in place in the track structure with its upper edge flush with the upper surface of the track structure so that supporting fluid emanating from the fluid passages therein may support and move successive articles along the track.

The flexible characteristics of the insert strip permit the track structure to be formed with curved or other non-straight configurations. The track also has bi-directional article movement capability. In its preferred embodiment the insert strip is produced by a chemical etching procedure which allows elongated lengths of insert strips to be inexpensively and accurately produced from various materials.



3,718,372
DOUBLE CIRCUIT BRAKE ARRANGEMENT FOR TRUCKS FOR DRAWING TRAILERS BRAKED BY PRESSURIZED AIR

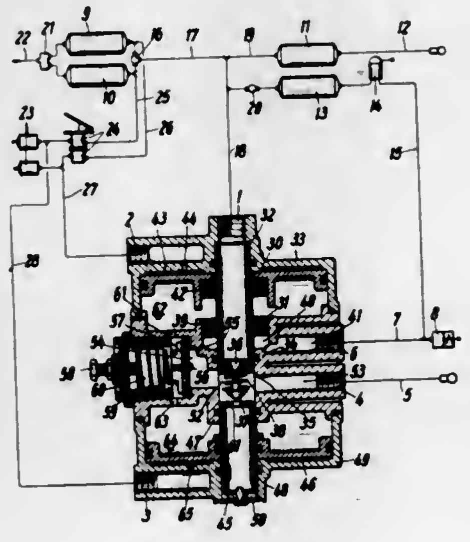
Hans Gruner and Heinz Nicolay, Heidelberg, Germany, assignors to Graubremse G.m.b.H., Heidelberg, Germany

Filed Mar. 12, 1971, Ser. No. 123,627

Claims priority, application Germany, Mar. 14, 1970, P 20 12 204.7

Int. Cl. B60t *7/20, 13/36*

U.S. Cl. 303—7 **7 Claims**



A two-circuit brake arrangement for trucks for drawing of trailers braked by pressurized air, which comprises two brake circuits, and a common pressure safety relay. The two brake circuits are connected with the common pressure safety relay. A common housing is provided and two oppositely operating step piston arrangements are disposed in the common housing. The step piston arrangements have cylinders. A central valve chamber includes a connection for a brake conduit for a trailer. The cylinders extend into the central valve chamber. The step pistons are hollow. One of the step pistons has an inlet seat and the other of the step pistons has an outlet seat within the range of the valve chamber for a spring biased double valve body. The double valve body closes the inlet seat. The step piston carrying the inlet seat defines inner spaces, and the inner space of the step piston carries the inlet seat in communication with a storage air connection. The inner space of the other step piston is in open communication with an airing connection. The cylinders receive the great part of the step piston carrying each a brake circuit connection on the outside of the pistons and are in communication on the other side with the valve chamber by means of a passage. Another spring-biased valve separates the part of the valve chamber receiving the double valve body and the brake conduit connection from the part of the valve chamber terminates the passages leading to the cylinders.

3,718,373
ARRANGEMENT FOR CONTROLLING THE BRAKE SYSTEMS OF TRAILERS OR THE LIKE

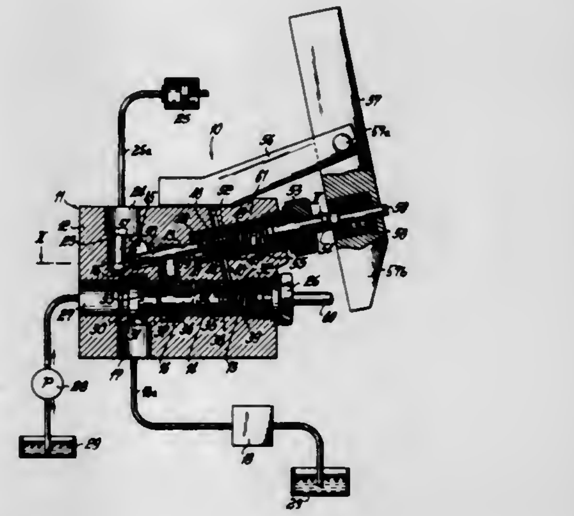
Friedrich Wilhelm Höfer, Hofingen, Germany, assignor to Robert Bosch G.m.b.H., Stuttgart, Germany

Filed Nov. 15, 1971, Ser. No. 198,719

Claims priority, application Germany, Nov. 13, 1970, P 20 55 801.4–21

Int. Cl. B65t *13/00*

U.S. Cl. 303—7 **26 Claims**



An arrangement for controlling the brake system of a trailer from the towing vehicle and for simultaneously controlling the flow of a pressurized fluid to one or more consumers utilizes a valve assembly having a housing for a shuttle which is movable between several positions to thereby regulate the flow of pressurized fluid from an inlet to a first outlet for one or more consumers, a second outlet for the hydraulic cylinder or cylinders of the brake system for the trailer, and through a passage wherein a control fluid stream flows from the inlet to a third outlet for recirculation to the source of fluid. The positions of the shuttle can be changed by a pilot valve unit which is controlled by a manually operable lever or by a hydraulic piston which is shiftable in response to changes of fluid pressure in the brake system of the towing vehicle. The rate of flow of pressurized fluid to the consumer or consumers can be changed while the brake system of the trailer is sealed from the inlet, and such flow is reduced or terminated when the brake system of the trailer receives pressurized fluid. The pilot valve unit can establish or terminate communication between the second and third outlets.

3,718,374
SKID CONTROL SYSTEM FOR AUTOMOTIVE VEHICLES

Takeshi Ochia, Toyota-shi, Aichi-ken, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi-ken, Japan

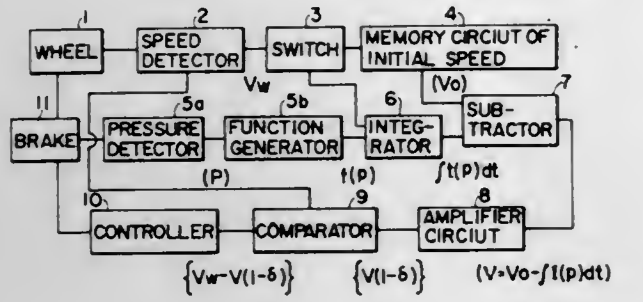
Filed June 30, 1970, Ser. No. 51,117

Claims priority, application Japan, July 1, 1969, 44/51477

Int. Cl. B60t *8/08*

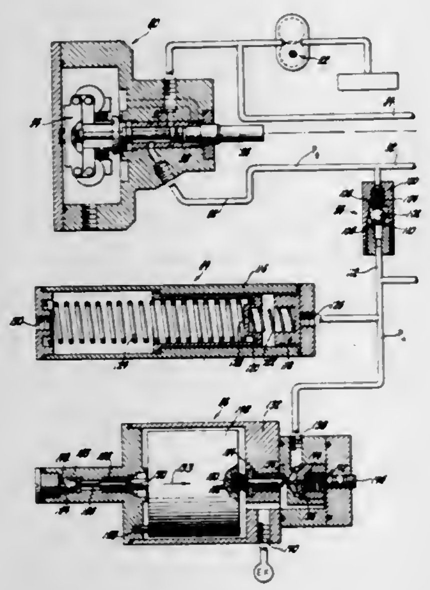
U.S. Cl. 303—21 A **5 Claims**

A skid control system for automotive vehicles having hydraulic brakes includes a wheel speed detector and a memory circuit connected to the detector to store the initial speed of the vehicle at the start of braking. A pressure detecting means is connected to the brake system to detect the fluid pressure during brake application, and a function generator converts the detected pressure into an arbitary function proportional thereto, and which is integrated. The integrated function is compared to the stored initial speed of the vehicle to derive a difference value which is amplified and supplied to a comparator connected to the wheel speed detector to provide a control signal. This control signal operates a servo mechanism to control the braking system in accordance with the control signal.



3,718,375
HYDRAULIC ANTI-LOCK BRAKE CONTROL SYSTEM

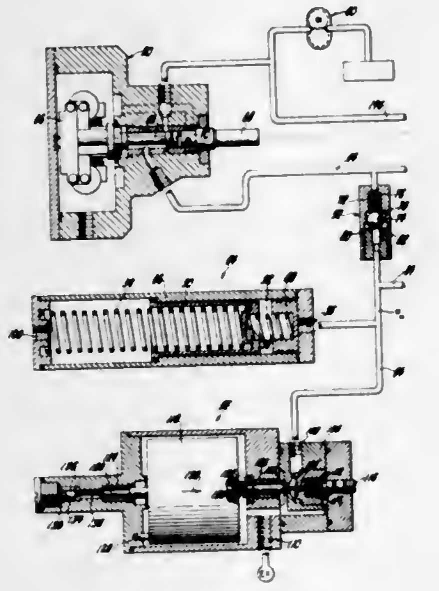
Laurence L. Bowler, Bloomfield Hills, and John L. Harned, Grosse Pointe Woods, both of Mich., assignors to General Motors Corporation, Detroit, Mich.
Filed Sept. 30, 1971, Ser. No. 185,087
Int. Cl. B60t *8/06*
U.S. Cl. 303—21 B **3 Claims**



A vehicle brake system includes a master cylinder, a regulating valve which modulates pump generated fluid pressure to provide a regulated pressure proportional to the master cylinder pressure, and a hydraulic actuator which provides a brake pressure proportional to the regulated pressure. The wheel slip condition is sensed by a transmission governor providing a wheel speed proportional pressure and a vehicle ground speed computer providing a vehicle ground speed proportional pressure. A control logic circuit including a hysteresis switching valve, a bypass valve, and a ball check valve functions to modify the regulated pressure in accordance with the difference between wheel speed pressure and vehicle ground speed pressure causing the hydraulic actuator to vary the wheel slip to continuously seek out the peak value of wheel-to-road friction coefficient.

3,718,376
HYDRAULIC ANTI-LOCK BRAKE CONTROL SYSTEM

Lauren L. Bowler, Bloomfield Hills, and John L. Harned, Grosse Pointe Woods, both of Mich., assignors to General Motors Corporation, Detroit, Mich.
Filed Oct. 1, 1971, Ser. No. 185,512
Int. Cl. B60t *8/12*
U.S. Cl. 303—21 CG **4 Claims**

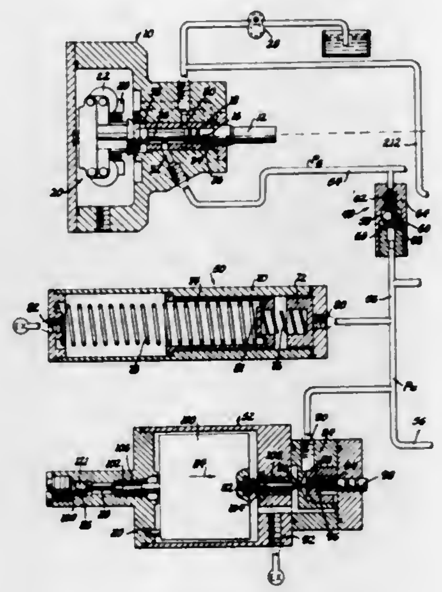


An all hydraulic anti-lock brake control system includes an operator actuated master cylinder fluidly connected to a wheel brake, a brake pressure modulator interposed fluidly intermediate the master cylinder and wheel brake, a transmission governor providing a fluid pressure proportional to the wheel speed, vehicle ground speed computer providing a fluid pressure proportional to the vehicle linear speed and valve means providing a control pressure for operation of the brake pressure modulator as a function of the difference existing between wheel speed pressure and vehicle ground speed pressure. In the first embodiment of the invention a servo control valve varies the control pressure as a function of the difference between the wheel speed pressure and the vehicle ground speed pressure so as to maintain a substantially constant wheel slip at a high value of wheel-to-road friction coefficient. The second and third embodiments vary the control pressure so as to continuously seek out the peak value of wheel-to-road friction coefficient and thereby maintain a high average coefficient. The second embodiment includes a hysteresis switching valve in combination with the servo control valve while the third embodiment employs a hysteresis switching valve.

3,718,377
HYDRAULIC VEHICLE GROUND SPEED COMPUTER

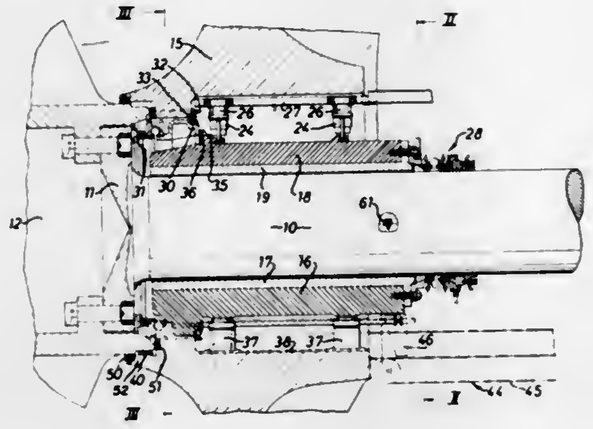
John L. Harned, Grosse Pointe Woods, and Laird E. Johnston, Birmingham, both of Mich., assignors to General Motors Corporation, Detroit, Mich.
Filed Sept. 30, 1971, Ser. No. 185,086
Int. Cl. B60t *8/06*
U.S. Cl. 303—21 CG **4 Claims**

A vehicle ground speed computer provides a hydraulic pressure signal proportional to the vehicle speed relative to the ground and includes a transmission governor or equivalent means providing a source of hydraulic pressure proportional to the vehicle wheel speed, an accumulator which is charged by the wheel speed pressure source, a flow responsive valve which isolates the accumulator from the wheel speed pressure source whenever the flow therethrough from the accumulator to the wheel speed pressure source is indicative of a wheel deceleration rate in excess of a predetermined value, and a decelerometer actuated valve which exhausts pressure from the accumulator in proportion to the vehicle linear deceleration whereby the pressure remaining in the accumulator is proportional to the vehicle ground speed irrespective of wheel slip caused by excessive braking.



3,718,378
TAIL-SHAFT BEARING ASSEMBLY

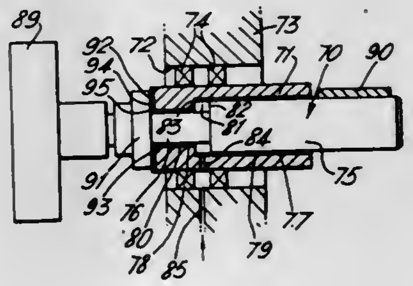
John Armstrong Clay, Sale, Cheshire, England, assignor to Turnbull Marine Design Company Limited, Cheshire, England
Filed June 1, 1970, Ser. No. 42,049
Claims priority, application Great Britain, June 5, 1969, 28,606/69
Int. Cl. F16c *33/74, 35/02*
U.S. Cl. 308—36.1 **13 Claims**



In a propeller shaft bearing arrangement having a split bearing extending through an opening in the stern frame of a ship, one part of the bearing being removable while the ship is afloat and a seal being provided for preventing the entry of water through the opening, there is provided the improvement that the other part of the bearing may be adjusted in position or removed while the ship is afloat. An inflatable seal is provided for preventing the entry of water during the removal of the other part of the bearing. Jacks, rollers and a drive mechanism are provided for facilitating the removal of the other part, and taper wedges for securing the other part in its normal position.

3,718,379
AIR BEARINGS

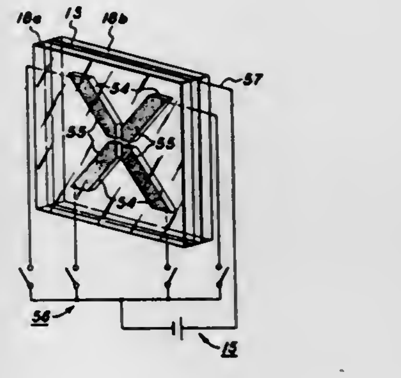
Raymond Williams and Robert Edwin Leckenby, Appleton, England, assignors to United Kingdom Atomic Energy Authority, London, England
Filed Mar. 9, 1971, Ser. No. 122,341
Claims priority, application Great Britain, Jan. 1, 1971, 133/71
Int. Cl. F16c *17/16*
U.S. Cl. 308—9 **5 Claims**



A journal gas bearing assembly comprising a fixed bearing sleeve and a shaft rotatable in the bearing sleeve longitudinal movement of the shaft relative to the bearing sleeve in one direction being limited by a hydrostatic thrust bearing formed by a cushion of gas trapped under pressure in the bore of the bearing sleeve between an internal step in the bore of the bearing sleeve and an external step on the shaft.

3,718,380
IMAGING SYSTEM IN WHICH EITHER A LIQUID CRYSTALLINE MATERIAL OR AN ELECTRODE IS SHAPED IN AN IMAGE CONFIGURATION

Joseph J. Wysocki; James E. Adams, both of Webster; James H. Becker, Penfield; Robert W. Madrid, Macedon, and Werner E. Haas, Webster, all of N.Y., assignors to Xerox Corporation, Rochester, N.Y.
Division of Ser. No. 821,565, May 5, 1969, Pat. No. 3,652,148. This application Aug. 5, 1971, Ser. No. 169,465
Int. Cl. G02f *1/16*
U.S. Cl. 350—160 LC **14 Claims**

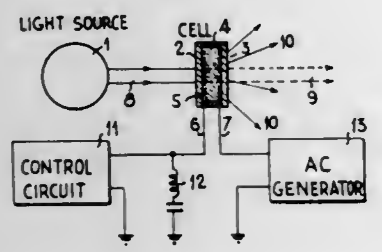


A system transforming an optically negative liquid crystalline substance to an optically positive liquid crystalline mesophase by an applied electrical field, and an imaging system wherein the electrical field-induced transition images a liquid crystalline member.

3,718,381

LIQUID CRYSTAL ELECTRO-OPTICAL MODULATORS

Georges J. Assouline; Michel Hareng, and Eugene Leiba, all of Paris, France, assignors to Thomson-CSF, France
Filed March 12, 1971, Ser. No. 123,583
Claims priority, application France, March 17, 1970, 7009518
Int. Cl. G02f *1/28*
U.S. Cl. 350—160 LC **8 Claims**



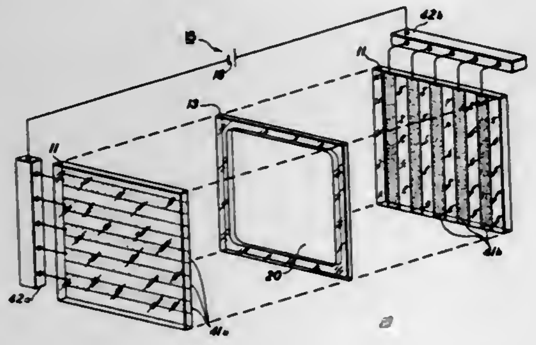
The present invention relates to electro-optical modulators wherein dynamic scattering of a layer of liquid crystal is controlled for transmitting a variable amount of radiant energy.

The liquid crystal modulator according to the invention comprises a cell associated with an a.c. generator. Under the action of this generator the delay time of the cell is reduced without introducing any misalignment of the liquid crystal molecules in the absence of an electrical control signal.

3,718,382

LIQUID CRYSTAL IMAGING SYSTEM IN WHICH AN ELECTRICAL FIELD IS CREATED BY AN X-Y ADDRESS SYSTEM

Joseph J. Wysocki; James E. Adams, both of Webster; James H. Becker, Penfield; Robert W. Madrid, Macedon, and Werner E. Haas, Webster, all of N.Y., assignors to Xerox Corporation, Rochester, N.Y.
Division of Ser. No. 821,565, May 5, 1969, Pat. No. 3,652,148. This application Aug. 5, 1971, Ser. No. 169,457
Int. Cl. G02f *11/16*
U.S. Cl. 350—160 LC **2 Claims**



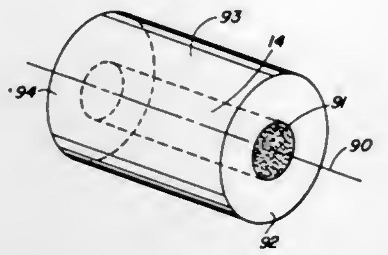
A system transforming an optically negative liquid crystalline substance to an optically positive liquid crystalline mesophase by an applied electrical field, and an imaging system wherein the electrical field-induced transition images a liquid crystalline member.

3,718,383

PLASTIC OPTICAL ELEMENT HAVING REFRACTIVE INDEX GRADIENT

Robert S. Moore, Pittsford, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
Filed Apr. 19, 1971, Ser. No. 134,995
Int. Cl. G02b *1/04, 5/14*
U.S. Cl. 350—175 GN **20 Claims**

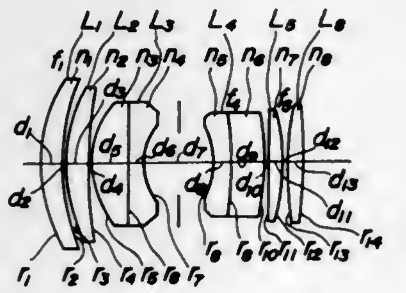
The invention relates to a transparent element for the deflection of incident electromagnetic radiation having an optical axis extending therethrough. The element includes a shaped polymeric matrix having an organic diluent therewithin, the diluent forming a continuous gradient in refractive index extending in a direction substantially perpendicular to the optical axis of the element. The element has lens-like properties.



3,718,384

ACCURATE LENS SYSTEMS FOR PRODUCING AN EXTREMELY SMALL IMAGE IN A REDUCED SCALE

Masaki Matsubara, Tokyo, Japan, assignor to Olympus Optical Company Limited, Shibuya-ku, Tokyo, Japan
Filed March 17, 1972, Ser. No. 235,743
Int. Cl. G02b *9/62*
U.S. Cl. 350—215 **3 Claims**



An accurate lens system for producing an extremely small image in a reduced scale, which is constructed as 6 components and 8 lenses and consists of first and second components of positive meniscus lenses, each component consisting of a single lens, third and fourth components of negative lenses, each component consisting of two lenses made integral into a unit lens, and fifth and sixth components of positive lenses, each component consisting of a single lens, all lenses being arranged in succession from the side of an object, and which is defined by the following five conditions, i.e.

$$0.51f \leqq f_4 \leqq 0.64f \text{ and } f_4 < 0; \qquad \text{(I)}$$

$$0.16f \leqq (d_8 + d_9) \leqq 0.19f; \qquad \text{(II)}$$

$$0.22f \leqq d_7 \leqq 0.29f; \qquad \text{(III)}$$

$$0.19 \leqq (\ r_7 \ + \ r_8 \ /2) \leqq 0.24f; \text{ and} \qquad \text{(IV)}$$

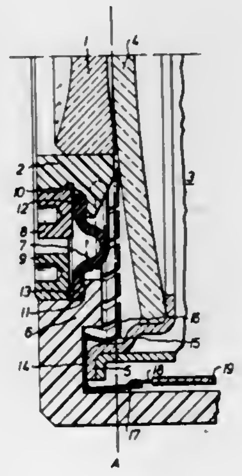
$$0.64f \leqq f_5 \leqq 0.8f \qquad \text{(V)}$$

where $r_1, r_2, \ldots r_{14}$ are radii of curvatures of the successive lens faces counted from an object, $d_1, d, \ldots d_{13}$ are air spaces between the successive lenses or axial thicknesses of the successive lenses, $f_1, f_2, \ldots f_8$ are focal lengths of the successive lenses, and f is a composite focal length of the total lens system.

3,718,385

APPARATUS FOR MOUNTING AN OPTICAL CORRECTION MEMBER IN A HOUSING

Gunter Prell, Wedel/Hostein, and Herbert Baersch, Hamburg, both of Germany, assignors to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Germany
Filed July 21, 1971, Ser. No. 164,674
Claims priority, application Germany, July 24, 1970, P 20 36 789.9
Int. Cl. G02b *7/02*
U.S. Cl. 350—252 **6 Claims**

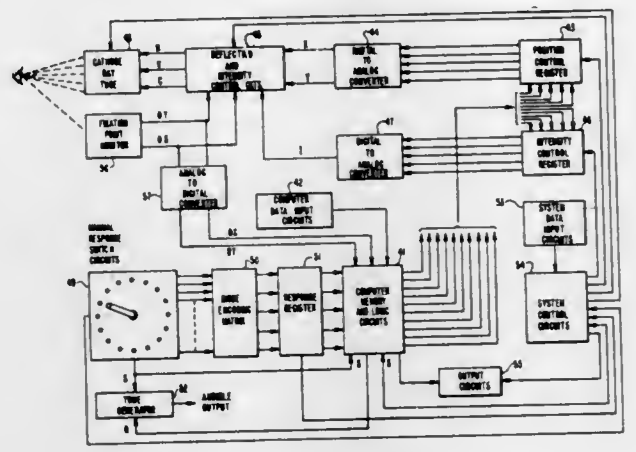


Apparatus for automatically adjusting a correction lens for an image processing tube of a viewing instrument in which the lens is axially aligned with a photocathode of the tube, including a resilient diaphragm which is mounted in a prestressed condition to thereby urge the lens toward the photocathode while automatically maintaining the axial alignment between the lens and the photocathode.

3,718,386

AUTOMATIC VISUAL FIELD EXAMINATION INCLUDING FIXATION MONITORING AND COMPENSATION

John R. Lynn, 10001 Preston Road, Dallas, Tex. 75230, and George W. Tate, Jr., 19523 Dennis Lane, Farmers Branch, Tex. 75234
Filed Sept. 17, 1971, Ser. No. 181,538
Int. Cl. A61b *3/00*
U.S. Cl. 351—39 **27 Claims**

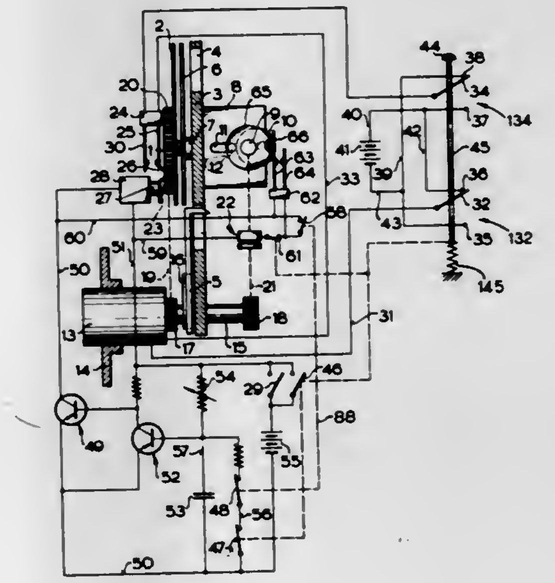


An illustrative embodiment of the present invention includes method and apparatus for determining the threshold value of visual stimuli presented at selected locations in the visual field of a subject. A programmed automatic data processing system is utilized together with a subject response device in a unique two-way feedback system to select location, brightness and spot size of stimuli (spots of light) to be presented and to present these stimuli on a test screen at locations which are unpredictable to the subject, with the term stimuli including test spots which are perceived and those which are not perceived. The subject communicates with the data processing equipment via the subject response device and the system interprets the responses to alter the stimulus presentation regime dynamically while communicating feedback to the subject of correct or incorrect perception of each stimulus. Eye movement of the subject is monitored and compensated for in the presentation of the spots of light by other system apparatus which also communicates with the data processing equipment to center the test field relative to the direction of gaze of the subject which is not necessaritly the center of the test screen or a fixed point.

3,718,387

MOTION PICTURE CAMERA WITH DISSOLVING SHUTTER

Albert Stieringer, Weil der Stadt, Germany, assignor to Robert Bosch Photokino GmbH, Stuttgart-Unterturkheim, Germany
Filed July 26, 1971, Ser. No. 164,873
Claims priority, application Germany, Aug. 1, 1970, P 20 38 337.3
Int. Cl. G03b *21/36*
U.S. Cl. 352—91 **10 Claims**



A motion picture camera with dissolving shutter wherein the motor of the drive for film transport is automatically arrested by a compact electronic switching device which arrests the motor with a predetermined delay following the start of making exposures with fade-out effect and which also arrests the motor with the same delay upon completed rewinding of film frames which were exposed with fade-out effect so that such frames can be exposed again but with fade-in effect. The switching device is controlled by a compact electronic timer which is adjustable and is started in response to the start of making exposures with fade-out effect and in response to starting of the motor for the purpose of transporting the once-exposed film frames rearwardly. The switching device is a transistor which is connected directly into the motor circuit or controls an electromagnet which in turn controls an interrupter switch in the motor circuit.

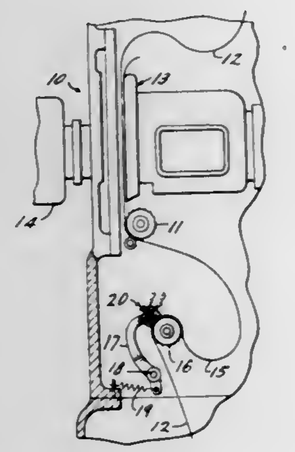
3,718,388
PICK-OFF DEVICE

Angelo Boudouris, Sylvania, and Harold M. Plumadore, Toledo, both of Ohio, assignors to Eprad Incorporated, Toledo, Ohio

Continuation-in-part of Ser. No. 873,394, Nov. 3, 1969, Pat. No. 3,639,046. This application Dec. 20, 1971, Ser. No. 209,601

Int. Cl. G03b *21/50*

U.S. Cl. 352—92 **9 Claims**



A universal pick-off device for a motion picture projector which can be substituted directly for a back-up roller associated with a driven sprocket in the projector. The pick-off device can be installed without modification in almost any commercial projector. Adjustment apparatus is provided for aligning the pick-off device with the sprocket. When a conducting tab or strip on the edge of a motion picture film completes a circuit between the pick-off device and the sprocket, an impulse signal is provided for external controls which can, for example, change to a second projector at the end of a film reel, lower or raise the lights, control background music, open or close curtains, etc.

3,718,389
IMAGE DISPLAY FROM CONTINUOUSLY MOVING IMAGE CARRIER

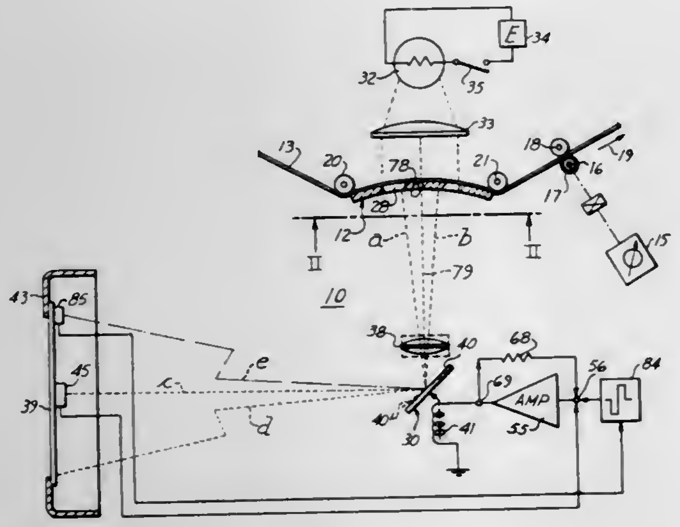
Dexter P. Cooper, Jr., Pasadena, Calif., assignor to Bell & Howell Company, Chicago, Ill.

Filed Jan. 11, 1971, Ser. No. 105,571

Int. Cl. G03b *41/10*

U.S. Cl. 352—109 **37 Claims**

A method of and apparatus for displaying images of a succession of recordings from a substantially continuously moving carrier operates with an optical compensator of a type being repeatedly advanced and being reset between successive advancements. Each image is displayed by way of the compensator and the compensator is advanced during the display of each image to compensate for the continuous carrier movement. The time for resetting of the compensator is determined by sensing extreme advanced position of the compensator. The compensator is then reset in response to each sensing of an extreme advanced position.



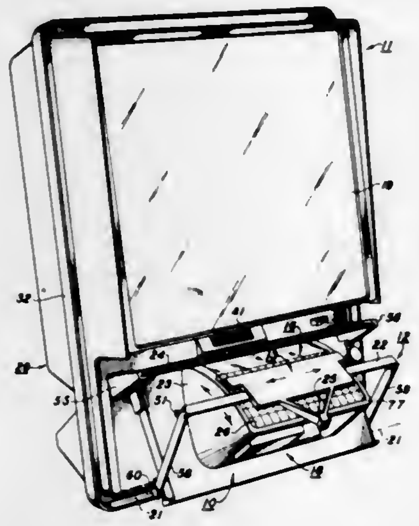
3,718,390
MICROFICHE INDEXER

Robert G. Holliday, Ann Arbor, Mich., assignor to Xerox Corporation, Rochester, N.Y.

Filed June 19, 1970, Ser. No. 47,848

Int. Cl. G03b *23/08*

U.S. Cl. 353—27 **12 Claims**



A microfiche containing a plurality of microimages is positioned relative to the imaging station of a microimage display device by a pivoted member journaled for rotation and a sliding traversing member.

3,718,391
MICROFILM READING APPARATUS

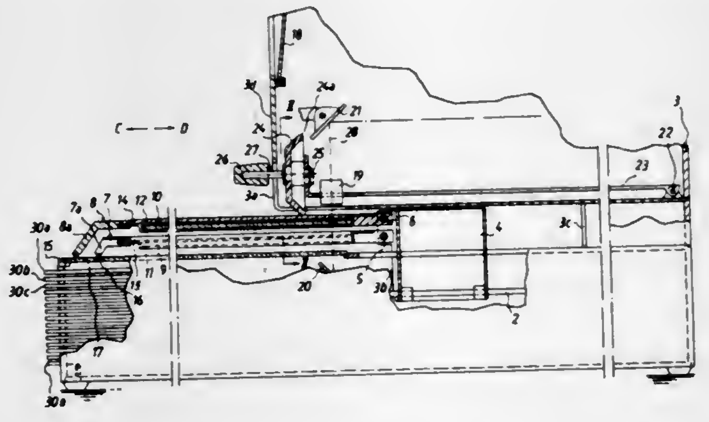
Josef Pfeifer and Kasimir Ambraschka, Unterhaching, and Adolf Koopmann, Wilfried Hofmann, Karl-Heinz Dietrich, and Walter Rauffer, Munich, Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Munich, Germany

Filed Mar. 28, 1972, Ser. No. 238,762

Claims priority, application Germany, Mar. 29, 1971, P 21 15 205.6

Int. Cl. G03b *3/00*

U.S. Cl. 353—101 **13 Claims**



A microfilm reader wherein discrete microfilm sheets are removably received in holders having transparent top panels and movable forwardly and rearwardly as well as sideways within the confines of a housing to place selected portions of microfilm sheets into register with a projection lens. The lens is mounted at the free end of a lever which is pivotable in the housing and further carries a block- or roller-shaped follower which rests on the top panel of the selected holder. That surface of the follower which abuts against the adjacent top panel is dimensioned and configurated in such a way that it can simultaneously abut against two adjacent top panels during shifting of one or more holders in order to place a selected portion of a selected microfilm sheet into register with the lens. This reduces the likelihood of shocks to the lens. The distance between the lens and the nearest microfilm sheet is adjustable by a mechanism which is installed between the lever and the follower and serves to insure that the focal plane of the lens can be made to coincide with the plane of the selected microfilm sheet.

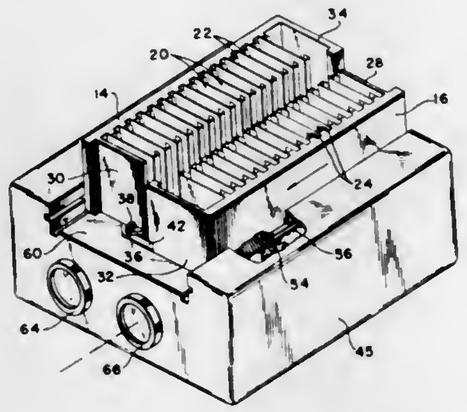
3,718,392
INTERLOCKING DUAL PURPOSE SLIDE TRAY STRUCTURE FOR FORMING A SINGLE TRAY OR A PAIR OF TRAYS

Donald M. Harvey, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed June 4, 1970, Ser. No. 43,328

Int. Cl. G03b *23/02, 23/16, 21/14*

U.S. Cl. 353—111 **8 Claims**



A slide tray structure for lap dissolve slide projectors having interleaved tray portions movable between a contracted position, in which a single tray is formed for the loading, editing and storing of slides, and for use in a standard projector, and an expanded position, in which two trays are formed for use in a lap dissolve slide projector of the type utilizing a pair of slide trays.

ERRATUM

For Class 355—78 see:
Patent No. 3,717,975

3,718,393
IMAGING APPARATUS

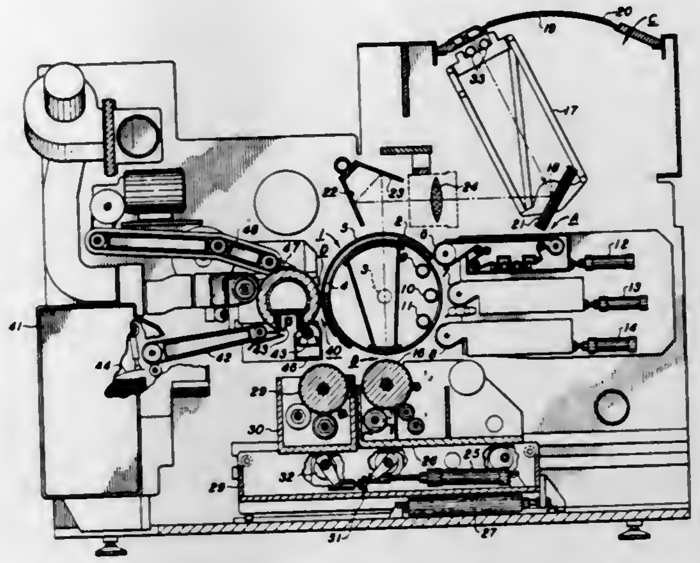
Egon Zurovskis, Penfield, and Raymond K. Egnaczak, Williamson, both of N.Y., assignors to Xerox Corporation, Rochester, N.Y.

Continuation of Ser. No. 876,921, Nov. 14, 1969. This application Dec. 9, 1971, Ser. No. 206,476

Int. Cl. G03g *15/04*

U.S. Cl. 355—8 **5 Claims**

An image carrying cylinder portion and optical system for use in the support of an image. The cylinder portion is transparent and light image is flowingly projected along a fixed path through the diameter of the cylinder from the inside to the outside surface. The cylinder portion is rotated through the light path along which the light image is projected in sychronism, flowing with the moving cylinder portion so that both the cylinder portion and the light image move through an image plane of the light image projection system.



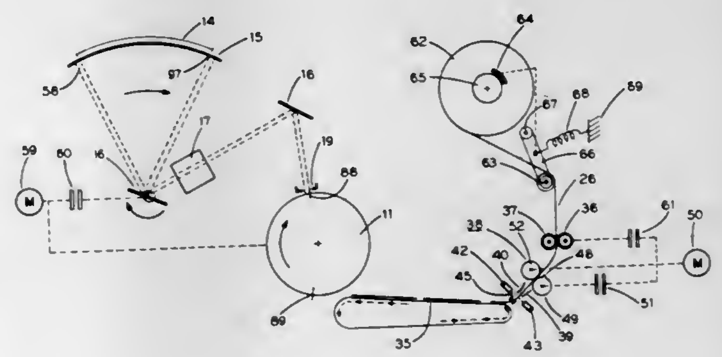
3,718,394
VARIABLE SHEET LENGTH PAPER FEED AND CUTTING SYSTEM

Leon Albert Tysko, Rockaway, and Robert Cortland Burnet, Hackettstown, both of N.J., assignors to Van Dyk Research Corporation, Whippany, N.J.

Filed Feb. 8, 1972, Ser. No. 224,563

Int. Cl. G03g *15/00*

U.S. Cl. 355—13 **14 Claims**



An arrangement for use in a xerographic copier to cut copy sheets to desired variable lengths from a continuous paper roll. Both the length of scan and the operation of the paper cutter are controlled in response to the movement of the paper. Control circuitry is provided to insure maximum efficiency of utilization of available machine time.

3,718,395
MACHINE FOR PRODUCING PLATES AND PRINTS FROM MICROFILM

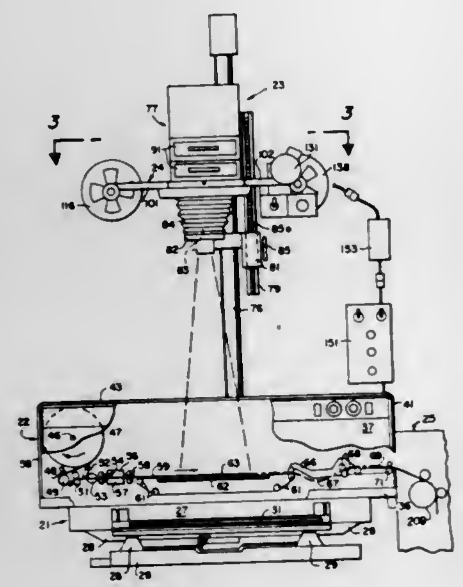
Henry C. Hollwedel, Jr., Belmont, Calif., assignor to George Lithograph Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 18,421, March 11, 1970, Pat. No. 3,634,006. This application Dec. 8, 1971, Ser. No. 205,934

Int. Cl. G03b *27/32, 27/52*

U.S. Cl. 355—27 **11 Claims**

A machine for making printing plates or prints from positive or negative microfilm rolls has a table movable horizontally in two directions to adjust the position of a paper transport having an exposure positioner. Above the copier is a photographic enlarger having its film holder replaced by apparatus which accurately advances microfilm frame by frame. The image os each frame is formed upon a cut sheet of copy paper at rest on the exposure positioner. The exposed sheet is then



transported into a photographic film processor for developing as the next sheet is advanced to exposure position and the next frame is advanced in the microfilm advance apparatus.

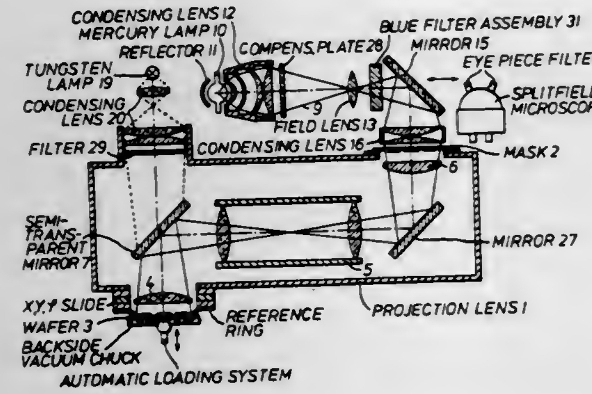
3,718,396
SYSTEM FOR PHOTOGRAPHIC PRODUCTION OF SEMICONDUCTOR MICRO STRUCTURES

Klaus Hennings, Heilbronn, Germany, assignor to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Germany

Filed Dec. 28, 1971, Ser. No. 212,944

Int. Cl. G01b *11/26*

U.S. Cl. 355—43 **37 Claims**



A system for producing microstructures on a substrate surface by forming an image of a mask, which contains a microstructure patter, on a photosensitive layer provided on such a substrate surface via a high resolution lens. The system has a semitransparent mirror and a microscope for observation of the alignment of a pattern to be formed on the substrate and another pattern already present on the substrate. The lens is built of a number of optical elements at least one of which is placed close to the substrate. The semitransparent mirror is placed between that element close to the substrate and the rest of the elements. A second mirror in the lens system provides for a compact symmetrical assembly. The system has illumination arrangements for projection of the mask pattern of the substrate using one wavelength, and for alignment using a different wavelength. The projection illumination arrangements are equipped with single or multiple source systems.

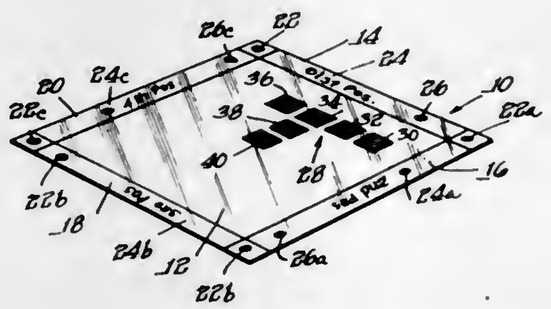
3,718,397
DEVICE FOR DETERMINING PROPER COLOR BALANCE IN COLOR PRINTING

Joseph J. Smajo, Chicago, Ill., assignor to Unilux Graphics, Inc., Hackensack, N.J.

Division of Ser. No. 845,288, July 28, 1969, Pat. No. 3,620,727. This application May 14, 1971, Ser. No. 143,358

Int. Cl. G03b *27/04*

U.S. Cl. 355—88 **5 Claims**



A step-wedge is reprinted four times, one for each of three colors plus black and white as a mask. The reprinting is in a different position each time, giving a total of four different positions with one selected value overprinted by each color to show the effect of the overprint, namely to demonstrate a neutral. If a neutral gray is obtained, then it is known that the printing is correct. If no neutral is obtained, a ready reference, not requiring the use of a densitometer or separation filters is immediately at hand.

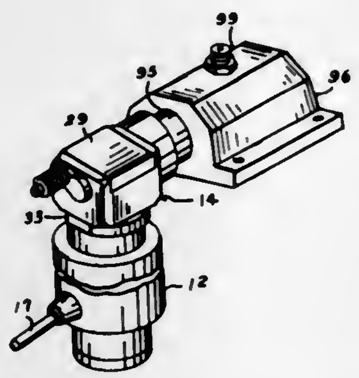
3,718,398
METHOD OF ALIGNING LASER BEAM BY ROTATION

Ardath M. Becraft, Dayton, and Clifford E. Hammer, Trotwood, Ohio, assignors to the United States of America as represented by the Secretary of the Air Force

Original application Sept. 26, 1969, Ser. No. 861,386. Divided and this application Apr. 29, 1971, Ser. No. 138,422

Int. Cl. G01b *11/26*

U.S. Cl. 356—153 **1 Claim**



A boresight alignment instrument having a helium-neon gas laser mounted on an alignment mandrel which fits into the gun barrel. A 45° mirror directs the laser beam along a line concentric with the axis of the bore of the barrel. The mandrel has an expanding collet to insure positive locking of the mandrel in the barrel. The laser beam is aligned with the desired output axis, of the adapter assembly, by securing the adapter assembly and laser to an alignment fixture which permits rotation of the laser and adapter assembly. The mirror position is adjusted to stop all motion of the light spot when the assembly is rotated 360°. The device is used with a highly reflective target to make the device useful under all lighting conditions.

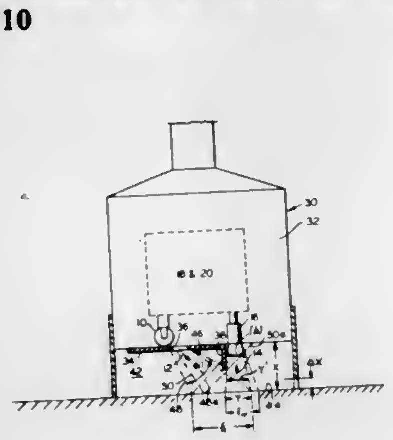
3,718,399
DISTANCE COMPENSATED REFLECTANCE SENSOR

Gabor U. Kalman, 363 Brook Street, Bristol, Conn.

Filed June 29, 1971, Ser. No. 158,044

Int. Cl. G01n *21/48;* **G01j** *3/46, 3/42*

U.S. Cl. 356—210 **6 Claims**



A distance compensated reflectance sensor is presented having a hand held sensing unit for sensing reflectance from surfaces to be measured and generating a signal thereof to be delivered to a main unit where the signal is compared with preset standards or limits for generation of a warning signal if the measured reflectance departs from desired values. The hand held sensor element has a light source, a detector element, and a baffle structure. The baffle provides a partial overlap of the illuminated field and the viewing field, to provide for automatic compensation in the event of the deviation in distance between the surface being examined and the detector element. The source, the detector, and the baffle are arranged so that all direct and directly reflected light are blocked from the detector, i.e., the detector sees only scattered light.

3,718,400
MIRROR DRUM OPTICAL SYSTEM FOR USE IN MICROSCOPIC SPECTROPHOTOMETER

Ken Yonekubo, Tokyo, Japan, assignor to Olympus Optical Company Limited, Tokyo, Japan

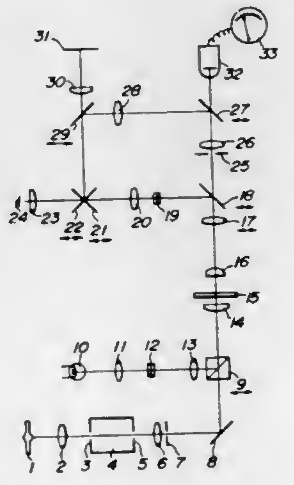
Filed Feb. 7, 1972, Ser. No. 224,041

Claims priority, application Japan, Feb. 6, 1971, 46/4500

Int. Cl. G01j *3/42;* **G01n** *21/06*

U.S. Cl. 356—96 **1 Claim**

A mirror drum optical system for use in a microscopic spectrophotometer has a system of a lens and mirrors adapted to be inserted into and retracted from the optical path. A camera is arranged to photograph the specimen and the centering of the pinholes and reflex viewing system and photoindicator permit sequential observation and measurement by an observer.



3,718,401
NIB AND WRITING INSTRUMENT CONSTRUCTION WITH CAPILLARY ACTION

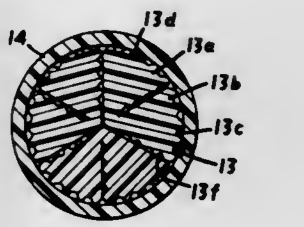
Yoshihito Kiriu, 13–4 Shinkoiwa, 4-chome, Katsushika-ku, Tokyo, Japan

Continuation of abandoned application Ser. No. 802,398, Feb. 26, 1969. This application Dec. 4, 1970, Ser. No. 95,372

Claims priority, application Japan, Feb. 28, 1968, 43/13,131

Int. Cl. B43k *8/00*

U.S. Cl. 401—199 **1 Claim**



A nib and writing instrument construction having a plurality of elongated elements within a tubular casing each having peripheral, longitudinal grooves or corrugations defining jointly and with the casing longitudinal capillary passageways for writing fluid flow therethrough from a writing fluid reservoir. The elements can be made of resin and the casing also of a suitable plastic and sharpened to a writing point. The elongated elements are held frictionally in the casing in an assembled condition and can themselves be provided with a central capillary passageway having a desired cross section and this passageway may be filled with fibers.

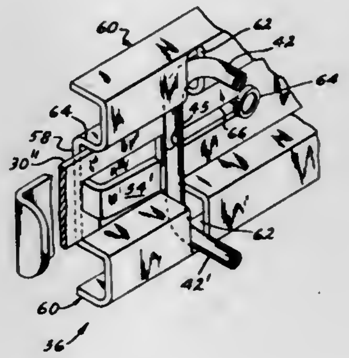
3,718,402
ARCHED RING-WIRE POST BINDER

Frank Stanley Schade, Holyoke, Mass., assignor to National Blank Book Company Inc., Holyoke, Mass.

Division of Ser. No. 784,533, Dec. 3, 1968, Pat. No. 3,606,557. This application May 21, 1971, Ser. No. 145,788

Int. Cl. B42f *3/02*

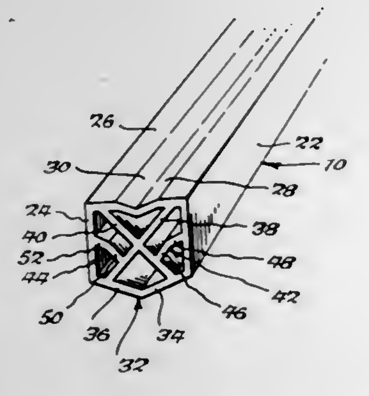
U.S. Cl. 402—31 **2 Claims**



An arch-type ring binder with cover members and hinged thereto an assembly of hingedly connected back panel sections comprising opposed side panel sections and a connecting panel section, an arched split ring loose leaf toggle mechanism fixed on one side panel and means on one of said other back panel sections, preferably the other side panel section, for releasably locking the arched rings thereto, said binder with the rings in locked condition providing a post binder type assembly with a loose leaf ring mechanism, and with the rings in unlocked condition having the operational advantages and usefulness of a ring binder type of loose leaf unit.

3,718,403
SEALING MEMBER

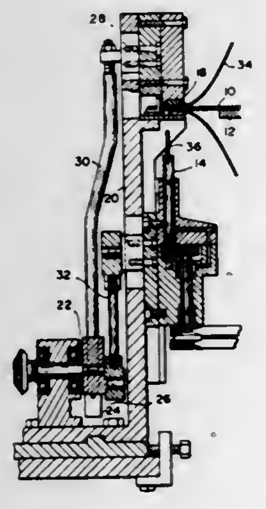
James J. Kerschner, Buffalo, N.Y., assignor to Acme Highway Products Corporation, Buffalo, N.Y.
Filed Feb. 16, 1971, Ser. No. 115,520
Int. Cl. E01c *11/10*
U.S. Cl. 94—18 **6 Claims**



A resilient sealing member for use in an expansion joint comprising a tubular structure provided with an internal construction including support bars which are pre-formed to facilitate the controlled folding thereof.

3,718,404
APPARATUS FOR DRILLING HOLES THROUGH A STACK OF SHEET PAPER

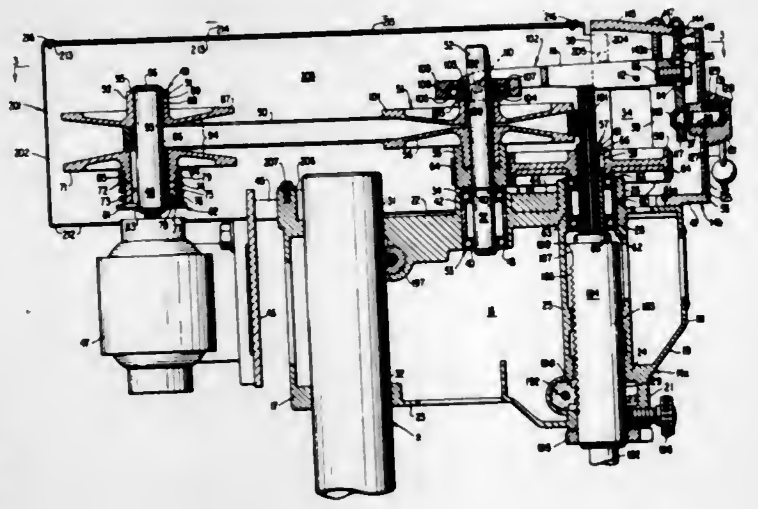
George G. Grinnell, 166 Independence Avenue, Quincy, Mass.; Sherman K. Grinnell, 1196 Belrose Rd., Mayfield Heights, Cleveland, Ohio, and Garith K. Grinnell, 187 Indianhead Street, Hansen, Mass.
Division of Ser. No. 717,738, April 1, 1968, Pat. No. 3,525,126. This application July 27, 1970, Ser. No. 58,544
Int. Cl. B23b *39/16*
U.S. Cl. 408—46 **4 Claims**



Stacks of sheets to be bound are fed into a drilling apparatus which forms a series of smooth openings into which binding elements are subsequently inserted. The stack of sheets is temporarily covered at the drilling station with a protective layer of drill lubricating material held in place by a wooden drill block which prevents development of burrs at the drill openings. The formation of the holes in the stack may be by means of a special design spiral drill or by means of a special design hollow drill.

3,718,405
DRILL PRESS OR LIKE VARIABLE SPEED DRIVE

Edward F. Keiter, Bellefontaine; Glenn F. Pfleiderer, Lafayette, both of Ohio, and David D. Pettigrew, Gibsonia, Pa., assignors to Rockwell Manufacturing Company, Pittsburgh, Pa.
Filed June 29, 1971, Ser. No. 157,949
Int. Cl. B23b *47/14, 47/16*
U.S. Cl. 408—128 **11 Claims**

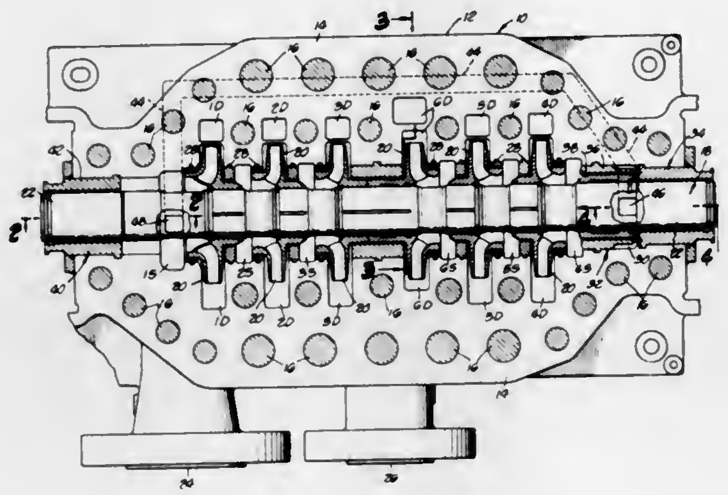


A vari-speed pulley drive transmission for overarm machine tools, such as drill presses and similar tools having depending tool spindles, and speed selector control means and spindle return spring tension adjustment means therefore. The speed selector control means is characterized by the inclusion therein of a selector knob and adjustable friction drag means accessible to an operator standing in operating position in front of the machine tool and eccentric pin connector means journalled in a shifter ring carried by the shiftable sheave of the driven vari-speed pulley and providing a pin and slot connection with the shifter lever for calibrating the speed of the vari-speed pulley drive with the selector knob and its associated speed scale graduations.

3,718,406
CENTRIFUGAL PUMP WITH INTEGRAL SEAL PRESSURE BALANCE

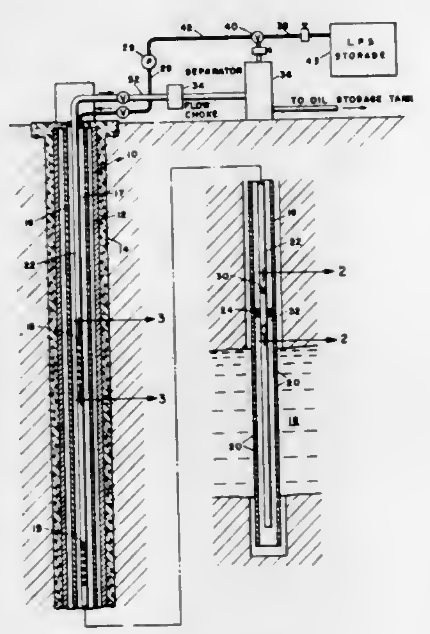
Hasan F. Onal, Hollywood, Calif., assignor to Borg-Warner Corporation, Vernon, Calif.
Filed March 22, 1971, Ser. No. 126,785
Int. Cl. F01d *11/00, 1/02, 25/24*
U.S. Cl. 415—111 **6 Claims**

An axially balanced multistage centrifugal pump having an impeller assembly of plural impellers fixed on a shaft which is rotatably and axially mounted within an elongated divided pump case formed of first and second cast metal housings and having fluid pressure stage dividers disposed between the impellers to form fluid pressure stages, whereby the pump in operation will contain fluid at a lower pressure at a first end of the housing and fluid at a higher pressure at the second end of the housing and fluid at a higher pressure at the second end thereof; first and second rotary fluid flow restriction seals mounted between the assembled case and the impeller shaft at the first and the second ends of the casing respectively to restrict fluid flow therebetween; a rotary fluid flow restriction baffle mounted pressure and around the shaft near the second rotary seal to define a seal pressure chamber. The improvement comprises an integral fluid pressure balance passageway integrally defined and incorporated within the wall of one of the housings, which passageway will be in fluid communication with the fluid under pressure contained in the seal chamber at the second end of the pump and with the lower pressure fluid contained at the first end of the pump, whereby fluid pressure exerted against the second seal and the first seal will be equalized at the same lower pressure contained at the first end of the pump.



3,718,407
MULTI-STAGE GAS LIFT FLUID PUMP SYSTEM

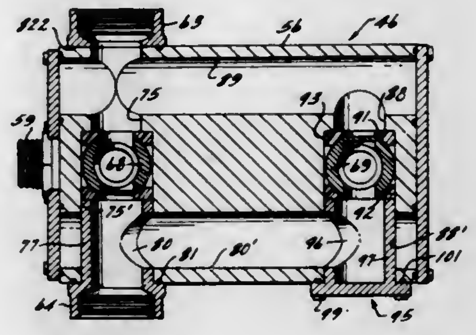
Joseph S. Newbrough, 6250 Primrose Drive, La Mesa, Calif.
Filed Feb. 16, 1971, Ser. No. 115,209
Int. Cl. F04f *1/18;* **B67d** *5/54*
U.S. Cl. 417—108 **9 Claims**

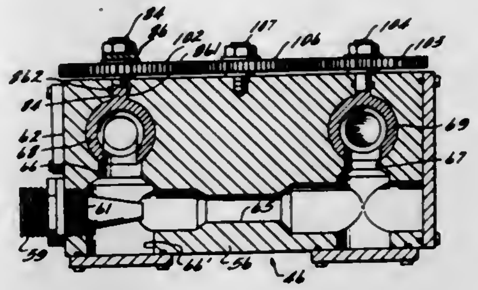


A gas lift pump system utilizing high pressure gas from a pump delivered down a pipe string to a jet pump at the producing zone of a well to provide an initial lift for the fluid and to admix gas and fluid, and a series of supplemental lift devices at spaced intervals along the vertical extent of the well. The supplemental lift devices include a check valve which has the effect of reducing the total head of fluid which each section is called upon to lift and a gas chamber, in conjunction with a pipe mounted within the delivery tubing, to force the fluid into succeeding sections and further promote mixing. The fluid is raised stage by stage until it reaches the surface where the gas is removed and re-cycled.

3,718,408
PUMP AND VALVE UNIT FOR ELECTRICAL DISCHARGE MACHINING

Gerald P. Dietrick, 523 Ridgeview Drive, Florence, Ky.
Division of Ser. No. 118,316, Feb. 24, 1971. This application March 20, 1972, Ser. No. 236,091
Int. Cl. F04f *5/48*
U.S. Cl. 417—178 **2 Claims**

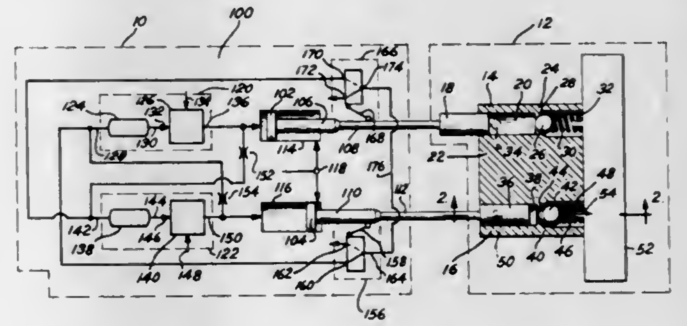




Electrical discharge machining equipment including a worktable reservoir tank, a fluid storage and settling tank and a source of clean fluid under pressure. Clean fluid under pressure is directed to a gap between an electrode and a workpiece in the reservoir tank during machining. Fluid is pumped between the tanks by a jet pump. Clean fluid under pressure powers the jet pump. A side arm of the jet pump can be connected to each of the tanks alternately to draw fluid therefrom. The discharge of the jet pump is connected to the other tank to discharge into the other tank.

3,718,409
RECIPROCATING PUMP CONTROL SYSTEM

Karl Brandenberg, Hayward, Calif., and Wilbert C. Kautz, West Unity, Ohio, assignors to The ARO Corporation, Bryan, Ohio
Filed Oct. 9, 1970, Ser. No. 79,476
Int. Cl. F64b *35/02*
U.S. Cl. 417—326 **16 Claims**

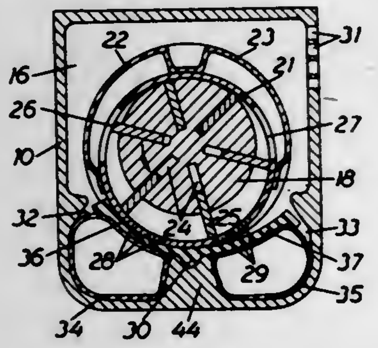


First and second reciprocating pumps are adapted to pump fluid continuously from a fluid source to a fluid output manifold. The control system operates the pumps maintaining at least one of them always in the pumping cycle. The control system includes a flip-flop circuit utilizing pneumatic accumulators, NOT logic elements and restrictors. Pneumatically operated drive pistons and associated cylinders are provided to control the reciprocating pumps.

3,718,410
REVERSIBLE PRESSURE FLUID ACTUATED VANE MOTOR

Karl Gustav Berger, Nacka, and Gustaf Harry Fernstrom, Klinten, Sweden, assignors to Atlas Copco Aktiebolag, Nacka, Sweden

Filed Dec. 22, 1970, Ser. No. 100,606
Claims priority, application Sweden, Dec. 31, 1969, 18,136/69
Int. Cl. F01c *21/12*; F03c *3/00*; F04c *29/08*
U.S. Cl. 418—15 **8 Claims**

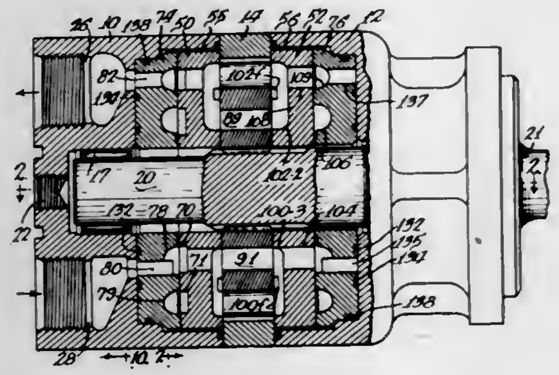


A reversible pressure fluid actuated vane motor has a reversing valve and a cylinder with dual outlet ports. Exhaust from the outlet ports passes via a cavity in the motor housing to the surrounding atmosphere without passing the reversing valve. Valve means and cooperating valve closing means are provided in the cavity for closing the one of said outlet ports offering during rotation in the respective rotational directions the first pressure fluid connection between the motor cylinder and the cavity.

3,718,411
HYDRAULIC MOTOR

Frederic W. Pollman, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Sept. 14, 1971, Ser. No. 180,317
Int. Cl. F01c *1/00*; F03c *3/00*; F04c *1/00*
U.S. Cl. 418—82 **30 Claims**

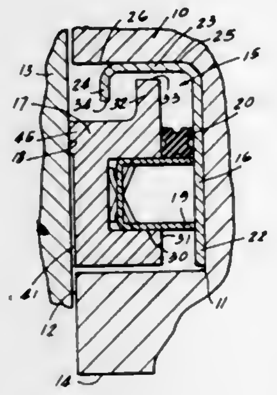


A rotary hydraulic motor including a stator having a central cylindrical cavity with radial slots communicating with the cavity and containing reciprocable sealing rollers, a cam rotor in the cavity with a peripheral cam surface including a plurality of cam lobes with intervening lows engaging the sealing rollers to form displacement chambers, a pair of port plates secured to opposite sides of the rotor for rotation therewith including outwardly disposed portions slidably engaging the sides of the stator adjacent the roller slots, an annular array of alternate inlet and outlet ports in each port plate adjacent the roller slots in the stator, and a pair of pressure plates disposed against the surfaces of the port plates remote from the rotor and the stator. Pressure chambers around the periphery of the port plates reduce deflection of the plates, and pressure chambers behind each pressure plate seal the port plates in the housing. The rotor is constructed with passages communicating the inlet ports in the two port plates and passages communicating the outlet ports in the two port plates. Provision is made for supplying pressure acting in the outer ends of the slots to urge the rollers toward the cam.

3,718,412
PUMPING SEAL FOR ROTARY PISTON ENGINES

Harold E. McCormick, Ballwin, Mo., assignor to Ramsey Corporation, St. Louis, Mo.

Filed Oct. 1, 1971, Ser. No. 185,580
Int. Cl. F01c *19/00*
U.S. Cl. 418—142 **11 Claims**



An oil seal for use between the side of a rotary piston engine rotor and the end plate of the rotor chamber, the seal being a cartridge seal including a housing with a seal member received therein and spring means biasing the seal member. The seal member has a sealing face which is grooved, the grooves formed at a non-radial angle, and the grooves acting as an inwardly pumping seal.

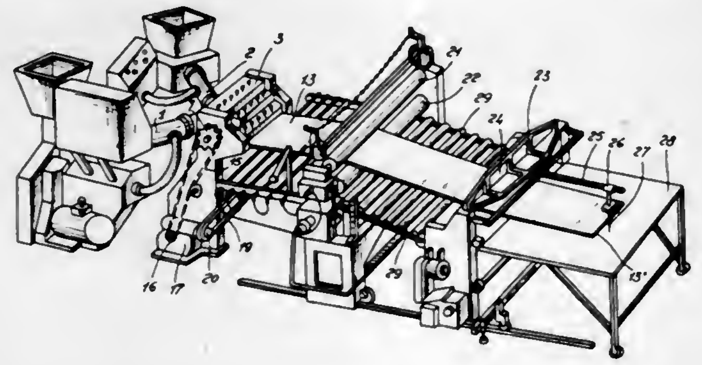
ERRATUM

For Class 423—415 see:
Patent No. 3,718,418

3,718,413
MANUFACTURING PROCESS AND MACHINE FOR PRODUCING AN EXTRUDED THERMOPLASTIC LAMINATE WITH MULTISHAPED VARIEGATION

Marisa Luraschi, 21040 Venegono Inferiore, Varese, Italy

Filed June 29, 1970, Ser. No. 50,504
Claims priority, application Italy, July 1, 1969, 19037 A/69
Int. Cl. B29f *1/12, 3/12*
U.S. Cl. 425—130 **6 Claims**

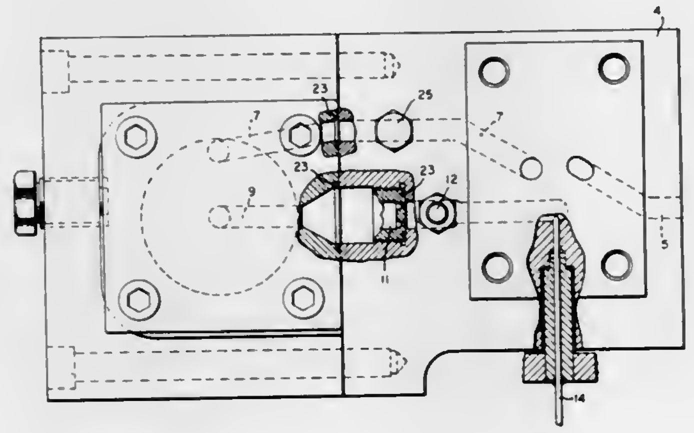


Manufacturing process and machine for producing a thermoplastic laminate, showing specklings with multishaped variegated pattern, characterized in that it is constituted of two or more extruders, connected to a distributing apparatus or die-plate, a pair of cylinders, a knife applied to the frame, a set rollers, constituting a sliding plate and a bench on which projects a guide, supporting a slider, sustaining a feeler or a photoelectric cell, the aforesaid distributing apparatus comprising two or more supply ducts, connected to so many extruders, at least one of said ducts being connected to a cylindrical chamber, provided in the distributing apparatus, inside which rotates a worm, provided peripherally with inclined grooves, said cylindrical chamber being further connected via a set small-sized channels to a portion of a supply duct.

3,718,414
PUMP WEAR PLATE VISCOMETER

Thurman Ralston Jones, Jr., Greenville, N.C., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Feb. 16, 1971, Ser. No. 115,657
Int. Cl. B29f *3/06*
U.S. Cl. 425—146 **1 Claim**

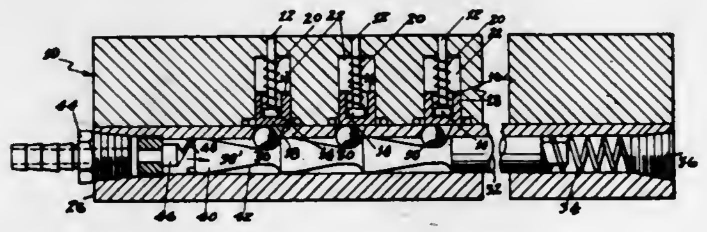


A modification of a spinning pump wear plate that enables it to be used both as a means to distribute polymer to spinning units and as an apparatus for monitoring melt viscosity of the polymer. The modification is such that polymer supplied through the wear plate by the spinning pump is first forced through a strainer, then through an orifice with a pressure transducer on each side of the orifice to measure the pressure drop across the orifice. A thermocouple or other temperature measuring device is positioned in the polymer stream near the orifice.

3,718,415
MECHANICAL AND PNEUMATIC KNOCKOUT PIN

Amedio P. De Felice, 251 Florence St., Leominster, Mass. 01453

Filed June 1, 1971, Ser. No. 148,817
Int. Cl. B29c *7/00*
U.S. Cl. 425—444 **15 Claims**

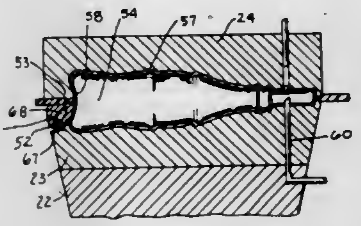


Knockout pins to eject molded articles from dies as the same opens, said pins being mechanically actuated by cams under pneumatic influence to a certain predetermined degree, and thereafter further actuated pneumatically only, to a greater extent.

3,718,416
APPARATUS FOR BLOW MOLDING CONTAINERS HAVING RAISED BOTTOM WALL PORTIONS

Richard K. Shelby, Chicago, Ill., assignor to Monsanto Company, St. Louis, Mo.

Filed Dec. 30, 1970, Ser. No. 102,783
Int. Cl. B29d *23/03*; B29c *7/00*
U.S. Cl. 425—326 **7 Claims**

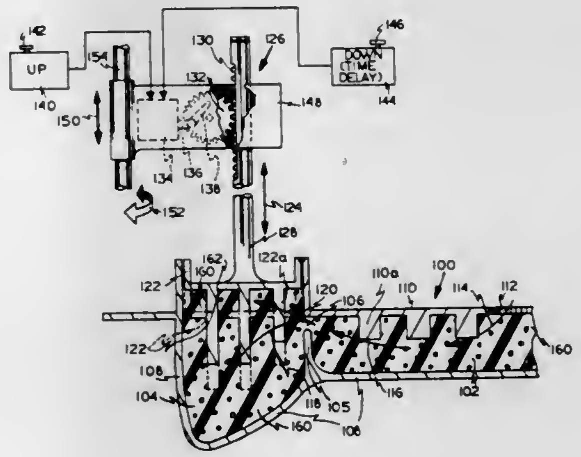


An improved method and apparatus for releasing blown containers having raised bottom wall portions from the mold, wherein a part of the molding surface defining the raised bottom wall is mounted, preferably by means of a pivotable insert in one of the mold sections, for movement away from the mold chamber during mold opening. An undercut portion in another of the mold sections cooperates with a portion of the plastic to hold the blown parison in that mold section during opening so that the chime section on the formed container is responsible for camming the insert away from the mold chamber. The mold assembly is preferably mounted for movement along a circular path in a vertical plane with the sections moving perpendicular to the axis of the path, the pivotable mold insert thereby returning to container forming position, preferably automatically under the influence of gravity, after release of an article as the mold moves downwardly in traversing the circular path.

3,718,417
APPARATUS FOR MOLDING FOAM ARTICLES

Eugene J. Bethe, Mishawaka, Ind., assignor to Uniroyal, Inc., New York, N.Y.

Division of Ser. No. 830,407, June 4, 1969. This application April 9, 1971, Ser. No. 132,783
Int. Cl. B29d *27/04*
U.S. Cl. 425—406 **2 Claims**

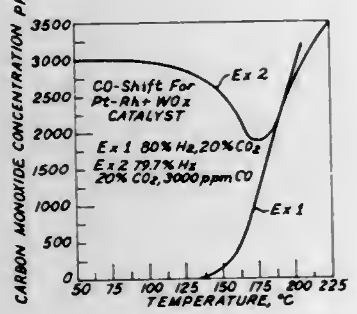


In the manufacture of foam cushions having portions of different densities, a foam material of uniform density is poured in a fluid condition into a mold having an auxiliary cavity with a retractable lid which is in its retracted position at the time that the foam is poured. After the foam has gelled or partially cured to the point where it is no longer fluid, the lid is replaced to compress the foam in one portion of the cushion, thus increasing its local density. Thereafter the foam is fully cured and removed from the mold. The resulting product is an integrally molded cushion exhibiting portions of different density.

3,718,418
CO SHIFT PROCESS

Donald Kingsley Fleming, Park Ridge; Sarabjit Singh Randhava, Evanston, and Elias Humberto Camara, Hickory Hills, all of Ill., assignors to Institute of Gas Technology, Chicago, Ill.

Filed Sept. 1, 1970, Ser. No. 68,633
Int. Cl. C01b *31/18;* **H01m** *27/10*
U.S. Cl. 423—415 **11 Claims**

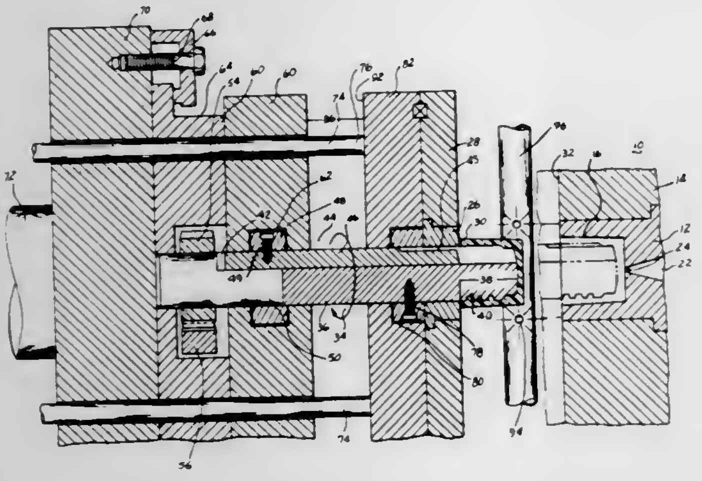


Process of conversion of CO_2 to CO in the presence of hydrogen, using catalysts of Rh and Ru metals, and alloys thereof with Pt, the Rh metals and alloys being beneficated with admixtures of reduced, amorphous tungsten or molybdenum oxides, and the Ru metals and alloys being beneficated by the molybdenum oxide only. Precise control of the product gas composition is obtained by predetermined control of process parameters of input gas flow rate and temperature conditions in the shift reactor.

3,718,419
APPARATUS FOR REMOVING A HOLLOW ARTICLE HAVING INTERNAL ENLARGEMENTS FROM AN INJECTION MOLD ASSEMBLY

Michael D. Adamo, East Lyme, Conn., assignor to Monsanto Company, St. Louis, Mo.

Filed April 21, 1971, Ser. No. 136,062
Int. Cl. B29f *1/14*
U.S. Cl. 425—438 **4 Claims**

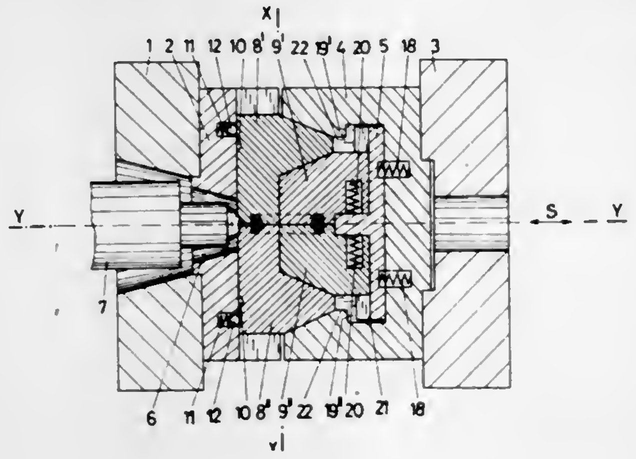


A method of removing a hollow article having peripherally spaced internal enlargements from an injection mold assembly by first drawing a portion of the mold core intermediate the enlargements rearwardly such that the end of this portion is substantially clear of the enlargements and then rotating the article and the enlargement defining portion of the core with respect to each other to substantially release the article from contact with the enlargement defining core portion. The apparatus includes a special core assembly comprising a shank member having an end portion with peripherally spaced molding depressions in its outer surface for forming the enlargements, a clearance member which is slidable along the shank member to create a clearance for the internal enlargements of either the part or the molding depressions of the shank member when either of the latter is rotated with respect to the other.

3,718,420
APPARATUS FOR PRODUCING ANNULARLY CLOSED, INTERCONNECTED ELEMENTS

Peter Florjancic, St.-Martinstrasse, D-81 Garmisch-Partenkirchen, Germany

Filed Aug. 10, 1970, Ser. No. 62,402
Int. Cl. B29c *7/00*
U.S. Cl. 425—441 **5 Claims**

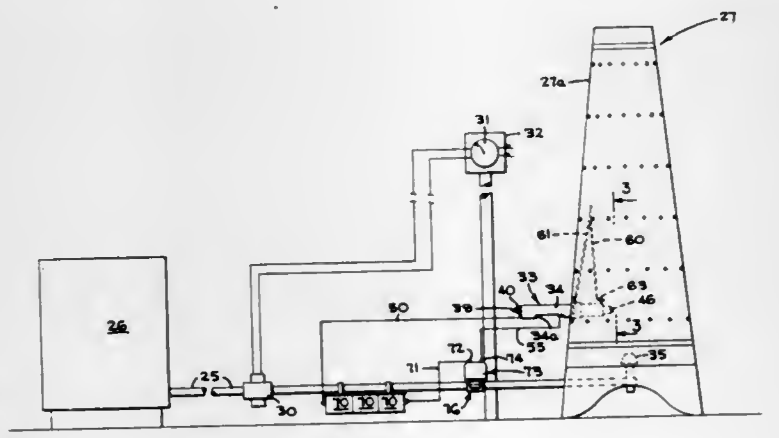


A device, such as a multi-part mold, for producing annularly closed interconnected elements from a material suitable to injection moulding. The parts of said mold being in two planes of division which are perpendicular to one another with said mold parts being provided with recesses corresponding to said annularly closed elements. The recesses of the mold parts lying in the first plane being designed to receive prefabricated interconnected elements and the recesses in the mold parts lying in the second plane receiving the new interconnected elements by injection of the moulding material.

3,718,421
ORCHARD HEATING SYSTEM

Maurice H. McMechan, Route 7, P.O. Box 59, Yakima, Wash.

Filed March 30, 1970, Ser. No. 23,635
Int. Cl. F23n *5/24*
U.S. Cl. 431—23 **14 Claims**

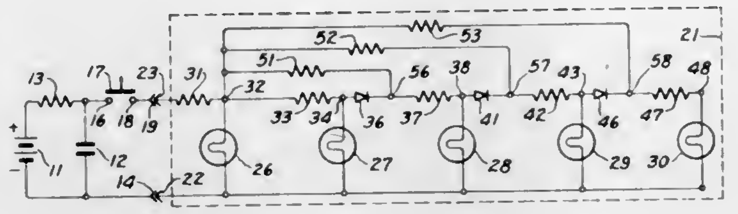


A thermostat, located in an orchard, automatically opens a liquid fuel line, causing the pressure in the line to close contacts in a switch which completes an electric circuit for energizing a resistance element in an orchard heater to ignite the heater.

3,718,422
PHOTOFLASH FIRING CIRCUITS EMPLOYING SERIES RESISTOR-DIODE COMBINATIONS

Sang-Chul Kim, Cleveland Heights, Ohio, assignor to General Electric Company, Schnectady, N.Y.

Filed Sept. 28, 1971, Ser. No. 184,463
Int. Cl. F21k *5/02*
U.S. Cl. 431—95 **14 Claims**

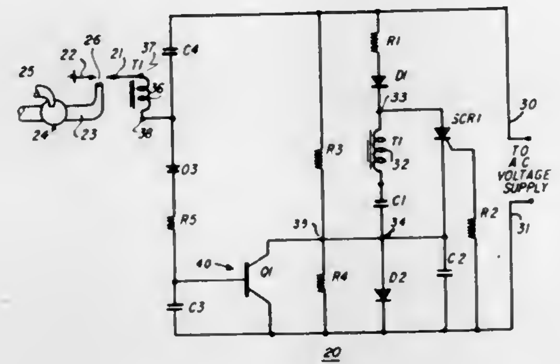


A plurality of series resistor-diode combinations are successively connected in series between a plurality of photoflash lamps, so as to connect the flash lamps into an electrical parallel circuit through the resistor-diode combinations. An end of the parallel circuit is adapted to be connected across a source of firing pulses. Each successive firing pulse will flash a different lamp. In a further embodiment, additional resistors are connected between the aforesaid end of the circuit and the respective resistor-diode combinations.

3,718,423
AUTOMATIC FUEL IGNITION SYSTEM

Russell B. Matthews, Goshen, Ind., assignor to Johnson Service Company, Milwaukee, Wis.

Filed Sept. 7, 1971, Ser. No. 178,019
Int. Cl. F23q *3/00*
U.S. Cl. 431—264 **4 Claims**

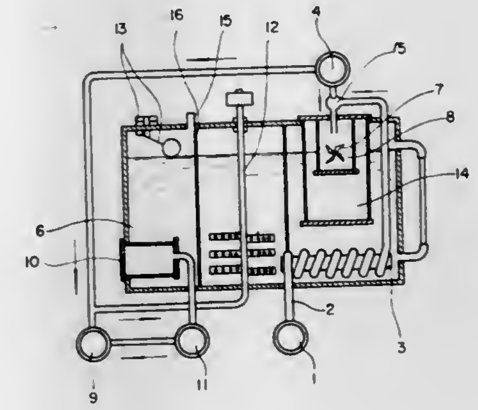


An automatic fuel ignition system includes an ignition circuit having an ignition transformer with a primary winding connected in a series circuit path, including a capacitor, across an AC source for charging the capacitor, and a secondary winding connected in series with a pair of ignition electrodes positioned adjacent a fuel outlet; a normally non-conducting silicon controlled rectifier, connected in shunt with the primary winding and the capacitor, is rendered conductive permitting the capacitor to discharge through the primary winding producing a voltage in the secondary winding whereby an ignition spark is generated across the electrodes for igniting the fuel; a control circuit enabled when the fuel is ignited inhibits further operation of the silicon control rectifier and thus inhibits further spark generation.

3,718,424
BURNER MECHANISM OF USED OIL

Kotaro Konagai, 267, Tegoshi, Shizuoka-shi, Shizuoka-ken, Japan

Filed Oct. 20, 1971, Ser. No. 190,715
Int. Cl. F23d *11/44*
U.S. Cl. 431—207 **10 Claims**

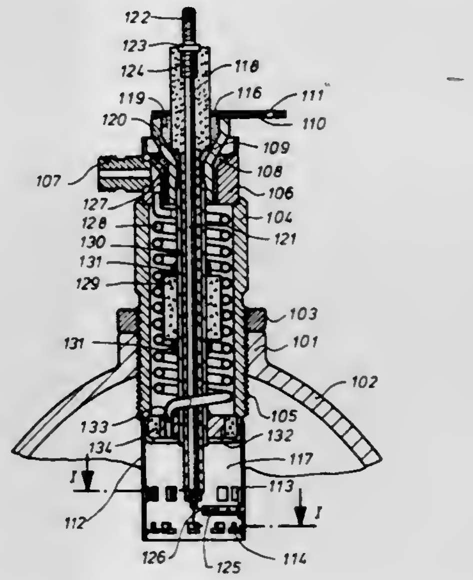


A burner mechanism of used oil wherein the used oil of heated condition is compulsorily mixed with pressured oil, mixture of the used oil with the air is then filtered so as to convert the air voids in the mixture into finer particles, filtered mixture is then again compulsorily mixed with pressured air and is finally supplied to a burner element. The mechanism may advantageously be provided with a rotary mixed for a better mixing of air with used oil.

3,718,425
GLOW PLUG CONSTRUCTION

Helmut Weyle, Bietigheim, Gunther Kauhl, Asperg, and Otto Beesch, Stuttgart, Germany, assignors to Robert Bosch G.m.b.H., Stuttgart, Germany

Filed Mar. 3, 1972, Ser. No. 231,607
Claims priority, application Germany, Mar. 17, 1971, P 21 12 815.4
Int. Cl. F23d *11/44*
U.S. Cl. 431—208 **8 Claims**

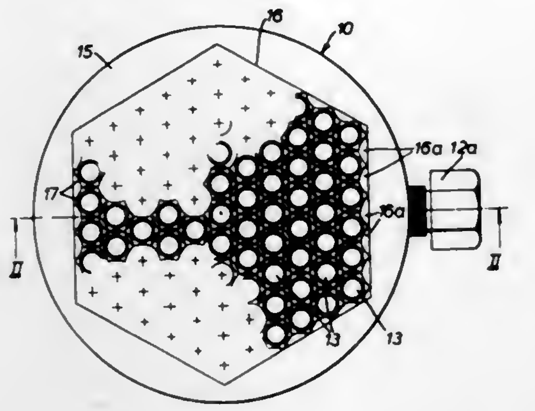


A glow plug has a tubular casing through which extends in insulated relationship a helix constituted by an electrically conductive tubular member. In the region of one end of the casing the tubular member has an inlet for combustible fuel fluid, and in the region of the other end it has one or more outlets. The tubular member is connected with a source of electrical energy which heats it so that when fluid passes through the tubular member, it will issue at the outlet as a vapor. A pair of electrodes are provided defining in the region of the outlet a high-voltage spark gap for igniting the issuing vapor.

3,718,426
BURNER

James Michael Harris, London, England, assignor to Gasmat Burners Limited
Filed Oct. 9, 1970, Ser. No. 79,423
Claims priority, application Great Britain, Oct. 16, 1969, 50,828/69
Int. Cl. F23d *13/12*
U.S. Cl. 431—328 **10 Claims**

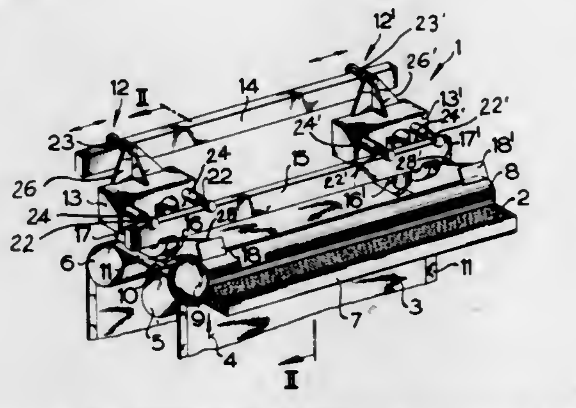
This invention consists of a burner for burning gaseous or liquid fuel comprising a bundle of tubular elements bunched together to provide passages for combustion air through said tubular elements and passages for fuel between said tubular elements, the essential novel feature of the invention consisting in providing each of the tubular elements with a head portion so shaped externally that when the tubular elements are bunched together with their head portions in contact, fuel orifices are formed between said head portions.



CHEMICAL

3,718,427
METHOD AND APPARATUS FOR TREATING A MOVING WEB OF MATERIAL

Karl-Heinz Ahrweiler, Zur Alten Schmiede 116, Germany, assignor to Eduard Kuesters Maschinenfabrik, Krefeld, Germany
Filed Sept. 20, 1971, Ser. No. 181,710
Claims priority, application, Germany, Feb. 2, 1971, P 21 04 694.6
Int. Cl. B05c *5/00*
U.S. Cl. 8—151 **22 Claims**



A method of and apparatus for selectively treating a moving web of material such as in the case of applying a liquid dye to a breadth of pile carpet. Liquid is applied to select portions of the web of material, the application thereof being responsive to a longitudinal border or edge of the web, the position of which is sensed by means provided on the apparatus.

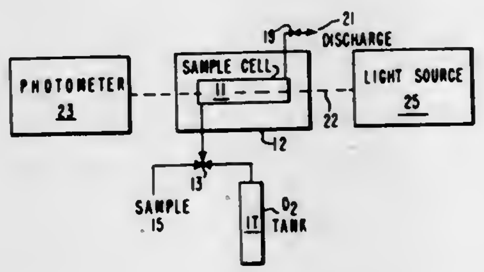
3,718,428
ALCOHOLIC COMPOSITION OF A CATIONIC DYE-ALKYL ARYL SULFONIC ACID COMPLEX AND PROCESS OF DYEING THEREWITH

Clemens Streck, Loudonville, N.Y., assignor to GAF Corporation, New York, N.Y.
Filed Dec. 21, 1970, Ser. No. 100,513
Int. Cl. D06p *5/04*
U.S. Cl. 8—173 **8 Claims**

A stable dye solution comprising a complex of a basic dye with a linear alkyl aryl sulfonic acid surfactant, a lower alcoholic component, an alkalizing agent to adjust the pH of the solution and water. The instant invention is further directed to a process of preparing said dye solution and a method of using same.

3,718,429
NO-NO$_2$ ANALYZER

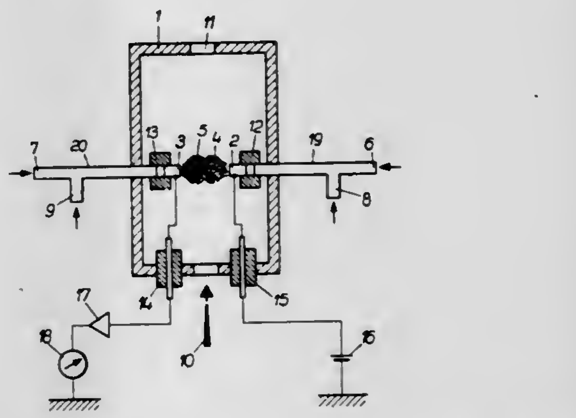
James A. Williamson, Jr., Newark, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.
Filed Mar. 15, 1971, Ser. No. 124,039
Int. Cl. G01n *21/24*
U.S. Cl. 23—232 R **32 Claims**



Apparatus and method for NO-NO$_2$ analysis in which a sample gas is placed in a pressure sample cell; measuring radiation in the 410–600 nm. range passed through the cell and detected; oxygen-containing gas introduced into the cell under pressure; the above radiation again passed through the cell and detected; and the temperature controlled after introducing the oxygen-containing gas. Preferably 4 atmospheres of substantially pure oxygen constitute the oxygen-containing gas; the above measuring radiation has a wavelength of about 436 nm.; radiation of about 546 nm. is passed through cell for reference purposes; and the presure within the cell is also controlled. When present, radiation below about 410 nm. should be excluded from the cell. Alternatively, the measuring radiation may be pased through the cell only after the oxygen-containing gas has been introduced therein.

3,718,430
FLAME IONIZATION DETECTOR

Horst Fischer, Fischbach/Taunus, and Manfred Neufelder, Frankfurt am Main, both of Germany, assignors to Battelle-Entwicklungs-Gesellschaft m.b.H., Frankfurt am Main, Germany
Filed Jan. 19, 1971, Ser. No. 107,621
Claims priority, application Germany, Jan. 24, 1970, P 20 03 207.9
Int. Cl. G01n *31/12*
U.S. Cl. 23—254 E **11 Claims**



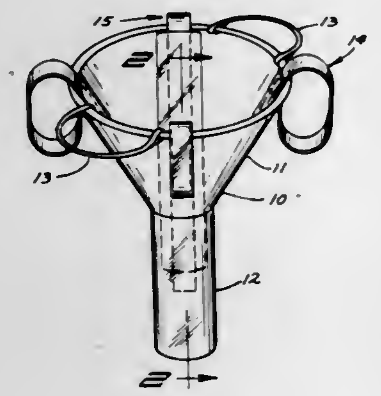
A housing has an air inlet port and an outlet port. Opposed burner jet assemblies provide flames from electrically conductive jets mounted on insulators. Hydrogen for combustion is supplied through pipes together with a test material and a reagent. A voltage source, amplifier, and meter are connected to detect variations in electrical conductivity of the flames between the jets and thus to detect certain ingredients in the test material.

3,718,431
METHOD OF STOOL SAMPLE COLLECTION AND TESTING APPARATUS THEREFOR

John J. Wild, 1100 East 36th St., Minneapolis, Minn.
Filed Feb. 1, 1971, Ser. No. 111,253
Int. Cl. A61b *5/00;* **G01n** *33/16*
U.S. Cl. 23—230 B **10 Claims**

A disposable device for private collection and testing of stool samples of human fecal discharge for the presence of abnormalities such as occult, or hidden blood, which may be a sign of malfunctioning of the intestinal tract of a patient. The device is self-contained and disposable after the test, which can be read by the patient himself. A flexible sample receiving member includes a portion adapted to gravitationally receive an intestinal stool discharge whereby a stool specimen may be deposited in the device and retained in a longitudinally elongated shape during sampling of the stool. After deposition of surface samples of the stool on the surface of the test medium, the stool may be allowed to pass down into the toilet leaving said samples in the device for further test processing.

In one such test a reagent can be dispersed longitudinally on the sample, the test "read" by the reaction, if any, of the reagent, the results noted, after which the entire device and stool samples are disposed of without requiring any direct handling or transportation to a laboratory, or the like.



3,718,432

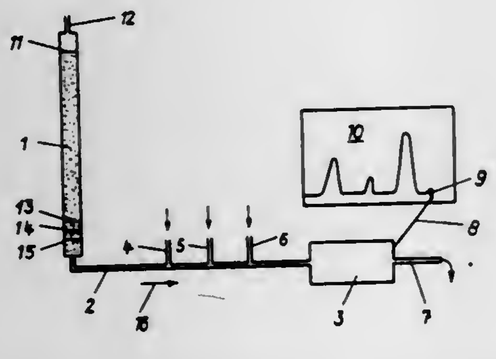
DETERMINATION OF AMMONIA AND ORGANIC AMINO COMPOUNDS

Marc Roth, 14 Petite Boissiere, Geneva, Switzerland

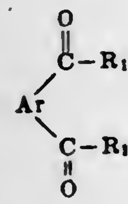
Filed Feb. 12, 1971, Ser. No. 114,788

Claims priority, application Switzerland, Feb. 17, 1970, 2,269/70

Int. Cl. G01n *21/38, 31/08, 33/16*
U.S. Cl. 23—230 R **28 Claims**



A process for the determination of ammonia and organic amino compounds having at least one primary amino group, in particular amino acids and their derivatives substituted on the carboxyl group, comprising the step of creating a fluorescent product by putting into contact the compound to be determined either with a compound of the Formula I:



in which Ar indicates an aromatic radical, the —COR_1 and —COR_2 groups being attached to adjacent carbon atoms, and R_1 and R_2 are identical or different and represent hydrogen or an organic radical, and with a reducing agent, or with a reaction product of the said compound of Formula I and the reducing agent.

3,718,433

METHOD OF ANALYZING OF AMMONIA, UREA, AND TYROSINE

Robert T. Emmet, Miami, Fla.
(14 Bricin St., Annapolis, Md. 21403)

No Drawing. Continuation-in-part of abandoned application Ser. No. 799,502, Feb. 14, 1969. This application July 26, 1971, Ser. No. 166,272

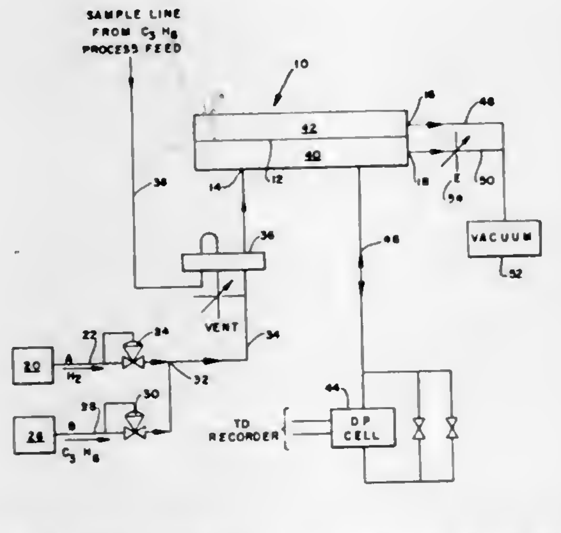
Int. Cl. G01n *21/22, 33/16*
U.S. Cl. 23—230 R **3 Claims**

A new system of chemical reactions for the analysis for ammonia, urea and tyrosine and also biuret and allantoin in certain solutions. The reactions consist of a chlorination of the nitrogen compound in dilute hypochlorite (OCl^-) solution followed by the condensation with phenol to form uniquely absorbing compounds; 630 mμ for ammonia, 454 mμ for urea and 375 mμ for tyrosine. This method provides several procedural advantages especially suited for clinical use.

3,718,434

APPARATUS AND METHOD FOR DETECTING GASEOUS CONTAMINANTS

Russell W. Pierce, Broadway & Elm Streets, Hanover, Mass.
Filed Jan. 13, 1972, Ser. No. 217,583
Int. Cl. G01n *7/10*
U.S. Cl. 23—232 R **24 Claims**



Method of detecting gaseous contaminants by monitoring the rate of diffusion of a given gas through a selectively permeable metallic surface which is reversibly poisoned by the contaminants. Apparatus for practicing method.

3,718,435

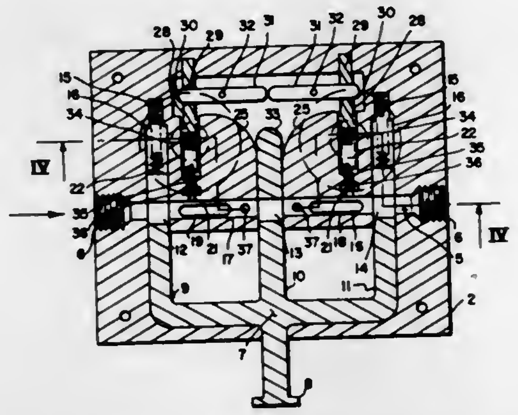
INSTANTANEOUS ON-LINE WATER TESTER

Ronald H. Tower, 3141 N. 37th St., Phoenix, Ariz. 85018

Filed Aug. 18, 1971, Ser. No. 172,787

Int. Cl. G01n *31/22, 33/18*
U.S. Cl. 23—253 R **11 Claims**

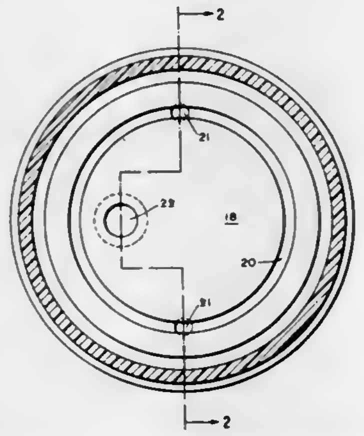
An instantaneous on-line water tester for use in a water flow line comprising gate means for closing the water flow line at spaced apart locations to isolate a predetermined quantity of water therebetween, means for injecting a predetermined quantity of indicator material into the isolated quantity of water and means for viewing the isolated quantity of water with the predetermined quantity of indicator material injected thereinto. The gate means may comprise spaced apart gate elements operable to close the water flow line sequentially, first at a relatively downstream location and thereafter at a relatively upstream location. The tester includes an operating member and connections from the operating member operable sequentially upon operation of the operating member to first operate the gate means to isolate the predetermined quantity of water and thereafter inject the predetermined quantity of indicator material into the predetermined quantity of water. The gate means may close the water flow line at spaced apart locations to isolate two predetermined quantities of water, the injecting means injecting a predetermined quantity of indicator material into each isolated quantity of water. The injecting means may include pressure producing means for forcing indicator material into the isolated quantity of water, and pressure relief means may be provided for permitting escape of a quantity of water equal to the quantity of indicator material forced into the isolated quantity of water. The gate means may be in the form of a fork projecting through the water flow line, the fork operating the injecting means when the predetermined quantity of water has been isolated. The fork may have three prongs constituting gate elements to isolate two predetermined quantities of water, such gate elements being operable to close the water flow sequentially, first at the farthest downstream location, thereafter at the intermediate location and finally at the farthest upstream location, the injecting means injecting a predetermined quantity of indicator material into each isolated quantity of water.



3,718,436

IMMUNO DIFFUSION CELL

Alexis E. Ushakoff, Plantation, Fla., assignor to Cordis Corporation, Miami, Fla.
Filed Nov. 11, 1971, Ser. No. 197,818
Int. Cl. C12k *1/10;* **G01n** *31/02, 33/16*
U.S. Cl. 23—253 R **2 Claims**

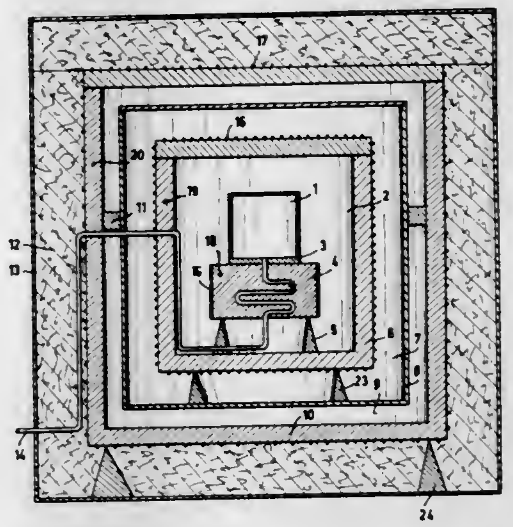


A two-directional immuno diffusion (ouchterlony) cell features a gel layer and an overlying template having wells for the reactants. One of the wells is in the form of an enclosed peripheral channel and the other is eccentric, such that diffusion of the respective reactants from the wells results in an elliptical reaction figure, the geometry and rate of formation of which are functions of the reactant concentrations and relative proportions.

3,718,437

ISOTHERMAL CALORIMETER

Paavo Paloniemi, Poutamaentie 13 D., Helsinki 36, Finland
Filed Dec. 28, 1970, Ser. No. 101,765
Int. Cl. G01n *25/20*
U.S. Cl. 23—253 R **20 Claims**

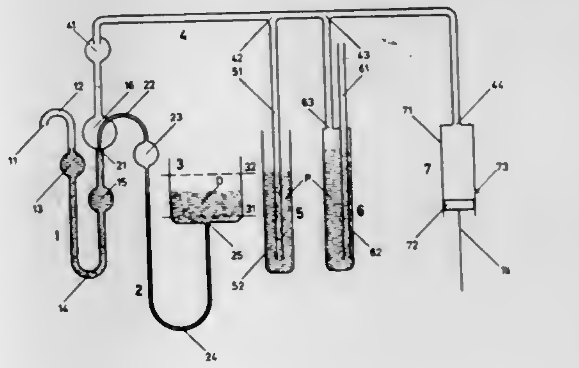


Isothermal calorimeter for the measurement of chemical reaction rate wherein a sample to be tested can be placed into a test chamber surrounded by a number of casings of a heat conductive material, said casings being insulated from each other by thermal insulating layers and being provided with separate temperature control systems in order to achieve good thermal stability in the system. The test chamber is connected to a gas feeding means through a gas channel means. The measurements are effected by means of a heat flow meter connected to the test chamber and to a metallic central mass.

3,718,438

DOSING APPARATUS

Arnost Anscherlik, 1 Schwarzenbergstrasse, 8134 Adliswil, Switzerland
Filed Sept. 8, 1970, Ser. No. 70,402
Claims priority, application Switzerland, Sept. 26, 1969, 14,679/69
Int. Cl. B01l *3/00*
U.S. Cl. 23—259 **12 Claims**



Dosing apparatus having an S-shaped dosing tube having an inlet and an outlet. An air supply means, such as a pump, is provided to supply air under pressure, vacuum or atmosphere to the inlet. A reagent storage tank having a supply tube leading into the inlet of the dosing tube is also provided. The mouth of the supply tube is connected near the inlet above the upper level of liquid in the reagent storage tank and at a level between the outlet of the dosing tube and the upper level of liquid in the reagent storage tank and has its other end connected to the bottom of the tank. The supply tube and dosing tube are formed to maintain a liquid seal against predetermined overpressure and vacuum produced in the device by the air pump and controlled by pressure and vacuum control units even if the reagent tank is at its lowest liquid level.

3,718,439

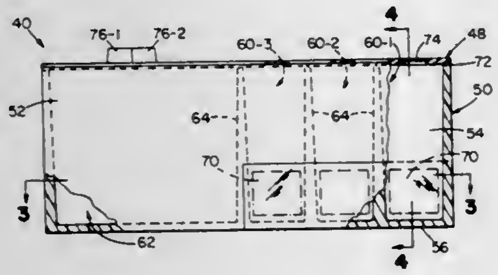
ANALYTICAL APPARATUS

Thomas A. Rosse, Lexington, David E. Blackmer, Harvard, Jerrold Zindler, Cambridge, and Thomas F. Kelley, Canton, Mass., assignors to Instrumentation Laboratory, Inc., Lexington, Mass.

Filed June 12, 1970, Ser. No. 45,706

Int. Cl. B65d *79/02;* **G01n** *21/34, 33/16*

U.S. Cl. 23—259 **9 Claims**



A cuvette assembly for use with photometric instrumentation includes a body portion that defines a plurality of sample chambers and includes two spaced parallel walls. Each sample chamber is defined in part by the two spaced walls and each wall has an optical window associated with each chamber so that an optical path through each chamber is defined, and the lengths of the optical paths through the chambers are equal.

3,718,440

REGENERATIVE AFTERBURNER FOR AIR POLLUTION ELIMINATION

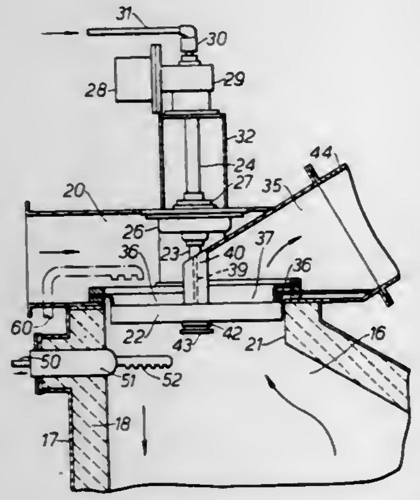
Richard W. Foster-Pegg, 101 Fourth Street, Warren, Pa.

Continuation-in-part of Ser. No. 838,544, July 2, 1969, abandoned. This application Jan. 27, 1971, Ser. No. 110,279

Claims priority, application Great Britain, July 5, 1968, 32225/68

Int. Cl. F23g *7/06;* **F23l** *5/02*

U.S. Cl. 23—277 C **2 Claims**



An afterburner including a regenerator disk having passages therethrough disposed over the combustion chamber, means slowly rotating the disk, a inlet duct having a first rigid seal extending completely about the periphery of the upper surface of the disk, and an exhaust duct extending through the inlet duct, the duct chamber having a second seal extending about a sector of the upper surface of the disk within the first seal.

3,718,441

METHOD FOR FORMING METAL-FILLED CERAMICS OF NEAR THEORETICAL DENSITY

Richard L. Landingham, Livermore, Calif., assignor to The United States of America as represented by the Secretary of the Army

Filed Nov. 18, 1970, Ser. No. 90,795

Int. Cl. B44d *1/02*

U.S. Cl. 29—182.1 **7 Claims**

A method for forming metal-filled ceramics of near theoretical density comprising the positioning of a ceramic compact in a vacuum chamber together with a quantity of the filler metal. The chamber is heated above the melting point of the metal and evacuated to a vacuum pressure of less than 10^{-4} torr. The vacuum removes the oxide film on the surface of the molten metal, thereby permitting the metal to flow freely into the ceramic void spaces.

3,718,442

STRANDED STEEL WIRE STRUCTURES

Wilbert A. Lucht, Orange, Conn., assignor to United States Steel Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 714,084, March 18, 1968, abandoned. This application Oct. 23, 1970, Ser. No. 83,614

Int. Cl. B21c *1/00*

U.S. Cl. 29—191.6 **1 Claim**

A high strength ductile hot rolled rod and/or cold drawn wire made from commonly used steels including 0.65 to 1.00 percent carbon, 0.25 to 1.20 percent manganese, 0.35 percent maximum silicon, 0.20 percent maximum aluminum, 0.05 percent maximum sulphur, 0.012 percent maximum nitrogen, and 0.05 percent maximum phosphorus, but with the addition of 0.03 to 0.15 percent vanadium and 0.20 percent maximum molybdenum. Because of the vanadium and molybdenum additions the rod, after being hot rolled, requires only one patenting step in cold drawing to size and the rod and wire have improved physical characteristics.

3,718,443

COMPOSITE METAL PRODUCTS

Roy Gwyn Faulkner, Stourbridge, and Peter John Bridges, Sutton Coldfield, both of England, assignors to The International Nickel Company, Inc., New York, N.Y.

Filed Dec. 14, 1971, Ser. No. 208,000

Claims priority, application Great Britain, Jan. 22, 1971, 2,952/71; July 16, 1971, 33,645/71

Int. Cl. B32b *15/00*

U.S. Cl. 29—196.6 **5 Claims**

A composite product comprising a foundation alloy containing Ni to 45%, Cr 15 to 25%, C up to 0.1%, titanium and/or niobium in a total of about from 1 to 4%, Al 0 to 4%, Mo 0 to 10%, balance Fe, clad with an alloy containing Cr 45 to 60%, C up to 0.04%, Zr 0.1 to 4%, balance Ni. An intermediate layer of nickel can be included between the foundation and the cladding.

3,718,444

JET FUEL ADDITIVE

Vincent F. Hnizda, Huntington Woods, Mich., assignor to Ethyl Corporation, New York, N.Y.

Filed Dec. 20, 1968, Ser. No. 785,800

Int. Cl. C10l *1/26*

U.S. Cl. 44—66 **14 Claims**

A method of reducing manganese containing deposits formed on the surfaces of jet engines from burning fuel containing organomanganese compounds as a smoke reducer is described. The deposits are reduced by adding an organic molybdenum compound to the organomanganese containing fuel.

Cyclopentadienyl manganese tricarbonyl compounds are useful organomanganese compounds; molybdenum naphthenate is a useful molybdenum compound.

3,718,445

FLAMMABLE COMPOSITION COMPRISING A GELLED HYDROCARBON

Howard Julian Troffkin, Arlington, Va., and Vernon Paul Wystrach, Noroton Heights, Conn., assignors to the United States of America as represented by the Secretary of the Army

No Drawing. Filed Dec. 23, 1966, Ser. No. 605,149

Int. Cl. C10l *7/02*

U.S. Cl. 44—7 C **7 Claims**

The invention relates to a cross-linkable, flammable composition of matter comprising a hydrocarbon fuel, a butadiene polymer containing 2 to 4 free carboxyl groups and 1,3,5-hexahydroaziridinylpropionyl-s-triazine.

3,718,446

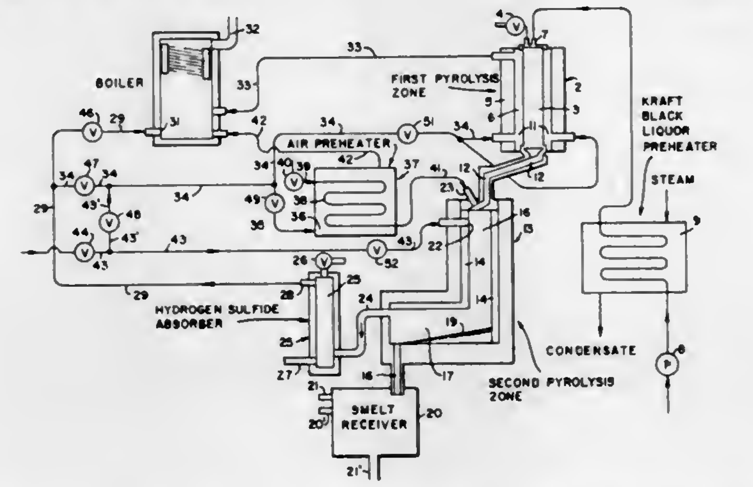
POLLUTANT-FREE PROCESS FOR PRODUCING A CLEAN BURNING FUEL GAS FROM ORGANIC-CONTAINING WASTE MATERIALS

David L. Brink, and Jerome F. Thomas, both of Berkeley, Calif., assignors to The Regents of the University of California, Berkeley, Calif.

Filed Feb. 18, 1970, Ser. No. 12,315

Int. Cl. C10j *3/10, 3/14, 3/20*

U.S. Cl. 48—209 **7 Claims**



A process involving the high temperature distillation and pyrolysis of an organic material such as kraft black liquor, formed during conventional chemical wood pulping, to break down the material to non-combustible solids and to a stable gaseous clean burning fuel. The process involves introduction of malodorous-containing gaseous emissions from the pulping operation as a source of oxygen for attaining the temperature necessary for the pyrolysis but insufficient to effect stoichiometric (complete) combustion of the organic material. These kraft mill malodorous emission gases are occasionally burned with inherent incomplete combustion, leaving significant amounts of obnoxious gases to pollute the atmosphere.

3,718,447

GRINDING WHEELS FORMED FROM PRE-POLYMER COMPOSITIONS CONTAINING ALIPHATICALLY UNSATURATED IMIDO RADICALS

Louis E. Hibbs, Jr.; Fred F. Holub, both of Schenectady, and Kenneth A. Darrow, Sprakers, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Sept. 30, 1970, Ser. No. 77,000

Int. Cl. B24b *1/00;* **C08g** *51/12*

U.S. Cl. 51—295 **7 Claims**

A molding composition for the manufacture of resinoid bonded abrasive structures is described. Each molding composition employs a high temperature thermosetting pre-polymer (or mixture of organic materials) containing aliphatically unsaturated imido radicals, which cures with essentially no evolution of volatiles to produce polyimide resin cross-linked with carbon-to-carbon and/or carbon-to-nitrogen bonds. The preferred molding composition embodies (in addition to the aforementioned type of pre-polymer) quantities of abrasive particles; particles of a strong, high thermal conductivity filler and solid lubricant particles. Grinding wheel composite structures produced from these molding compositions are particularly effective for dry grinding.

3,718,448

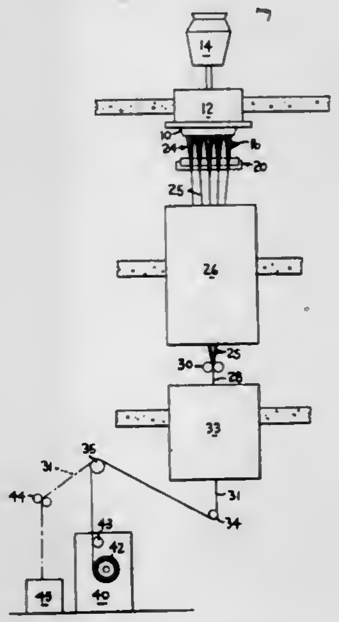
GLASS FIBER FORMING AND COATING PROCESS

Warren W. Drummond, Allison Park, and Donald W. Denniston, Pittsburgh, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 80,219, Oct. 12, 1970, abandoned, which is a continuation of Ser. No. 814,731, April 9, 1969, abandoned, which is a continuation-in-part of Ser. No. 742,743, July 5, 1968, abandoned. This application Jan. 3, 1972, Ser. No. 214,748

Int. Cl. C03c *25/02*

U.S. Cl. 65—3 **10 Claims**



Simultaneously forming a large number of continuous filament glass fibers from a single bushing, coating the individual glass fibers with an aqueous liquid coating material, combining the fibers into a plurality of strands and drying the coating on the fibers while the strands are spaced from each other. In the strand forming process, the individual coated glass fibers are brought together and held together in small, spaced groups of fibers and the small groups of the coated fibers are dried while in this spaced relation before they are collected on the forming tube.

3,718,449

SIZING, COATING AND COMBINED SIZING AND COATING COMPOSITION FOR GLASS FIBERS

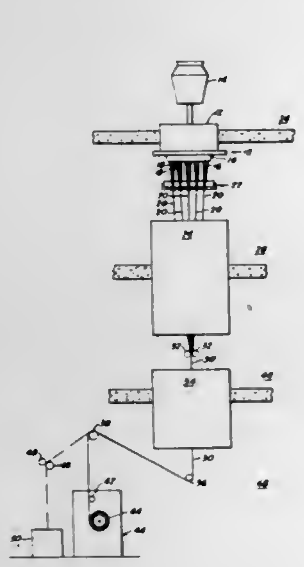
Dennis M. Fahey, Aspinwall, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Dec. 1, 1970, Ser. No. 93,980

Int. Cl. C03c *25/02*

U.S. Cl. 65—3 **7 Claims**

Individual glass fibers are coated with a combined sizing and coating composition that includes furfuryl alcohol as a constituent. The preferred combined sizing and coating composition comprises an aqueous mixture including furfuryl alcohol, ammonia, an elastomeric latex selected from natural and synthetic rubber latices such as neoprene, isoprene, butyl rubber, butadiene-styrene copolymers, acrylonitrile-butadiene-styrene terpolymers, styrene-butadiene-vinylpyridine terpolymers, and the like, an aminosilane coupling agent such as gamma-aminopropyltriethoxysilane, and a resorcinol-formaldehyde resin. An aqueous solution of the combined sizing and coating composition is prepared and the individual glass fibers are coated shortly after attenuation with this combined sizing and coating composition. The coated individual glass fibers are thereafter gathered into strands and the strands are dried while spaced from each other. The dried strands are thereafter collected on a forming tube and are used as a glass fiber reinforcement for elastomeric products. The furfuryl alcohol may also be used as a constituent in a sizing composition that includes a coupling agent and also, in a coating composition, for use with glass fibers that have been previously coated with a separate sizing composition.



3,718,450

FLOAT PROCESS FOR MANUFACTURE OF GLASS RIBBON

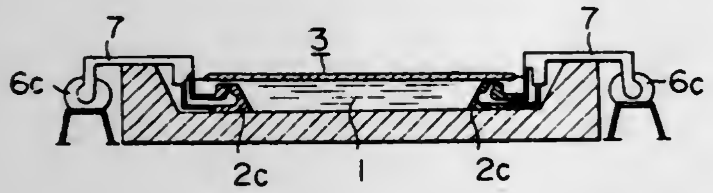
Nobuyoshi Ohsato, and Naotomo Akashi, both of Maizuru, Japan, assignors to Nippon Sheet Glass Co., Osaka, Japan

Filed Oct. 14, 1970, Ser. No. 80,686

Claims priority, application Japan, Oct. 15, 1969, 44/82728

Int. Cl. C03b *18/00*

U.S. Cl: 65—99 A **8 Claims**



An improvement in the float process for the manufacture of glass ribbon having a thickness different from the equilibrium thickness, said improvement being characterized in that jets of molten metal are impinged against both side edge portions of the glass ribbon from nozzles disposed below the glass ribbon and in the molten metal bath, and a lateral stretching force, in the case of outward impinging, or a lateral contracting force, in the case of inward impinging, is imparted to the glass ribbon by the momentum of the molten metal impinged from the nozzles against the glass ribbon.

3,718,451

METHOD OF MAKING FERTILIZER FROM CHICKEN MANURE

Heinz Baumann, 3 Zucherfabrikstr., Frankethal upper Palatinate, Germany

Continuation of Ser. No. 831,105, June 6, 1969, abandoned.

Filed July 7, 1971, Ser. No. 160,506

Int. Cl. C05f *11/08*

U.S. Cl. 71—9 **7 Claims**

A fertilizer and soil conditioner material is prepared from chicken manure, normally containing 80–90 percent water, by mixing the manure with a small amount of comminuted urea-formaldehyde resin foam sufficient to absorb the water, fermenting the manure while mixed with the foamed resin, and reducing the water content to not much more than 40 percent. The product is a practically odorless humus-like substance rich in microbial cells.

3,718,452

COMBATING UNWANTED VEGETATION WITH 2-ARYL-5-SUBSTITUTED 1,3,4-OXADIAZOLES

Norman A. Dahle, Mission, and William C. Doyle, Jr., Leawood, both of Kans., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Oct. 24, 1969, Ser. No. 869,369

Int. Cl. A01n *9/22*

U.S. Cl. 71—92 **23 Claims**

Unwanted vegetation is combated by application of a class of phenyloxadiazoles which possess either or both pre and post-emergent phytotoxicity. The herbicides as a class are severely toxic to a minority of plant species, most of the compounds having pre-emergent effectiveness against crabgrass. Some of the compounds, as for example, 2-(3′,4′-dichlorophenyl)-5-methyl-1,3,4-oxadiazole, are particularly useful for pre-emergent control of weeds in a standing crop because of an almost total absence of post-emergent phytotoxicity.

A small group of compounds, such as 2-dimethylamino-5-(2′,4′-dimethylphenyl)-1,3,4-oxadiazole are predominantly post-emergent herbicides and a number of compounds, as for instance, 2-diethylamino-5-p-tolyl-1,3,4-oxadiazole, have both pre- and post-emergent activity and are useful in combating both crabgrass and broadleaf weeds in fields of small grains and in brome grass pastures.

3,718,453

PRODUCTION OF POTASSIUM DIHYDROGEN PHOSPHATE FERTILIZERS

William H. Thompson, Dublin 14, Ireland, assignor to W. & H. M. Goulding Limited, Dublin, Ireland

Filed Sept. 19, 1969, Ser. No. 859,435

Claims priority, application Great Britain, Sept. 20, 1968, 44,789/68; June 6, 1969, 28,659/69

Int. Cl. C05b *7/00;* **C01b** *25/28*

U.S. Cl. 71—34 **11 Claims**

The invention relates to the production of fertilizers, in particular potassium dihydrogen phosphate. This is obtained through acid attack on phosphate rock by a medium obtained by the reaction of sulphuric acid with potassium chloride. In particular, the phosphate rock is reacted with a medium comprising potassium bisulphate, sulphuric acid and phosphoric acid. As a result, the solid calcium sulphate formed in the reaction mixture can be readily filtered off from the mother liquor and the potassium dihydrogen phosphate product can be recovered in a commercially operative process. The mother liquor containing phosphoric acid and potassium dihydrogen phosphate is recycled to the original reaction mixture.

3,718,454

STABILIZED PESTICIDAL WETTABLE POWDER FORMULATIONS

Konrad Albrecht, Frankfurt am Main, Germany, assignor to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany

Filed Dec. 2, 1969, Ser. No. 881,587

Claims priority, application Germany, Dec. 5, 1968, P 18 12 947.0

Int. Cl. A01n *9/24*

U.S. Cl. 71—106 **8 Claims**

The invention provides stabilized pesticidal formulations containing at least one 4,6-dinitro-2-sec.butylphenyl ester as active ingredient and as a stabilizing agent a sodium dinaphthylmethane disulfonate having unsatified free sulfonic acid groups.

3,718,455

METHOD OF COMBATTING WEEDS WITH α-NAPHTHOXY ACETAMIDES

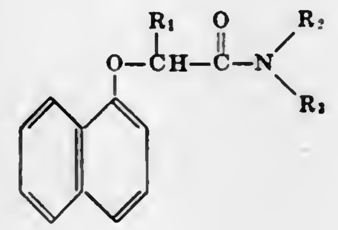
Don R. Baker, Orinda; Harry Tilles, El Cerrito, both of Calif., and Chester L. Dewald, Celaya, Gto., Mexico, assignors to Stauffer Chemical Company, New York, N.Y.

Continuation-in-part of Ser. No. 794,836, Dec. 19, 1968, abandoned, which is a division of Ser. No. 637,624, May 11, 1967, abandoned, which is a continuation-in-part of Ser. No. 352,310, March 16, 1964, abandoned. This application July 20, 1970, Ser. No. 56,656

Int. Cl. A01n *9/20*

U.S. Cl. 71—118 **17 Claims**

Substituted α-naphthoxy acetamides having the general formula



wherein R_1 selected from the group consisting of hydrogen and lower alkyl, R_2 is selected from the group consisting of hydrogen, lower alkyl, and lower alkenyl, and R_3 is selected from the group consisting of lower alkyl, and lower alkenyl; provided that when R_1 and R_2 are both hydrogen then R_3 is lower alkyl having from one to two carbon atoms, inclusive. The compounds are effective as herbicides in the control of grasses and broadleaf plants with both pre-emergence and post-emergence activity. Representative compounds are N,N-dimethyl α-naphthoxyacetamide, N,N-diethyl 2(α-naphthoxy)-propionamide, N-isopropyl 2(α-naphthoxy)-butyramide, and N-methyl α-naphthoxy-acetamide.

3,718,456

HERBICIDAL METHOD EMPLOYING 4-CHLORO-1-NAPTHYL 2′-PROPYNYL ETHER

Alexander Mihailovski, Berkeley, Calif., assignor to Stauffer Chemical Company, New York, N.Y.

Filed July 12, 1971, Ser. No. 161,990

Int. Cl. A01n *9/24*

U.S. Cl. 71—124 **1 Claim**

The use of a 4-chloro-1-napthyl 2′-propynyl ether as a herbicide is disclosed.

3,718,457

PROCESS FOR THE RECOVERY OF MERCURY FROM WASTE BRINE FROM MERCURY CELLS

John Hubert Entwisle, and Robert William Griffiths, both of Runcorn, England, assignors to Imperial Chemical Industries Limited, London, England, by said Entwisle

Filed Jan. 29, 1971, Ser. No. 111,091

Claims priority, application Great Britain, Feb. 20, 1970, 8,226/70

Int. Cl. C22b *43/00*

U.S. Cl. 75—108 **11 Claims**

A process for recovering mercury from waste brine from mercury cells comprising adding sulphide or hydrosulphide ions to the brine to precipitate mercury sulphide, trapping the mercury sulphide on a mixed media filter in which the average size of particles in successive super-imposed layers decreases and the specific gravity of the particles increases from the top of the filter downwards, removing the mercury sulphide from the filter by backwashing with an aqueous liquor, separating the mercury sulphide from the backwash liquor and treating the sulphide to produce metallic mercury.

3,718,458

LIQUID-LIQUID SEPARATION OF COBALT FROM AMMONIACAL SOLUTIONS

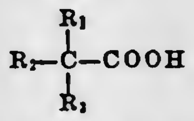
Gordon Malcolm Ritcey, and Bernard Henry Lucas, both of Ottawa, Ontario, Canada, assignors to Canadian Patents and Development Limited, Ottawa, Ontario, Canada

Filed Jan. 26, 1971, Ser. No. 109,899

Int. Cl. C22b *23/04*

U.S. Cl. 75—119 **12 Claims**

A process for separating cobalt from an aqueous ammoniacal solution in which metals are dissolved, the solution containing at least 50 grams/liter of an ammoniacal salt and the cobalt being in the cobaltous form. The solution at pH 7–9 is contacted with a tertiary, mono-carboxylic acid of the formula



$$R_2-\overset{\displaystyle R_1}{\underset{\displaystyle R_3}{\overset{|}{\underset{|}{C}}}}-COOH$$

wherein R_1, R_2 and R_3 are alkyl groups and the molecular chain contains 6–19 carbon atoms, preferably dissolved in an inert organic diluent. The cobalt values are extracted from the aqueous phase to the organic extract phase and the resultant cobalt loaded organic phase is separated from the remaining aqueous raffinate phase containing, for example, the nickel in solution.

3,718,459

COMPOSITE COMPOSITIONS

Hans-Jurgen A. Stenzel, Brentwood, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed June 29, 1970, Ser. No. 64,836

Int. Cl. C21c *7/02;* **C22b** *5/00*

U.S. Cl. 75—132 **6 Claims**

Ferrophosphorus containing at least 1 percent silicon by weight is admixed with calcium carbonate and formed into an integral composite, the silicon content of which is converted to silica upon addition of the composite to molten iron, steel, or alloys thereof. The composite provides, for example, a useful effective low silicon source of phosphorus and alloying constituents for iron, steel and their alloys.

3,718,460

MG-AL-SI ALLOY

George S. Foerster, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 687,457, Dec. 4, 1967, abandoned. This application June 5, 1970, Ser. No. 43,946

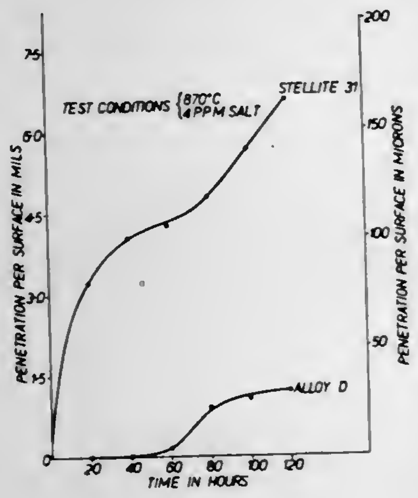
Int. Cl. C22c *23/00;* **B22d** *21/00*

U.S. Cl. 75—168 M **2 Claims**

A magnesium alloy containing 3.5 to 7% Al, 0.4 to 1.5% Si, up to 1% Mn and up to 2% Zn. Such alloy possesses the combination of high strength and improved creep resistance over the prior art alloys. This alloy is particularly adaptable to die casting.

3,718,461
COBALT-BASE ALLOYS

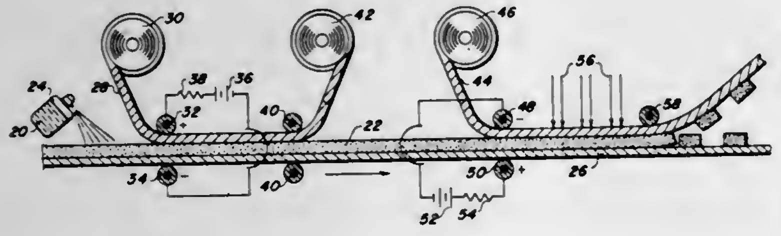
Michael Albert Pike Dewey, High Wycombe, England, assignor to Fulmer Research Institute Limited
Filed Aug. 19, 1971, Ser. No. 173,159
Claims priority, application Great Britain, Aug. 24, 1970, 40,699/70
Int. Cl. C22c *19/00*
U.S. Cl. 75—171 **16 Claims**



Alloys consisting of at least 45% cobalt and particular amounts of carbon, chromium, tungsten and aluminium, have a high resistance to oxidation and hot-corrosion attack and, also, a high mechanical strength at temperatures up to about 900° C. The alloys may also contain iron and/or nickel.

3,718,462
MANIFOLD ELECTRIFICATION PROCESS

Ivar T. Krohn, and Geoffrey A. Page, both of Rochester, N.Y., assignors to Xerox Corporation, Rochester, N.Y.
Filed June 3, 1969, Ser. No. 829,963
Int. Cl. G03g *13/22*
U.S. Cl. 96—1.3 **12 Claims**



A process for improving the imaging characteristics of electrically photosensitive material employed in the manifold layer transfer imaging process which comprises subjecting the material to an electric field of known polarity and then reversing the polarity of the field prior to the exposure of the imaging material to electromagnetic radiation to which it is sensitive.

3,718,463
PHOTOCONDUCTIVE COATING COMPOSITIONS USING A POLY(VINYL-HALOBENZAL) BINDER

Raymond H. Young, Jr., Macon, Ga., assignor to Monsanto Company, St. Louis, Mo.
No Drawing. Filed June 22, 1971, Ser. No. 155,655
The portion of the term of the patent subsequent to Aug. 22, 1989, has been disclaimed
Int. Cl. G03g *5/08, 5/04*
U.S. Cl. 96—1.8 **11 Claims**

Disclosed herein are coating compositions comprising an organic solvent solution of a photoconductor, a dye sensitizer and a poly(vinyl-halobenzal) binder.

3,718,464
DEVELOPMENT ACCELERATORS FOR IMAGE TRANSFER SYSTEMS

Donald E. Janssen; Delbert D. Reynolds, and Bernard C. Cossar, all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.
Filed Aug. 24, 1971, Ser. No. 174,507
Int. Cl. G03c *1/48, 5/54, 7/00*
U.S. Cl. 96—29 D **27 Claims**

A development accelerator comprising a 2-substituted aminomethyl-5-alkylhydroquinone or salt thereof increases the maximum density in a direct-positive color diffusion transfer system utilizing immobile couplers which form diffusible dyes.

3,718,465
DIFFUSION TRANSFER ELEMENT AND METHOD

Carl F. W. Ekman, Bedford, Mass., assignor to Itek Corporation, Lexington, Mass.
Continuation-in-part of application Ser. No. 492,254, Oct. 1, 1965. This application May 18, 1970, Ser. No. 38,029
Int. Cl. G03c *1/68*
U.S. Cl. 96—29 **26 Claims**

Process and products for recording an image comprising (1) exposing a copy medium comprising a photosensitive material capable upon exposure of producing a physically developable image and image-forming materials which upon exposure will undergo an oxidation-reduction type reaction to form an insoluble image in the exposed portions of the medium, (2) contacting this medium with an image-receiving medium in the presence of solvent for the image-forming materials, whereby the image-forming materials in the unexposed portions of the image storage medium are transferred to the image-receiving medium, and the transferred image-forming materials establish a positive image pattern in the image-receiving medium. The invention also relates to systems for practicing these processes.

3,718,466
MAGNETIC DEVELOPMENT

Jay George Schreckendgust, Franklin, Ohio, assignor to A. E. Staley Manufacturing Company, Decatur, Ill.
No Drawing. Filed July 12, 1971, Ser. No. 161,958
Int. Cl. G03c 5/24
U.S. Cl. 96—48 R **6 Claims**

Forming ferromagnetic patterns which comprise exposing a non-magnetic base bearing a solid, light-sensitive organic layer having a thickness of at least 0.2 micron, capable of developing a R_d of 0.2 to 2.2 by powder embedment imaging with physical force, to actinic radiation in predetermined areas corresponding to an optical pattern; continuing the exposure to establish a potential R_d of 0.2 to 2.2 by powder embedment imaging with physical force; applying to said layer of organic material, free flowing ferromagnetic powder particles having a diameter along at least one axis of at least about 0.3 micron, but less than 25 times the thickness of said first organic layer; while the layer is at a temperature below the melting point of said organic layer, embedding said ferromagnetic particles in a stratum at the surface of said organic layer without physical force by applying a magnetic field substantially perpendicular to said light-sensitive layer; and removing non-embedded particles from said organic layer to develop a discrete permanent pattern of ferromagnetic material.

3,718,467
POSITIVE WORKING PHOTOGRAPHIC PROCESS FOR PRODUCING COLORED IMAGES OF METAL CHELATES OF SULFUR COMPOUNDS

Eiichi Inoue and Toshihiro Yamase, Tokyo, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
No Drawing. Continuation-in-part of abandoned application Ser. No. 774,178, Nov. 7, 1968. This application Mar. 25, 1971, Ser. No. 128,201
Int. Cl. G03c *5/24*
U.S. Cl. 96—48 R **7 Claims**

Colored images are obtained by imagewise exposing a composition containing a sulfur compound such as a dithiocarbamate, thioxanthate or N,N-diacetic acid derivative of a dithiocarbamate in order to photolyze said sulfur compound and then treating the photolyzed composition with a metal salt.

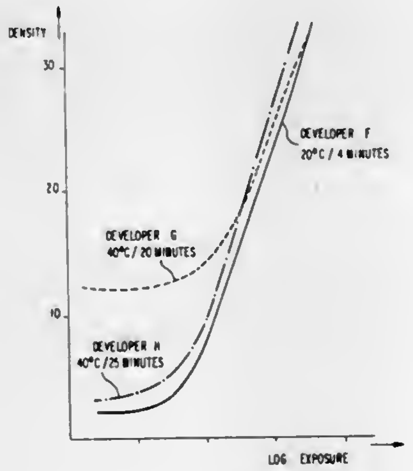
3,718,468
STABILISING DEVELOPED PHOTOGRAPHIC IMAGES

Werner Berthold, Kiel; Anita Von Konig, and Helmut Timmler, both of Leverkusen, all of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany
Filed April 1, 1970, Ser. No. 24,868
Claims priority, application Germany, April 15, 1969, P 19 19 045.5
Int. Cl. G03c *5/26, 1/06, 1/34*
U.S. Cl. 96—50 **3 Claims**

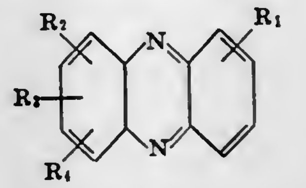
Exposed and developed photographic silver images can be stabilized by treating the layer containing the exposed image with a compound which reacts with the silver halide in the unexposed and undeveloped areas of the layer to form a light-insensitive reaction product. Fading of the silver images thus produced is prevented by performing the development in the presence of mercapto substituted heterocyclic compounds.

3,718,469
MAKING OF A PHOTOGRAPHIC IMAGE

Tadao Hatano; Hikoharu Hara; Masatoshi Sugiyama, and Reiichi Ohi, all of Ashigara-Kamigun, Kanagawa, Japan, assignors to Fuji Photo Film Co., Kanagawa, Japan
Filed Oct. 19, 1970, Ser. No. 82,032
Claims priority, application Japan, Oct. 17, 1969, 44/83032
Int. Cl. G03c *5/26, 5/30, 1/34*
U.S. Cl. 96—50 R **23 Claims**



A method for forming a photographic image which comprises treating a gelatinous silver halide photographic material in the presence of an aldehyde-type hardening agent and a compound represented by the following general formula:



wherein R_1 and R_2 are each hydrogen, chlorine, bromine, hydroxyl group, carboxyl group, carboxyl group substituted with sodium, potassium or ammonium, sulfoxyl group, or sulfoxyl group substituted with sodium, potassium or ammonium, wherein at least one of said R_1 and R_2 being a carboxyl group, substituted carboxylate, sulfoxyl group or substituted sulfoxylate, and R_3 and R_4 each being hydrogen, an alkyl group, or a hydrocarbon ring, and product so obtained is disclosed.

3,718,470
SURFACE DEVELOPMENT PROCESS UTILIZING AN INTERNAL IMAGE SILVER HALIDE EMULSION CONTAINING A COMPOSITE NUCLEATING AGENT-SPECTRAL SENSITIZING POLYMETHINE DYE

John Spence, Honeoye Falls, and Donald E. Janssen, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.
Continuation of Ser. No. 85,705, Oct. 30, 1970, abandoned. This application Feb. 12, 1971, Ser. No. 115,128
Int. Cl. G03c *5/24*
U.S. Cl. 96—64 **11 Claims**

Polymethine dyes, including cyanine, carbocyanine, dicarbocyanine, merocyanine and styryl dyes, are useful in direct positive photographic image-forming processes when included in a light-sensitive silver halide internal image emulsion. These dyes are N-substituted with alkyl groups whose terminal carbon atom is additionally substituted with 1-hydrazonoalkyl groups. They function both as spectral sensitizers and as nucleating agents.

3,718,471
FILM RECORD CARD

Evan A. Edwards, Pittsford, and Frederick F. Tone, Holley, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.
Filed Aug. 3, 1970, Ser. No. 60,491
Int. Cl. G03c *1/52, 1/64, 1/66*
U.S. Cl. 96—75 **14 Claims**

A film record card having an aperture therein and a photographic film secured over the aperture wherein the card has an area in one face thereof recessed about the aperture to a depth at least as great as the thickness of the film, the film having dimensions greater than the aperture and less than the recessed area. A second recessed area is formed in the same face of the card and extends about the periphery of the first recessed area, the second recessed area having a depth substantially less than the thickness of the film. A thin layer of a fluid-impermeable material, such as a thermoplastic film, is coated on the recessed areas and acts to protect the card from the adverse effects of photographic processing solutions as well as acting to secure the photographic film over the aperture.

3,718,472
FILTER DYES FOR PHOTOGRAPHIC ELEMENTS

Gene L. Oliver, and Judith M. Harbison, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.
Filed March 4, 1971, Ser. No. 120,933
Int. Cl. G03c *1/84*
U.S. Cl. 96—84 R **16 Claims**

Oxonol, benzylidene and cinnamylidene dyes derived from cyanomethylsulfone compounds are useful as filter dyes, especially for photographic elements. They absorb primarily in the blue region of the spectrum. Bis(methylsulfonylacetonitrile)trimethine oxonol, sodium salt; 2-p-dimethylaminobenzylidene-2-methylsulfonylacetonitrile and 2-p-dimethylaminocinnamylidene-2-methylsulfonylacetonitrile are illustrative of the filter dyes of the invention.

3,718,473
PHOTOPOLYMERIZABLE ELEMENTS CONTAINING HYDRO PHILIC COLLOIDS AND POLYMERIZABLE MONOMERS FOR MAKING GRAVURE PRINTING PLATE RESISTS

Joseph Edmund Gervay, Red Bank, and Peter Walker, Colts Neck, both of N.J., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 864,206, Oct. 6, 1969, abandoned, which is a continuation-in-part of Ser. Nos. 766,329, Oct. 9, 1968, abandoned, and Ser. No. 849,297, Aug. 7, 1969, abandoned. This application Jan. 27, 1971, Ser. No. 110,319

Int. Cl. G03c *1/90, 1/68, 1/70*

U.S. Cl. 96—83 **12 Claims**

A photopolymerizable element comprising a support strippable from a photopolymerizable layer comprising a hydrophilic, macromolecular organic polymer dispersion medium including a dispersed phase containing (1) at least one ethylenically unsaturated monomer having a boiling point above 100° C. at normal atmospheric pressure and being capable of forming a high polymer by free-radical initiated, chain-propagating addition polymerization; and (2) in reactive association with said monomer, at least one free-radical photoinitiator activatable by actinic radiation in an amount mount constituting from 0.01 to 20.0 percent by weight of the total solids in said dispersion. The elements are useful for making continuous tone gravure printing plates and printed circuit etching resists. On exposure to actinic radiation, the dispersed monomer droplets polymerize or harden to various degrees and the layer becomes resistant to diffusion of aqueous etching solutions in proportion to the exposing radiation. Exposure, first to a conventional gravure screen pattern then to a continuous tone positive or negative, leaves an image in the resist which may be pressed against and transferred to a moistened metal plate and the support stripped off. The resist-bearing metal plate is then etched with an etching solution, e.g., aqueous ferric chloride, to produce a continuous tone gravure image suitable for printing.

3,718,474
LAYERS CROSSLINKABLE BY LIGHT

Gunter Kolb; Adolf Schmidt; Robert Schmitz-Josten, and Erich Wolff, all of Leverkusen, Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed April 5, 1971, Ser. No. 131,526

Claims priority, application Germany, April 23, 1970, P 20 19 598.6

Int. Cl. G03c *1/68*

U.S. Cl. 96—115 P **5 Claims**

Soluble polymeric cyclopentadienes form particularly desirable light-sensitive layers, being crosslinked to insoluble condition by light with or without the help of a crosslinking agent.

3,718,475
SILVER HALIDE SUPERSENSITIZED PHOTOGRAPHIC EMULSION

Keisuke Shiba, and Akira Sato, both of Ashigara-Kamigun, Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed June 25, 1970, Ser. No. 49,981

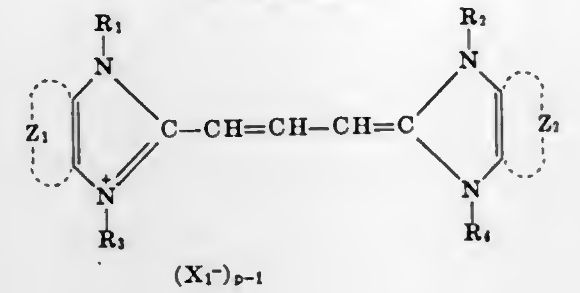
Claims priority, application Japan, June 25, 1969, 44/50117

Int. Cl. G03c *1/14*

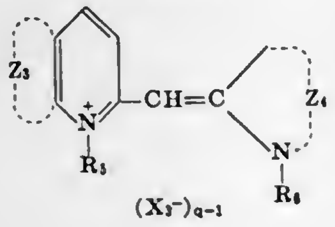
U.S. Cl. 96—124 **22 Claims**

A silver halide photographic emulsion is super-sensitized in the green wave length region by adding thereto at least one sensitizing dye of the following formula I and at least one sensitizing dye of the following formula II; and, optionally a compound of the following formula III:

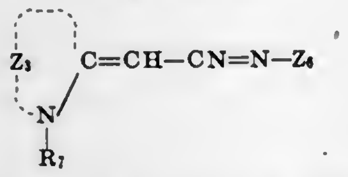
FORMULA I



FORMULA II



FORMULA III



The substituents are described in detail hereinbelow.

3,718,476
SILVER HALIDE ELEMENT CONTAINING MEROCYANINE DYES WITH A 3-PYRROLINYLALKYL GROUP

Arthur Fumia, Jr., and Donald W. Heseltine, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 23, 1970, Ser. No. 83,621

Int. Cl. G03c *1/10*

U.S. Cl. 96—127 **7 Claims**

Novel merocyanine dyes of which the acid nucleus, such as a rhodanine nucleus, has a 3-pyrrolinylalkyl group attached thereto. The dyes are spectral sensitizers for silver halide photographic emulsions and also increase the blue sensitivity of the silver halide. Intermediates for these dyes are novel cyanoalkyl-3-pyrrolines and aminoalkyl-3-pyrrolines.

3,718,477
SILVER HALIDE EMULSIONS CONTAINING HOLOPOLAR CYANINE DYES WITH URAZOLE NUCLEUS

Philip W. Jenkins, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Filed Oct. 19, 1970, Ser. No. 82,076

Int. Cl. G03c *1/22*

U.S. Cl. 96—140 **7 Claims**

Novel polymethine dyes derived from certain urazole compounds are described. The dyes have utility as filter dyes and many of them are useful as spectral sensitizers for photographic silver halide emulsions. Anhydro-1-[2-(2-benzothiazolyl ethohydroxide)vinyl] - 4 - phenylurazole, anhydro - 1 - [4-(2-benzothiazolyl ethohydroxide)-1,3-butadienyl]-4-phenylurazole and anhydro - 1 - [2-(2-benzothiazolyl ethohydroxide)vinyl] - 4 - phenyldithiourazole, for example, are illustrative of the polymethine dye compounds.

3,718,478
A PROTEIN-ACETYLENIC ESTER COMPLEX TO RETARD DIGESTION IN THE RUMEN

Bernard S. Wildi, Kirkwood, and Robert E. Miller, Ballwin, all of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Oct. 27, 1970, Ser. No. 84,478

Int. Cl. A23k *1/18*

U.S. Cl. 99—2 R **5 Claims**

Improved protein feed material for ruminants which is resistant to digestive breakdown in the rumen but not in the abomasum and/or intestines which comprises the reaction product of a protein-containing feed material and an ester selected from the group consisting of acetylenic monoesters and acetylenic diesters. Exemplary of such acetylenic esters are ethylene glycol, bispropiolate and n-decyl propiolate.

3,718,479
METHOD FOR MANUFACTURE OF PROCESSED FOODS FROM SOYBEANS

Tomoei Kanno, Chibaken, and Harunobu Kobayashi, Tokyo, both of Japan, assignors to Shawa Sangyo Kabushiki Kaisha, Tokyo, Japan

Filed June 2, 1970, Ser. No. 42,863

Int. Cl. A23l *1/20*

U.S. Cl. 99—17 **6 Claims**

Treating soybeans for use in processed foods, by submerging whole soybeans in water containing 0.1 to 0.5% of sulfurous acid and mother starter of lactic acid bacteria, crushing, skinning, and steaming said soybeans, and subjecting said soybeans to fermentation by inoculating a culture of microorganisms possessing proteolytic and soybean cotyledon cell macerating activity and then drying and pulverizing said soybeans.

3,718,480
PASTA

Maurice Robert Tremblay, Bramalea, Ontario, and Richard Launt Maurer, Mississauga, Ontario, both of Canada, assignors to Thomas J. Lipton Limited, Toronto, Ontario, Canada

Continuation-in-part of Ser. No. 105,098, Jan. 8, 1971, abandoned, which is a continuation-in-part of Ser. No. 37,350, May 14, 1970, abandoned. This application Feb. 7, 1972, Ser. No. 224,252

Int. Cl. A23l *1/16*

U.S. Cl. 99—85 **10 Claims**

Preparation of a wheat flour pasta by preparing a dough, shaping the dough into individual pasta pieces, pre-drying the pieces to a moisture content between 22 and 27 per cent by utilizing warm dry air and then drying the pasta to between 8 and 13 per cent moisture by application of microwave energy. The use of microwave energy materially reduces the overall drying time and produces a pasta with a shortened rehydrating time and less microbiological buildup.

3,718,481
FISH FILLET PRODUCT AND METHOD FOR MAKING

Jean Joaquin, Fairfax, Calif.
(2 Niven Way, Larkspur, Calif. 94939)

Filed Mar. 6, 1968, Ser. No. 710,834

Int. Cl. A23l *1/325*

U.S. Cl. 99—111 **11 Claims**

A ready-to-cook seafood product comprised of a pair of fish fillets forming an enclosure for a stuffing material which remains substantially sealed to prevent loss of moisture and flavor juices even during the subsequent cooking of the product prior to eating. The method for making the product, which can be stored in a frozen state until ready for use, comprises the steps of filleting a flat type fish to provide two boneless fillets of approximately the same size, depositing a chilled edible stuffing material on one fillet, placing the other fillet over the stuffing material and folding it downwardly into contact with the first fillet and forming a peripheral edge seal between the two fillets forming an enclosure for the stuffing material.

3,718,482
A FOOD COMPOSITION WITH ISOASCORBIC ACID-PHOSPHATE AS AN ANTIOXIDANT

David F. Hinkley, Plainfield, N.J., assignor to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 816,771, April 16, 1969, abandoned. This application May 6, 1971, Ser. No. 140,998

Int. Cl. A23l *3/00;* **C07d** *5/12*

U.S. Cl. 99—150 **9 Claims**

Novel isoascorbic acid phosphates and salts thereof, useful as antioxidants, are prepared by phosphorylating 5,6-O-loweralkylidene isoascorbic acid. Also, antioxidant compositions and methods of inhibiting oxidation in preserved foods and beverages are included.

3,718,483
METHOD FOR PREPARING STORAGE-STABLE BAKERY PRODUCTS WITHIN HERMETICALLY SEALED CONTAINERS

James W. Davis, Winston-Salem, N.C., and Anthony P. Umina, Hopkinton, and Nancy J. Kelley, Natick, Mass., assignors to the United States of America as represented by the Secretary of the Army

No Drawing. Filed Nov. 18, 1970, Ser. No. 90,796

Int. Cl. A21d *8/06*

U.S. Cl. 99—182 **6 Claims**

Storage-stable bread and cake products are produced within rigid, hermetically sealed containers by partially filling a metal can with a batter or dough mixture that is characterized by having a moisture content substantially less than that of a normal batter or dough and having ¼ to ⅔ the normal amount of chemical leavening agent, hermetically sealing the can under a vacuum of from 10 to 30 inches of mercury and cooking the contents within the sealed container.

3,718,484
SOLIDIFIED PRODUCT FROM HIGH FRUCTOSE CORN SYRUP AND PROCESS FOR THE PREPARATION THEREOF

Elmer F. Glabe, Chicago, Ill., assignor to Food Technology, Inc., Chicago, Ill.

Filed Aug. 20, 1970, Ser. No. 65,737

Int. Cl. A23l *1/08*

U.S. Cl. 99—199 **10 Claims**

Dehydrating high fructose corn syrup by slurrying the syrup with ungelatinized starch having a gelatinization temperature of at least 150°F heating the slurry at 15° to 30° degrees below the gelatinization temperature of the starch to condition the starch such that it will only partially gelatinize when the slurry is dried; subsequently drying the slurry in a thin film on a heated surface while simultaneously partially gelatinizing the starch therein.

3,718,485
FOOD DEHYDRATION METHOD

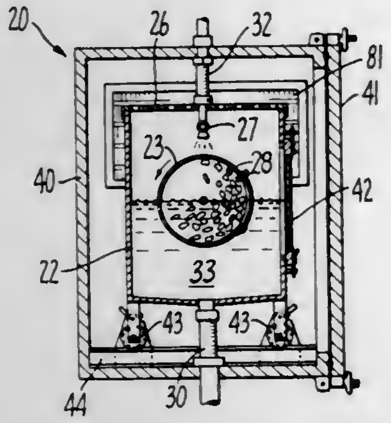
Marion P. Lankford, Fremont, Calif., assignor to Vacu-dry

Filed July 1, 1970, Ser. No. 51,535

Int. Cl. A23b *7/02, 7/03*

U.S. Cl. 99—204 **4 Claims**

A method for uniformly controlling the amount of medium and moisture residuals in processes for dehydrating particulate comestibles by contact with a heated liquid heat transfer medium within an evacuated drying region wherein each piece of comestible alternately is moved into contact with circulating medium to heat and vaporize its contained-moisture and then removed from such contact substantially into an adjacent vapor space to release a major portion of the vaporized moisture directly into that space and food products having unique structure and composition which are produced by such method.



3,718,486
METHOD OF PACKAGING FOODSTUFFS AND A PACKAGING FOR EMPLOYING THE METHOD

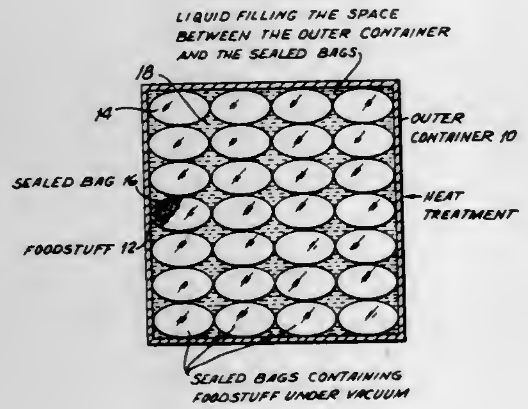
Jens-Lauge Bolund Jensen, 400 Roskilde, Fyrrevej 18, Denmark

Filed Sept. 15, 1970, Ser. No. 72,503

Claims priority, application Denmark, Sept. 18, 1969, 4982/69

Int. Cl. A231 *3/10*

U.S. Cl. 99—214 **2 Claims**


LIQUID FILLING THE SPACE BETWEEN THE OUTER CONTAINER AND THE SEALED BAGS
18
14
OUTER CONTAINER 10
SEALED BAG 16
HEAT TREATMENT
FOODSTUFF 12
SEALED BAGS CONTAINING FOODSTUFF UNDER VACUUM

A method and a packaging assembly for packaging foodstuffs which are to be preserved by the application of heat and comprising steps of wrapping the foodstuffs in thin, heat-resistant, gas and liquid-tight bags, evacuating and sealing the bags, depositing one or more sealed bags in receptacles, filling up the receptacle with a heat-transmitting liquid which dampens the movement of the bags within the receptacle and alleviates impact by external forces, and sealing the receptacle, which can then be subjected to heat treatment for the preservation of the food contents.

3,718,487
PANCAKE-MAKING MACHINE

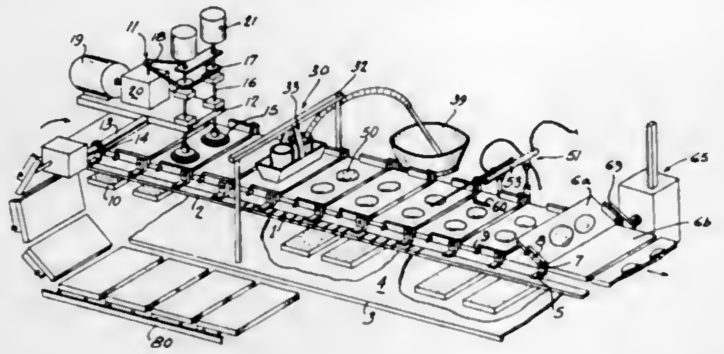
Fred William Brunner, Eugene, Oreg., assignor to Mannings, Inc., San Francisco, Calif.

Filed Feb. 12, 1971, Ser. No. 114,958

Int. Cl. A47j *37/06*

U.S. Cl. 99—353 **5 Claims**

An apparatus for continuously making pancakes is described. The apparatus includes a series of griddle plates pivotally mounted on an endless conveyor, a blade arranged to travel between a griddle plate and partially cooked pancakes thereon and a device for swinging each plate about its axis so as to transfer partially cooked pancakes thereon to the next forward plate in the direction of travel with the pancakes in an upside-down position.



3,718,488
PRECIOUS METAL DECORATING COMPOSITIONS CONTAINING BIS-CHELATE DERIVATIVES OF PALLADIUM

Swiatoslaw Trofimenko, Newark, and Lawrence G. Vaughan, Wilmington, both of Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 792,847, Jan. 21, 1969. This application March 2, 1971, Ser. No. 120,303

Int. Cl. C23c *3/04*

U.S. Cl. 106—1 **10 Claims**

Precious metal decorating compositions containing bis-chelate derivatives of palladium are useful in forming decorative films having high thermal stability. These precious metal decorating compositions are suitable for application to various substrates including glass, quartz, alumina, and other ceramic materials.

3,718,489
INSULATING CASTABLE

James A. Crookston, and Glen W. Charles, both of Mexico, Mo., assignors to A. P. Green Refractories Co., Mexico, Mo.

Filed Jan. 4, 1971, Ser. No. 103,793

Int. Cl. C04b *35/02, 35/10*

U.S. Cl. 106—64 **6 Claims**

The disclosure concerns an insulating refractory castable useable at temperatures above 2,800°F., and specifically an insulating refractory castable useable at 3,000°F. which has a bulk density of from 82 to 88 pounds per cubic foot in place. The product comprises 60–70 percent of a size graded acid and/or alumina refractory aggregate, 5 to 15 percent expanded clay aggregate of a density of from 9–11 pounds per cubic foot, and from 15 to 35 percent calcium aluminate cement.

3,718,490
PROCESS FOR PURIFICATION OF REFRACTORY METAL NITRIDES

Cyril Alfred Morgan, E. Molesey; Scott Gordon Arber, Chessington, and Oswald William John Young, Surbiton, all of England, assignors to United States Borax & Chemical Corporation, Los Angeles, Calif.

Filed Dec. 9, 1970, Ser. No. 96,652

Claims priority, application Great Britain, Dec. 16, 1969, 61,357/69

Int. Cl. C04b *35/58;* **C01b** *21/06*

U.S. Cl. 106—65 **7 Claims**

Carbon is removed from refractory metal nitrides, such as aluminum nitride, by heating the impure nitride with boric oxide in an atmosphere of nitrogen at a temperature of about 1,200 °–2050°C. Boron nitride is formed and provides a valuable mixture of boron nitride and refractory metal nitride.

3,718,491
PROCESS FOR SILICATE-PERLITE STRUCTURES

Paul C. Yates, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 744,297, July 12, 1968, abandoned. This application Feb. 19, 1971, Ser. No. 117,109

Int. Cl. C04b *43/00*

U.S. Cl. 106—84 **7 Claims**

Water resistant silicate-perlite insulation materials are made by mixing an aqueous solution of an alkaline ionic silicate and a colloidal amorphous silica sol, adding perlite to said mixture, molding the combined mixture into the desired shape and exposing said shaped article to an acidic substance to set the article rapidly and provide immediate water resistance.

3,718,492
REFRACTORY ALUMINOUS CEMENTS

Alexandru I. Braniski, Teodor Ionescu, and Nicolae Deica, Bucharest, Rumania, assignors to Institutul de Cercetari Metalurgice, Bucharest, Rumania

No Drawing. Filed Mar. 30, 1970, Ser. No. 24,029

Claims priority, application Rumania, May 27, 1969, 60,093

Int. Cl. C04b *7/32*

U.S. Cl. 106—104 **3 Claims**

The known refractory aluminous cements are made of alumina and limestone, e.g. of calcium aluminate $CaO.Al_2O_3$ and dialuminate $CaO_2.Al_2O_3$ (hydraulic re-impurities.

The high quality calcium and magnesia aluminous refractory cements of the present invention, are obtained from any kind of natural or artificial raw materials containing calcium, mixed with natural or artificial raw materials containing magnesia and in mixes in succession with natural or artificial hydrated or nonhydrated raw materials containing aluminum oxide in suitable stoichiometric proportions, by burning until sintering or melting, which assures spinel formation, $MgO\text{-}Al_2O_3$ (super-refractory constituent) and of calcium aluminate $CaO.Al_2O_3$ and dialuminate $CaO_2.Al_2O_3$ (hydraulic refractory constituents).

3,718,493
PROCESS FOR THE PRODUCTION OF CARBON FILAMENTS FROM COAL TAR PITCH

Louis A. Joo, Johnson City, John A. McKee, Elizabethton, and Frederick L. Shea, Johnson City, Tenn., assignors to Great Lakes Carbon Corporation, New York, N.Y.

No Drawing. Original application June 4, 1968, Ser. No. 734,257, now Patent No. 3,595,946. Divided and this application Oct. 28, 1970, Ser. No. 84,896

Int. Cl. C08h *13/00;* **C09d** *3/24*

U.S. Cl. 106—273 R **1 Claim**

Carbon filaments are made from specially treated high temperature coal tar pitch. The pitch is filtered, heat treated and its low molecular weight components are removed by distillation. The treated pitch is spun into filaments, the filaments partially oxidized and then carbonized under carefully regulated conditions to yield filamentary carbon having a tensile strength of more than 100,000 p.s.i. The filaments may be graphitized.

3,718,494
SHEET-LIKE ALPHA ALUMINUM OXIDE

Howard W. Jacobson, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed March 4, 1971, Ser. No. 121,001

Int. Cl. C08h *17/04*

U.S. Cl. 106—291 **2 Claims**

Single crystals of alpha aluminum oxide are prepared in the form of sheet-like particles having an average thickness of 10 to 250 μ and major faces averaging 15 to 1,000 mμ^2. The particles find utility in reinforcement of plastics and can also be coated with TiO_2 to give a lustrous pigment.

3,718,495
HEAT-SHRINKABLE PRESSURE-SENSITIVE ADHESIVE TAPE

Jun Tomita, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 513,537, Dec. 13, 1965, abandoned. This application Feb. 12, 1971, Ser. No. 115,093

Int. Cl. C09j *7/02;* **B05c** *3/107*

U.S. Cl. 117—7 **8 Claims**

Heat-shrinkable electrically insulative pressure-sensitive adhesive tape made from 1) a backing selected from polyethylene terephthalate and polyvinyl chloride backings that shrink at a useful elevated temperature at least twice as much in length as in width and shrink within the ranges of 10–50 percent in length and 0–15 percent in width and 2) a pressure-sensitive adhesive that exhibits a high shear strength and a high viscosity.

3,718,496
TEXTURED CAUL PLATE SURFACED WITH FURNACE CEMENT

Jack August Willard, Hamilton, Ohio, assignor to Formica Corporation, Cincinnati, Ohio

Filed Nov. 16, 1970, Ser. No. 90,050

Int. Cl. B32b *3/14, 15/14;* **B44c** *1/20*

U.S. Cl. 117—10 **6 Claims**

A design imparting plate which used in the manufacture of decorative laminates is produced by the process of applying a coating of a viscous cementitious material onto a rigid metal plate; sculpturing a three dimensional design thereon and then heating the coated plate to permanently affix the sculpture design to the base plate.

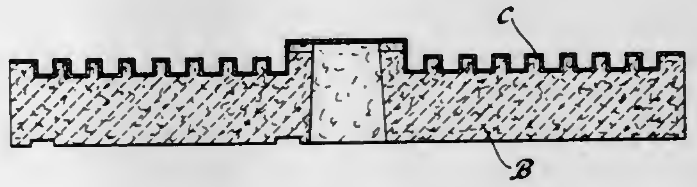
3,718,497
HEATER COIL SUPPORT

Hal H. Rice, Birmingham, Mich., assignor to General Motors, Detroit, Mich.

Filed Nov. 19, 1970, Ser. No. 90,943

Int. Cl. H05b *3/68*

U.S. Cl. 117—35 R **7 Claims**



An infrared radiant type heating coil support and method for forming same, wherein the support block is a ceramic fibrous plate of low mass but having good mechanical strength and low shrinkage under the repeated heating and cooling cycling encountered in normal use and having a dull finish, craze resistant coating including an infrared reflecting metal oxide selected from the group of zirconia, titania, tin oxide and Uverite.

3,718,498
CATALYTIC COMPOSITION

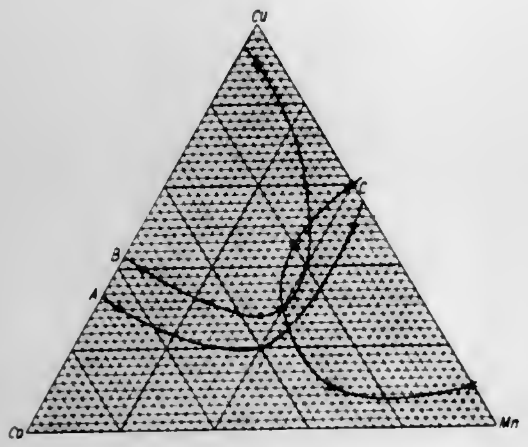
Patrick John Denny, and Dennis Albert Dowden, both of Stockton-on-Tees, England, assignors to Imperial Chemical Industries Limited, London, England

Filed March 29, 1971, Ser. No. 128,684

Int. Cl. B44d *1/02*

U.S. Cl. 117—97 **9 Claims**

By coating the internal surface of a cooking oven with a catalytic composition comprising porous mutually sintered vitreous enamel particles and finely divided transition metal oxides including copper oxide with the oxides of cobalt or manganese or both, the surfaces are rendered substantially self-cleaning. Preferred compositions are disclosed for situations in which (a) build-up of deposits is to be minimized, or (b) rapid removal of deposited fat is required.



3,718,499

PROCESS FOR PROTECTING FERROUS BASE METALS AGAINST CORROSION, AND ARTICLES PRODUCED THEREBY

Jerome J. Kanter, 12300 Hobart Ave.,
Palos Park, Ill. 60464
No Drawing. Filed Aug. 10, 1970, Ser. No. 62,719
Int. Cl. C23f *7/04, 11/00*
U.S. Cl. 117—127 **13 Claims**

Iron, steel and other ferrous base metal articles are protected against corrosion, such as water and steam corrosion, by a process in which such articles are treated with a pyrochlore-microlite mineral, containing Group V metal constituents, in an alkaline water medium.

3,718,500

COATED ARTICLES

Edwin B. Nyquist, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.
Filed Nov. 14, 1969, Ser. No. 876,996
Int. Cl. B32b *15/08, 27/30*
U.S. Cl. 117—132 R **6 Claims**

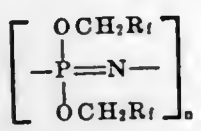
This application discloses non-porous substrata, such as primed and unprimed metallic surfaces and plastic surfaces, coated with a continuous adherent coating of an interpolymer composed essentially of from 0.1 to 20 weight percent of an adhesion promoting monomer which is an alkyl amino alkyl acrylamide such as N,N -dimethylaminoethyl methacrylamide with the remainder of the interpolymeric composition being made up of at least one monoethylenically unsaturated comonomer.

3,718,501

OIL REPELLENT TEXTILE FINISH

Richard Frederick Stackel, and George Robert Depaolo, both of Bridgewater Township, Somerset County, N.Y., assignors to American Cyanamid Company, Stanford, Conn.
Division of Ser. No. 678,180, Oct. 26, 1967, Pat. No. 3,524,907. This application April 23, 1970, Ser. No. 43,301
Int. Cl. C08j *1/44*
U.S. Cl. 117—139.5 A **3 Claims**
0000

Polyfluoro alkyl esters of polymeric phosphonitrilic acid (Formula I) having average molecular weights in the range of 5,000–10,000, a method for making the polymers, and the use of the polymers in oil and water repellent finishes for cellulosic textile materials.



$$\left[-\overset{\displaystyle OCH_2R_f}{\underset{\displaystyle OCH_2R_f}{P}}=N-\right]_n$$

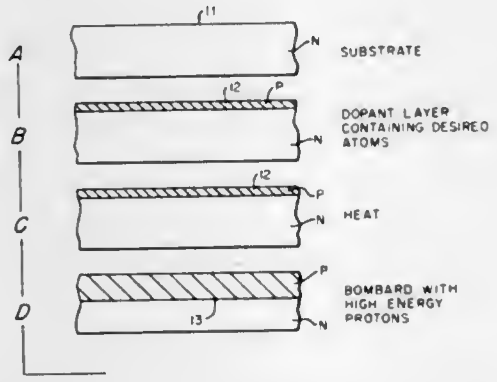
I

R_f is a perfluoroalkyl group of at least two carbon atoms, preferably of at least three carbon atoms, and n is the number of units required for an average molecular weight between 5,000 and 10,000.

3,718,502

ENHANCEMENT OF DIFFUSION OF ATOMS INTO A HEATED SUBSTRATE BY BOMBARDMENT

James F. Gibbons, 735 De Soto Drive, Palo Alto, Calif.
Filed Oct. 15, 1969, Ser. No. 866,692
Int. Cl. B44d *1/18, 1/20*
U.S. Cl. 117—212 **29 Claims**


A
B
C
D
11
N
SUBSTRATE
12
P
DOPANT LAYER CONTAINING DESIRED ATOMS
12
P
N
HEAT
P
13
N
BOMBARD WITH HIGH ENERGY PROTONS

This invention describes a method of enhancing the diffusion of atomic species carried on the surface of a solid substrate into the substrate by elevating the temperature of the substrate to permit atoms and vacancies to propagate and then creating vacancies in selected regions of the substrate through bombardment by a beam of protons or other particles, said bombard-ment acting to enhance diffusion of the surface atom species into the substrate at said regions.

3,718,503

METHOD OF FORMING A DIFFUSION MASK BARRIER ON A SILICON SUBSTRATE

William B. Glendinning, Belford, and Wellington B. Pharo, Neptune, N.J., assignors to the United States of America as represented by the Secretary of the Army
No Drawing. Continuation-in-part of application Ser. No. 124,915, Mar. 16, 1971. This application July 14, 1971, Ser. No. 162,688
Int. Cl. B44d *1/18, 1/02;* **C23f** *13/00*
U.S. Cl. 117—212 **5 Claims**

The top surface of a silicon substrate having a particular impurity profile is exposed to a chemical vapor environment of nitric oxide, hydrogen fluoride and water at about 35 degrees C., and for about 3 to 5 minutes. Simultaneously with the exposure to the above-described vapor mixture, an image is projected onto the top surface of the silicon substrate during the entire time interval of vapor exposure. For completion of device fabrication, dopant atoms are then diffused into the silicon surface where the image has been projected.

3,718,504

PROCESS FOR EXTRACTING SUGARS FROM CATTLE MANURE

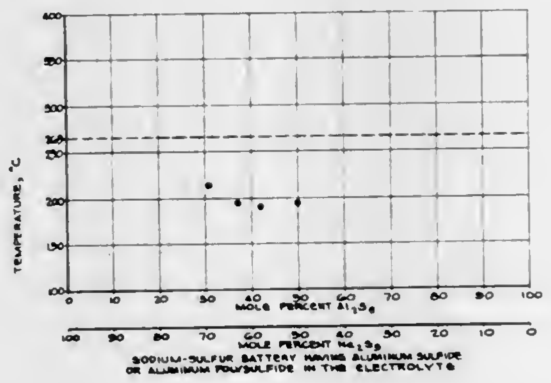
Barron S. Whittingham, Culver City, Calif., assignor to Feed Recycling Co., Ripley, Calif.
No Drawing. Continuation-in-part of application Ser. No. 111,751, Feb. 1, 1971. This application June 12, 1972, Ser. No. 261,795
Int. Cl. C13k *1/02*
U.S. Cl. 127—37 **8 Claims**

Process for extracting sugars from the cellulosic residue of cattle manure. The manure is first treated to remove protein and proteinaceous compounds. The cellulosic residue is then treated in water with sulphur dioxide (SO_2), or sodium hydrosulfite ($Na_2S_2O_4$), which acts as a reducing agent, and it is then subjected to an acid hydrolysis reaction to convert to sugars, after which the sugars are removed.

3,718,505

SODIUM-SULFUR BATTERY HAVING ALUMINUM SULFIDE OR ALUMINUM POLYSULFIDE IN THE ELECTROLYTE

John J. Werth, Princeton, N.J., assignor to ESB Incorporated
Filed Dec. 7, 1971, Ser. No. 205,560
Int. Cl. H01m *35/02*
U.S. Cl. 136—6 **7 Claims**



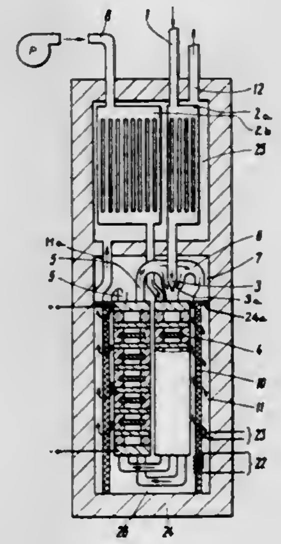
A reduced operating temperature for a sodium-sulfur battery is achieved with a new electrolyte comprising sodium polysulfide, aluminum sulfide or aluminum polysulfides, and free sulfur when the electrodes are in the charged condition. The electrolyte, which has a melting point in the range of approximately 200° C., permits the battery to be sealed with polytetrafluoroethylene sealing materials. Based on presently limited data, it appears that the reduced melting point temperature of the electrolyte can be obtained with solutions in which the ratio of the mole percent of sodium polysulfide to the mole percent of aluminum sulfide or aluminum polysulfide varies considerably.

3,718,506

FUEL CELL SYSTEM FOR REACTING HYDROCARBONS

Wilfried Fischer, Neckargemund, and Franz-Josef Rohr, Ober-Abstelnach, both of Germany, assignors to Aktiengesellschaft Brown, Boveri & Cie, Baden, Switzerland
Filed Feb. 22, 1971, Ser. No. 117,381
Int. Cl. H01m *27/00*
U.S. Cl. 136—86 C **6 Claims**

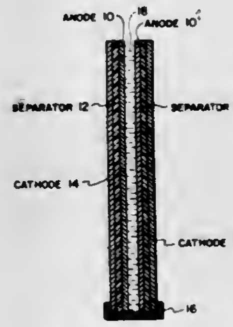
A fuel cell system of the high temperature type includes one or more fuel cells operating with an electrolyte such as an oxygen ion conductive solid or a carbonate melt to which fresh reaction gases containing hydrocarbon fuel and oxygen respectively are fed after preheating in heat exchangers. The system may also include a separate reformer for converting the hydrocarbons into hydrogen and other gases. A portion of the exhaust gases from the fuel side of the cell is recycled through the fuel cell by entrainment with fresh fuel gas by means of the aspirating effect of a nozzle through which fresh fuel gas is injected into the cell and the remainder of the exhaust gas from the fuel side together with oxygen impoverished gas discharged from the cell are led to an after-combustion catalyst in the form of a tubular structure surrounding the fuel cells and also the reformer component if one is utilized for burning of the remaining hydrocarbon content of the fuel gas. The heat generated during the after-burning phase in the catalytic zone is mostly transferred over a very short path to the fuel cells to maintain the fuel cells at their proper operating temperature and to supply the power requirements of the reformer if the latter is utilized. The remaining heat in the exhaust gases is conducted to the exchangers for heat transfer to the incoming fresh reaction gases.



3,718,507

BI-CELL UNIT FOR FUEL CELL

David Linden, Little Silver, N.J., assignor to The United States of America as represented by the Secretary of the Army
Filed March 24, 1971, Ser. No. 127,486
Int. Cl. H01m *27/30, 29/02*
U.S. Cl. 136—86 R **1 Claim**



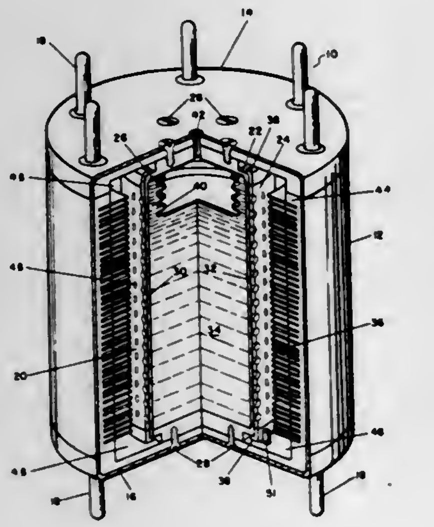
A bi-cell unit is provided for a fuel cell. The bi-cell unit is comprised of two electrode packs. Each of the electrode packs includes an anode, an air cathode, and a separator between the anode and the cathode. The two packs are assembled together with the anodes spaced apart and facing each other, the space between the anodes defining an anolyte chamber through which a liquid mixture of fuel and electrolyte is circulated.

This invention relates in general to a bi-cell unit for a fuel cell and in particular, to a bi-cell unit for a hydrazine-air fuel cell.

3,718,508

DEFERRED-ACTION BATTERY COMPRISING A PERFORATED AMPOULE SEALED WITH REMOVABLE PLUGS

Seymour Levine, 26 Clarendon Terrace, Dover, N.J.
Filed Aug. 30, 1971, Ser. No. 175,847
Int. Cl. H01m *21/00*
U.S. Cl. 136—90 **4 Claims**



This invention relates to an automatically activated delay action battery, containing an electrolyte, sealed in an ampoule of novel design. This novel ampoule comprises a perforated container whose perforations are sealed with removable plugs, and a slidably mounted sleeve with misaligned holes over the container restraining the plugs. Set-back force slides the sleeve to align the holes with the perforations and centrifugal force causes the electrolyte to dislodge the plugs and flow into contact with the plates to activate the battery.

3,718,509

COATED METAL AND METHOD

Victor V. Germano, Mentor-on-the-Lake, Ohio, assignor to Diamond Shamrock Corporation, Cleveland, Ohio
Continuation-in-part of Ser. No. 729,932, May 17, 1968, abandoned. This application Feb. 3, 1971, Ser. No. 112,429
Int. Cl. C23f *7/26*
U.S. Cl. 148—6.2 **19 Claims**

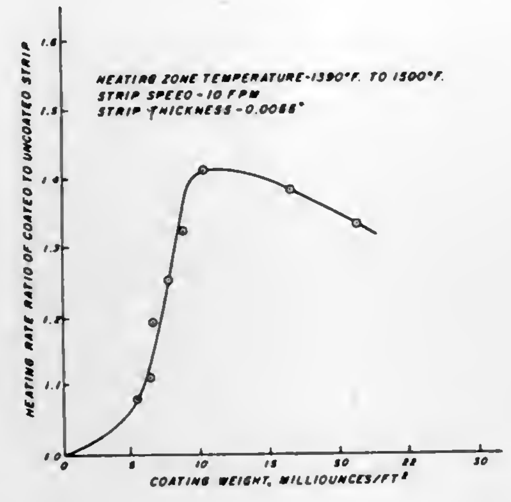
A composite coating provides enhanced corrosion protection for metal substrates, can maintain weldability where otherwise desirable and provide a surface for receiving electrocoat paint. The undercoating on the surface of the substrate is the residue obtained from heating an applied corrosion-resistant, hexavalent-chromium-containing coating composition, which residue is in intimate mixture with pulverulent metal. The coating over such residue results form curing an applied topcoat composition comprising additional hexavalent-chromium-containing coating composition.

3,718,510

METHOD FOR INCREASING THE HEATING RATE IN CONTINUOUS ANNEALING PROCESSES

Edward J. Patula, Monroeville; Robert R. Somers, Penn Hills Township, and William L. Roberts, Franklin Township, Westmoreland Cty., all of Pa., assignors to United States Steel Corporation
Filed Feb. 16, 1971, Ser. No. 115,456
Int. Cl. C21d *1/48*
U.S. Cl. 148—14 **4 Claims**

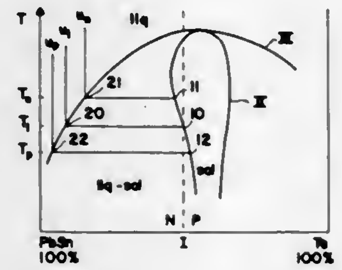
Alkali metal silicate coatings are applied to steel sheet or strip material to increase the emissivity of the material undergoing heating and/or cooling under substantially radiative conditions. The heating rate of the sheet material is markedly increased with the application of coating thicknesses within the range of about 5 to 20 milliounces/ft².



3,718,511

PROCESS FOR EPITAXIALLY GROWING SEMICONDUCTOR CRYSTALS

Michel Moulin, Chilly-Mazarin, France, assignor to Thomson-CSF
Filed Dec. 15, 1970, Ser. No. 98,262
Claims priority, application France, Dec. 17, 1969, 6943698
Int. Cl. H01l *1/00*
U.S. Cl. 148—171 **9 Claims**



A semiconductor with a P/N junction, adapted to be used as a detector or emitter of luminous radiation, is grown from a bath consisting of a liquefied mixture of three elements which are the constituents of two alloys or solid solutions taken from Groups II/VI and/or IV/VI of the Periodic Table. The proportions of the three elements in the mixture are so chosen that the solidus curve of the temperature/composition diagram intersects the stoichiometric line at a point lying along the boundary between the solid and the solid/liquid phase on the side of the lower concentrations of the element common to the two alloys. In a state of thermodynamic equilibrium for the liquid/solid phase, the bath is slowly cooled in a temperature range above or below a critical temperature corresponding to the point of intersection with resulting growth of an N-type or P-type layer on a substrate immersed in the bath. By a change in the composition, with or without a shift in temperature, the conductivity type of the layer is altered with formation of a P/N junction.

3,718,512

POROUS PARTICLES CONTAINING DISPERSED ORGANIC LIQUID AND GASEOUS COMPONENTS

Gerald L. Hurst, Dallas, Tex., assignor to Kinetics International Corporation, Dallas, Tex.
Filed Oct. 8, 1970, Ser. No. 79,039
Int. Cl. C06b *1/04*
U.S. Cl. 149—2 **30 Claims**

Economical and effective cap sensitive explosive compositions are manufactured by combining appropriate proportions of a non-cap sensitive organic liquid containing oxidizing groups with a porous substrate. The preferred liquid is nitromethane or nitromethane diluted with a hydrocarbon. The preferred substrate is a finely divided ionic nitrate powder. The explosive compositions are rendered cap sensitive and highly brisant by providing a substrate which disperses the organic liquid while maintaining this fluid in intimate contact with dispersed air. The preferred finely divided ionic nitrate substrates used in the present invention are prepared by grinding to the desired particle size, preferably less than 500 microns.

3,718,513

MINE STERILIZATION BY MEANS OF A DELIQUESCENT ADDITIVE

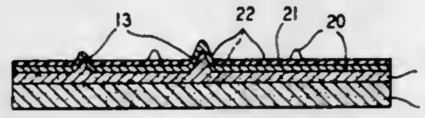
Maurice Baer and Joseph H. Severini, Morris, N.J., assignors to the United States of America as represented by the Secretary of the Army
No Drawing. Filed Jan. 25, 1971, Ser. No. 109,629
Int. Cl. C06c *1/00*
U.S. Cl. 149—24 **13 Claims**

Self-sterilization capability is imparted to a chemically oriented mine by the incorporation into the active explosive of a material which is hygroscopic and deliquescent. The latter material absorbs moisture from the atmosphere and deliquesces into an aqueous solution which reacts with the active explosive rendering it less sensitive and ultimately sterilized and safe to handle.

3,718,514

REMOVAL OF PROJECTIONS ON EPITAXIAL LAYERS

William Charles Erdman, Danielsville, and Paul Miller, Allentown, Pa., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill and Berkeley Heights, N.J.
Filed May 28, 1971, Ser. No. 148,081
Int. Cl. H01l *7/50*
U.S. Cl. 156—17 **8 Claims**



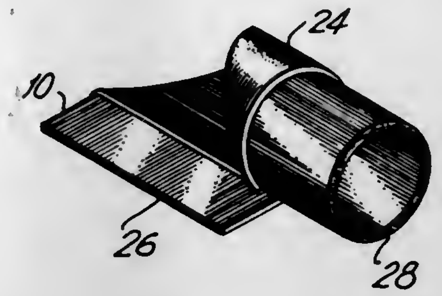
A method for removing projections from the surface of epitaxially-deposited semiconductor layers is described. These projections can adversely affect the results of photolithographic processing. The method involves producing an oxide layer on the surface and applying a discontinuous film to the oxide in such a manner that the discontinuities preferentially align with the projections. By means of a series of etching steps, the projections are selectively removed without affecting the integrity of the epitaxial layer.

3,718,515

PROCESS FOR MANUFACTURING SHAPED ENERGY TRANSMISSION ARRAYS

Amnon Goldstein, Forest Hills, N.Y., assignor to Decicom Systems, Inc.
Division of Ser. No. 709,474, Feb. 29, 1968, Pat. No. 3,544,192. This application June 29, 1970, Ser. No. 60,183
Int. Cl. B65h *54/00*
U.S. Cl. 156—174 **3 Claims**

A shaped energy transmission array made by forming an energy transmission sheet having a plurality of channels therein, a pair of opposed edges defining a plurality of discrete inputs to said channels and a plurality of discrete outputs from said channels respectively, bending the sheet along a line intermediate the pair of opposed edges so that portions of the sheet are in overlapping relation, shaping the portion of the sheet extending normally from the first of said pair of opposed edges to the desired shape whereby the first edge defines the desired shape, and fixing the conformation of the shaped array. The array may be formed from a plurality of filaments such as electrical conductors or fiber optical filaments aligned in side by side relation so that the pair of opposed edges are defined by the opposed ends of the filaments.



3,718,516

PROCESS FOR PRODUCTION OF INTERLAYER SAFETY-GLASS

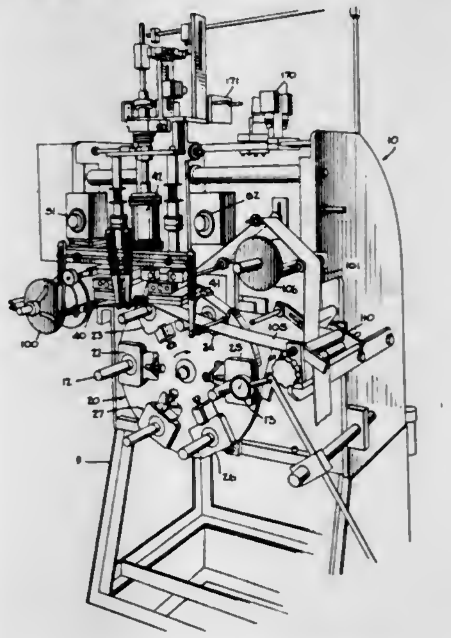
Francis T. Buckley, Hampden; Raymond F. Kiek, Wilbraham, and Donald I. Christensen, East Longmeadow, all of Mass., assignors to Monsanto Company, St. Louis, Mo.
Continuation-in-part of Ser. No. 683,487, Nov. 16, 1967, Pat. No. 3,556,890. This application Jan. 11, 1971, Ser. No. 105,722
Int. Cl. B32b *17/10, 31/12*; **C03c** *17/00*
U.S. Cl. 156—106 **4 Claims**

This invention relates to an improvement in the process for preparing laminated safety-glass wherein glass sheets are washed and then laminated to a poly(vinyl acetal) interlayer, the improvement which comprises adjusting the salt content of the final rinse water for the glass sheets so as to provide a salt content in the range of from 50 to 500 parts per million. The resulting laminates are found to have increased impact strength.

3,718,517

METHOD AND APPARATUS FOR DECORATING ARTICLES

Thomas L. Berg, 1110 23rd Street, North Bergen, N.J.
Filed Feb. 19, 1970, Ser. No. 12,714
Int. Cl. B32b *31/10, 31/20*
U.S. Cl. 156—234 **30 Claims**



A method and apparatus for decorating the outer surface of an article or ware wherein the article is initially positioned on a holding mandrel mounted to a rotary table while at a loading station. The article is subsequently advanced to a decorating station whereat a layer of transfer material is interposed between the article and a printing die. The transfer material is caused to engage the article being decorated with the die being moved across the outer surface thereof whereby a portion of the transfer material is caused to adhere to the article. Further means are provided to register the articles with respect to one another, accommodate surface irregularities on the article, permit uniform decorating of the article, accommodate tapered articles, allow for rapid changeover and adjustment of the machine, permit multi-color decorating, as well as others.

3,718,518

PROCESS OF PREPARING BONDED MATERIALS USING POLYURETHANE ADHESIVES WHICH FORM BONDS OF IMMEDIATE HIGH STRENGTH

Eugen Bock, Leverkusen, and Manfred Dollhausen, Hitdorf, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed June 9, 1970, Ser. No. 44,870

Claims priority, application Germany, June 19, 1969, P 19 30 336.7

Int. Cl. B29c *3/00;* **C09j** *3/16, 5/02*

U.S. Cl. 156—242 **8 Claims**

A method of providing bonded materials having a high resistance to separation immediately after bonding at room and at elevated temperatures using a hydroxyl polyurethane adhesive having a molecular weight of at least 50,000 prepared from organic diisocyanate, hydroxyl polyesters having a molecular weight of from 2,000 to 10,000 and 0.1 to 0.7 mol per mol of polyester of an alkane diol having at least four carbon atoms in the molecule. A solvent solution of the adhesive is applied to at least one of the surfaces of the articles to be bonded together and heated to a temperature of at least 70°C. to both activate the adhesive and evaporate the solvent. Immediately following the heat treatment the surfaces are pressed together forming an immediate high strength bond which is highly resistant to separation.

3,718,519

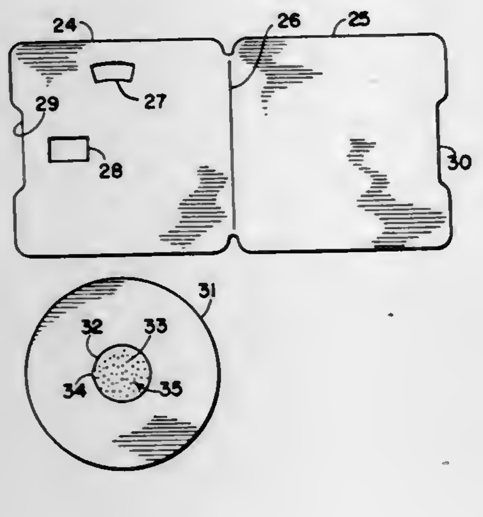
METHOD OF MAKING FLAT ROTATABLE DISC ASSEMBLIES

Donald Lee Montgomery, 12621 Victoria Ave., Los Angeles, Calif. 90066

Filed July 21, 1971, Ser. No. 164,694

Int. Cl. B32b *31/00;* **G06c** *27/00*

U.S. Cl. 156—250 **5 Claims**



A rotatable disc assembly includes top and bottom panels sandwiching a disc therebetween. Rather than the usual grommet for rotatably mounting the disc, a concentric disc is cut in the disc material and its top and bottom surfaces are glued to the top and bottom panels respectively. The concentric disc thus serves as a bearing for the disc itself.

3,718,520

TIRE BUILDING DRUM

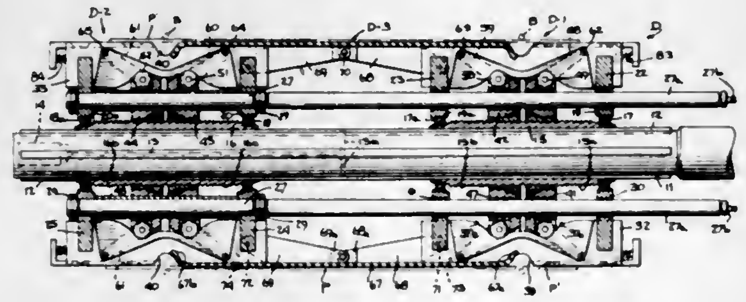
Jean Leblond, Compiegne, France, assignor to Uniroyal Englebert France S.A., Neuilly sur Seine, France

Filed June 30, 1970, Ser. No. 51,227

Claims priority, application France, July 1, 1969, 6922235

Int. Cl. B29h *17/26*

U.S. Cl. 156—400 **15 Claims**



A radially expansible and axially contractable single-stage tire building drum, especially suited for building tire carcasses of high stiffness ply material having metallic wire cords or cables incorporated therein, is disclosed. The drum has two axially spaced, radially split cylindrical drum end sections arranged for opposed joint axial movements and each composed of rigid, circumferentially aligned, cylindrical sector-shaped elements, and an elastically radially expansible tubular diaphragm surrounding the space between the drum members and circumferentially secured to the latter at its ends. In the radially smallest and axially largest condition of the drum, the two drum end sections and the diaphragm, the latter at that time being internally rigidly supported by an internal lever system linking the drum end sections to one another, define a minimum diameter continuous cylindrical surface for receiving the carcass ply material and enabling the bead cores to be loosely slipped thereonto. Mechanical camming means including screw-actuated rollers operatively engaging the sector-shaped elements are provided for forcing the same radially outwardly under high unyielding forces to cause the carcass ply material to be tightly clamped against the surrounding bead cores, which minimizes the possibility of slippage of the ply material relative to the bead cores during the ply turn-up operation and during the subsequent shaping operation as the carcass is inflated and expanded radially outwardly while the drum end sections are displaced axially inwardly of the drum.

This abstract is not to be taken either as a complete exposition or as a limitation of the present invention, however, the full nature and extent of the invention being discernible only by reference to and from the entire disclosure.

3,718,521

APPARATUS FOR IMPREGNATING YARNS, AND MORE PARTICULARLY GLASS YARNS, WITH SYNTHETIC RESINS

Andre Violleau, Vitrolles-le-Roucas, Rene Louis Coffy, Marseille, and Bernard Robert Laurent Marie Bancal, St.-Gratien, France, assignors to Societe Nationale Industrielle Aerospatiale, Paris, France

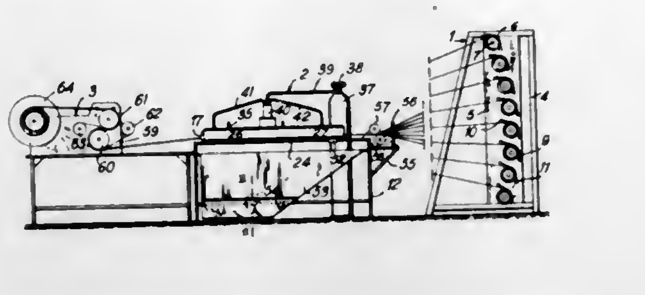
Filed July 24, 1970, Ser. No. 58,056

Claims priority, application France, July 29, 1969, 6925874

Int. Cl. B65h *75/00*

U.S. Cl. 156—433 **5 Claims**

Impregnating apparatus is provided which includes a support for at least one spool of yarn to be impregnated, an impregnating unit formed by two chambers within a single enclosed space, a first chemical processing chamber and a second chamber for providing mechanical processing in conjunction with a dipping of the yarn or yarns into a resin bath, means for heating said chambers, and drawing and winding means.



3,718,522

METHOD AND APPARATUS FOR PRODUCING A HOLLOW BODY FROM A HELICALLY WOUND STRAND

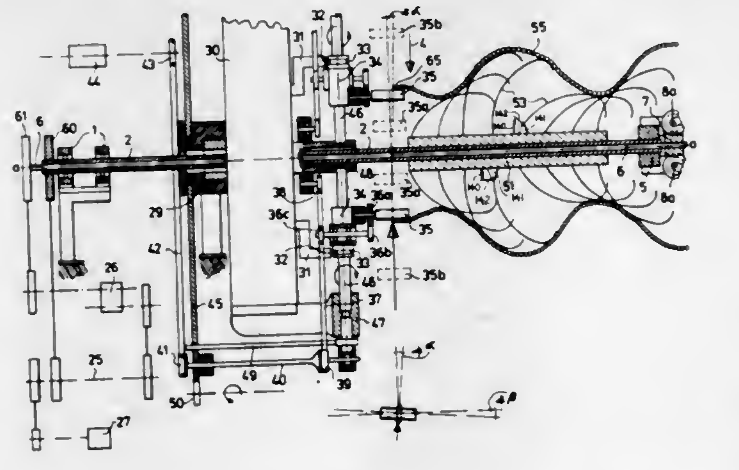
Wolfgang Arnold, Sonnenhalde, D-7241 Vespersweiler, Germany

Filed Feb. 16, 1970, Ser. No. 11,806

Claims priority, application Germany, Feb. 14, 1969, P 19 07 355.3

Int. Cl. B65c *9/04*

U.S. Cl. 156—448 **22 Claims**



A method and apparatus for forming a hollow, generally tubular, body of noncylindrical shape from a helically wound strand of a material which will firmly bond to itself upon contact, e.g. a thermoplastic. The strand is continuously deposited, onto and in contact with the last helical winding of the hollow body as the body is being continuously and simultaneously rotated and moved along its longitudinal axis, and the radial distance from the horizontal axis of the hollow body of the point of contact between the deposited strand and the last helical winding is gradually varied in accordance with the desired shape of the body. Simultaneously, the speed of rotation of the hollow body is varied in accordance with the variation of the radial distance of the contact point to maintain the peripheral speed at the contact point constant. A number of specific embodiments of apparatus for forming a body in this manner are disclosed.

3,718,523

TIRE BEAD WRAPPING MACHINE

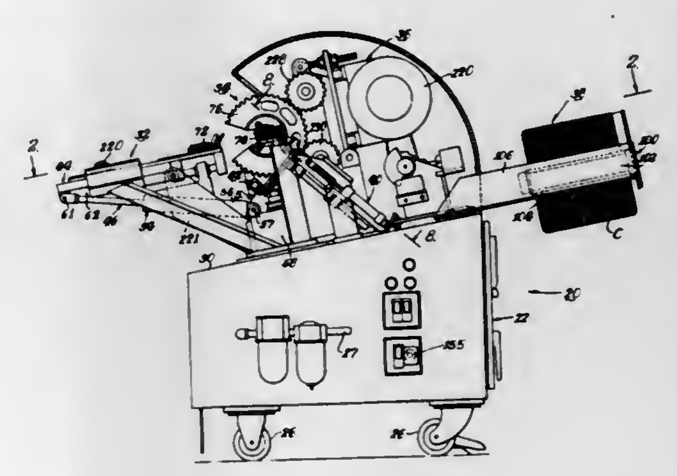
Edwin E. Mallory and William S. Mapel, Niles, Mich., assignors to National-Standard Company, Niles, Mich.

Filed Apr. 21, 1971, Ser. No. 135,970

Int. Cl. B29h *7/22, 17/34*

U.S. Cl. 156—460 **14 Claims**

A tire bead wrapping machine designed to automatically feed the cord to the shuttle from a spool mounted remote from the shuttle. A cord feeding assembly uses a pair of gripping fingers to bring the end of the cord to a cord feeding position adjacent one side of the shuttle, from which position the free end is picked up by the accumulator assembly at the start of a bead wrapping cycle. The excess cord is stored on the accumulator spools as the shuttle rotates about the bead. When a sufficient length of cord for one wrapping cycle is removed from the spool, a cord cutting assembly severs the cord and holds the free end of the cord coming from the spool, which free end is gripped by the gripping fingers and conveyed to the cord feeding position to prepare the machine for the next bead wrapping cycle.



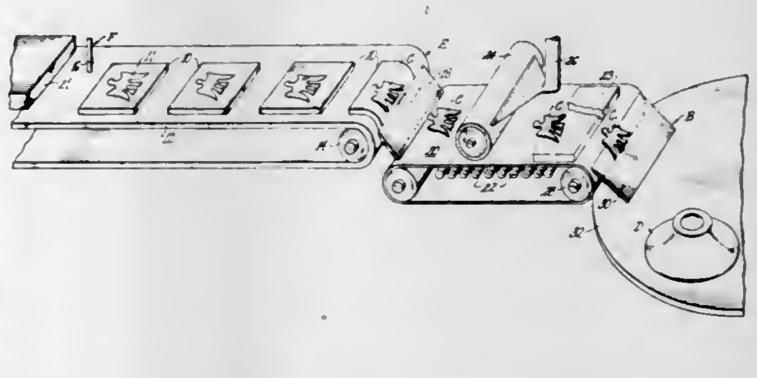
3,718,524

APPARATUS FOR FORMING ATTACHABLE INCOMPLETELY-CURED PLASTIC WAFERS

Elvin M. Bright, 17242 Bircher Street, Granada Hills, Calif. Continuation-in-part of Ser. No. 686,170, Nov. 28, 1967, Pat. No. 3,609,114. This application Aug. 28, 1970, Ser. No. 67,898

Int. Cl. B29b *5/00*

U.S. Cl. 156—500 **11 Claims**

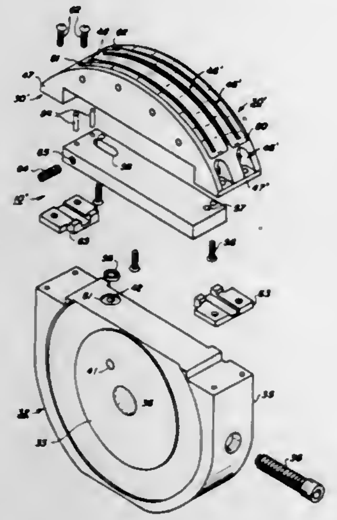


Apparatus for continuously forming delicately configured, partially polymerized decorative plastic wafers in condition for attachment and in situ curing on a supporting surface. Measured charges of flowable, plastic material are charged into preheated open-top molds where they assume a level top surface with the underface conforming to the mold configuration. After a period of travel the wafer is ejected when still incompletely polymerized but with its configured undersurface capable of lying on a planar surface without deformation. The succession of flexible, silicone rubber molds are secured to a flexible endless belt conveyor which moves them from a charging station to an ejection station in a period calculated to effect, say, 75 percent polymerization of the plastic. Each wafer is there ejected by arcing of the moving conveyor belt, as by abrupt direction-reversal over a guide roller. A slide plate then guides the emerging wafers onto a second conveyor without inversion, where their exposed top planar faces are roller-coated with adhesive and polymerization catalyst, then heated and conveyed to a bonding station for attachment to a supporting surface, such as a curved ceramic article.

3,718,525
LABEL TRANSFER WHEEL

John V. McGuire, Deerfield, and Donald W. Watson, Arlington Heights, both of Ill., assignors to Xerox Corporation, Stanford, Conn.

Filed Jan. 13, 1971, Ser. No. 106,083
Int. Cl. B65c *9/08, 9/14, 9/24*
U.S. Cl. 156—539 **3 Claims**

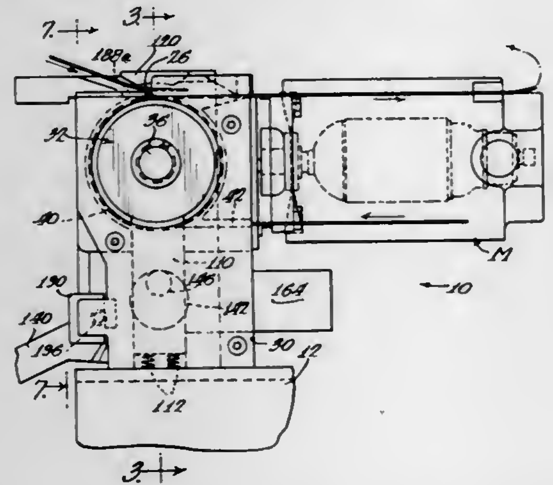


A transfer wheel with a radially extended land portion for transferring address-bearing labels or the address information therefrom onto articles being labeled. The transfer wheel land includes a series of thin slot-like vacuum holddown grooves extending along the periphery thereof in the plane of transfer wheel rotation. An individual vacuum admission port is provided for each holddown groove adjacent the leading end thereof, the ports being normally open to the atmosphere and serving to initially attract and attach the leading end of the labels thereto. The arrangement is such that direct communication of the supply ports with the atmosphere is first closed off by the label itself, thereby enhancing the vacuum pulldown effect within the holddown grooves to progressively cause the remainder of the label to be attached to the surface of the transfer wheel land in a sort of rolling action so that free spots or buckling of the label is avoided. As a further modification, in heat transfer applications, the surface of the land consists of a resistor type heating material alongside and between the vacuum holddown grooves to heat the label prior to transfer.

3,718,526
APPARATUS FOR FRICTION FUSING

James R. Annis, Jr., Rolling, Ill., assignor to Signode Corporation

Filed Feb. 25, 1971, Ser. No. 118,935
Int. Cl. B30b *5/00;* **B65b** *13/24*
U.S. Cl. 156—580 **24 Claims**

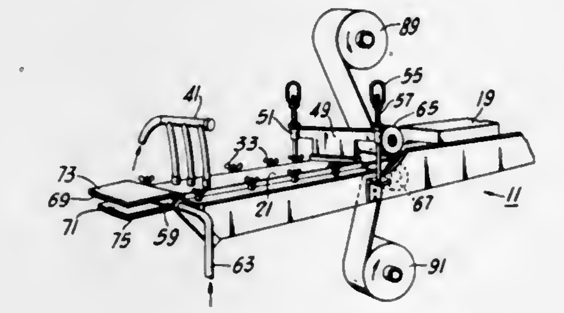


A strapping machine for feeding strap from a supply, tensioning a strap loop around an article, friction fusing overlapping end portions of the strap and cutting the loop of strap from the supply. The machine includes a strap engaging wheel, with an anvil and a feed pad supported adjacent the periphery of the wheel and biased towards the wheel to frictionally grip strap between the anvil and wheel or the feed pas and wheel. A unidirectional motor drives the feed wheel, and a drive mechanism between the motor and the wheel is capable of (1) rotating the wheel in one direction while the feed pad forces the strap into engagement with the periphery of the wheel, (2) rotating the wheel in a second direction while the anvil frictionally grips over-lapping portions of the strap to tension the strap loop about an article and (3) automatically converting rotation in the second direction to oscillating movement to friction fuse the overlapping strap portions.

3,718,527
APPARATUS FOR IMPREGNATING FIBER REINFORCEMENTS WITH HARDENABLE RESIN

James L. Goodman, Bristol, Tenn., assignor to Morrison Molded Fiber Glass Company, Bristol, Va.

Filed Sept. 3, 1968, Ser. No. 756,895
Int. Cl. B32b *31/08;* **D04h** *3/12*
U.S. Cl. 156—381 **9 Claims**



Apparatus for practicing the method of the invention includes a closed chamber into which partially impregnated material is introduced and wherein additional resin flows. A pressure plate at the exit end of the chamber compresses the resin impregnated material to spread the resin more completely throughout the material and to prevent excess resin from exuding from the chamber.

Additional dry filamentary material may be applied to the resin impregnated filamentary material prior to entering a resin curing zone.

3,718,528
HEAT REFLECTING LAMINATE

Axel Emil Bergstrom, Fregattvagen 7, Lidingo, Sweden
Continuation of Ser. No. 752,468, April 14, 1968, abandoned. This application Aug. 9, 1971, Ser. No. 170,337
Int. Cl. B44f *1/00*
U.S. Cl. 161—1 **5 Claims**

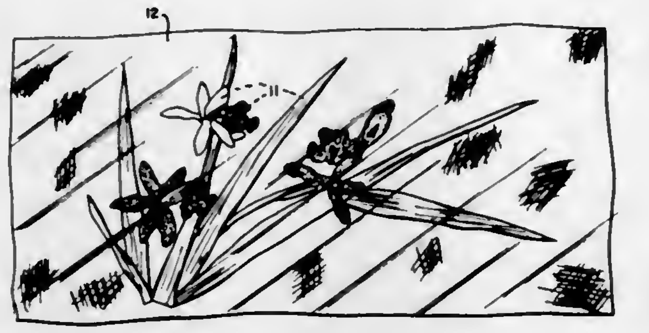
A radiation filter laminate material which transmits visible light and reflects heat radiation, comprising a plastic substrate on which is precipitated catalytically at least one coating of a metal or metals which impart to the material the properties of reflecting heat radiation to a greater degree than it reflects visible light, and which is also provided with a textile reinforcing material adhered to one or both sides thereof.

3,718,529
PICTURE AND METHOD OF MAKING SAME

Margot O. Coleman, 10100 SW. 56th Ave. 33156, and Elizabeth W. Johnson, 4780 Pine Drive 33143, both of Miami, Fla.

Filed May 24, 1971, Ser. No. 146,100
Int. Cl. A01n *3/00;* **A41g** *1/00;* **B44f** *7/00*
U.S. Cl. 161—19 **6 Claims**

Natural flowers, foliage and/or plants, fresh or dried are grouped in an attractive arrangement on a backing sheet of paper or the like in which the sheet should be impervious to water and shrinkage and the material pressed as flat as possible against the sheet and glued thereto if desired, after which a sheet of silk tissue paper or the like is placed over the pressed material and painted over with a clear white water-diluted glue followed by brushing all possible wrinkles, when dry a coat of decoupage is applied providing either a glossy or flat finish. Acrylic paints are then applied, simulating the color of the actual material as closely as possible; and finally, when dry, a final coating of acrylic gel is applied.



3,718,530
TREATMENT OF POLYPROPYLENE SURFACE TO PROMOTE ADHESIVE BONDING

Thomas F. Watson, Greensboro, N.C., assignor to Burlington Industries, Inc., Greensboro, N.C.

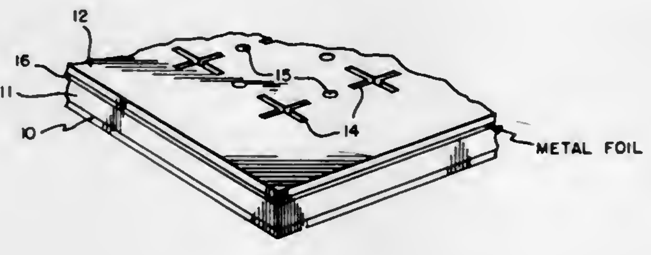
Filed Sept. 16, 1970, Ser. No. 72,789
Claims priority, application Sweden, Aug. 18, 1967, 11626/67
Int. Cl. B32b *25/08*
U.S. Cl. 161—67 **2 Claims**

The adhesion of carboxylated SBR adhesive to polypropylene carpet backings is improved by a coating on the polypropylene of chlorinated polypropylene having a chlorine content of 10–20%.

3,718,531
MOUNTING BASE MATERIAL FOR RUBBER PRINTING PLATES AND METHOD OF MANUFACTURING THE SAME

Thomas W. Lewis, Charlotte, N.C., assignor to Rexham Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 793,008, Jan. 22, 1969, abandoned. This application Dec. 30, 1970, Ser. No. 102,870
Int. Cl. B32b *3/30;* **B41f** *27/06, 27/08*
U.S. Cl. 161—116 **4 Claims**



A non-internally delaminable mounting material having an outer surface which includes a visibly and tactually discernible alignment grid and a method of manufacturing the same are disclosed herein. The laminate material includes outer layers of polyethylene terephthalate or polyvinyl fluoride film and inner layers of a resilient cellulosic material and includes a layer of metal foil between the outer film layer and the cellulosic material.

3,718,532
MICROPOROUS SHEETS AND PROCESSES

Stanley l. Hayes, Jr., Hamilton, Mass., assignor to USM Corporation, Flemington, N.J.

Filed April 8, 1970, Ser. No. 26,591
Int. Cl. B32b *3/26, 5/14, 5/18*
U.S. Cl. 161—159 **4 Claims**

Microporous sheet having pores of controlled size and arrangement and process of making in which temperature and composition are coordinated to control growth of size of nonsolvent liquid droplets constituting the discontinuous phase of an emulsion of which the continuous phase is a heated liquid polymeric reactive material which sets through reaction to solid condition and in which process the droplets are removed after setting of the reactive material to leave spaces constituting openings or pores in the solidified material. Pores of smaller size relative to the size of pores in the body of the sheet are provided in the sheet by control of the temperature of a casting surface.

3,718,533
COMPOSITE SHEETS FOR AGRICULTURAL USE

Shigeru Shibata, 213 Kamikuze-cho Kuze, Minami-ku, Kyoto, Japan

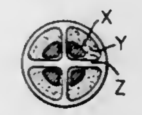
Filed Dec. 16, 1970, Ser. No. 98,769
Claims priority, application Japan, May 6, 1970, 45/44,663; Oct. 31, 1970, 45/95,555
Int. Cl. B32b *15/08*
U.S. Cl. 161—165 **4 Claims**

A composite sheet for agricultural use comprises a base layer of polyvinylchloride, a polyester film, an aluminum film vapor deposited on the polyester film to a thickness of 80 to 400 A., a protective layer made of a material selected from the group consisting of polyamide and an epoxide resin and applied on the surface of the aluminum film, and a bonding agent cementing the surface of the protective layer to the base layer. The composite sheet transmits approximately 55% of visible rays, but only approximatelyl 30% of infrared rays and approximately 12 to 30% of ultraviolet rays.

3,718,534
SPONTANEOUSLY CRIMPING SYNTHETIC COMPOSITE FILAMENT AND PROCESS OF MANUFACTURING THE SAME

Miyoshi Okamoto, Osaka, and Koji Watanabe, Otsu, Japan, assignors to Toray Industries, Inc., Tokyo, Japan

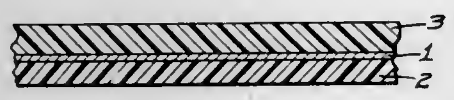
Filed Mar. 26, 1970, Ser. No. 22,803
Claims priority, application Japan, Mar. 26, 1969, 44/22,381
Int. Cl. B29f *3/10;* **D02g** *3/00*
U.S. Cl. 161—173 **16 Claims**



A spontaneously crimping synthetic composite filament having silk-like hand feel and sheen comprises at least two synthetic polymeric filamentary constituents which are different from each other and eccentrically incorporated into a filament body and has a fineness not exceeding 2.0 denier. The composite filament is manufactured using a process comprising (1) preparing a plurality of composite streams each of which is composed of at least two polymeric constituent streams eccentrically incorporated, (2) uniting the composite streams with a polymeric stream into a complex conjugate stream in which the uniting stream fills up spaces between the composite streams, (3) spinning the complex conjugate stream into a filament form, and (4) removing the uniting constituent in order to obtain the composite filaments. The invention includes a complex conjugate filament intermediately obtained in the above-stated process. The complex conjugate filament is composed of a plurality of composite filamentary segments and a uniting constituent which is removable.

3,718,535
PREFORMED SELF-SUPPORTING, FLEXIBLE AND COHERENT ELECTRICALLY HEATABLE LAMINAR STRUCTURE AND METHOD OF MANUFACTURE THEREOF

Ramsey C. Armstrong, Pacific Palisades, and Herbert Hoover, III, San Marino, both of Calif., assignors to The Sierracin Corporation, Sylmar, Calif.
Continuation-in-part of Ser. No. 634,296, April 27, 1967, abandoned, which is a continuation-in-part of Ser. No. 575,072, Aug. 25, 1966, abandoned. This application March 26, 1970, Ser. No. 22,878
Int. Cl. B60l *1/02;* **B32b** *15/08*
U.S. Cl. 161—165 **22 Claims**



Flexible sublaminates suitable for lamination between rigid transparent dielectric plies to form electrically powerable transparent safety glass-type constructions are prepared by first disposing on at least one surface of a carrier film a thin, adherent electrically conductive metallic coating and subsequently laminating to the metal-coated surface an interlayer film to form a flexible coherent laminar structure transparent when its exterior surfaces are smooth. Carrier films employed have an ultimate elongation of less than about 150 percent and tensile strength greater than about 5000 psi; interlayer films have ultimate elongation greater than about 150 percent and tensile strength less than about 6500 psi. Exemplary conductive metals are gold, silver, chromium, copper, and Inconel.

3,718,536
COMPOSITE BOARD AND METHOD OF MANUFACTURE

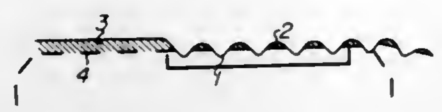
Martin L. Downs, Appleton, and Milton G. Schmitt, Kaukauna, both of Wis., assignors to Thilmany Pulp & Paper Company, Kaukauna, Wis.
Filed April 22, 1970, Ser. No. 31,023
Int. Cl. B32b *5/16, 19/02, 29/00, 31/20*
U.S. Cl. 161—168 **11 Claims**

A composite board formed from a mass of shredded paper containing thermoplastic material.

3,718,537
NONWOVEN FIBROUS PRODUCT AND METHOD FOR PRODUCING SAME

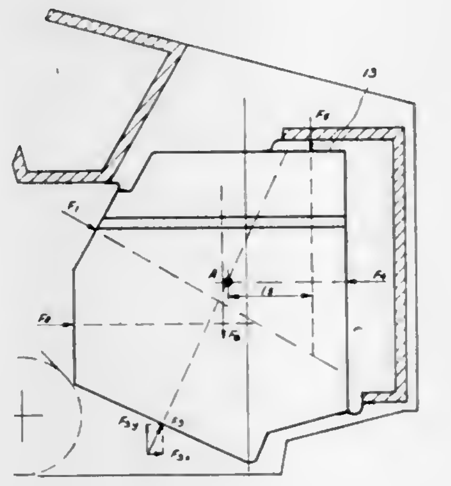
Atsushi Kawai, Takehiro Katsuyama, Migaku Suzuki, and Hidenori Ohta, Ohtake, Japan, assignors to Mitsubishi Rayon Company, Ltd., Tokyo, Japan
Filed Sept. 8, 1970, Ser. No. 70,421
Int. Cl. D21h *5/12*
U.S. Cl. 162—157 C **14 Claims**

A nonwoven fibrous product having excellent hand is produced without using adhesives by dispersing in an aqueous medium viscose fibers comprising hydroxymethyl cellulose xanthate, forming the dispersed fibers into a web, swelling the formed web, bonding the swollen viscose fibers and decomposing the hydroxymethyl cellulose xanthate to cellulose.



3,718,538
PAPER MACHINE HEAD BOX HAVING IMPROVED BALANCE

Taisto Ensio Makela, Karhula, Finland, assignor to A. Ahlstrom Osakeyhtio, Noormarkku, Finland
Filed April 9, 1971, Ser. No. 132,786
Int. Cl. D21f *1/02*
U.S. Cl. 162—340 **4 Claims**

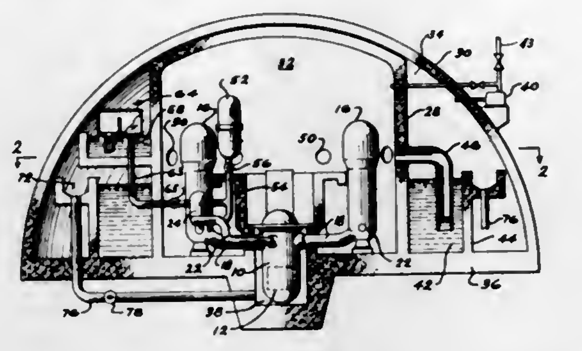


The head box is fitted with a stationary lower lip and a movable hollow body forming an upper lip. The lower end of the body has been attached to a stationary supporting beam of the head box with a flexible gasket so that a cavity is formed between the supporting beam and a front wall of the body. The cavity forms a closed space, which is limited by the side plates of the head box, the supporting beam, and another flexible gasket between the beam and the upper edge of the movable body, and flexible side gaskets between the side plates and the body. The closed space thus formed is communicating with the inside of the head box through channels in the movable body, which has been connected with a stationary front wall of the head box by a flexible gasket.

3,718,539
PASSIVE NUCLEAR REACTOR SAFEGUARD SYSTEM

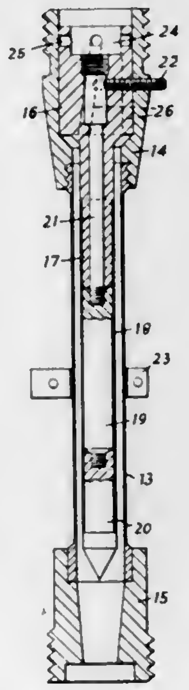
John M. West, West Hartford, Conn., and William D. Fletcher, Arlington, Va., assignors to Combustion Engineering, Inc., Windor, Conn.
Continuation-in-part of Ser. No. 730,719, May 21, 1968, abandoned. This application March 31, 1971, Ser. No. 129,724
Int. Cl. G21c *15/18*
U.S. Cl. 176—37 **8 Claims**

A safeguard system for a nuclear power plant is disclosed that incorporates means for containing the effects of a reactor accident to protect the environs of the plant against the release of harmful contaminants. The system includes particular containment structure housing the plant and a vapor suppression pool for condensing vaporous elements released from the plant. Various core cooling apparatus are integrated into the system to provide immediate and long term cooling of the reactor following a serious accident.



3,718,540
ELECTROLYTIC CELLS

Henry Philip Bailey, Fossway, England, assignor to International Research & Development Company Limited, Newcastle upon Tyne, England
Filed March 19, 1970, Ser. No. 126,057
Int. Cl. C22d *1/02*
U.S. Cl. 204—272 **14 Claims**



An electrolysis cell for purification of water containing dissolved chlorides by generation of chlorine or hypochlorite consists of coaxial tubular anode and cathode defining an annular flow passage for the continuous flow of the electrolyte and the inlet passages to the annular passage are arranged to produce a swirling motion of the electrolyte around the axis of the anode in order to prevent blocking of the narrow annular passage by deposits.

3,718,541
ISOLATION OF PROTEINS

Vladimir Kalina, Lausanne, Switzerland, assignor to Societe d'Assistance Technique Pour Produits Nestle S.A., Lausanne, Switzerland
No Drawing. Filed July 16, 1970, Ser. No. 62,766
Claims priority, application Great Britain, Aug. 28, 1969, 42,795/69
Int. Cl. C12b *1/00*
U.S. Cl. 195—28 R **8 Claims**

A protein isolate is obtained from bacterial cells by subjecting the cells to an alkaline shock of short duration which is followed by degradation with an acid. Other features of the invention are disclosed in the specification.

3,718,542
INVERTED STEPS FOR THE PREPARATION OF 9α-FLUORO-16-METHYLENE-PREDNISOLONE OR-PREDNISONE AND 21-ESTERS THEREOF

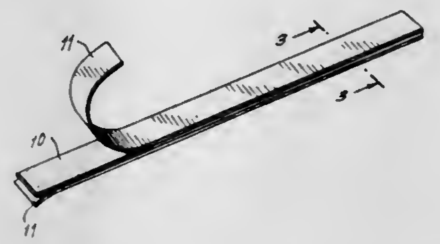
Klaus Irmscher; Fritz Von Werder; Karl-Heinz Bork, and Hans-Gunther Kraft, all of Darmstadt, Germany, assignors to Merck Patent Gesellschaft mit beschrankter Haftung, Darmstadt, Germany
Filed Aug. 20, 1969, Ser. No. 851,723
Int. Cl. C07c *169/32*
U.S. Cl. 195—51 E **7 Claims**

A process having improved yields is provided for the production of 9α-fluoro-16-methylene-prednisone or prednisolone and 21-esters thereof, the key to the process being the order of steps as follows:

a. microbiologically dehydrogenating 9β,11β-oxido-16-methylene-4-pregnene-17α-ol-3,20-dione in the 1(2) position;
b. reacting the resultant 9β,11βoxido-16-methylene-1,4-pregnadiene-17α-01-3,20-dione with hydrogen fluoride; and
c. reacting the resultant 9α-fluoro-16-methylene-1,4-pregnadiene-11β,17α-diol-3,20-dione with iodine in an alkaline solution, and thereafter with an alkali metal acetate to form 9α-fluoro-16-methylene-prednisolone-21-acetate.

3,718,543
BACTERIORIA TEST MATERIAL

John A. Lagomarsino, Wantagh, N.Y., assignor to Bio-Derivatives Corporation, Deer Park, N.Y.
Filed Jan. 4, 1971, Ser. No. 103,695
Int. Cl. C12k *1/10*
U.S. Cl. 195—99 **20 Claims**

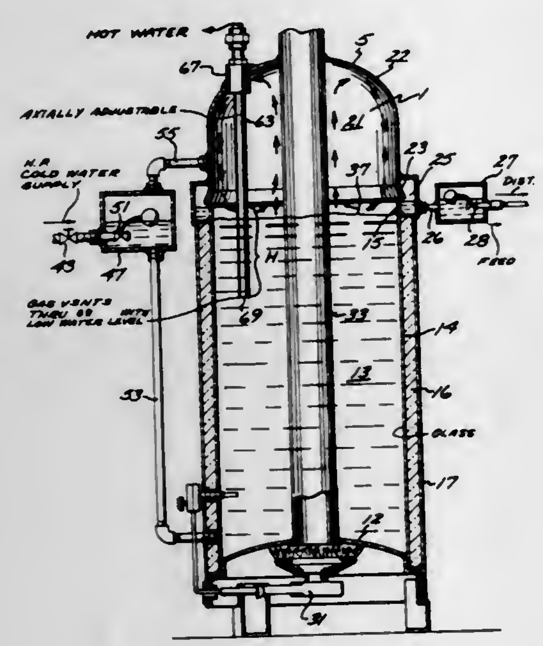


An improved bacteriuria test material is made up of an admixture of sulfanilamide and N-(1-Naphthyl) ethylenediamine dihydrochloride. In one embodiment a solution of these materials is employed to impregnate a paper strip or a cotton swab and then permitted to dry. In use when the resulting test material, such as the aforementioned impregnnated paper or cotton swab, is brought into contact or wetted with a test specimen containing nitrite, indicating the presence of bacteria in the urine or the test specimen, the paper or swab undergoes a fairly rapid color change to a rose or red color.

3,718,544
WATER HEATING AND PURIFICATION SYSTEM

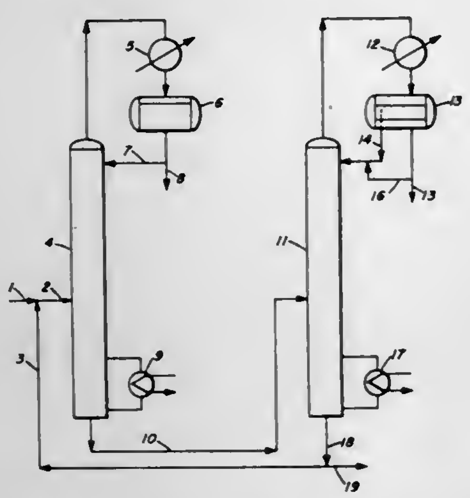
Anker V. Sims, Redondo Beach, Calif., assignor to Pollution Research & Control Corp., Glendale, Calif.
Filed Feb. 2, 1970, Ser. No. 7,852
Int. Cl. B01d *3/00;* **F28b ; B01d** *3/14*
U.S. Cl. 202—190 **5 Claims**

Apparatus for producing distilled water and undistilled hot water including a hot water tank with an insulated lower portion and an uninsulated upper portion, condensation occurring on the walls forming the upper portion and resultant condensate being collected in a distillate trough positioned below the walls of the upper portion. A withdrawal tube adjustable in height extends below the water surface and means are provided in the inlet line to throttle the flow of incoming water to correspond closely to the flow from the hot water system under maximum demand conditions. A separate vaporizing vessel can be used in combination with a conventional hot water heater, the operation thereof requiring recirculation of water from the vessel to the hot water heater at periodic intervals.



3,718,545
DISTILLATION PROCESS FOR RECOVERING SUBSTANTIALLY ANHYDROUS FORMIC ACID FROM AQUEOUS SOLUTIONS

Theodore Horlenko, Corpus Christi, Tex., assignor to Celanese Corporation, New York, N.Y.
Filed April 26, 1971, Ser. No. 138,569
Int. Cl. B01d *3/36*; **C07c** *53/02*
U.S. Cl. 203—15 **14 Claims**



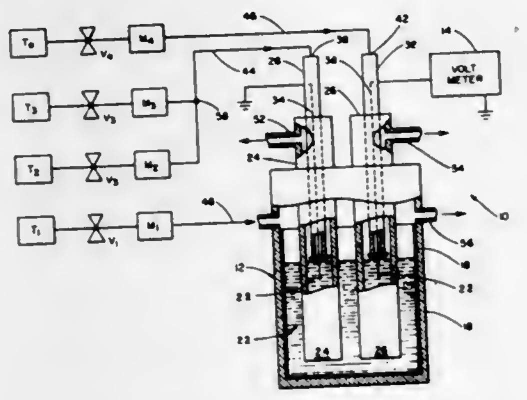
Substantially anhydrous formic acid is recovered from aqueous solution by azeotropically distilling the solution with a non-aromatic hydrocarbon entrainer which boils between about 60° and 120° C. Paraffinic and alicyclic hydrocarbons boiling between about 80° C and about 115° C are particularly suitable entrainers. The residue of the azeotropic distillation, containing formic acid and water is a formic acid:water ratio at least as great as that obtaining in any ternary azeotrope of formic acid, water, and the entrainer, can then be topped to separate water as a distillate from the formic acid, the residue from the topping distillation then being recycled to the azeotropic distillation. The process can be employed with feedstocks containing acetic acid in addition to formic acid and water.

ERRATUM

For Class 204—272 see:
Patent No. 3,718,540

3,718,546
SULFUR OXIDE ACTIVITY MEASUREMENT

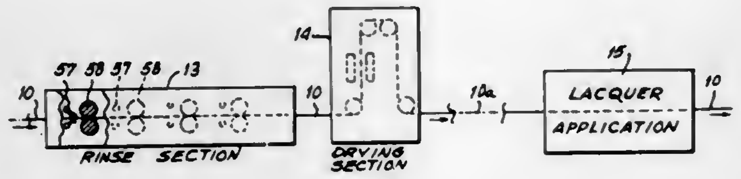
Francis J. Salzano, Patchogue, Andrew M. Davis, Blue Point, Hugh S. Isaacs, Shoreham, and Leonard Newman, Smithtown, N.Y., assignors to the United States of America as represented by the United States Atomic Energy Commission
Filed Dec. 9, 1971, Ser. No. 206,352
Int. Cl. G01n *27/46*
U.S. Cl. 204—1 T **10 Claims**



A sulfur oxide activity meter for measuring directly in an electrochemical cell the changes in SO_2 activity in a sample gas being supplied continuously to the cell. The electrolyte consists of molten fused Li_2SO_4, K_2SO_4 and Na_2SO_4. The sample gas forms part of one electrode while a reference gas having a fixed concentration of SO_2 forms part of the other electrode.

3,718,547
CONTINUOUS ELECTROLYTIC TREATMENT FOR CLEANING AND CONDITIONING ALUMINUM SURFACES

William Ernest Cooke and Jacques Francois Cote, Kingston, Robert Arthur Innes, Amherstview, and Roy Cowieson Spooner, Kingston, Ontario, Canada, and Walter Maria Eduard Kellermann, Oswego, N.Y., assignors to Alcan Research and Development Limited, Montreal, Quebec, Canada
Filed Nov. 16, 1970, Ser. No. 89,862
Int. Cl. C23b *9/00*
U.S. Cl. 204—28 **15 Claims**



High speed continuous treatment of aluminum, e.g. aluminum strip, is obtained for cleaning the surface and conditioning it for subsequent application of lacquer or other organic coating, by electrolytic treatment in hot acidic electrolyte maintained in turbulence at the surface of the travelling sheet, employing current at levels that preferably involve a very low total coulombic charge, for example in a range up to 3 coulombs per square inch. Special advantage in lacquer pretreatment and the like is realized with electrode sequence such that the strip is cathodic both before and after anodic action, and additionally improved efficiency is achieved with a substantially larger anodic area than the total area of cathodic polarity. Efficient cleaning at high speeds is obtainable in the lower portion of the above range of coulombic charge, advantageously with electrode areas reduced to afford relatively high current densities.

3,718,548
PROCESS FOR THE COLORING OF ANODIZED LAYERS ON ALUMINUM

Jean-Francois Paulet, Siblingen, and Fritz Endtinger, Neuhausen am Rheinfall, Switzerland, assignors to Swiss Aluminium Ltd., Chipps, Switzerland
No Drawing. Filed Apr. 13, 1971, Ser. No. 133,749
Claims priority, application Switzerland, Apr. 16, 1970, 5,662/70
Int. Cl. C23b *9/02*
U.S. Cl. 204—35 N **6 Claims**

The invention relates to a process for coloring oxide layers on aluminum. This consists in using meltable organic coloring matters in undissolved state, which are brought into contact with the oxide layer and molten into the pores of the oxide layer by heating.

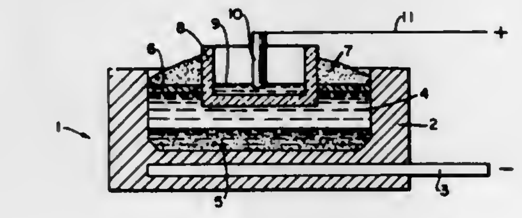
3,718,549
ALKALINE NICKEL PLATING SOLUTIONS

Arthur H. Du Rose, Richmond Heights, and Robert L. Stern, Cleveland Heights, both of Ohio, assignors to Kewanee Oil Company, Bryn Mawr, Pa.
Continuation of Ser. No. 752,169, Aug. 13, 1968, abandoned. This application June 14, 1971, Ser. No. 153,068
Int. Cl. C23b *5/08*, *5/46*
U.S. Cl. 204—49 **1 Claim**

An alkaline nickel electroplating bath and process wherein brighter and more ductile nickel electroplate is formed due to the inclusion of addition agents which include certain organic amines, nitriles, unsaturated organic acids and heterocyclic compounds. Such plating processes are operable from room temperature to about 180°F over a current density range of 5 to 100 amps per sq. ft. Typical addition agents include 1,6-Morpholino-2-hexyne; N-Allyl benzene sulfonamide; Sodium phosphite; Carboxymethylpyridinium iodide and 2-Phenyl-2-Cyanoethoxybutyne.

3,718,550
PROCESS FOR THE ELECTROLYTIC PRODUCTION OF ALUMINUM

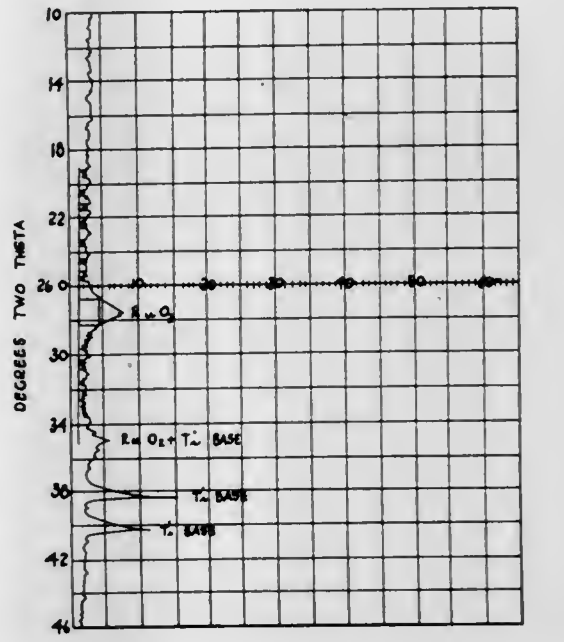
Hans-Jurgen Klein, Sierre, Switzerland, assignor to Swiss Aluminium Ltd., Chippis, Switzerland
Filed Dec. 2, 1970, Ser. No. 94,581
Claims priority, application Switzerland, Dec. 5, 1969, 17,975/69
Int. Cl. C22d *3/12*; **B01k** *3/06*
U.S. Cl. 204—67 **5 Claims**



Process for the electrolytic production of aluminum from a fused alumina-containing bath of alkali aluminum fluoride in which the part of the anode in contact with the bath consists of an oxidic electron-conducting ceramic material chemically resistant to the fluoride bath. Preferably the ceramic material consists predominantly of SnO_2.

3,718,551
RUTHENIUM COATED TITANIUM ELECTRODE

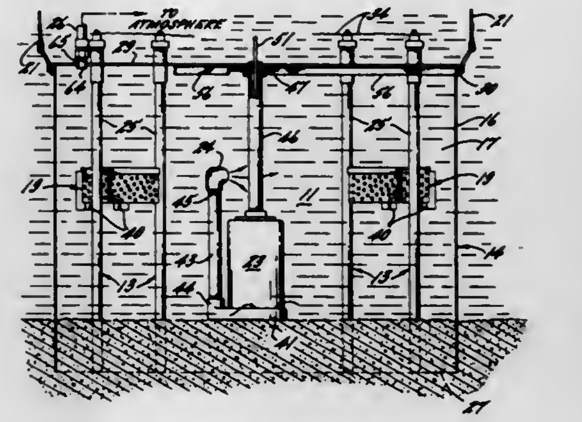
Aleksandrs Martinsons, Wadsworth, Ohio, assignor to PPG Industries, Inc., Pittsburg, Pa.
Continuation-in-part of Ser. No. 767,281, Oct. 14, 1968, Pat. No. 3,562,008. This application Nov. 2, 1970, Ser. No. 86,033
Int. Cl. B01r *3/04*, *1/00*
U.S. Cl. 204—98 **2 Claims**



An anode for the electrolysis of brines is disclosed. The anode has a titanium base member and an electroconductive coating thereon. The electroconductive coating comprises a mixture of amorphous titanium dioxide and a member of the group consisting of ruthenium and ruthenium oxide.

3,718,552
METHOD AND APPARATUS FOR ELECTROLYTICALLY RECOVERING METALS

Charles H. Mortell, 6929 South Main Street, Rockford, Ill.
Filed Dec. 21, 1970, Ser. No. 99,784
Int. Cl. C22d *1/00*, *1/02*; **C23b** *5/68*
U.S. Cl. 204—105 R **9 Claims**



A depositer for electrolytically recovering metal from the bed of a body of water includes a submersible housing with a closed top end and an open bottom end and is operable to lodge by walls defining the sides of the housing within the bed to form a closed chamber containing a portion of the bed and water. The housing serves as the anode of the depositor and is electrically connected with an energy source for supplying direct current thereto. A plurality of rods depending from the top end extend into the chamber, serve as the cathodes, and are also connected with the energy source. Mounted on the inside wall of the chamber are a plurality of sieves adapted to hold a dissolvable chemical used to increase the conductivity of water captured in the chamber. A pump agitator suspended from the top and positioned within the chamber draws material from the bed and circulates it within the chamber to thoroughly mix the chemical with the captured water and bed to more readily ionize the metal to be recovered. As a suitable electric potential is applied between the anode and cathodes, the ionized metal confined within the chamber deposits upon the cathode rods.

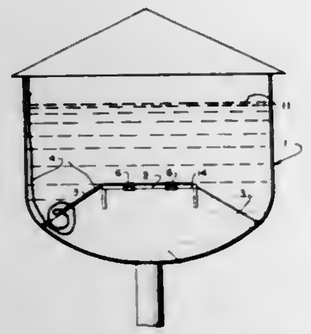
3,718,553
CRACKING OVER CONTAMINATED CATALYST

William A. Stover, Woodbury, N.J., assignor to Mobil Oil Corporation
Filed Dec. 28, 1970, Ser. No. 102,128
Int. Cl. C10g *11/02, 11/04*
U.S. Cl. 208—120 **12 Claims**

A process for cracking, in the absence of hydrogen, a gas oil charge, which comprises contacting said gas oil charge under catalytic cracking conditions with a catalyst, consisting of a crystalline aluminosilicate, having an exchangeable sodium content of less than 4 weight percent, contained in a porous matrix, which catalyst has impregnated thereon, prior to contact with said gas oil charge, a controlled amount of nickel, iron or vanadium in an amount of 100 to 1,000 ppm. of at least one of said metals and recovering from the cracked products, a gasoline of higher octane number than that capable of realization by cracking said charge under identical conditions with an otherwise identical catalyst, but which had not undergone initial impregnation with at least one of said metals.

3,718,554
CATHODIC PROTECTION FOR WATER TANKS

Lloyd K. Jacobs, 430 Allen Drive, Vine Grove, Ky. 40175, and Richard N. Hull, Rte. 1, P.O. Box 145, Irvington, Ky. 40146
Filed Sept. 18, 1969, Ser. No. 858,989
Int. Cl. C23f *13/00*
U.S. Cl. 204—147 **4 Claims**



The present invention discloses a support system for cathodic protection apparatus used in liquid containing metal tanks wherein submerged anodes are attached to buoyant submerged means, which means is maintained in a totally submerged condition by flexible attachment to the walls of the water tank, thereby preventing ice accumulation on and damage to the anodes.

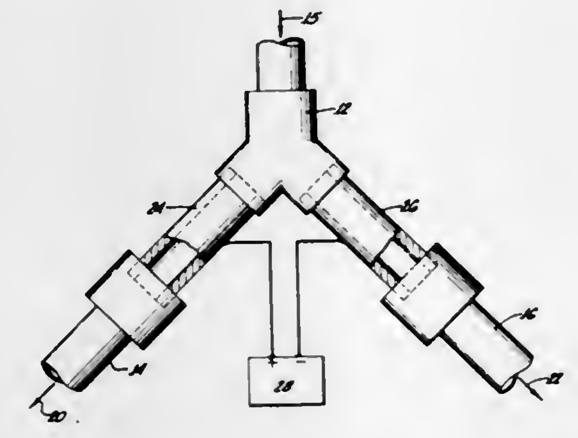
3,718,555
ELECTROCHEMICAL MACHINING ELECTROLYTE

Jacob B. Darling, Carmel, Ind., and Mitchell LaBoda, Detroit, Mich., assignors to General Motors Corporation, Detroit, Mich.
Division of Ser. No. 750,772, Aug. 7, 1968. This application Feb. 22, 1971, Ser. No. 117,693
Int. Cl. B23p *1/00*
U.S. Cl. 204—129.75 **2 Claims**

Hygroscopic additives for sodium and potassium chlorate and perchlorate electrochemical machining electrolytes. These additives have a fire retardant effect on combustibles exposed to electrolyte splash. When used in conjunction with relative humidities of above about 35 percent, the additives prevent the electrolyte splash from drying sufficiently to support combustion. Specific materials which are compatible with the electrolyte are disclosed.

3,718,556
IONIC pH CONTROL

Gilson H. Rohrback, Whittier, Calif., assignor to Magna Corporation, Santa Fe Springs, Calif.
Filed July 22, 1970, Ser. No. 57,088
Int. Cl. B01k *3/00;* **C02c** *5/12*
U.S. Cl. 204—149 **12 Claims**



An aqueous system is made either more basic or more acidic by feeding a liquid containing a preponderance of pH changing hydroxyl or hydrogen ions. The pH changing ions are produced at the electrodes of an electrolyzing system. Liquid flowing past one of the electrodes is returned to the aqueous system of which the pH is to be controlled and liquid flowing past the other electrode is discharged. The amount of pH change is controllable, either open-loop or closed-loop. Control may be achieved by several methods including varying the voltage applied to the electrodes and varying the flow rate past one or both of the electrodes.

3,718,557
PROCESS OF MAKING CLF$_3$O

Howard H. Rogers, Woodland Hills, and Donald Pilipovich, Canoga Park, both of Calif., assignors to North American Rockwell Corporation
Filed Dec. 6, 1967, Ser. No. 688,628
Int. Cl. B01j *1/00*
U.S. Cl. 204—157.1 **4 Claims**

Production of ClF$_3$O by reacting under ultraviolet light a compound selected from the group consisting of ClF$_2$F and ClO$_2$F with a compound selected from the group consisting of ClF$_5$, ClF$_3$, ClF, OF$_2$ and F$_2$.

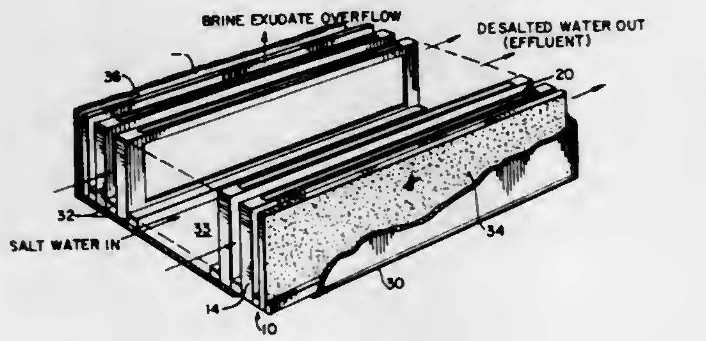
3,718,558
PROCESS FOR PRODUCING A CROSS-LINKED COPOLYMER OF TETRAFLUOROETHYLENE AND PROPYLENE USING HIGH ENERGY IONIZING RADIATION

Yoneho Tabata, Matsudo, and Gen Kojima, Tokyo, both of Japan, assignors to Asahi Glass Company Ltd., Tokyo, Japan
Filed Dec. 11, 1970, Ser. No. 97,387
Claims priority, application Japan, Dec. 11, 1969, 44/99615
Int. Cl. C08d *1/00;* **C08f** *1/16*
U.S. Cl. 204—159.2 **6 Claims**

A cross-linked copolymer of tetrafluoroethylene and propylene is produced by irradiating a copolymer of tetrafluoroethylene and propylene in the absence of monomers of tetrafluoroethylene, propylene, or other copolymerizable monomer, with high energy ionizing radiation.

3,718,559
ELECTROGEL PROCESS FOR REMOVING ELECTROLYTES AND CONCENTRATING THE SAME FROM AN AQUEOUS SOLUTION

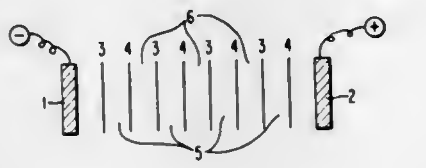
Richard A. Wallace, 9707 Fourth Avenue, Brooklyn, N.Y.
Filed March 27, 1970, Ser. No. 23,311
Int. Cl. B01d *13/02;* **B01k** *5/00;* **C02b** *1/82*
U.S. Cl. 204—180 G **28 Claims**



An electrolytic continuous method for simultaneously removing electrolytes from aqueous solution and concentrating the electrolytes produced therefrom which comprises subjecting an aqueous electrolyte solution to contact with an inorganic oxide gel under the influence of an electrical field, allowing the electrolyte to be sorbed by the gel until a point of saturation is achieved, whereby the electrolyte is exuded from said gel and then recovering the resultant electrolyte exudate from said gel. Conveniently, the apparatus comprises at least one electrolyte concentrating unit comprising an inorganic oxide gel core encased within an open module having a bottom wall and a pair of parallel opposing sides and opposing end walls and whose opposing sides further comprise a cation-permeable membrane and an anion-permeable membrane, respectively, and a source of an applied electrical field.

3,718,560
PROCESS FOR ELECTRODIALYSIS OF SUGAR SOLUTIONS

Michiyuki Sugiyama, Yoshikuni Takatori, Ryosuke Touyama, Akira Nakamura, Teiji Yamauchi, and Masaaki Kato, Yokohama, and Yushio Nakashiba, Tokyo, Japan, assignors to Taito Co., Ltd., and Asahi Kasei Kogyo Kabushiki Kaisha
Continuation-in-part of application Ser. No. 201,317, Nov. 23, 1971, which is a continuation-in-part of application Ser. No. 52,335, July 6, 1970. This application May 30, 1972, Ser. No. 257,852
Int. Cl. B01d *13/02;* **B01k** *5/00*
U.S. Cl. 204—180 P **48 Claims**



A desalination process for the removal of salts from sugar solutions by electrodialysis in a cell having ion-permeable membranes alternatively disposed between the electrodes by contacting the sugar solution with the alternately disposed ion-permeable membranes comprising having as an anion exchange membrane an ion-permeable membrane with an ion exchange capacity of less than about 0.3 milliequivalent/gram of dry membrane and having as the cation exchange membrane an ion-permeable membrane having cation permselectivity. The desalination process can be advantageously used in sugar refining with additional sugar refining techniques, such as adsorption or carbonation.

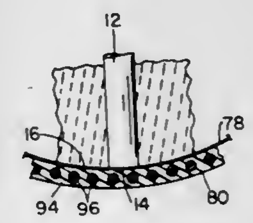
3,718,561
POROMERIC POLYMERIC PRODUCTS AND PROCESS THEREFOR

Ezekiel J. Jacob, 25 Monroe Place, Brooklyn, N.Y.
Continuation of Ser. No. 691,121, Dec. 14, 1967, abandoned. This application July 7, 1970, Ser. No. 56,150
Int. Cl. B01d *13/02;* **B01k** *5/00*
U.S. Cl. 204—180 R **3 Claims**

The present invention shows how to make poromeric polymeric products by leaching out water-soluble electrolytes from a polymeric material with the help of galvanic or electrolytic current.

3,718,562
ELECTRODE ASSEMBLY

Ihsan A. Haddad, Bedford, Mass., assignor to Instrumentation Laboratory, Inc., Lexington, Mass.
Filed May 18, 1970, Ser. No. 38,202
Int. Cl. G01n *27/46*
U.S. Cl. 204—195 P **14 Claims**

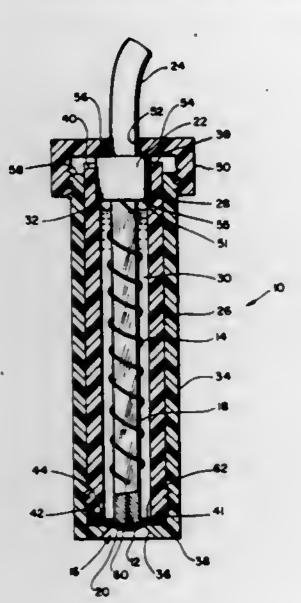


An electrode assembly includes an elongated tubular support member to which is secured a coupling structure. An electrode structure is supported by the coupling structure and has a sensing surface that projects externally of the coupling structure. A housing structure has a selectively permeable membrane secured over an opening at one end so that a chamber is defined for receiving an electrolyte solution. The housing is connected to the coupling structure so that the exposed sensing surface of the electrode structure is disposed in the electrolyte structure with its sensing surface in contact and distorting the membrane structure. The housing and coupling structures have cooperating engaged locating surfaces that define the amount of permitted distortion of the membrane structure.

3,718,563
POLAROGRAPHIC SENSOR AND MEMBRANE THEREFOR

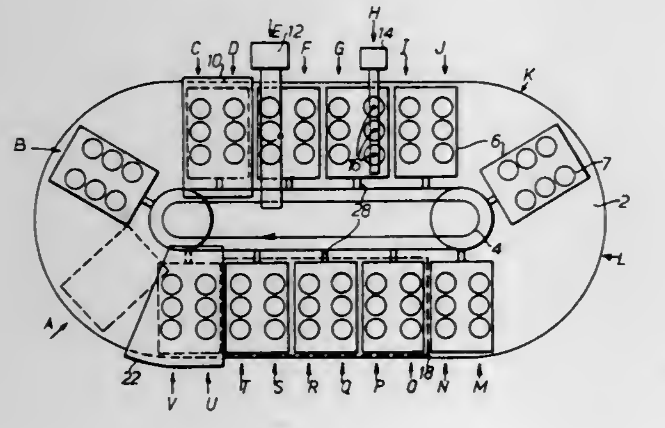
Irwin H. Krull, Garden Grove, and Donald N. Martin, Whittier, both of Calif., assignors to Beckman Instruments, Inc.
Filed Feb. 22, 1971, Ser. No. 117,633
Int. Cl. G01n *27/30, 27/40*
U.S. Cl. 204—195 P **9 Claims**

A polarographic sensor comprising a pair of electrodes joined by an electrolyte with a multi-layer gas permeable-essentially ion impermeable membrane separating the electrodes and electrolyte from the sample medium. The layers of the membrane are held together so as to prevent migration of electrolyte therebetween to the region overlying the sensing electrode and to prevent the trapping of gas or liquid between the layers in such region. The outer layer of the membrane is preferably formed of silicone rubber while the next layer is formed of a material which is less permeable to gas and water vapor than the outer membrane, for example Teflon. A polarographic sensor employing such a membrane exhibits good time response and minimal flow sensitivity.



3,718,564
ELECTROPHORETIC CASTING OF POTTERY

John Alfred Charles Ebrey, Stoke-on-Trent, and George Terah Gough, Newcastle, England, assignors to Gough and Company (Hanley) Limited, Stoke-on-Trent, Staffordshire, England
Filed July 15, 1971, Ser. No. 162,948
Claims priority, application Great Britain, Mar. 3, 1971, 5,895/71
Int. Cl. B01k *5/00, 5/02*
U.S. Cl. 204—181 **10 Claims**

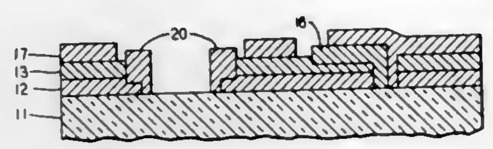


In the casting of ceramic articles from slip in porous moulds, casting up is aided by electrophoresis, the electrophoretic treatment being commenced after a short initial cast up and ceasing before a final cast up which has a much longer duration than the electrophoretic treatment. Apparatus for carrying out the process is also described.

3,718,565
TECHNIQUE FOR THE FABRICATION OF DISCRETE RC STRUCTURE

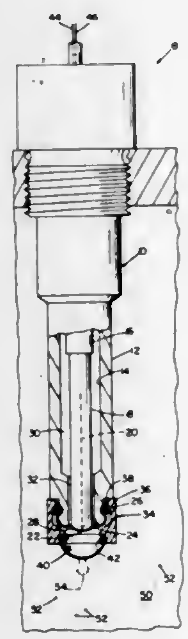
Frank Palmer Pelletier, Wescosville, Pa., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.
Filed Nov. 27, 1970, Ser. No. 93,242
Int. Cl. C23c *15/00*
U.S. Cl. 204—192 **1 Claim**

A technique for the fabrication of tantalum-based resistors and capacitors on a single substrate member involves a series of process steps wherein a layer of tantalum nitride and a layer of beta-tantalum are sequentially deposited upon a substrate member and serve as the resistor and capacitor films respectively of the desired structure, the capacitor film being converted to a protective anodic oxide during the course of the processing.



3,718,566
POLAROGRAPHIC ELECTRODE ASSEMBLY

William Michael Krebs, Waltham, Mass., assignor to Instrumentation Laboratory, Inc., Lexington, Mass.
Filed Jan. 7, 1971, Ser. No. 104,665
Int. Cl. G01n *27/30*
U.S. Cl. 204—195 P **7 Claims**

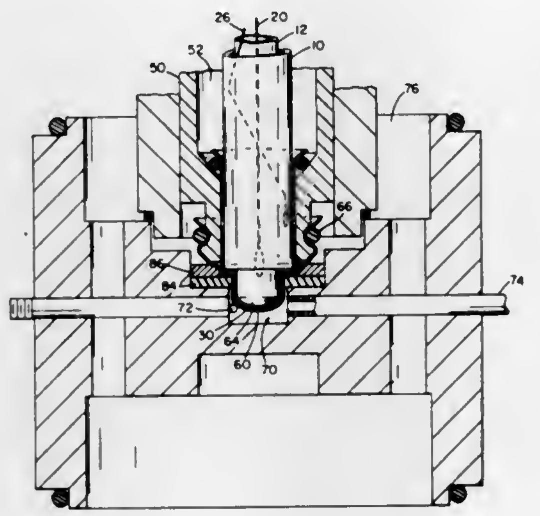


An electrochemical electrode assembly includes a housing defining an electrolyte chamber. The housing has an aperture in a wall and a selectively permeable membrane is disposed across the aperture. An electrode is supported within the chamber in close proximity to the membrane and a filter is supported on the housing and interposed between the membrane and test material in spaced relation to the membrane to intercept liquid particles while freely passing gas from the medium.

3,718,567
ELECTRODE ASSEMBLY

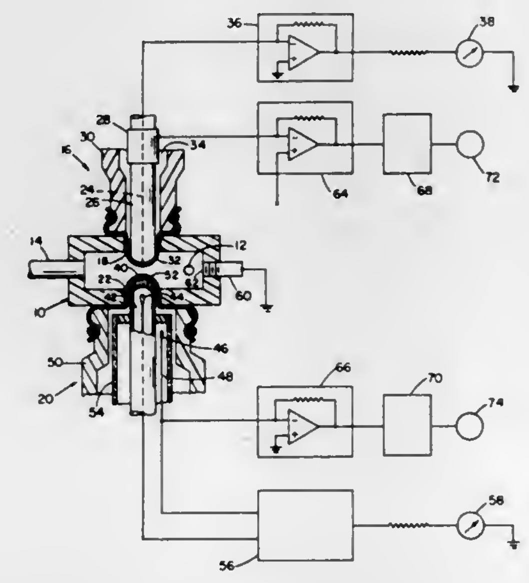
Ihsan A. Haddad, Brighton, and Thomas A. Rosse, Lexington, Mass., assignors to Instrumentation Laboratory, Inc., Lexington, Mass.
Filed Apr. 7, 1970, Ser. No. 27,194
Int. Cl. G01n *27/46*
U.S. Cl. 204—195 P **7 Claims**

Electrochemical apparatus includes an electrode assembly having an electrolyte chamber with a projecting stem portion. A pH sensitive membrane is secured across the end of the projecting stem portion and a selectively permeable membrane is secured over the pH sensitive membrane. The electrode assembly is disposed in an analysis chamber so that the pH sensitive membrane is entirely within the analysis chamber. A clamp at the port of the analysis chamber clamps the selectively permeable membrane against the external surface of the stem.



3,718,568
ELECTROCHEMICAL SENSOR INSTRUMENTATION

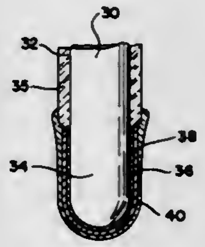
Robert T. Neuwelt, Arlington, Mass., assignor to Instrumentation Laboratory, Inc., Lexington, Mass.
Filed May 21, 1971, Ser. No. 145,839
Int. Cl. G01n *27/30, 27/40*
U.S. Cl. 204—195 P **17 Claims**



Apparatus for monitoring the integrity of a selectively permeable membrane in an electrochemical sensor system that includes two half cells, a monitoring electrode having a surface disposed in the sample chamber, and a monitoring circuit connected to a half cell on the opposite side of the selectively permeable membrane from the monitoring electrode for sensing current flow resulting from the difference in electric potential at the monitoring electrode and the galvanic potential genereated by the connected half cell for providing an output signal to indicate the integrity of the selectively permeable membrane.

3,718,569
METHOD OF MAKING SOLID STATE GLASS ELECTRODE

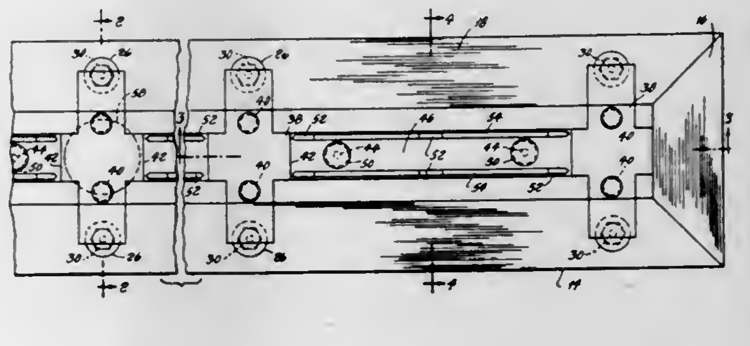
Arne J. Petersen, Balboa, and George Matsuyama, Fullerton, both of Calif., assignors to Beckman Instruments, Inc.
Division of Ser. No. 866,249, Oct. 14, 1969, Pat. No. 3,649,506. This application Nov. 29, 1971, Ser. No. 203,091
Int. Cl. G01n *27/36;* **C03c** *27/04*
U.S. Cl. 204—195 G **8 Claims**



A solid state glass electrode in which a conductor having a surface layer of an electrochemically active metal is coated with a first coating of a mixture of a glass and a halide of the active metal and a second outer coating of ion sensitive glass. The preferred active metal and halide are copper and cuprous chloride, respectively. The electrode is rugged, has a response approximating that of a standard glass electrode and has better stability over long periods and changing temperature conditions than previous solid state glass electrodes.

3,718,570
CATHODIC PROTECTION ANODE WITH SECTIONS REPLACEABLE UNDERWATER

Isidore Geld, Flushing, N.Y., assignor to the United States of America as represented by the Secretary of the Navy
Filed June 1, 1970, Ser. No. 42,169
Int. Cl. C23f *13/00*
U.S. Cl. 204—196 **1 Claim**

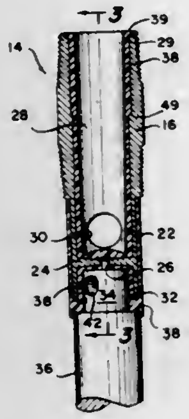


An impressed current anode assembly for cathodic protection that includes several anode sections clamped to a bus conductor in the assembly. Each anode section is separable from the anode assembly and replaceable by a scuba diver equipped with simple hand tools.

3,718,571
ANODE FITTING

Arthur W. Bidwell, Middletown, Ohio, assignor to Magnode Products, Inc., Trenton, Ohio
Filed June 30, 1971, Ser. No. 158,431
Int. Cl. C23f *13/00*
U.S. Cl. 204—197 **9 Claims**

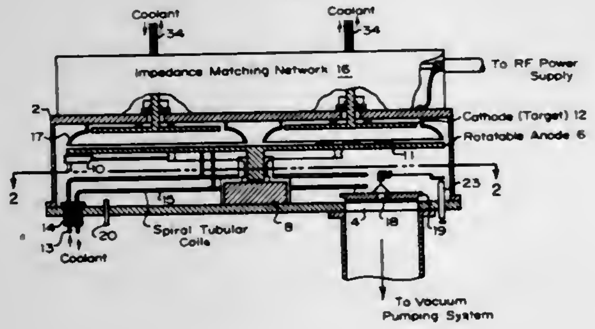
An anode fitting for protecting metallic surfaces such as water heaters, water tanks, and the like which are in contact with an electrolyte, from corrosion, the fitting including a connector member adapted to be secured to the metallic surface in electrical contact therewith and having a fluid passageway therethrough, the connector member including a hollow nipple portion having a depending tubular portion. The tubular portion includes an annular flange portion therein which is positioned so as to form a socket at the distal end of the tubular portion, the socket being adapted to receive an electrode formed of a metal which is higher in the electromotive series than the metal forming the metallic surface. The electrode includes a core wire secured in electrical contact to the annular flange portion and a coating of insulating material lines the fluid passageway, and covers the outside of the tubular portion and substantially fills the space between the electrode and the socket.



3,718,572

SPUTTERING SYSTEM WITH SPIRALLY COILED COOLANT COIL

Billie J. Robison, Palo Alto, and Richard A. D. Lucic, Sunnyvale, Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.
Filed Oct. 7, 1971, Ser. No. 187,264
Int. Cl. C23c *15/00*
U.S. Cl. 204—298 **10 Claims**

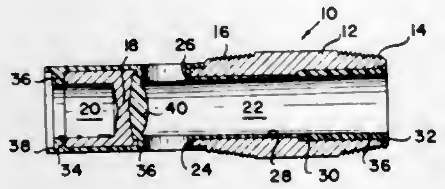


The anode and the workpieces of a thin film sputtering system are cooled by coolant that circulates through spiral tubular coils located below the anode and into chambers located within the anode. The anode is rotatable, and the cooling coils expand and contract to permit partial rotation of the anode. The two cathodes of the sputtering system are cooled by coolant that circulates through chambers within the cathodes. The cathodes are designed to minimize contamination from residue coolant leaking into the gastight enclosure of the sputtering system while the cathodes are being removed. The gastight enclosure is connected to a vacuum pump through a port. A throttle plate, located within the enclosure over the port, aids the vacuum pump to efficiently regulate the gas pressure in the enclosure during a sputtering run.

3,718,573

FLUID FITTING

Arthur W. Bidwell, Middletown, Ohio, assignor to Magnode Products, Inc., Trenton, Ohio
Filed Nov. 8, 1971, Ser. No. 196,367
Int. Cl. C23b *5/70*
U.S. Cl. 204—297 R **17 Claims**



A fitting for fluid systems and the like comprising a body member having an annular wall and having means on the outside surface thereof for securing the body member to a support member, the body member being tubular and having opened upper and lower ends, and having an annular baffle spaced from the ends and dividing the body member into two separate chambers. The body member includes a pair of diametrically opposed openings in the wall adjacent the baffle opening into one of the chambers, the other of the chambers forming a socket. The securing means is positioned above the wall opening. Also, the one of the chambers, the wall openings, the outside wall of the body member from the wall opening downwardly to beyond the lower end thereof, and the lower end of the wall member are covered with a plastic insulating coating.

ERRATUM

For Class 208—120 see:
Patent No. 3,718,553

3,718,574

METHOD FOR HEAVYING POLYCYCLIC SUBSTANCES

Tadashi Araki, Kiro Asano, Hitoshi Takita, and Takao Awao, Tokyo-to, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Chuo-ku, Tokyo-to, Japan
Filed Dec. 28, 1970, Ser. No. 101,510
Claims priority, application Japan, Dec. 29, 1969, 45/105,232
Int. Cl. C10c *3/02*
U.S. Cl. 208—44 **5 Claims**

Method for heavying polycyclic substance, wherein the crude material is treated with an oxidizing agent, and then treated with ammonia or amines.

3,718,575

HYDROCRACKING FOR LPG PRODUCTION

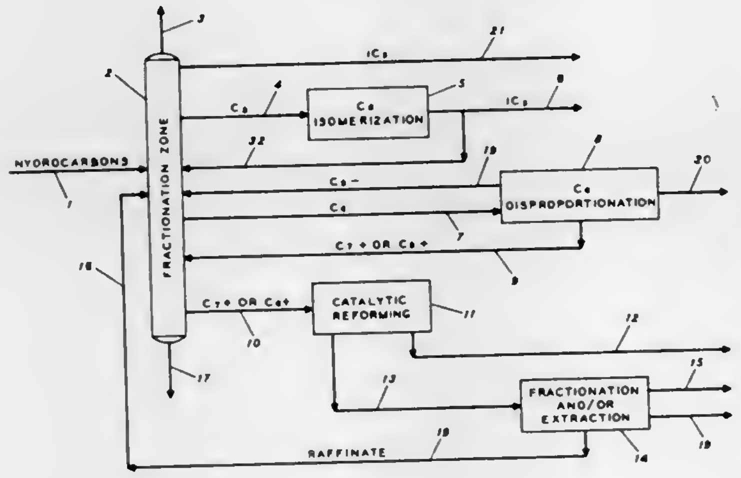
Charles H. Watkins, Des Plaines, Ill., assignor to Universal Oil Products Company, Des Plains, Ill.
Filed July 12, 1971, Ser. No. 161,586
Int. Cl. C10g *13/02, 31/14, 37/04*
U.S. Cl. 208—59 **7 Claims**

Liquefied petroleum gas, herein referred to as "LPG," is produced from heavy hydrocarbon distillates through the utilization of a two-stage hydrocracking process. The product effluent from the first stage is separated to provide a vaporous gasoline boiling range fraction which is utilized as the charge stock to the second stage.

3,718,576

GASOLINE PRODUCTION

Thomas R. Hughes, Orinda, and Robert P. Sieg, Piedmont, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.
Continuation-in-part of Ser. No. 3,303, Jan. 16, 1970, and a continuation-in-part of Ser. No. 3,306, Jan. 16, 1970. This application July 1, 1970, Ser. No. 51,488
Int. Cl. C10g *39/00*
U.S. Cl. 208—93 **6 Claims**

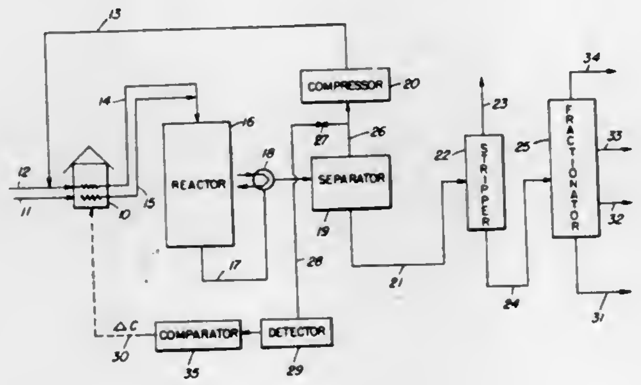


A process for producing gasoline from a hexane-rich hydrocarbon feed which comprises disproportionating the hexane-rich feed to obtain at least C_5 hydrocarbons and C_7+ hydrocarbons, and catalytically reforming the C_7+ hydrocarbons to obtain reformate. Preferably, the normal pentane hydrocarbons obtained from disproportionating the hexane are fed to a C_5 isomerization process to obtain isopentane. Preferably, a common fractionation zone is used for the disproportionation, catalytic reforming and C_5 isomerization processes.

3,718,577

CONTROL OF HYDROCRACKING PROCESS FOR CONSTANT CONVERSION

Yuen Chen Nai, Titusville, and Yuan Yan Tsoung, Trenton, both of N.J., assignors to Mobil Oil Corporation
Filed July 16, 1971, Ser. No. 163,161
Int. Cl. C10g *13/00*; **G01n** *27/16, 27/62*
U.S. Cl. 208—108 **7 Claims**

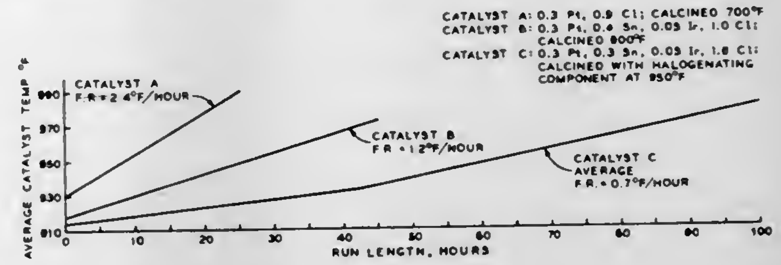


The level of conversion of a hydrocracking operation is controlled as a function of the amount of carbon determined in the recycle gas stream separated from the effluent of the hydrocracking operation.

3,718,578

REFORMING WITH A PLATINUM-TIN-IRIDIUM CATALYST

Waldeen C. Buss, Richmond, and Harris E. Kluksdahl, San Rafael, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.
Filed Feb. 20, 1970, Ser. No. 13,044
Int. Cl. C10g *35/08*
U.S. Cl. 208—139 **5 Claims**



Reforming a naphtha in the presence of hydrogen with a catalyst composition comprising a porous solid carrier, 0.01 to 3 weight percent platinum, 0.01 to 5 weight percent tin; and 0.001 to 1 weight percent iridium; also the novel supported platinum-tin-iridium catalyst.

3,718,579

PROCESS FOR CHARGING CATALYST

George A. Uhl, Markham, and Lloyd A. Baillie, Homewood, both of Ill., assignors to Atlantic Richfield Company, New York, N.Y.
Filed Sept. 24, 1971, Ser. No. 183,690
Int. Cl. C10g *23/02*
U.S. Cl. 208—143 **19 Claims**

An improved process for charging a solid substantially spherical catalyst to a fixed bed reactor by charging the catalyst at a rate of fill of the reactor of up to about 17 inches per minute and in a manner such that the catalyst particles are distributed at substantially the same rate over the entire surface of the catalyst bed.

3,718,580

ABSORBING OLEFINS WITH A COPPER-EXCHANGED TYPE X ZEOLITE

Donald H. Rosback, Elmhurst, Ill., assignor to Universal Oil Products Company, Des Plains, Ill.
Division of Ser. No. 865,979, Oct. 13, 1969, Pat. No. 3,649,176. This application Aug. 16, 1971, Ser. No. 172,323
Int. Cl. C10g *25/04*
U.S. Cl. 208—310 **5 Claims**

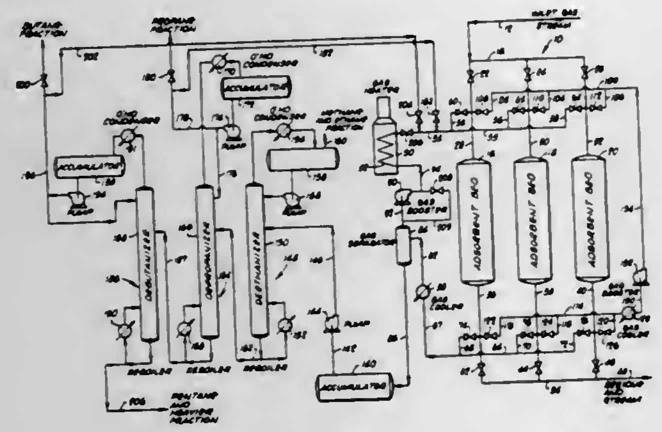
A new composition of matter, a method for the preparation of a copper-exchanged Type X structured zeolite and a separation process employing the same. The zeolite sorbent is prepared by a procedure employing an aqueous ion exchange step and a final activation step including contacting a copper-exchanged zeolite with a mixture containing a cuprous salt and a hydrocarbon. The process involves the selective separation of olefinic hydrocarbons from saturated hydrocarbons and employs a Type X structured zeolite containing copper cations at a portion of the cationic exchange sites within the zeolite. The olefins are selectively retained by the sorbent and are removed in a concentrated form by a desorption step.

3,718,581

ADSORPTION PROCESS FOR RECOVERING CONDENSIBLE COMPONENTS FROM A GAS STREAM

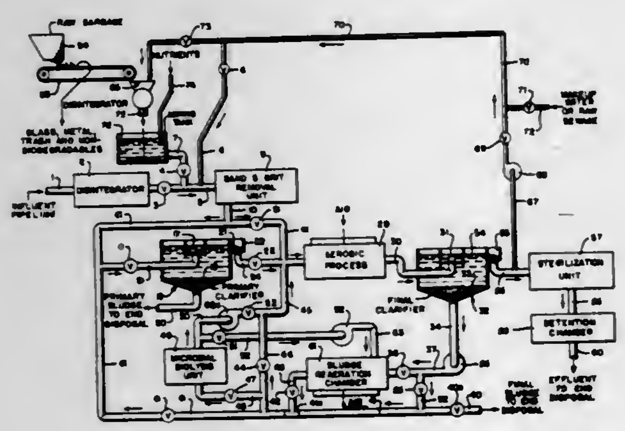
Joseph A. Kleinpeter, Ponca City, Okla., assignor to Continental Oil Company, Ponca City, Okla.
Filed March 2, 1971, Ser. No. 120,081
Int. Cl. C10g *5/02*
U.S. Cl. 208—340 **5 Claims**

The present invention relates to an improved cyclic adsorption process for recovering condensible components from a gas stream wherein the condensible components are removed from the adsorbent by contacting it with a heated regeneration gas stream and after being recovered are separated into liquid fractions of differing molecular weights. By the present invention, the adsorbent is periodically washed with quantities of



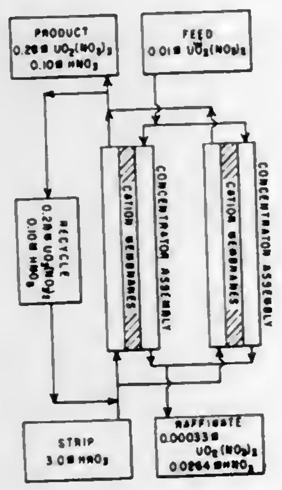
one or more of the recovered liquid fractions so that components adsorbed thereon which are not readily removed by the heated regeneration gas stream are removed by the solvent action of the liquid fraction or fractions thereby preventing the build-up of said components on said adsorbent and the resultant decrease in absorption capacity.

3,718,582
MICROBIAL BIOLYSIS PROCESS
Edmund G. Smith, 206 Watchung Ave., Upper Montclair, N.J., and John W. Hood, 43 John Street, Ridgewood, N.J.
Continuation-in-part of Ser. No. 765,243, Oct. 4, 1968, Pat. No. 3,591,491. This application March 23, 1971, Ser. No. 127,135
Int. Cl. C02c *1/06*
U.S. Cl. 210—6 **11 Claims**



The method of treating sewage or other biodegradable waste materials in a system including an aerobic process wherein a settleable sludge is formed which comprises returning a part or all of the sludge to a point in advance of the input of the aerobic process and subjecting a selected portion of the returned sludge to heat or vacuum under conditions suitable for the biolysis of the microorganisms in said portion, the portion being selected to meet the food requirements of the active aerobic organisms in the aerobic process. The portion subjected to biolysis is so regulated that substantially all of the biodegradable matter is consumed and only a relatively small quantity of said matter is removed to end disposal.

3,718,583
METHOD FOR THE CONCENTRATION OF HEAVY METAL CATIONS USING ION SELECTIVE MEMBRANES
James S. H. Wu, Grifton, N.C., and Broughton L. Baker, Columbia, S.C., assignors to the United States of America as represented by the United States Atomic Energy Commission
Continuation of abandoned application Ser. No. 18,579, Mar. 11, 1970. This application Nov. 29, 1971, Ser. No. 203,088
Int. Cl. B01d *13/00*
U.S. Cl. 210—22 **1 Claim**



The concentration of heavy metal cations, such as uranyl or plutonium cations, from ionic solutions separated by an ion selective membrane, wherein the difference in chemical potentials of the various ion species provide the driving force to effect a transfer across the membrane, is enhanced by separating a portion of the extract solution being concentrated in heavy metal cation product and recirculating that portion along with the initial strip solution into contact with the membrane. The preferred ratio of the recirculating portion to the initial strip solution is between about 1 to 1 and 5 to 1.

3,718,584
COLLOIDAL METAL OXIDE SOLS IN POLAR ORGANIC SOLVENTS
Lawrence F. Beste, Wilmington, Del.; Edward B. Jones, Waynesboro, Va., and Paul C. Yates, Wilmington, Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.
Filed Nov. 30, 1970, Ser. No. 93,861
Int. Cl. C09d *5/18;* **C09k** *3/28;* **B27k** *3/16*
U.S. Cl. 252—8.1 **9 Claims**

Sols of Sb_2O_3, SnO_2 and TiO_2 in organic polar liquids are prepared by reacting a soluble salt of the metal with water and ammonia in a solution in the liquid. The reaction produces the metal oxide in colloidal dispersion and an insoluble ammonium salt, which precipitates and is filtered off. Sols in liquids which are solvents for organic polymers are used to incorporate metal oxides into the polymers and polymeric articles such as fibers and films to provide flame resistance.

3,718,585
STABILIZING ASPHALT IN WATER-BASE DRILLING FLUIDS
James L. Lummus and Duane B. Anderson, Tulsa, and Carl D. Edwards, Broken Arrow, Okla., assignors to Amoco Production Company, Tulsa, Okla.
Filed Aug. 2, 1971, Ser. No. 168,303
Int. Cl. C10m *3/14, 3/08*
U.S. Cl. 252—8.5 C **10 Claims**

The action of an agent for causing solid particles of asphalt to enter into and form a stable suspension in water-base drilling fluid is improved by prehydrating the

agent and dissolving the prehydrated agent in normal propanol and water before use. The asphalt-stabilizing agent may be a limited class of ethoxylated alkyl phenols or ethoxylated polypropylene glycols. The monobutyl ether of ethylene glycol or of diethylene glycol can be used in place of normal propanol.

3,718,586
SOLVENT FOR CLEANING WELL BORES, FLOWLINES, ETC.
William C. Rollo, Box 756, and John D. Melancon, Rte. 1, Box 399, both of Winnie, Tex. 77665
No Drawing. Continuation-in-part of abandoned application Ser. No. 74,158, Oct. 21, 1970. This application Dec. 2, 1971, Ser. No. 204,351
Int. Cl. B01f *1/00;* **C23g** *5/02*
U.S. Cl. 252—8.55 B **5 Claims**

A solvent is provided for paraffin, waxy sludges and the like of petroleum origin. The solvent includes a liquid petroleum gas and a composition of a normally liquid aromatic. When the liquid petroleum gas is then combined with normally liquid aromatic, increased solvent properties are obtained by addition of a liquid petroleum sulfonate as well as a surfactant and ethylene glycol. The solvent may be used in processes for cleaning oil and gas well bores, flow lines, transmission lines and storage tanks.

3,718,587
CYANURIC ACID DERIVATIVES AS FINISH ADDITIVES
Roop S. Bhakuni, Copley, and Joseph L. Cormany, Jr., Akron, Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio
No Drawing. Filed Oct. 5, 1970, Ser. No. 78,251
Int. Cl. D06m *13/34*
U.S. Cl. 252—8.6 **1 Claim**

Cyanuric acid derivatives as adhesion promoting agents are added to the finish or spinning composition applied to tire yarn used in making tire reinforcing cord as a means of promoting adhesion between the cord and the rubber when using a conventional R/F/L adhesive.

3,718,588
METHOD FOR REDUCING FRICTION ON CONVEYORS WITH AQUEOUS SALTS OF PHOSPHATE ESTERS
Thomas J. Bellos, Kirkwood, and Franklin E. Mange, St. Louis, Mo., assignors to Petrolite Corporation, Wilmington, Del.
No Drawing. Filed May 13, 1968, Ser. No. 730,214
Int. Cl. C10m *3/40, 3/04*
U.S. Cl. 252—32.5 **22 Claims**

Method using lubricant comprising water and a salt of a phosphate ester on conveyors.

3,718,589
PREPARATION OF NEUTRAL AND HIGHLY BASIC ALKYLPHENATES AND SULFURIZED ALKYLPHENATES
Lynn C. Rogers, and Mack W. Hunt, both of Ponca City, Okla., assignors to Continental Oil Company, Ponca City, Okla.
Filed Aug. 31, 1971, Ser. No. 176,676
U.S. Cl. 252—33.4 **29 Claims**

A process for preparing neutral and highly basic magnesium alkylphenates or sulfurized alkylphenates wherein the process comprises:

a. forming an admixture of alkylphenol or sulfurized alkylphenol, nonvolatile diluent oil, and a volatile process solvent;
b. adding a stoichiometric neutralizing amount of a carbonated magnesium alcoholate at a temperature of from about 30°C to about 60°C;
c. heating the mixture to a reflux temperature of from about 65°C to about 90°C, and maintaining the mixture at this reflux temperature for a period of from about 20 minutes to about 1½ hours; then
d. removing the volatile materials by heating.

If a highly basic (overbased) product is to be prepared, the same steps are followed as in the production of the neutral phenate, except that after neutralization, and prior to removing the volatile materials from the mixture, carbonated magnesium alcoholate and water are added concurrently to the mixture.

3,718,590
POLYPHENYL THIOETHER LUBRICATING COMPOSITIONS
Frank S. Clark, St. Louis, Mo., assignor to Monsanto Company, St. Louis, Mo.
Filed Dec. 28, 1970, Ser. No. 102,152
Int. Cl. C10m *1/48*
U.S. Cl. 252—46.7 **5 Claims**

Lubricating compositions comprising polyphenyl thioethers, polyphenyl ethers-thioethers or mixtures thereof and containing small amounts of an organic phosphinic acid have improved lubricating properties. These compositions are useful as lubricants over wide temperature ranges.

3,718,591
LUBRICANT COMPOSITIONS CONTAINING TERPOLYMERS
Rudolf J. A. Eckert, Amsterdam, Netherlands, assignor to Shell Oil Company, New York, N.Y.
Continuation of Ser. No. 776,778, Nov. 18, 1968, abandoned. This application Jan. 25, 1971, Ser. No. 109,674
Claims priority, application United Kingdom, Nov. 27, 1967, 53761
Int. Cl. C10m *1/46, 1/28*
U.S. Cl. 252—49.8 **4 Claims**

Lubricating compositions containing a terpolymer of ethylene, with an alkyl ester of an unsaturated carboxylic acid, and with an olefinically unsaturated compound containing either a phosphorus atom or a heterocyclic nitrogen atom exhibit good thermal stability, viscosity index, and dispersant properties.

3,718,592
PROTECTION AGAINST RADIANT HEAT ENERGY
Robert A. Prosser, 15 Maire Ave, Natick, Mass.
Filed Nov. 21, 1969, Ser. No. 878,945
Int. Cl. F16l *59/08;* **C04b** *43/00*
U.S. Cl. 252—62 **8 Claims**

This invention relates to a process for providing protection against intense radiant heat energy such as that released by a thermonuclear explosion. The process is characterized by disposing a dye in the vapor state between the source of radiant heat energy and an object to be protected. The chromophore groups of the dye intercept photons primarily in the ultra-violet, visible and infra-red regions and reradiate and/or dissipate heat energy to the air thereby decreasing the heat energy reaching the object to be protected. The dyes contemplated by the invention are those that contain chromophore groups defined as molecules or portions thereof capable of intercepting photons and which are stable in the vapor state. In a preferred embodiment, the dye is combined with a carrier which secures the dye to a substrate to be protected and preferably is capable of vaporizing or gassing as opposed to liberating smoke, at least in part, at relatively low temperatures, as required for protection of the substrate, to liberate dye which is vaporized and propelled towards the source of radiant heat energy by the gaseous decomposition products of the carrier.

3,718,593

PROCESS FOR THE PRODUCTION OF AN ELECTROPHOTOGRAPHIC LIQUID DEVELOPER CONTAINING GELATIN

Yasuo Tamai, Asaka-shi, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Feb. 5, 1970, Ser. No. 9,042
Claims priority, application Japan, Feb. 5, 1969, 44/8517
Int. Cl. G03g *9/04*
U.S. Cl. 252—62.1 **10 Claims**

A process for producing a liquid developer for developing electrostatic latent images which comprises (1) adding to an aqueous solution of gelatin, the concentration of the gelatin being in the range of approximately 1 to 20 percent by weight, an alcohol in an amount less than that of causing the precipitation of gelatin to provide a solution of gelatin in a water-alcohol mixed solvent, (2) dispersing the solution thus prepared in an organic solvent which is miscible with water but is a nonsolvent for gelatin to form a dispersion of fine gelatin particles where the amount of said organic solvent is at least 10 times the amount of the mixed gelatin solution of water and alcohol and recovering the fine gelatin particles from the dispersion, and (3) dispersing the fine gelatin particles thus recovered in a carrier having an electric resistance of higher than $1010^{10}\Omega$cm.

3,718,594

METHOD OF PREPARING MAGNETICALLY RESPONSIVE CARRIER PARTICLES

Howard A. Miller, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
Division of Ser. No. 799,966, Feb. 17, 1969, Pat. No. 3,632,512. This application Nov. 30, 1970, Ser. No. 93,798
Int. Cl. G03g *9/02*
U.S. Cl. 252—62.1 **6 Claims**

Ferromagnetic carrier particles having uniform surface and triboelectric properties can be prepared by treatment of commercial iron powders in an aqueous acid solution, followed by removal of acid, rinsing and controlled drying to induce or exclude oxidation. The resultant particles can subsequently be overcoated with a thin, uniform, continuous film of a nonferrous material such as metal or a resinous material. These carrier particles are useful for applying electroscopic toner material to electrostatic latent images.

3,718,595

METHOD OF IMPROVING THE PIEZOELECTRIC PROPERTIES OF CERAMICS

Sadayuki Takahashi and Norio Tsubouchi, Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Minato-ku, Tokyo, Japan
No Drawing. Filed Mar. 20, 1972, Ser. No. 236,491
Int. Cl. C04b *35/46, 35/48*
U.S. Cl. 252—62.9 **14 Claims**

Piezoelectric properties of ceramics of the type

$$Pb(Li_{1/4}M_{3/4})O_3\text{-}PbZrO_3\text{-}PbTiO_3$$

(where M is either Nb, Ta or Sb),

$$Pb(Fe_{1/3}Nb_{2/3})\text{-}PbZrO_3\text{-}PbTiO_3$$

(where M is either Nb or Sb),

$$Pb(Ni_{1/3}Nb_{2/3})O_3\text{-}PbZrO_3\text{-}PbTiO_3$$

and $Bi(Li_{1/2}M_{1/2})O_3$-$PbZrO_3$-$PbTiO_3$ (where M is either Nb, Ta or Sb) are improved by thermally diffusing Cr in said ceramics whereby to provide an average amount by weight of about 0.05 to 0.5% Cr_2O_3 therein.

3,718,596

FUNCTIONAL FLUID COMPOSITIONS

William R. Richard, Jr., Kirkwood, Mo., assignor to Monsanto Company, St. Louis, Mo.
Filed Feb. 16, 1970, Ser. No. 11,849
Int. Cl. C09k *3/00*
U.S. Cl. 252—78 **15 Claims**

Phosphate ester base functional fluid compositions containing small amounts of water and a mixture of high and low molecular weight polymers of the alkyl esters of α-β unsaturated aliphatic mono-carboxylic acids as viscosity index improvers inhibit erosion of material and damage to mechanical members in a hydraulic system.

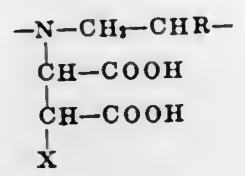
3,718,597

WASHING, BLEACHING AND CLEANSING AGENTS CONTAINING COPOLYMERIC N-ALKYLCARBOXYLIC ACID ALKYLENEIMINES

Achim Werdehausen; Ullrich Jahnke, both of 4019 Monheim; Gunter Jakobi, 4010 Hilden, and Guntram Walther, 4000 Dusseldorf-Eller, all of Germany, assignors to Henkel & Cie GmbH, Dusseldorf, Germany
Filed Dec. 1, 1970, Ser. No. 94,213
Claims priority, application Germany, Dec. 1, 1969, P 19 60 140.2The portion of the term of this patent subsequent to March 21, 1989, has been disclaimed.
Int. Cl. C11d *7/54*
U.S. Cl. 252—102 **6 Claims**

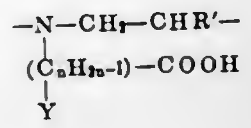
A washing, bleaching and cleansing agent having a content of from 50 to 99.9 percent, by weight, of customary components of washing, bleaching and cleansing agents and from 0.1 to 50 percent, by weight, of salts of at least one copolymeric N-alkylcarboxylic acid-alkyleneimine, said copolymeric N-alkylcarboxylic acid-alkyleneimine having an average molecular weight of from 500 to 500,000 and the recurring N-alkylcarboxylic acid-alkyleneimine units are of different structure of the formulas I and II

I



$$\begin{array}{l}-N-CH_2-CHR-\\ \;|\\ \;CH-COOH\\ \;|\\ \;CH-COOH\\ \;|\\ \;X\end{array}$$

II



$$\begin{array}{l}-N-CH_2-CHR'-\\ \;|\\ (C_nH_{2n-1})-COOH\\ \;|\\ \;Y\end{array}$$

where R represents a member selected from the group consisting of H and CH_3, R' represents a member selected from the group consisting of H and CH_3, X represents a member selected from the group consisting of H and $—CH_2—COOH$, Y represents a member selected from the group consisting of H, $—CH_2—COOH$ and $—CH_2—CH_2COOH$ and n represents an integer of from one to two, the ratio of recurring N-alkylcarboxylic acid-alkyleneimine units of formula I to those of formula II being from one to 100 to 100 to one.

3,718,598

PREPARATION OF CHLORIDE-FREE HYPOCHLOROUS ACID SOLUTIONS

John A. Wojtowicz, Cheshire; Milton Lapkin, Woodbridge, and Mohindar S. Puar, Hamden, all of Conn., assignors to Olin Mathieson Chemical Corporation
Division of Ser. No. 792,761, Jan. 21, 1969, Pat. No. 3,578,400. This application Aug. 5, 1970, Ser. No. 61,456
Int. Cl. C01b *11/04*
U.S. Cl. 252—187 R **2 Claims**

Solutions of hypochlorous acid (HOCl), free chloride and chlorine are prepared by extraction of aqueous chlorination mixtures containing HOCl and chloride using an extraction solvent selected from the group consisting of lower alkyl ketones, lower alkyl cyanides and lower alkyl esters of lower alkanoic acids. The lower alkyl suitably contains one to five carbon atoms and the lower alkanoic acids suitably contain one to five carbon atoms. The resulting solutions, containing from about 0.5 to about 50 percent by weight of HOCl, are useful for chlorohydrination reactions where the presence of chloride or chlorine is deleterious.

3,718,599

STABILIZATION OF OXALATE ESTER SOLUTIONS DURING STORAGE

Michael McKay Rauhut, Norwalk, Conn., assignor to American Cyanamid Company, Stamford, Conn.
Filed June 29, 1970, Ser. No. 56,084
Int. Cl. C09k *3/00*
U.S. Cl. 252—188.3 **8 Claims**

This invention relates to a means and method for improving the storage stability of a chemiluminescent reaction component comprising an oxalic-type compound in a solvent, by adding a weak acid thereto, said reaction component being capable of providing chemiluminescent light on admixture with a hydroperoxide compound in the presence of a fluorescer.

3,718,600

METHOD OF MANUFACTURING A LUMINESCENT SILICATE ACTIVATED BY BIVALENT EUROPIUM

Marinus Gerardus Antoine Tak, and Otto Jan Van Klinken, both of Emmasingel, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.
Filed June 23, 1971, Ser. No. 155,840
Claims priority, application Netherlands, July 1, 1970, 7009688
Int. Cl. C09k *1/54, 1/62*
U.S. Cl. 252—301.4 F **7 Claims**

A luminescent silicate activated by bivalent europium defined by the formula $Ba_{1-x-p}Sr_xEu_pZrSi_3O_9$ which O x 0.2 and 0.002 p 0.10 is prepared by starting from a mixture of barium strontium disilicate, at least 1.5 mol of ZrO_2 and at least 1 mol of SiO_2 per mol of disilicate. The mixture, which also comprises europium, is heated at a temperature of between 1,200° and 1,400°C is a reducing atmosphere.

3,718,601

FLUORESCENT HIGH ALUMINA SUBSTRATES

Andrew Gomperz Dentai, Plainfield; Le Grand Gerard Van Uitert, Morris Township, Morris County, and John Charles Williams, Whippany, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.
Filed Jan. 4, 1971, Ser. No. 103,418
Int. Cl. C09k *1/10*
U.S. Cl. 252—301.4 R **9 Claims**

Substrate-supported circuitry is manufactured by forming circuitry on a high alumina dielectric substrate having a fluorescent character arising from the incorporation of both europium oxide plus yttrium (and/or lanthanum and/or gadolinium) oxide, with the latter oxide (s) acting as a dispersing agent. Testing the integrity of the circuitry is accomplished by irradiating the substrate with ultraviolet light and sensing the passage of any visible light through the circuitry that may occur in the presence of defects.

3,718,602

LIQUID MEDIUM FOR OPTICAL THIRD HARMONIC GENERATION

Paul P. Bey, Oxon Hill, John F. Giuliani, Kensington, and Herbert Rabin, Bethesda, Md., assignors to the United States of America as represented by the Secretary of the Navy
Original application Sept. 25, 1968, Ser. No. 762,553. Divided and this application July 19, 1971, Ser. No. 163,677
Int. Cl. C09k *1/02*
U.S. Cl. 252—301.2 R **5 Claims**

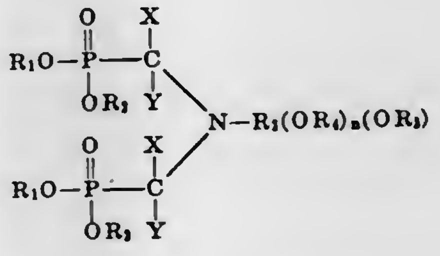
This invention is directed to a liquid medium of dye fuchsin in hexafluoroacetone sesquihydrate or hexafluoroisopropanol which generates an enhanced third harmonic light wave of the 1.6 micron neodymium laser line.

3,718,603

METHODS OF INHIBITING CORROSION WITH SUBSTITUTED TERTIARY AMINE PHOSPHONATES

Robert S. Mitchell, Webster Groves, Mo., assignor to Monsanto Company, St. Louis, Mo.
Filed Aug. 4, 1971, Ser. No. 169,130
Int. Cl. C23f *11/16*
U.S. Cl. 252—389 A **20 Claims**

Substituted tertiary amine phosphonates of the general formula



wherein R_1, R_2, R_3, R_4, R_5, X and Y are hereinafter defined and n is 1 - 20, alone or in combination with zinc, dichromate, silicates, certain thiols and 1,2,3-triazoles and/or mixtures thereof, are disclosed as inhibiting the corrosion of metals by oxygen-bearing waters.

3,718,604

CORROSION INHIBITOR CONTAINING A WATER SOLUBLE EMULSION OF A FATTY AMINE WITH A CATIONIC EMULSIFIER

Gerhard W. Scherf, Mineral Springs Road, RR-3, Dundas, Ancaster, Ontario, and Gary C. Pfaff, 246 York Road, Dundas, Ontario, both of Canada
Filed Aug. 27, 1970, Ser. No. 67,570
Int. Cl. C23f *11/16, 11/14*
U.S. Cl. 252—391 **7 Claims**

A composition and method for inhibiting steam-corrosion, comprising adding to the water a stable, cationic, fatty amine emulsion which breaks down upon heating, thereby allowing the fatty amine to enter the vapor phase and coat the interior surfaces exposed to the steam. Optionally, an ethoxylated straight chain aliphatic acid may be added where the boiler water containers inorganic salt impurities, or is at a high temperature in order to maintain stability of the emulsion.

3,718,605

WIDE RANGE COLORIMETRIC REAGENT COMPOSITION FOR CHLORINE

Lester F. M. Storm, Pasadena, Calif., assignor to Sterilizer Control Royalties, North Hollywood, Calif.
No Drawing. Filed Mar. 22, 1971, Ser. No. 126,955
Int. Cl. G01n *31/16*
U.S. Cl. 252—408 **9 Claims**

Reagent compositions for colorimetrically measuring the concentration of chlorine in water samples under controlled acid conditions contain ortho tolidine alone, or combinations with lesser proportions of acid fuchsin or acid methyl orange. A wide range of colors results which are better visually differentiated than by single color agents producing only differences in intensity for varying concentrations of chlorine.

3,718,606
SILVER HALIDE MONOCRYSTAL PARTICLE-TRACT DETECTORS DOPED WITH MANGANESE

Gunter Haase, Frankfurt am Main, and Erwin Schopper, Koenigstein/Taunus, both of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed Nov. 2, 1970, Ser. No. 86,277

Claims priority, application Germany, Nov. 21, 1969, P 19 58 425.9

Int. Cl. G01t *3/00, 5/10*

U.S. Cl. 252—408 **4 Claims**

The photographic properties in particular the light sensitivity of silver halide monocrystal-track detectors are highly improved by adding manganese ions as doping agents.

3,718,607
CATALYST FOR DEHYDROGENATION OF ALKANES

George Robert Martin, Freeport, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed July 19, 1971, Ser. No. 164,150

Int. Cl. B01j *11/74*

U.S. Cl. 252—439 **7 Claims**

A process for dehydrogenating an alkane to form an olefin by passing it over a catalyst comprising nickel or cobalt sulfide and cerium oxide alone or in combination with barium oxide, preferably on an alumina support, at a temperature of from about 550° to 625° C. and recovering the olefin.

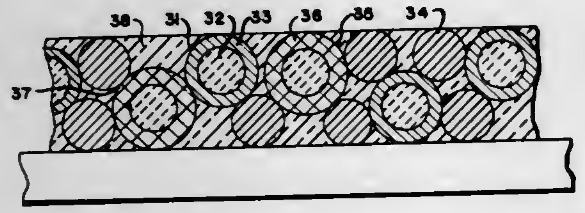
3,718,608
RESISTOR COMPOSITIONS FOR MICROCIRCUITRY

Daniel W. Mason, Peabody; Henry H. Nester deceased, late of Peabody, Mass., by Dianne L. Nester, administratrix, assignors to Owens-Illinois, Inc., Toledo, Ohio

Filed Oct. 6, 1969, Ser. No. 13,918

Int. Cl. H01b *1/02;* **B44d** *1/02*

U.S. Cl. 252—514 **2 Claims**



Resistor and conductor paste compositions and structures formed therefrom for hybrid integrated circuits are disclosed in which a metal which substantially contributes the electrical conductivity is coated over micron-sized glass particles. The metal coated particles are then mixed and fused into a glass matrix, the whole adhering to a ceramic substrate. This structure results in greater conductivity for a given quantity of the metal.

Efficient metals for the purpose are silver and the noble metals and alloys of these relatively expensive materials.

3,718,609
LIQUID DETERGENT COMPOSITIONS

Dean R. Weimer, Ponca City, Okla., assignor to Continental Oil Company, Ponca City, Okla.

Int. Cl. C11d *1/02*

Filed April 5, 1971, Ser. No. 131,461

U.S. Cl. 252—545 **7 Claims**

A liquid detergent composition is provided having an aqueous layer and a layer of a liquid water-immiscible oily material, which composition when shaken, forms a temporary oil-in-water emulsion. The aqueous layer contains a foam-producing water-soluble organic detergent, a non-emulsifying foam stabilizer, and water.

3,718,610
CURABLE MIXTURES OF EPOXIDE RESINS AND PIPERIDINE DERIVATIVES

Helmut Zondler, Allschwil, Switzerland, and Wolfgang Pfleiderer, Konstanz, Germany, assignors to Ciba-Geigy AG, Basle, Switzerland

Filed March 17, 1971, Ser. No. 125,381

Claims priority, application Sweden, March 23, 1970, 4338/70

Int. Cl. C08g *30/14*

U.S. Cl. 260—2 N **13 Claims**

Curable moulding compositions, coating compositions and adhesive compositions which contain a polyepoxide compound, for example a liquid polyglycidyl ether of bisphenol A, and, as the curing agent, a substituted 4-amino-3-aminomethyl-piperidine for example 1-methyl-4-amino-3-aminomemethylpiperidine. The curing of the curable mixtures according to the invention to give shaped articles and the like is appropriately carried out in the temperature range of 20° to 150° C.

3,718,611
URETHANE FOAMS CONTAINING HALOGEN CONTAINING POLYMERS AND METHODS FOR PREPARING THE SAME USING CERTAIN CATALYSTS

Edwin M. Maxey, Stow, and John T. Harrington, Akron, Ohio, assignors to The General Tire & Rubber Company

No Drawing. Filed Apr. 24, 1969, Ser. No. 819,087

Int. Cl. C08g *41/04, 22/38*

U.S. Cl. 260—2.5 BE **22 Claims**

The discoloration of low density, flexible polyurethane foams containing halogen containing polymers such as polyvinyl chloride is reduced or prevented by using certain sterically hindered tertiary amines as catalysts, i.e., those containing a well-shielded nitrogen atom, for example, N-methyl dicyclohexyl amine.

3,718,612
PROCESS FOR PRODUCING A CIGARETTE FILTER MATERIAL

Robert L. Strickman, River Vale, N.J., assignor to The Robert L. Strickman Foundation, Inc., New York, N.Y.

Division of Ser. No. 721,563, April 11, 1968, Pat. No. 3,618,618, which is a continuation-in-part of Ser. No. 559,495, Dec. 6, 1966, abandoned, which is a continuation-in-part of Ser. No. 424,626, Jan. 11, 1965, abandoned, which is a continuation-in-part of Ser. No. 59,035, Sept. 28, 1960, abandoned. This application June 16, 1970, Ser. No. 57,842

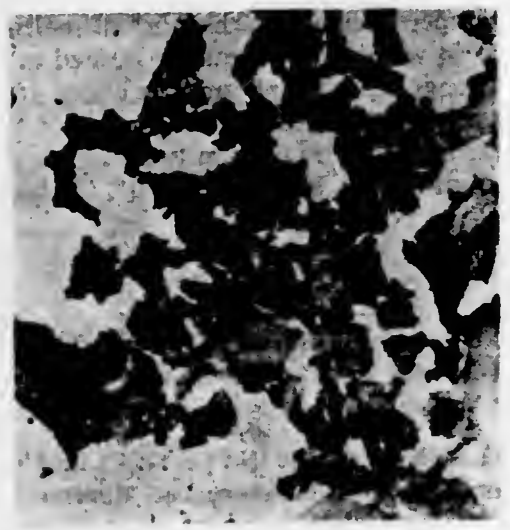
Int. Cl. C08g *22/44*

U.S. Cl. 260—2.5 BD **12 Claims**

Filter materials for filtering aerosols, such as cigarette filters for filtering tobacco smoke, are provided comprising rigid polyurethane particles devoid of any cellular structure. Preferably the particles are granular and of jagged, spiny, cragged nature. The rigid polyurethane is produced from a polyol and a polyisocyanate.

The particles are produced by first preparing a rigid polyurethane foam, preferably with the aid of a blowing agent, granulating the foam, treating the granules with hot water or steam to hydrolyze unreacted isocyanate and other free materials to render them inert, and then dried.

Preferably, inorganic additives may be present during the preparation of the rigid polyurethane foam, such as the lower alkyl silicates, e.g., ethyl silicate, and water soluble salts of the acids of metals of groups VA and VIA of the Periodic Table, e.g., sodium tungstate.



Inorganic additives may be added to the filter particles, such as an alkaline earth metal carbonate, silicate or hydroxide.

3,718,613
POLYURETHANE FOAM RETICULATED BY FIRE-POLISHING METHOD

Marvin T. Conger and Theodore A. Evans, Akron, Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

No Drawing. Continuation-in-part of application Ser. No. 784,188, Dec. 16, 1968. This application Oct. 26, 1970, Ser. No. 84,167

Int. Cl. C08g *22/44, 22/08*

U.S. Cl. 260—2.5 BD **4 Claims**

A reticulated foam made by fire polishing a cellular product made by reacting a mixture of a hydrocarbon polyol of 500 to 10,000 molecular weight, an organic polyisocyanate, and a blowing agent, where the blowing agent may be water or other low boiling substances.

3,718,614
POLYMERIC VISCOSITY CONTROL ADDITIVES FOR SILICA THIXOTROPIC COMPOSITIONS

Nelda Marjorie Smyth, Stamford, Conn., assignor to American Cyanamid Company, Stamford, Conn.

Filed Feb. 23, 1971, Ser. No. 118,165

Int. Cl. C08f *45/40, 45/34*

U.S. Cl. 260—31.8 R **1 Claim**

Novel thixotropic compositions and processes for their formation employing as viscosity control additives therein members selected from the group consisting of: 1) homopolymers and copolymers of poly(alkylene oxides) having terminal alkyl groups; 2) homopolymers and copolymers of poly(vinyl alkyl esters) and poly(vinyl alkyl ethers) with the optional inclusion of minor amounts of alkylenes and styrenes in said copolymers; 3) 1:1 alternating copolymers of maleic anhydride with alkylenes and styrenes; 4) cellulose esters and mixed cellulose esters of 2-, 3- and 4-carbon acids and mixtures of said esters with the poly(alkylene oxides).

3,718,615
HALOGENATED POLYMERIC COMPOSITIONS CONTAINING ZINC BORATE

William G. Woods, Fullerton, Joseph G. Whiten, Dublin, and Nelson P. Nies, Laguna Beach, all of Calif., assignors to United States Borax & Chemical Corporation, Los Angeles, Calif.

Continuation-in-part of Ser. No. 725,169, April 29, 1968, abandoned. This application March 5, 1971, Ser. No. 121,603

Int. Cl. C08h *51/04;* **C08f** *45/04;* **C09d** *5/18*

U.S. Cl. 260—28 **14 Claims**

Halogenated polymeric compositions containing a fire retarding amount of zinc borate of the formula $2ZnO\cdot 3B_2O_3\cdot 3.5H_2O$.

3,718,616
HIGH IMPACT P OLYVINYL-AROMATIC COMPOSITIONS

Leslie A. Muirhead, Wilmslow, England, assignor to Shell Oil Company, New York, N.Y.

Continuation-in-part of Ser. No. 759,523, Sept. 12, 1968, abandoned. This application April 14, 1971, Ser. No. 134,054

Claims priority, application Australia, Nov. 10, 1968, 44670

Int. Cl. C08f *45/28, 45/52*

U.S. Cl. 260—28.5 B **6 Claims**

The impact strength of polyvinyl-aromatic compositions such as impact polystyrene is appreciably increased by the addition of at least 13 percent weight of petroleum jelly.

3,718,617
MINIMUM IRRITATION POTENTIAL POTTING COMPOUND

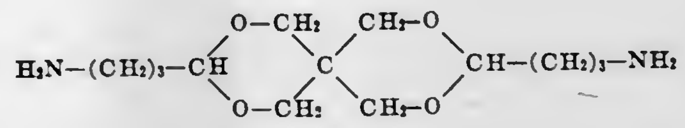
Lewis M. Royal, Attleboro Falls, Mass., assignor to Texas Instruments Incorporated, Dallas, Tex.

No Drawing. Filed July 29, 1970, Ser. No. 59,355

Int. Cl. C08g *51/34*

U.S. Cl. 260—30.4 ED **20 Claims**

A minimum irritation potential potting compound is provided which cures into potting possessing the thermal shock resistance, dimensional stability, adhesiveness to soft metals, electrical resistivity and moisture resistance required for potting electrical devices such as, for example, tubular motor protectors. The potting compound cures at room temperature and prior to cure has a viscosity under flow conditions which is sufficiently low to facilitate application and a thixotropic index of between 2 and 3, high enough to prevent seepage and sagging. The novel potting formulation comprises a mixture of an alkyl glycidyl ether reactive diluent having alkyl chain lengths of between 12 and 14 carbon atoms and an amine-monofunctional glycidyl ether adduct curing agent formed by the reaction of two moles of a heterocyclic spiro diamine represented by the formula:



with one mole of butyl glycidyl ether, with a conventional glycidyl ether of bisphenol A, fillers, thixotropic materials and polar compounds. A novel low toxicity hardener composition comprising the above stated amine-glycidyl adduct and one or more ethylene oxide or propylene oxide adducts of diethylene triamine or triethylene tetramine is also provided, as is a method of preparing potting which involves minimum exposure of personnel to skin irritation.

3,718,618
EPOXY RESIN COMPOSITIONS CONTAINING A PARTIAL ACID-ADDITION SALT OF AROMATIC POLYAMINE AND WATER SOLUABLE AMINE

Herman B. Wagner, Perkasie, Pa., and David S. Weiant, Laurel Township, Moorestown County, N.J., assignors to Tile Council of America Inc., New York, N.Y.

Filed April 6, 1970, Ser. No. 26,112

Int. Cl. C08g *30/14*

U.S. Cl. 260—47 EN **15 Claims**

Water-cleanable epoxy resin compositions capable of curing rapidly at ambient temperatures which contain an epoxy resin, a partial acid-addition salt of an aromatic polyamine and a water-soluble, strongly basic amine are described.

3,718,619
CURING POLYURETHANE PREPOLYMERS WITH LIQUID EXTENDER COMPRISING 4,4′-METHYLENEBIS(2-CHLOROANILINE) AND ETHYLENE OXIDE CAPPED BISPHENOL A

Norman E. Rustad, Barrington, Ill., assignor to The Quaker Oats Company, Chicago, Ill.

Filed Aug. 27, 1971, Ser. No. 175,699

Int. Cl. C08g *22/14*

U.S. Cl. 260—47 CB **5 Claims**

This invention relates to the curing of isocyanate terminated polyurethane prepolymers with a liquid extended consisting of 4,4′-methylenebis(2-chloroaniline) and ethylene oxide capped bisphenol A.

3,718,620
AROMATIC POLYSULPHONE-DIPHENYL SULPHONE BLENDS

Charles Richard Hart, Hitchin, Hertfordshire; Eric Nield, Watton-at-Stone, Hertfordshire, and John Brewster Rose, Letchworth, Hertforshire, all of England, assignors to Imperial Chemical Industries Limited, London, England

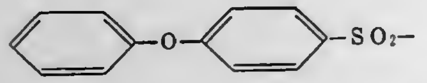
Filed June 10, 1971, Ser. No. 151,917

Claims priority, application Great Britain, June 11, 1970, 28,356/70

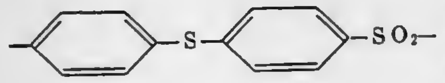
Int. Cl. C08g *23/10*

U.S. Cl. 260—30.8 R **6 Claims**

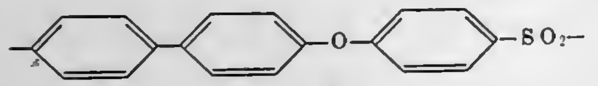
A thermoplastic composition is provided comprising (a) 90 to 99.99 percent by weight of at least one aromatic polysulphone consisting essentially of repeating units having the formulas I, II or III, either alone or in combination with each other and/or with up to 80 percent of units having the formula IV



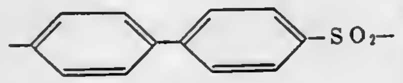
I



II



III



IV

and (b) 10 to 0.01 percent by weight of diphenyl sulphone.

3,718,621
SOLID STATE POLYMERIZATION PROCESS

Warren K. Wilson, Cuyahoga Falls, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio No Drawing. Filed Sept. 17, 1969, Ser. No. 858,876

Int. Cl. C08g *17/01*

U.S. Cl. 260—75 M **2 Claims**

The invention is a process for carrying out the polymerization of polyethylene terephthalate polymer in solid state at a temperature above the normal melting point of the polymer in which the polymer is heated at a temperature in the range of from about 1 to about 10° C. below its melting point and as the melting point of the polymer increases raising the temperature to maintain it within the range of from about 1 to about 10° C. below the increased melting point.

3,718,622
GEL PREVENTION IN POLYURETHANES

Louis T. Camilleri, North Bellmore, and Manfred H. Huebner, Lindenhurst, both of N.Y., assignors to Hooker Chemical Corporation, Niagara Falls, N.Y.

Filed Dec. 31, 1970, Ser. No. 103,282

Int. Cl. C08g *22/16, 41/04*

U.S. Cl. 260—75 NP **9 Claims**

The formation of gel particles in bulk polymerized thermoplastic polyurethanes is greatly reduced by employing a high molecular weight monofunctional compound having a hydroxyl group in the reaction mixture of an organic compound containing groups reactive with isocyanato groups and an organic polyisocyanate. The polyurethanes can be employed in applications such as the preparation of films, sheets, pipe, and coatings, either alone or in blends with other plastics such as polyvinylchloride, and the like.

3,718,623
HEAT-CURABLE POLYURETHANE FOAMS AND ELASTOMERS BASED ON AROMATIC POLYESTERS

Friedrich Lohse, Allschwil; Rolf Schmid, Reinach/Bl, and Hans Batzer, Arlesheim, all of Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

Filed March 1, 1971, Ser. No. 120,055

Claims priority, application Switzerland, March 5, 1970, 3274/70

Int. Cl. C08g *22/12, 22/24, 22/44*

U.S. Cl. 260—75 NP **15 Claims**

Heat-curable plasticized mixtures for the manufacture of moulding materials based on polyurethanes, containing (a) a polyisocyanate, for example 3,5,5-trimethyl-3-(isocyanatomethyl)-cyclohexane-isocyanate-(1) ["isophoronediisocyanate"], (b) a long-chain polyester processing terminal hydroxyl groups (for example a polyester of 4 mols of sebacic acid and 4.5 mols of 1,6-hexanediol) and (c) a defined aromatic polycarboxylic acid hydroxyester containing at least one secondary hydroxyl group (for example a hydroxyester manufactured by reacting 1 mol of trimellitic anhydride and 1 mol of 1,2-propanediol in a first stage, and further reaction with 2 mols of a monoepoxide), with the mixture containing, per 1 equivalent of isocyanate group, 0.05 to 0.3 hydroxyl equivalents of the polyester (b) and 0.3 to 1.0 hydroxyl equivalents of the aromatic polycarboxylic acid hydroxyester (c). The mouldings obtained by hot curing of the moulding compositions are flexible, tough and impact-resistant, and these mechanical properties are largely independent of temperature; a transition to the soft rubbery-elastic state only occurs above 150°C.

3,718,624
METHOD OF CURING POLYURETHANE PREPOLYMERS WITH LIQUID EXTENDER COMPRISING 4,4′-METHYLENEBIS (2-CHLOROANILINE) AND LOW MOLECULAR WEIGHT POLYTETRAMETHYLENE ETHER GLYCOL

Norman E. Rustad, Barrington, Ill., assignor to The Quaker Oats Company, Chicago, Ill.

Filed Aug. 27, 1971, Ser. No. 175,700

Int. Cl. C08q *22/14*

U.S. Cl. 260—77.5 AM **4 Claims**

This invention relates to the curing of isocyanate terminated polyurethane prepolymers with a liquid extender consisting of 4,4′-methylenebis(2-chloroaniline) and low molecular weight polytetramethylene ether glycol.

3,718,625
PRODUCTION OF A POLYACYLOXALAMIDRAZONE

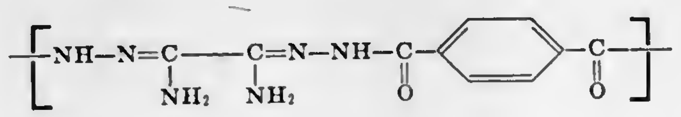
Michael Wallrabenstein, Worth; Albert Schopf, Hering, and Dieter Frank, Elsenfeld, all of Germany, assignors to Glanzstoff AG, Wuppertal, Germany

Filed Oct. 5, 1970, Ser. No. 78,301

Int. Cl. C08g *20/20, 20/22*

U.S. Cl. 260—78 TF **11 Claims**

Production of polyacyloxalamidrazones, especially a very high molecular weight polyterephthaloyloxalamidrazone having recurring units of the formula



I

by an interfacial polycondensation of oxalic acid bisamidrazone with an acyl dihalide monomer such as terephthalic acid dichloride at temperatures of 0°C. to 60°C. in a two-phase solvent system consisting essentially of water and a water-immiscible, inert organic solvent, in the presence of an acid acceptor and in the presence of a substantial amount of a neutral alkali metal salt. High molecular weight polymer films or filaments can be formed from an alkaline solution of the polymer.

3,718,626
POLYESTERS DERIVED FROM 5-PENTANOLIDES

Katsumi Hayashi, Mentor, Ohio, assignor to The Lubrizol Corporation, Wickliffe, Ohio

Continuation-in-part of Ser. No. 88,164, Nov. 9, 1970. This application Feb. 22, 1971, Ser. No. 117,729

Int. Cl. C08g *17/017*

U.S. Cl. 260—78.3 **1 Claim**

Polyesters are prepared by the condensation of 5-pentanolides (delta-valerolactones) in the presence of an alkaline reagent. These polyesters may be extended with polyisocyanates.

3,718,627
CF_2=$CFCF_2CF_2SO_2F$ AND DERIVATIVES AND POLYMERS THEREOF

Walter Gustav Grot, Chadds Ford, Pa., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 595,332, Nov. 18, 1966, abandoned. This application Nov. 26, 1968, Ser. No. 779,273

Int. Cl. C07c *143/68, 143/70;* **C08f** *15/02*

U.S. Cl. 260—79.3 MU **5 Claims**

The compound CF_2=$CFCF_2CF_2SO_2F$ and derivatives thereof are prepared and polymerized to polymers, including copolymers such as with tetrafluoroethylene, which are useful as ion exchange resins.

3,718,628
VULCANIZATION OF ETHYLENE-PROPYLENE-DIENE TERPOLYMERS

Jackson S. Boyer, Wilmington, Del., and Richard D. Cassar, West Chester, Pa., assignors to Sun Oil Company, Philadelphia, Pa.

Filed June 23, 1970, Ser. No. 49,177

Int. Cl. C08f *27/07;* **C08d** *9/00*

U.S. Cl. 260—79.5 B **14 Claims**

Ethylene-propylene-diene terpolymer elastomer compositions having improved vulcanization properties containing auxiliary vulcanization accelerators selected from mono and dihydrazide derivatives of monobasic and dibasic organic acids containing C_2 to C_{40} carbon atoms and having alkyl, aryl, alkenyl and cyclic structures.

3,718,629
OXIDATION OF AROMATIC HYDROCARBONS TO PHENOLS WITH OXYGEN

Richard F. Heck, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.

Filed May 22, 1968, Ser. No. 731,276

Int. Cl. C07c *37/00*

U.S. Cl. 260—621 G **3 Claims**

An aromatic hydrocarbon having 6 to 18 carbons is oxidized to a phenol of the same number of carbons by contacting with oxygen, cuprous acetate, and acetic acid at 0° to 150° C.

3,718,630
STABILIZATION OF POLYOXYMETHYLENE

Glen Frederick Leverett, Vienna, W. Va., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed May 4, 1970, Ser. No. 34,517

Int. Cl. C08g *1/24*

U.S. Cl. 260—67 FP **9 Claims**

A process for stabilizing polyoxymethylene prepared using an onium salt, e.g.: a quaternary ammonium compound, as a polymerization catalyst which consists of contacting the polymer with a minor amount of a carboxylic acid having a normal boiling point of 150°C. or less e.g.: formic acid and acetic acid, preferably at a temperature in the range 90°–165° C. The acid is carried by inert gas such as nitrogen and the acid is present in inert gas at a concentration 0.0005–0.5 mole percent.

3,718,631
4-VINYL PYRIDINE POLYMERS OF IMPROVED PROPERTIES FOR PURIFICATION OF POLYMERS CONTAINING ZIEGLER-NATA CATALYST RESIDUES

Jacques Grosmangin and Jean Peyrot, Le Havre, France, assignors to Compagnie Francaise de Raffinage, Paris, France

No Drawing. Filed Nov. 16, 1970, Ser. No. 90,102

Claims priority, application France, Nov. 15, 1969, 6939352

Int. Cl. C08f *5/00*

U.S. Cl. 260—80.72 **13 Claims**

A 4-vinyl pyridine copolymer or terpolymer useful in the purification of polymers prepared by ionic polymerization, e.g. with Ziegler-Nata catalysts; the copolymers and terpolymers of said 4-vinyl pyridine are prepared by copolymerizing 4-vinyl pyridine with divinyl benzene, and styrene for the terpolymer, in a specific ratio of monomers to solvent to obtain a copolymer or terpolymer with a defined and improved accessibility of the nitrogen atom to the impurities in the polymers sought to be purified; included within the invention are the method for preparing and the method for utilizing said copolymers and terpolymers of said 4-vinyl pyridine.

3,718,632

CONTINUOUS PROCESS FOR THE PRODUCTION OF ETHYLENE COPOLYMERS

Irwin J. Gardner, Fanwood, and Charles Cozewith, Westfield, N.J., assignors to Esso Research and Engineering Company

Filed Oct. 19, 1970, Ser. No. 81,895

Int. Cl. C08f *15/40*

U.S. Cl. 260—80.78 **11 Claims**

Process for the continuous production of elastomeric copolymers of ethylene and one or more higher alpha-olefins having 3 to 8 carbon atoms, preferably propylene; and terpolymers of ethylene, an alpha-olefin of 3 to 8 carbon atoms and a nonconjugated acyclic or alicyclic diolefin comprises a multi-staged reactor system to which solvent, monomers, and a Ziegler-Natta catalyst composition consisting of a transition metal catalyst and an organoaluminum cocatalyst are fed to a first stage wherein polymerization occurs and from which a polymer cement is fed to subsequent stages to which are fed the same or different monomers, organoaluminum cocatalysts and a catalyst reactivator. By means of the multi-staged reactor system, higher rates and conversions of alpha-olefin are achieved, yield of polymer based on the transition metal catalyst is increased by several fold and polymers having a broad range of molecular weights are produced.

3,718,633

HYDROXY-TERMINATED COPOLYMERS OF BUTADIENE AND FERROCENE DERIVATIVES

Mart G. Baldwin, Newtown, Pa., and Samuel F. Reed, Jr., Huntsville, Ala., assignors to The United States of America as represented by the Secretary of the Army

Filed Nov. 25, 1969, Ser. No. 886,601

Int. Cl. C08d *1/34, 3/06*

U.S. Cl. 260—82.1 **2 Claims**

The copolymers of vinyl ferrocene (VF) and butadiene are disclosed along with preparative procedures therefor. The copolymers are produced in an organic solvent when polymerization is initiated by an azo type initiator selected from the initiators consisting of azo-bis-(2-methyl-hydroxy-valeronitrile), azo-bis-(hydroxyethyl-2-methyl proprionate), and azo-bis-(2-methyl-3-hydroxy proprionitrile). The copolymers serve as a binder for solid propellant compositions and also serve to increase the burning rate of solid propellants wherein used.

3,718,634

POLYMERIZATION OF ALKYL VINYL ETHERS WITH CATALYST BASED ON DIALKYL ALUMINUM HALIDE AND WATER

Herman S. Schultz, Easton, Pa., assignor to GAF Corporation

Filed May 17, 1967, Ser. No. 639,015

Int. Cl. C08f *3/38*

U.S. Cl. 260—91.1 M **11 Claims**

High molecular weight amorphous, or only slightly crystalline, polymers of improved characteristics are obtained by polymerization of alkyl vinyl ethers using an improved catalyst system comprising the reaction product of a dialkyl aluminum halide and co-catalytic amount of water.

3,718,635

PROCESS FOR POLYMERIZATION OF OLEFINS AND CATALYST COMPOSITION THEREFOR

Toru Tomoshige, Iwakuni, and Shiro Honma, Otake, both of Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Filed Dec. 14, 1970, Ser. No. 98,197

Claims priority, application Japan, Dec. 16, 1969, 44/100605

Int. Cl. C08f *1/56, 3/10*

U.S. Cl. 260—93.7 **8 Claims**

A process for polymerizing α-olefins in the presence of a Ziegler catalyst, such catalyst comprising (i) a pulverulent catalyst component obtained by mechanically or physically copulverizing a halogen compound of low valency titanium obtained by reducing titanium tetrahalide with a member selected from the group consisting of hydrogen, metallic aluminum and metallic titanium, an oxide selected from the group consisting of (a) an oxide selected from the group consisting of MgO, Al_2O_3 and SiO_2 and (b) a compound oxide containing at least two elements selected from the group consisting of Mg, Al and Si, in an inert atmosphere in the solid phase until the average particle size of the pulverized product reaches 5 microns or less; and (ii) an organoaluminum or organozinc compound.

3,718,636

CATALYSTS AND PROCESS FOR THE POLYMERIZATION OF OLEFINS

Jacques Stevens, Braine-l'Alleud, and Michel George, Brussels, Belgium, assignors to Solvay & Cie, Brussels, Belgium

No Drawing. Filed Jan. 22, 1970, Ser. No. 5,128

Claims priority, application France, Jan. 24, 1969, 6901486

Int. Cl. C08f *1/56, 3/06*

U.S. Cl. 260—94.9 D **15 Claims**

Catalysts for the low pressure polymerization and copolymerization of olefins are provided which comprise an activator which is an organometallic compound and a solid product obtained by reacting a support comprised of a solid bivalent metal compound with an organometallic compound, separating the resulting solid product, and then reacting this product with a halogenated derivative of a transition metal. The organometallic compound reacted with the support may be the same or dilferent from the activating compound. The polymerization and copolymerization of olefins is carried out using these catalysts.

3,718,637

PROCESS FOR THE POLYMERIZATION OF CONJUGATED DIENES

Adel F. Halasa, 5040 Everett Road, P.O. Box 244, Bath, Ohio 44210

No Drawing. Continuation-in-part of application Ser. No. 854,268, Aug. 29, 1969. This application Mar. 25, 1971, Ser. No. 128,155

Int. Cl. C08d *3/04, 3/06, 1/20*

U.S. Cl. 260—94.2 T **15 Claims**

Conjugated dienes are polymerized by a new catalyst system which permits control of the molecular weight and gives a more easily processed product, together with an increased proportion of 1,2- configuration in the polymer repeating unit structure. This catalyst system comprises (1) a sodium allyl compound having 3–10 carbon atoms and (2) a lithium alkyl, a lithium aryl or a lithium ferrocenyl, cobaltcenyl or nickelcenyl compound. The diene polymers produced by this process have controllable molecular weights in the range of 5,000 to 1,000,000, preferably 100,000 to 500,000, broad molecular weight distribution, glass transition temperatures higher than normally obtained, high degree of branching, high proportion of 1,2- repeating unit configuration, and are more easily processed in the production of rubber and other compositions for commercial use.

3,718,638

PROCESS FOR THE POLYMERIZATION OF CONJUGATED DIENES

Tai Chun Cheng, Mogadore, and Adel F. Halasa, Bath, Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

No Drawing. Continuation-in-part of application Ser. No. 854,309, Aug. 29, 1969. This application June 7, 1971, Ser. No. 150,735

Int. Cl. C08d *1/20, 3/04, 3/06*

U.S. Cl. 260—94.2 T **17 Claims**

Conjugated dienes are polymerized by a new catalyst system which permits control of the molecular weight and

gives a more easily processed product, together with an increased proportion of 1,2 configuration in the polymer repeating unit structure. This catalyst system comprises (1) a sodium allyl compound having 3–10 carbon atoms, (2) a sodium alkoxide or aryloxide of 1–10 carbon atoms, and (3) a potassium t-alkoxide of 4–10 carbon atoms. The diene polymers produced by this process have controllable molecular weights in the range of 5,000 to 1,000,000, preferably 100,000 to 500,000, broad molecular weight distribution, glass transition temperatures higher than normally obtained, high degree of branching, high proportion of 1,2 repeating unit configuration, and are more easily processed in the production of rubber and other compositions for commercial use.

3,718,639

PROCESS FOR PRODUCING CATIONIC LIGNIN AMINES

Sten I. Falkehag, Mount Pleasant, and Peter Dilling, Charleston, both of S.C., assignors to Westvaco Corporation, New York, N.Y.

Filed April 26, 1971, Ser. No. 137,574

Int. Cl. C07g *1/00*

U.S. Cl. 260—124 A **4 Claims**

The process of this invention involves reacting a lignin with the reaction product of epichlorohydrin and a tertiary amine, preferably in salt form. The tertiary amine is preferably converted to salt form with hydrochloric acid and the pH adjusted to between 7–11, preferably between 9 and 9.5. The tertiary amine salt is reacted with epichlorohydrin for about 1 to 6 hours at a temperature below 90° C., preferably below 55°C. The pH of the reaction is slowly raised to around 11 while allowing the reaction to go to completion. From 2 to 10 moles (per 1,000 grams of lignin) of the tertiary amine-epichlorohydrin intermediate are reacted with lignin at a temperature below 90° C., preferably 50° C. for from 1 to 24 hours to forms cationic lignin amines that are water-soluble.

3,718,640

TRIAZOLE AZO PIGMENTS

Armand Roueche, Bottmingen, Switzerland, assignor to Ciba-Geigy AG, Basel, Switzerland

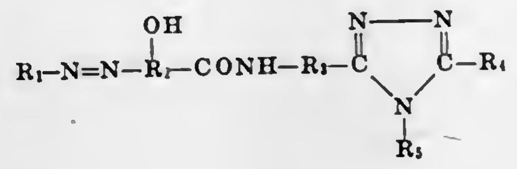
Filed April 22, 1970, Ser. No. 30,980

Claims priority, application Switzerland, May 7, 1969, 7010/69

Int. Cl. C09b *29/36, 33/12, 43/14*

U.S. Cl. 260—157 **8 Claims**

Azo pigments of the formula



wherein R_1 denotes an aromatic radical, R_4 denotes a cyclic radical of aromatic character, R_2 denotes a naphthalene radical in which the azo, hydroxyl and —CO group are in the 1,2,3-position, R_3 denotes an arylene radical and R_5 denotes an alkyl or aryl group or a hydrogen atom, are useful for coloring plastics and lacquers in orange ro red shades of excellent fastness properties.

3,718,641

REACTIVE ARYLAZO-PYRAZOLONE DYESTUFFS

Rolf Muller, Frankfurt am Main; Hanswilli von Brachel, Offenbach am Main; Rudolf Klein, Frankfurt am Main-Fechenheim; Ewald Schmidt, Bischofsheim, and Heinz Bender, Bergen-Enkheim, all of Germany, assignors to Cassella Farbwerke Mainkur AG, Frankfurt, Germany

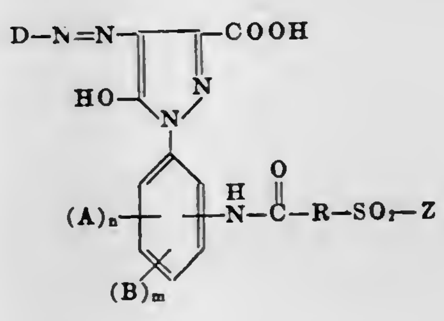
Filed May 4, 1970, Ser. No. 34,604

Claims priority, application Germany, May 6, 1969, P 19 22 940.4

Int. Cl. C09b *62/70, 62/82*

U.S. Cl. 260—162 **7 Claims**

Dyestuff of the formula



wherein D is the residue of a diazo component; A, B and Z are substituent moieties; *m* and *n* are integers and R is a hydrocarbon bridging member as well as the copper, cobalt and chromium metal complexes thereof, which are useful for dyeing wool, polyamide, silk or cellulose fibers in good dye yields having highly brilliant greenish to reddish yellow shados possessing good fastness properties.

3,718,642

PROCESS FOR THE QUATERNIZATION OF BASIC DYESTUFFS

Klaus-Friedrich Lehment, Union, N.J., and Roderich Raue, Leverkusen, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

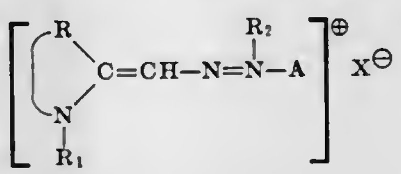
Filed June 25, 1969, Ser. No. 836,635

Claims priority, application Germany, July 3, 1968, P 17 70 782.3

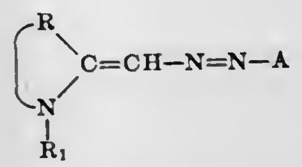
Int. Cl. C09b *43/00;* **D06p** *3/76*

U.S. Cl. 260—165 **5 Claims**

Process for the production of basic dyestuffs of the formula



by quaternizing dye bases of the formula



in the presence of alkaline agents wherein the improvement comprises adding as alkaline agents tertiary amines which are space occupying substituted on the nitrogen atom. In the formulas given R represents the residual constituent of a 5- or 6-membered heterocyclic ring; R_1 and R_2 are alkyl, cycloalkyl or aralkyl and R_1 can additionally be aryl; A is an aromatic or heterocyclic radical and X is an anion. The compounds are used as basic dyestuffs.

3,718,643

DERIVATIVES OF BIS(-HYDROXYARYL)ALKANOIC ACIDS

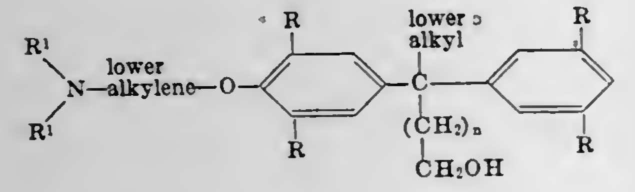
Josef Fried, Chicago, Ill.; Edward J. Pribyl, Metuchen, N.J., and John Krapcho, Somerset, both of N.J., assignors to E. R. Squibb & Sons, Inc., New York, N.Y.

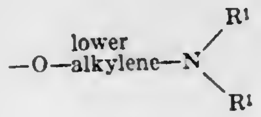
Continuation-in-part of Ser. No. 793,612, Jan. 23, 1969, abandoned, which is a continuation-in-part of Ser. No. 566,245, July 19, 1966, abandoned, which is a continuation-in-part of Ser. No. 288,630, June 18, 1963, abandoned. This application Sept. 30, 1970, Ser. No. 77,036

Int. Cl. C07d *87/28, 93/10, 27/04*

U.S. Cl. 260—243 B **7 Claims**

This application relates to alcohols of the general formula





and to acid addition salts thereof. These substances inhibit cholesterol biosynthesis and aid in the regulation of cholesterol in the blood.

3,718,644

ANTIBIOTIC SEPARATION AND PURIFICATION

Roy G. Weston, Matawan, and Irving Putter, Martinsville, N.J., assignors to Merck & Co., Inc., Rahway, N.J.

No Drawing. Filed June 30, 1970, Ser. No. 51,320

Int. Cl. C07d *99/24*

U.S. Cl. 260—243 C **16 Claims**

A method for the recovery and purification of an antibiotic mixture comprising 7β-(D-5-amino-5-carboxyvaleramido) - 3 - (α-methoxy-p-sulfooxycinnamoyloxymethyl)-7-methoxy-3-cephem-4-carboxylic acid and the p-hydroxy analog thereof and the separation of those components from each other.

3,718,645

1,5-BENZODIAZEPINES AND PROCESS FOR PREPARING THEM

Heinz Kuch, Frankfurt am Main, and Irmgard Hoffmann, Bad Soden, Taunus, both of Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister, Lucius & Bruning, Frankfurt am Main, Germany

Filed May 6, 1971, Ser. No. 140,978

Claims priority, application Germany, April 15, 1970, P 21 18 262.7

Int. Cl. C07d *53/04*

U.S. Cl. 260—239.3 B **3 Claims**

Dialkylphosphinylalkylene-substituted 1,5-benzodiazepines useful as medicaments in the treatment of psychic diseases are obtainable by reacting the corresponding benzodiazepines with a dialkyl-phosphinylalkyl halide or by reacting a 2-dialkyl-phosphinylalkylaminodiphenylamine with a malonic acid dihalide or alkylmalonic acid dihalide.

3,718,646

N-LOWER ALKENYL-2,3-DIHYDRO-2-OXO-5-PHENYL-1H-1,4-BENZODIAZEPINE-1-CARBOXAMIDES

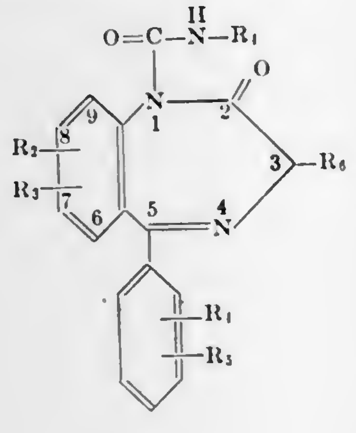
Robert B. Moffett, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Oct. 5, 1970, Ser. No. 78,167

Int. Cl. C07d *53/06*

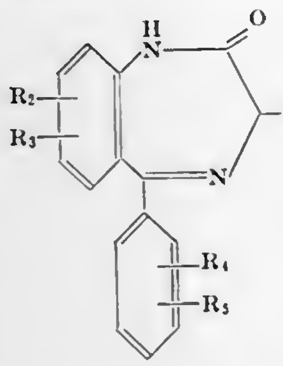
U.S. Cl. 260—239.3 D **7 Claims**

A 2,3-dihydro-2-oxo-5-phenyl-1H-1,4-benzodiazepin-1-carboxamide of the formula:



—II

thereof, wherein R$_1$ is alkenvl of three to eight carbon atoms, inclusive, cycloalkyl of three to six carbon atoms, inclusive, and haloalkyl, in which the alkyl group is of two to six carbon atoms, inclusive and the halogen is fluorine, chlorine, bromine, or iodine; wherein R$_2$, R$_3$, R$_4$, and R$_5$ are selected from the group consisting of hydrogen, alkyl of one to three carbon atoms, inclusive, fluorine, chlorine, bromine, cyano and trifluoromethyl, and wherein R$_6$ is hydrogen or alkyl of one to three carbon atoms, inclusive, and the pharmacologically acceptable acid addition salts thereof, are prepared by reacting a compound of the structure



I

wherein R$_2$, R$_3$, R$_4$, R$_5$, and R$_6$ have the values of above, with an alkenyl, cycloalyl, or haloalkyl isocyanate. The products of formula II are useful as tranquilizers and sedatives.

3,718,647

PROCESS FOR MAKING 1,2,5-THIADIAZOLES IN THE SINISTER CONFIGURATION AND NOVEL INTERMEDIATES

Leonard M. Weinstock, Belle Mead, Roger J. Tull, Metuchen, and Dennis M. Mulvey, Whitehouse Station, N.J., assignors to Charles E. Frosst & Co., Kirkland, Quebec, Canada

No Drawing. Original application Apr. 21, 1969, Ser. No. 818,474. Divided and this application Aug. 16, 1971, Ser. No. 172,234

Int. Cl. C07d *87/46*

U.S. Cl. 260—247.1 **4 Claims**

Preparation of S-3-X-4-(3-substituted amino-2-hydroxypropoxy)-1,2,5-thiadiazole beta adrenergic blocking agents using as starting material an optically active alkamine in the sinister configuration, or a derivative of said alkamine, which is reacted with an 3-X-4-chloro(or RO— where R is hydrogen or an alkali metal)-1,2,5-thiadiazole. Novel 3-morpholino-4-chloro(or RO—)-1,2,5-thiadiazoles and novel alkamines and their preparation also are described.

3,718,648

BASICALLY SUBSTITUTED 2,4-(1H,3H)-QUINAZOLINDIONE DERIVATIVES

Rudi Beyerle, Bruchkobel, and Adolf Stachel, deceased, late of Frankfurt am Main-Fechenheim, by Inge Stachel, Frankfurt am Main-Fechenheim, and Sophie Stachel, Augsburg, Germany, heirs, assignors to Cassella Farbwerke Mainkur Aktiengesellschaft, Frankfurt am Main-Fechenheim, Germany

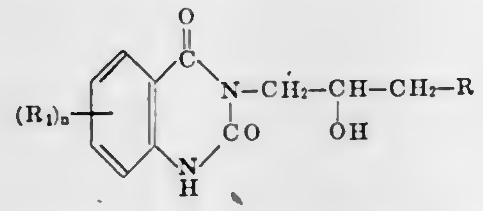
No Drawing. Filed June 25, 1970, Ser. No. 49,932

Claims priority, application Germany, July 4, 1969, P 19 34 037.5

Int. Cl. C07d *87/50*

U.S. Cl. 260—247.2 A **6 Claims**

Pharmacologically valuable, basically substituted 2,4-(1H,3H)-quinazolindione derivatives having the formula



wherein R stands for the radical selected from the group consisting of di-C$_1$-C$_4$-alkylamine, N-methyl-benzylamine, N-methyl-N-cyclohexylamino, N-methyl-allylamino, N-methyl piperazino, N - methyl-N-(piperidino-n-propyl)-amino, N-methyl-N-(methoxy-n-propyl)-amino, hexamethylene-imino, morpholino, thio-morpholino, pyrrolidino and piperidino, said radical being bound via a nitrogen atom; R$_1$ stands for alkoxy groups having 1 to 4 carbon atoms, which are preferably in the 6,7 or 6,7,8-position; and *n* stands for the integers 2 or 3.

3,718,649

PROCESS FOR THIOURACIL PRODUCTION

Gerald T. Dyer, Weston, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Continuation of Ser. No. 740,105, June 26, 1968, abandoned. This application Oct. 5, 1970, Ser. No. 78,232

Int. Cl. C07d *51/32*

U.S. Cl. 260—251 R **8 Claims**

Novel method for preparing 4-hydroxy pyrimidine and 2-substituted analogues thereof such as thiouracil. Essentially the method involves the reaction of an ester of acetic acid with an ester of formic acid and an alkali metal alcoholate in the presence of an inert nitrogen atmosphere. The reaction mixture produced by the foregoing contains the corresponding alkali metal formylacetic ester which is reacted with thiourea to produce thiouracil.

3,718,650

NEW DERIVATIVES OF SUBSTITUTED PIPERAZINES

Roland Yves Mauvernay, Riom; Norbert Busch, Puy de Dome; Jacques Moleyre, Menetrol, and Jacques Simond, Chamalieres, all of France, assignors to Societe Anonyme Centre Europeen De Recherches Mauvernay, Riom, France

Filed Feb. 23, 1971, Ser. No. 118,077

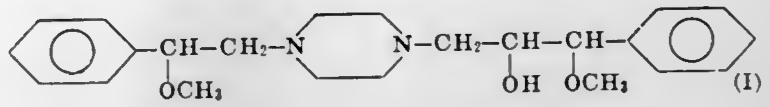
Claims priority, application France, March 2, 1970, 7007383

Int. Cl. C07d *51/70*

U.S. Cl. 260—268 R **2 Claims**

A process for obtaining substituted piperazine derivatives, notably an amino-alcohol derivative for therapeutic use, is described.

At least one epoxide, particularly 3-phenyl, 3-methoxy, 1,2-propylene oxide is reacted on a substituted piperazine, particularly 1-(2-phenyl, 2-methoxy)ethyl piperazine. The invention notably relates to a new amino-alcohol formula (I).



(I)

as well as the addition salts thereof with organic or inorganic acids which are pharmaceutically acceptable.

The application of the compound of formula (I) in medicines having antitussive, mucolytic and eupneic actions.

3,718,651

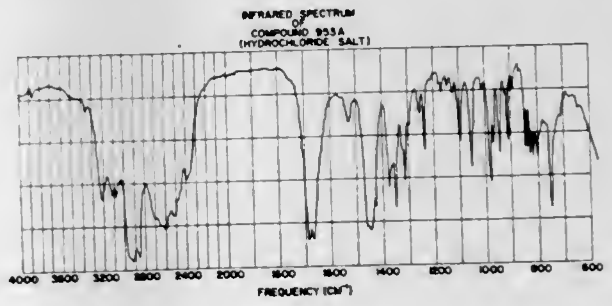
3,6-BIS (5-CHLORO-2-PIPERIDINYL)-2,5-PIPERAZINE-DIONE

Charles O. Gitterman, Cranford, John Madas, Clark, Edward L. Rickes, Rahway, and Thomas H. Stoudt, Westfield, N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of application Ser. No. 834,534, June 18, 1969. This application Nov. 23, 1970, Ser. No. 91,644

Int. Cl. C07d *51/72*

U.S. Cl. 260—268 DK **4 Claims**



3,6-bis(5 - chloro-2-piperidinyl) - 2,5 - piperazinedione, also known as Compound 593A, is obtained by fermentation of a heretofore unknown species of *Streptomyces griseoluteus*. Compound 593A has demonstrated activity in inhibiting the growth of tumors in mammals and birds, and in inhibiting the growth of certain microorganisms.

3,718,652

NAPHTHOYLENE-BENZIMIDAZOLIUM DYESTUFFS

Robert Frederick Michel Sureau, Enghien-les-Bains, and Marie-Josephe Jeanne Alicot, Soisy-sous-Montmorency, France, assignors to Ugine Kuhlmann, Paris, France

No Drawing. Original application Jan. 17, 1967, Ser. No. 609,757, now Patent No. 3,586,677, dated June 22, 1971. Divided and this application Aug. 27, 1970, Ser. No. 67,572

Claims priority, application France, Jan. 24, 1966, 46,932

Int. Cl. C07d *35/10*

U.S. Cl. 260—282 **5 Claims**

Cationic dyestuffs derived from naphthoylene-benzimidazolium compounds.

3,718,653

QUINOYL ALKANESULFONATES AND TOLUENESULFONATES

Martin Hamer, Skokie, Ill., assignor to International Minerals & Chemical Corporation

Continuation-in-part of Ser. No. 645,898, June 14, 1967, Pat. No. 3,535,324. This application Feb. 26, 1970, Ser. No. 14,641

Int. Cl. C07d *33/60*

U.S. Cl. 260—283 S **9 Claims**

Novel compounds of the classes of halopyridyl or haloquinolyl alkanesulfonates, including haloalkanesulfonates, and halopyridyl or haloquinolylα-toluenesulfonates, are useful as agricultural toxicant compositions. The compounds are prepared by the reaction, in the presence of a hydrogen halide acceptor, of an appropriate halogenated pyridinol or quinolinol with an appropriate alkanesulfonyl halide or an appropriate α-toluenesulfonyl halide. The compounds are also prepared by the reaction of an alkali metal salt of the halogenated pyridinol or quinolinol with the alkanesulfonyl halide or the α-toluenesulfonyl halide.

3,718,654

ANILINO-3-PYRIDINESULFONIC ACIDS

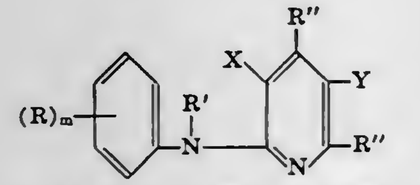
Renat Herbert Mizzoni, Long Valley R. D., and Herbert Morton Blatter, Summit, both of N.J., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 24,869, April 1, 1970, Pat. No. 3,671,512. This application Nov. 12, 1970, Ser. No. 89,021

Int. Cl. C07d *31/48*

U.S. Cl. 260—294.8 R **4 Claims**

New ortho-anilino-3-pyridinesulfonic acids, e.g., those of the formula



R=H, alkyl, free, esterified or etherified OH, CF_3, NO_2, amino, free or functionally converted carboxy or sulfo
R'=H, alkyl or acyl
R''=H or alkyl, m=1-3
one of X and Y=H or alkyl, other is SO_3H

the N-oxide and functional derivatives thereof, are diuretic and antiinflammatory agents.

3,718,655

CERTAIN DIISONIAZID METHANE SULFONATE COMPLEXES

Carlos Ferrer-Salat; Jorge Ferrer-Batiles, and Juan Colome-Riera, all of Barcelona, Spain, assignors to Laboratories Ferrer S.L., Barcelona, Spain

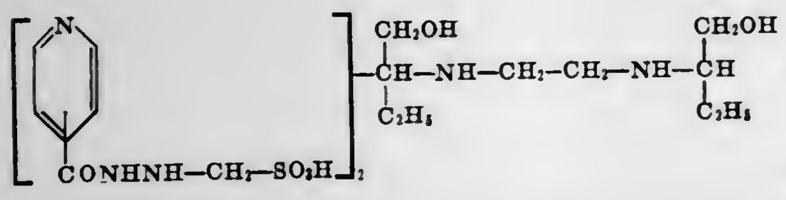
Filed July 28, 1970, Ser. No. 59,010

Claims priority, application Spain, July 28, 1969, 369,952

Int. Cl. C07d *31/48*

U.S. Cl. 260—294.8 H **2 Claims**

Di-isoniazidmethane sulfonate of d(+)2,2'(ethylenediimino)di-1-butanol having the formula



constituting an improved tuberculostatic agent and method of preparing the same by reacting d(+)2,2'(ethylenediimino) di-1-butanol and isoniazid methane sulfonic acid.

3,718,656

PYRAZOLO(1.5-A) PYRIDINE DERIVATIVES

Toshihiko Okamoto, Bunkyo-ku, Tokyo; Masaaki Hirobe, Setagaya-ku, Tokyo; Seigo Suzue, Itabashi-ku, Tokyo; Yoshio Nagatsu, Urawa-shi, Saitama-ken; Keiichi Ushiyama, Minamisaitama-gun, Saitama-ken; Susumu Satoh, Kita-ku, Tokyo, and Tsutomu Irikura, Nerima-ku, Tokyo, all of Japan, assignors to Kyorin Seigaku Kabushiki Kaisha, Tokyo, Japan

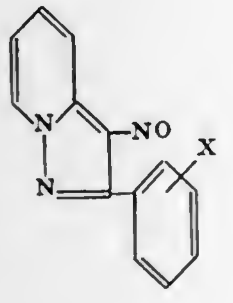
Filed April 8, 1971, Ser. No. 132,558

Claims priority, application Japan, Sept. 25, 1970, 45/83985

Int. Cl. C07d *31/34, 31/42*

U.S. Cl. 260—295 F **9 Claims**

The present invention provides 2-substituted-3-nitrosopyrazolo[1,5-a]pyridines expressed by the general formula,



(I)

where X stands for a halogen atom, a lower alkoxy, hydroxy or acetoxy group, and a method for synthesizing the same. The substances of this invention expressed by the general formula (I) exhibit excellent antimicrobial action for example, the tubercle bacillus in vitro and are especially efficacious as medicine for trichomanas disease and supparative inflammation.

3,718,657

CERTAIN-2-SUBSTITUTED-1,2,3,4-TETRAHYDRO-BETA OR GAMMA CARBOLINES

David Lyon Garmaise, Montreal; Gerard Yvon Paris, Duvernay, Quebec, both of Canada, and Nicholas Peter Plotnikoff, Lake Bluff, Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Filed Dec. 3, 1970, Ser. No. 94,984

Int. Cl. C07d *31/42*

U.S. Cl. 260—296 A **6 Claims**

A new series of closely related compounds, the β- and Δ-carbolines carrying on the piperidino-nitrogen an unsaturated hydrocarbon side chain with three carbon atoms, was found to possess valuable anti-depressant activity with an unusually high therapeutic index.

3,718,658

COMPOUND FOR RETARDING COMBUSTION OF POLYCARBONAMIDES

John C. Summers, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed July 10, 1970, Ser. No. 54,017

Int. Cl. C07c *143/63*

U.S. Cl. 260—501.12 **2 Claims**

Sulfanilate salts of guanidine and guanylurea, useful as flame-retardants for synthetic polymeric resins. Incorporation of such salts into, for example, polycarbonamides, produces a self-extinguishing flame-resistant composition.

3,718,659

5-ARYL-3H-1,2,4-DITHIAZOLES AND PROCESS FOR THEIR MANUFACTURE

Horst Bohme, and Kurt-Henning Ahrens, both of Frankfurt/Main, Germany, assignors to Farbwerke Hoechst Aktiengesellschaft Vormals Meister Lucius & Bruning, Frankfurt am Main, Germany

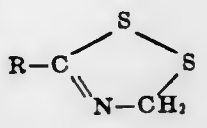
Filed Sept. 1, 1970, Ser. No. 68,776

Claims priority, application Germany, Sept. 11, 1970, P 19 45 968.8

Int. Cl. C07d *91/70*

U.S. Cl. 260—302 R **9 Claims**

5-Aryl-3H-1,2,4-dithiazoles of the formula I



in which R is an aromatic radical which may be unsubstituted or mono-, di- or tri-substituted in meta- or para-position by lower alkyl, trifluoromethyl, lower alkoxy, benzyloxy, halogen, nitro, hydroxy, lower acyl, carboxy, lower carbalkoxy or carbobenzoxy, and their physiologically tolerable salts, active against fungi. A process for preparing these compounds.

3,718,660

ARYLSULPHONYL UREAS CONTAINING HETEROCYCLIC ACYLAMINO GROUPS

Hans Plumpe, and Walter Puls, Wuppertal-Elberfeld, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Oct. 28, 1968, Ser. No. 771,318

Claims priority, application Germany, Nov. 2, 1967, P 16 70 945.8

Int. Cl. C07d *85/22*

U.S. Cl. 260—307 D **23 Claims**

Blood sugar lowering compounds useful as oral antidiabetics are provided. The compounds have low toxicity and are well tolerated. They are arylsulphonyl ureas having heterocyclic acylamino groups such as N-[4-(β-[3-methylisoxazolyl-(5)-carboxamido]-ethyl)-benzene-sulphonyl]-N'-cyclohexyl-urea and its congeners and analogs administrable in tablets or capsules containing for example 1 mg of active agent. The compounds can be prepared in several ways such as by reacting an appropriate amine or amine salt with a heterocyclic acylamino group-containing arylsulphonamide derivative or corresponding arylsulphonylisocyanate. The substituents on the benzene ring are preferably para to one another but may be in the ortho and meta positions to each other. The reactions can be carried out with or without a solvent or diluent and are exothermic or heated at elevated temperature.

3,718,661

PHOSPHORIC ESTERS

Wolfram Dietsche, 58 Moltkestrasse, 6701 Altrip; Heinrich Adolphi, 11 Kalmitweg, 6703 Limburgerhof; Peter Beutel, 27 Strahlenburgstrasse, 6800 Mannheim, and Karl-Heinz Koenig, 8a Pierstrasse, 6710 Frankenthal, all of Germany

Filed Sept. 25, 1970, Ser. No. 75,704

Int. Cl. A01n *9/36;* **C07f** *9/16*

U.S. Cl. 260—308 C **5 Claims**

New and valuable substituted O,O-dialkylthionophosphoric esters having a good insecticidal action and a process for controlling insects with these compounds.

3,718,662

MERCAPTOBENZIMIDAZOLYL UREAS AND THIOUREAS

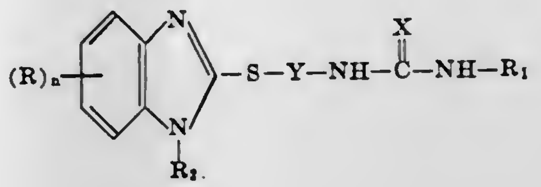
Venkatachala L. Narayanan, Hightstown, and Rudiger D. Haugwitz, Highland Park, N.J., assignors to E. R. Squibb & Sons, Inc., New York, N.Y.

No Drawing. Filed Apr. 21, 1971, Ser. No. 136,197

Int. Cl. C07d *49/38*

U.S. Cl. 260—309.2 **6 Claims**

Mercaptobenzimidazolyl ureas and thioureas are provided having the structure



and which are useful as anthelmintic agents.

3,718,663

PREPARATION OF OIL-SOLUBLE BORON DERIVATIVES OF AN ALKYLENE POLYAMINE-UREA OR THIOUREA-SUCCINIC ANHYDRIDE ADDITION PRODUCT

Edmund J. Piasek, Chicago; Robert E. Karll, Batavia, and Richard J. Lee, Downers Grove, all of Ill., assignors to Standard Oil Company, Chicago, Ill.

Division of Ser. No. 685,254, Nov. 24, 1967. This application Aug. 31, 1970, Ser. No. 68,470

Int. Cl. C07d *27/00*

U.S. Cl. 260—326.3 **4 Claims**

Complex substituted alkylene polyamines such as di(alkenyl-succinimide) of N_1,N_3 symmetrical bis(aminopolyazalkylene) ureas that react with boric acid in oil solution either with low boric acid utilization efficiency or react to form a hazy product whose haze cannot be removed by filtration are readily converted to the desired oil solution of boron and nitrogen containing products by first preparing an oil solution of super boron containing product of the complex substituted alkylene polyamine, combining the oil solution of super boron containing product with oil solution of the complex substituted alkylene polyamine and equilibrating the resulting mixture to a uniform boron to nitrogen content throughout.

3,718,664

TRIS (HYDROXYMETHYL) AMINOMETHANE SALT OF THIOCTIC ACID

Carlos Ferrer Salat; Jorge Ferrer Batlles, and Juan Colome Riera, all of Barcelona, Spain, assignors to Laboratorios Ferrer, S.L., Barcelona, Spain

Division of Ser. No. 616,780, Dec. 17, 1967, Pat. No. 3,562,273. This application Sept. 3, 1970, Ser. No. 69,225

Claims priority, application Spain, Feb. 17, 1966, 323,195

Int. Cl. A61k *27/00;* **C07d** *71/00*

U.S. Cl. 260—327 A **1 Claim**

The present invention concerns new compounds of antiacidotic action such as the derivatives of tris (hydroxymethyl) aminomethane, of important therapeutic application.

3,718,665
AZABICYCLO-(N)-ALKYLENE-5,11-DIHYDRODIBENZOXA (OR THIA) ZEPINES

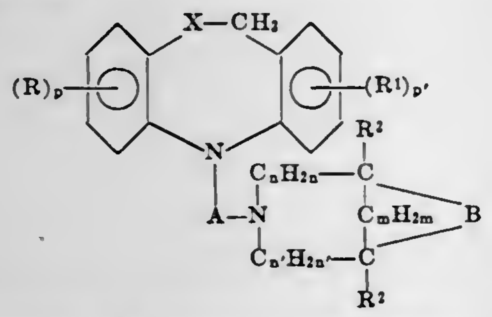
Harry L. Yale, New Brunswick, N.J., assignor to E. R. Squibb & Sons, Inc., New York, N.Y.

No Drawing. Filed Sept. 30, 1970, Ser. No. 77,035

Int. Cl. A61k *27/00;* **C07d** *87/54, 93/42*

U.S. Cl. 260—327 B **9 Claims**

Dihydrodibenzoxa (or thia) zepines are provided having the structure



which are useful as antihypertensive agents.

3,718,666
SUBSTITUTED PHENYLACETONITRILES

Horst Zeugner, Hannover, Klaus-Wolf von Eickstedt, Hannover-Bemerode, Werner Stuhmer, Eldagsen, and Siegfried Funke, Hannover, Germany, assignors to Kali-Chemie Aktiengesellschaft, Hannover, Germany

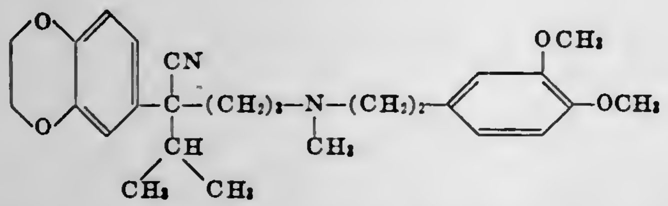
No Drawing. Filed Dec. 30, 1970, Ser. No. 102,961

Claims priority, application Germany, Jan. 7, 1970, P 20 00 435.7

Int. Cl. C07d *15/18*

U.S. Cl. 260—340.3 **2 Claims**

α-Isopropyl-α-[(N-methyl-N-homoveratryl)-γ - aminopropyl]-3,4-ethylenedioxy-phenylacetonitrile of the formula



(I)

and pharmaceutically acceptable acid addition compounds thereof.

The compounds have a dilatent effect on the coronary vessels and improve the contractility of the cardiac muscle. They are therefore suited for treatment of heart patients suffering from coronary insufficiency.

3,718,667
2,3-DISUBSTITUTED LEVULINALDEHYDE COMPOUNDS

Donald P. Strike, Rosemont, and Herchel Smith, Bryn Mawr, Pa., assignors to American Home Products Corporation, New York, N.Y.

No Drawing. Division of application Ser. No. 876,116, Nov. 12, 1969, which is a continuation-in-part of application Ser. No. 765,020, Oct. 4, 1968, which in turn is a continuation-in-part of application Ser. No. 702,185, Feb. 1, 1968, all now abandoned. This application Apr. 15, 1971, Ser. No. 134,469

Int. Cl. C07d *7/04;* **C07c** *59/32*

U.S. Cl. 260—345.8 **1 Claim**

4,5-disubstituted-3-hydroxycyclopentanones (I) are prepared by hydrogenolyzing the corresponding 4,5-disubstituted-2,3-epoxycyclopentanone (IV) which in turn is provided by reacting the corresponding 4,5-disubstituted-2-cyclopenten-1-one (III) with alkaline hydrogen peroxide. Compounds (III) are prepared by cyclizing the corresponding 2,3-disubstituted levulinaldehyde (II) with a base. The products of the process are biologically active, especially compound (I) substituted in the 4-position with 3′-hydroxyoctyl and in the 5-position with 6′-carboxyhexyl. This compound has prostaglandin-like activity, especially blood pressure lowering and bronchodilator activity, and is a totally-synthetic dihydroprostaglandin E_1 (dihydro PGE_1). The processes of the invention may also be used to obtain compounds with prostaglandin-like activity from appropriately substituted naturally occurring cyclopentanones, e.g. those isolated from the Caribbean gorgonian, *Plexaura homomalla.*

3,718,668
BENZODIPYRONES

Hugh Cairns, Sandbach, Cheshire, and Robert Minshull, Brereton, Cheshire, both of England, assignors to Fisons Limited, Suffolk, England

Continuation-in-part of Ser. No. 751,753, Aug. 12, 1970, abandoned. This application Aug. 7, 1970, Ser. No. 62,170

Int. Cl. C07d *7/34*

U.S. Cl. 260—345.2 **28 Claims**

Certain benzodipyrones, e.g., 4,10-dioxo-2,8-dicarboxy-5-methoxy-4H,10H-benzo(1,2-b:3,4-b′) dipyran disodium salt and many others which are disclosed, inhibit the release and/or action of toxic products which arise from the combination of certain types of antibody and specific antigen; and are useful in the treatment of conditions — such as asthma, hay fever, etc. — in which antigen reactions are responsible for said conditions.

3,718,669
4,4-BIS (2-N ITRO-X-HALO-ANILINO)-1,1 DIANTHRAQUINONYL

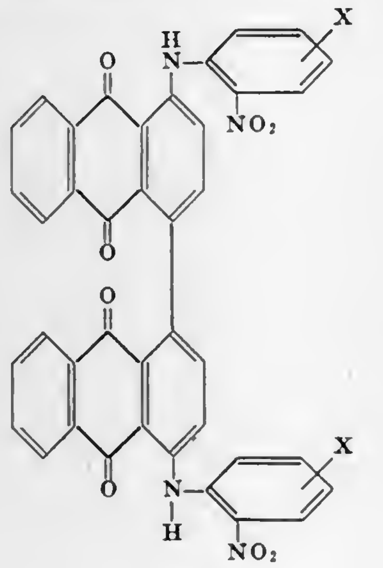
Herman Gerson, New York, N.Y., assignor to Allied Chemical Corporation, New York, N.Y.

Filed April 30, 1971, Ser. No. 139,189

Int. Cl. C09b *1/32*

U.S. Cl. 260—367 **6 Claims**

A compound of the formula



wherein X is independently fluorine, chlorine or bromine, is useful as a pigment imparting desirable red colorations to a variety of synthetic resins. These new pigments are characterized by excellent mass tone, fastness to light and to lacquer solvents.

3,718,670
PROCESS FOR THE PREPARATION OF 17-OXO-STEROIDS FROM 17a-HYDROXY-20-OXO-STEROIDS

John Peter Turnbull, London, England, assignor to Glaxo Laboratories Limited, Middlesex, England

Filed Dec. 21, 1970, Ser. No. 100,402

Int. Cl. C07c *169/22*

U.S. Cl. 260—397.3 **6 Claims**

Process for the preparation of 17-oxo-steroids which comprises oxidizing 17α-hydroxy-20-oxo-steroids by means of one-electron transfer oxidizing agents.

3,718,671
21-HALOGEN STEROIDS

Henry Laurent, 1 Berlin 37; Karl-Heinz Kolb, 1 Berlin 45, and Rudolf Wiechert, 1 Berlin 39, all of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Germany

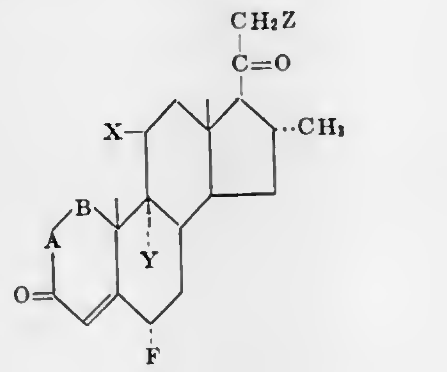
Filed March 11, 1970, Ser. No. 23,117

Claims priority, application Germany, March 11, 1969, P 19 13 042.8; Jan. 29, 1970, P 20 04 767.0

Int. Cl. C07c *169/34*

U.S. Cl. 260—397.3 **17 Claims**

21-halogen steroids having the formula



(I)

wherein —A—B— is —CH═CH— or —CCl═CH—, Y and Z are each a halogen atom, and X is a halogen atom having the same or a lesser atomic weight than Y and in the case where —A—B—is a —CCl═CH— group, X can also be hydroxyl.

3,718,672
DISULFONAMIDES OF DIAMINO DIPHENYL SULFONES

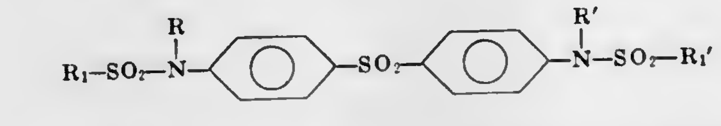
Markus Matzner, Edison; Walter T. Reichle, Millington; Sui-Wu Chow, and James E. McGrath, both of Somerville, all of N.J., assignors to Union Carbide Corporation, New York, N.Y.

Filed April 6, 1970, Ser. No. 26,045

Int. Cl. C07c *143/74*

U.S. Cl. 260—397.6 **4 Claims**

Compounds of the structure



wherein R, R′ , R_1 and R_1' are C_1 to C_{20} hydrocarbon radicals. These compounds are useful as initiators or activators in the anionic polymerization of lactam monomers.

3,718,673
PROCESS FOR THE PREPARATION OF 21-CHLORO-6,6,9ALPHA-TRIFLUORO-11BETA, ALPHA, 17ALPHA-TRIHYDROXY-1,4-PREGNADIEN-3,20-DIONE 16,17-KETALS AND SELECTED INTERMEDIATES

William Charles Ripka, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Feb. 1, 1971, Ser. No. 111,615

Int. Cl. C07c *173/00*

U.S. Cl. 260—397.3 **8 Claims**

6,6-Difluoro-11α,16α,17α-trihydroxy-4-pregnen-3,20-dione 16,17-ketal 17-ketal is prepared by a process involving the 11α-microbiological hydroxylation of the corresponding 16α,17α-dihydroxy steroid. The 11α-hydroxyl is converted sequentially to the 9,11-double bond, 9,11-epoxy and 9α-fluoro-11β-hydroxyl. Optionally the 1,2-position is dehydrogenated and a 21-hydrogen converted to a 21-hydroxy, acyloxy, bromine or chlorine. The latter steroid ketals are highly active anti-inflammatory and glucocortical agents.

3,718,674
DIASTEREOMERS OF α-HYDRAZINO-β-(PHENYL)PROPIONITRILES

Sandor Karady, Elizabeth; Seemon H. Pines, Murray Hill; Manuel G. Ly, Edison, and Meyer Sletzinger, North Plainfield, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed June 24, 1970, Ser. No. 49,542

Claims priority, application Canada, March 25, 1970, 78,422

Int. Cl. C07c *169/52, 121/78*

U.S. Cl. 260—397.1 **4 Claims**

Diastereomers of and a method of resolving α-hydrazino-β-(substituted or unsubstituted phenyl)alkanoic acid derivatives.

3,718,675
CARBONIC CARBOXYLIC ANHYDRIDES

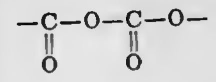
Giuliana C. Tesoro, Dobbs Ferry, N.Y., assignor to J. P. Stevens & Co. Inc., Garfield, N.J.

Division of Ser. No. 653,632, July 17, 1967, Pat. No. 3,575,960. This application June 18, 1970, Ser. No. 57,887

Int. Cl. C07c *69/00, 53/28, 53/34*

U.S. Cl. 260—408 **2 Claims**

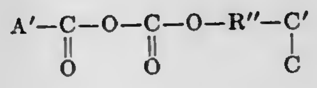
A process for esterification of cellulose wherein a cellulosic material is reacted under mild conditions and in the absence of a catalyst with mixed carbonic carboxylic anhydrides having the characteristic group



$$-\underset{\underset{O}{\|}}{C}-O-\underset{\underset{O}{\|}}{C}-O-$$

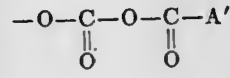
whereby a monovalent or divalent carbon acyl group is bonded to the cellulose by replacing active hydrogen, with consequent ester formation, and there is released as by-products an alcohol or glycol and carbon dioxide.

In addition, novel compounds of the carbonic carboxylic anhydride class which are useful in the formation of cellulose esters according to the above-mentioned process, and which are characterized by the formula



$$A'-\underset{\underset{O}{\|}}{C}-O-\underset{\underset{O}{\|}}{C}-O-R''-\underset{\underset{C}{|}}{C'}$$

wherein A′ is polyfluoroalkyl or polyfluoroalkoxyalkyl, R″ is a lower alkylene group, and G′ is selected from the group consisting of hydrogen and



$$-O-\underset{\underset{O}{\|}}{C}-O-\underset{\underset{O}{\|}}{C}-A'.$$

3,718,676
PREPARATION OF CARBOXYLIC ACIDS

Lawrence J. Kehoe, Huntington Woods, and Raymond A. Schell, Berkley, both of Mich., assignors to Ethyl Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 776,819, Nov. 18, 1968, abandoned. This application March 20, 1970, Ser. No. 21,473

Int. Cl. C08h *17/36*

U.S. Cl. 260—413 **18 Claims**

A process is described for preparing carboxylic acids from olefins, water and carbon monoxide in a liquid reaction medium using a combination of a tin or germanium salt and a platinum salt as the catalyst. Olefins having at least one α-carbon-to-carbon double bond and containing up to about 30 carbon atoms are useful reactants. Suitable reaction media are alkyl ketones and alkyl ethers.

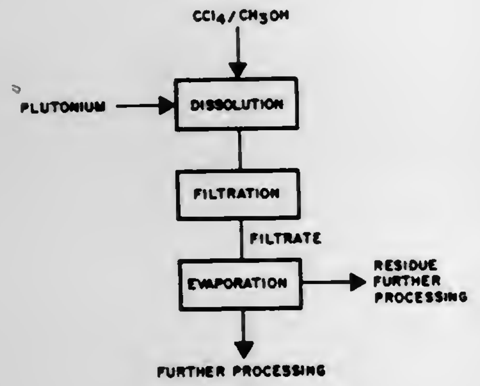
3,718,677
PLUTONIUM DISSOLUTION AND PLUTONIUM ALKOXIDE PRODUCT

Sam H. Pitts, Jr., Arvada, Colo., assignor to the United States of America as represented by the United States Atomic Energy Commission

Filed Dec. 29, 1971, Ser. No. 213,301

Int. Cl. C07f *13/00*

U.S. Cl. 260—429.1 **8 Claims**



Nonaqueous method of dissolving plutonium and product formed, the method being submerging plutonium in a bath containing an alkyl alcohol taken from the group ROH, where R is an alkyl radical having from 1 to 4 atoms of carbon, and a halogen, either as an absorbed gas or as a compound such as RX_n, where R is a straight chain alkyl radical and X is a halide, filtering the solution after dissolution is complete, and evaporating the filtrate to yield a plutonium compound.

3,718,678
1-(α-CYANOMETHYLENE-HYDRAZINO)-PHENOXY-3-AMINOPROPAN-2-OLS

Roy Farrand, and Roy Hull, both of Macclesfield, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Oct. 27, 1969, Ser. No. 869,923

Claims priority, application Great Britain, Nov. 12, 1968, 53,612/68

Int. Cl. C07c *121/78*

U.S. Cl. 260—465 D **12 Claims**

The disclosure relates to 1-amino-3-(hydrazinophenoxy)-2-propanol derivatives, processes for their manufacture, pharmaceutical compositions containing them and a method of using them to produce cardiac β-blockade in warm-blooded animals. Representative of the compounds disclosed is 1-p-(α-cyano-α-ethoxycarbonylmethylenehydrazino)phenoxy-3-isopropylaminopropan-2-ol.

3,718,679
PHOSPHINE OR PHOSPHITE GOLD COMPLEXES OF THIOMALIC ACID

Elizabeth R. McGusty, Philadelphia, and Blaine M. Sutton, Hatboro, both of Pa., assignors to Smith Kline & French Laboratories, Philadelphia, Pa.

Filed April 27, 1971, Ser. No. 137,961

Int. Cl. C07f *1/12*

U.S. Cl. 260—430 **4 Claims**

Phosphine or phosphite gold complexes of thiomalic acid having anti-arthritic activity are prepared by reaction of an appropriate phosphine or phosphite gold halide with thiomalic acid.

3,718,680
PHOSPHINE OR PHOSPHITE GOLD COMPLEXES OF THIOETHANOL AND DERIVATIVES THEREOF

Elizabeth R. McGusty, Philadelphia, and Blaine M. Sutton, Hatboro, both of Pa., assignors to Smith Kline & French Laboratories, Philadelphia, Pa.

Filed June 7, 1971, Ser. No. 150,734

Int. Cl. C07f *1/12*

U.S. Cl. 260—430 **5 Claims**

Phosphine or phosphite gold complexes of thioethanol and derivatives thereof, such as ether or ester derivatives, having anti-arthritic activity are prepared by reaction of an appropriate phosphine or phosphite gold halide with thioethanol or its corresponding derivative.

3,718,681
ACYLOXYBENZOYLOXYSILANES

Patrick James Adams, Tecumseh, Mich., assignor to Stauffer-Wacker Silicone Corporation, Adrian, Mich.

Division of Ser. No. 734,248, June 4, 1968, Pat. No. 3,542,836. This application April 23, 1970, Ser. No. 43,312

Int. Cl. C07f *7/02, 7/08*

U.S. Cl. 260—448.2 R **5 Claims**

Acyloxyaroyloxysilanes and acyloxyaroyloxysiloxanes, especially acyloxybenzoyloxysilanes and acyloxybenzoyloxysiloxanes, are described as new compositions of matter. These compositions are useful as cross-linkers and surfactants for polyurethanes.

3,718,682
PROCESS FOR OBTAINING HYDROGENOCHLOROSILANES

Georges Bakassian, Caluire, and Andre Bazouin, Luzinay 38, both of France, assignors to Rhone-Poulenc S.A., Paris, France

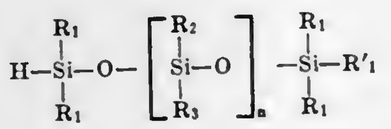
Filed Dec. 20, 1971, Ser. No. 210,205

Claims priority, application France, Dec. 22, 1970, 7046220

Int. Cl. C07f *7/08*

U.S. Cl. 260—448.2 P **8 Claims**

Dialkylhydrogenochlorosilanes are obtained by reacting a siloxane



$$H-\overset{R_1}{\underset{R_1}{Si}}-O-\left[\overset{R_2}{\underset{R_3}{Si}}-O\right]_n-\overset{R_1}{\underset{R_1}{Si}}-R'_1$$

with a chlorosilane $(R_4)_p\,SiCl_{4-p}$ in the presence of a hexaalkylphosphotriamide or N-alkyl-pyrrolidone, where R_1 is $C_1 - C_6$ alkyl, R_2, R_3, R'_1 and R_4 are alkyl or alkenyl having up to 6 carbon atoms, cycloalkyl or cycloalkenyl having 5 or 6 ring carbon atoms, or henyl, alkylphenyl or phenylalkyl and where R'_1 can also be hydrogen, and R_4 can also be hydrogen or chloromethyl, *n* is zero or an integer up to 20, preferably 0 – 5, and *p* is 0, 1 or 2.

3,718,683
PROPANAL DERIVATIVES

Odd Kristiansen, Reinach, Basel-Land, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

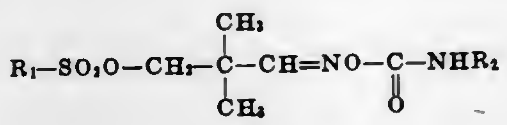
No Drawing. Filed Nov. 12, 1971, Ser. No. 198,420

Claims priority, application Switzerland, Nov. 20, 1970, 17,206/70

Int. Cl. C07c *143/68*

U.S. Cl. 260—456 A **9 Claims**

2,2-dimethyl-propanal-carbamoyloximes of the formula



$$R_1-SO_2O-CH_2-\overset{CH_3}{\underset{CH_3}{C}}-CH=NO-\underset{\overset{\|}{O}}{C}-NHR_2$$

wherein R_1 represents C_1–C_4 alkyl, C_2–C_4 alkenyl or phenyl and R_2 represents C_1–C_4 alkyl, processes for their production and their use for pest control.

3,718,684
METHOD FOR SYNTHESIZING ALPHA-HALOACRYLONITRILE ACID

Kailash C. Pande, and George M. Trampe, both of Parkersburg, W. Va., assignors to Borg-Warner Corporation, Chicago, Ill.

Filed Oct. 7, 1969, Ser. No. 864,540

Int. Cl. C07c *121/16*

U.S. Cl. 260—465.7 **2 Claims**

A method of preparing α-haloacrylic acid and derivatives thereof from dihalopropionic acid and derivatives using aqueous ammonium hydroxide or anhydrous ammonia. The reaction proceeds by dehydrohalogenation of the dihalo compound to provide the α-halo compound.

3,718,685
FLUORENOL BIS-BASIC ESTERS

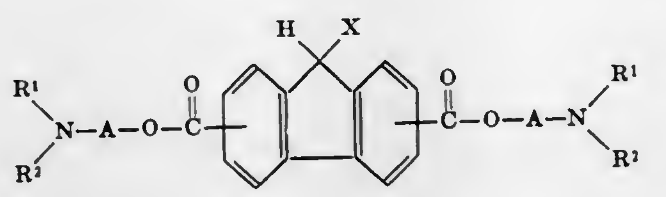
Arthur D. Sill, and Robert W. Fleming, both of Cincinnati, Ohio, assignors to Richardson-Merrell Inc., New York, N.Y.

Division of Ser. No. 790,171, Jan. 9, 1969, Pat. No. 3,647,860. This application May 14, 1971, Ser. No. 143,424

Int. Cl. C07c *69/76*

U.S. Cl. 260—473 F **7 Claims**

Novel fluorene and fluorenol bis-basic ester compounds, their method of preparation and use as antiviral agents. The compounds are of the formula



wherein:

A. each of R^1 and R^2 is hydrogen, (lower) alkyl, cycloalkyl of three to six ring carbon atoms, alkenyl of three to six carbon atoms or each set of R^1 and R^2 taken together with the nitrogen to which they are attached is pyrrolidino, piperidino, N-(lower)alkylpiperazino or morpholino;

B. each A is alkylene of two to about eight carbon atoms and separates its adjacent oxygen and nitrogen atoms by an alkylene chain of at least two carbon atoms; and

C. X is H or OH; or a pharmaceutically acceptable acid addition salt thereof.

3,718,686
ALKYNYL ESTERS OF ALKOXYBENZOIC ACIDS

Madhukar Subraya Chodnekar, Basel; Albert Pfiffner, Pfaffhausen; Norbert Rigassi, Arlesheim; Ulrich Schwieter, Reinach, and Milos Suchy, Basel, all of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed March 10, 1971, Ser. No. 123,060

Claims priority, application Switzerland, March 25, 1970, 4621/70

Int. Cl. C07c *69/78*

U.S. Cl. 260—473 R **8 Claims**

Alkynyl, benzyl or phenyl, ethers and esters which are ring substituted with an oxy or a thio aliphatic chain. These ethers and esters are useful in killing and preventing the proliferation of insects by upsetting their hormonal balance.

3,718,687
SULFUR CONTAINING CARBOXYLIC ACIDS

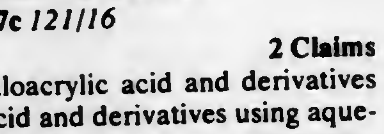
Carl D. Emerson, Kansas City, and Paul C. Aichenegg, Prairie Village, Kans., assignors to Baychem Corporation, New York, N.Y.

No Drawing. Application June 20, 1969, Ser. No. 835,229, now Patent No. 3,629,313, which is a division of application Ser. No. 401,253, Oct. 2, 1964, now Patent No. 3,442,941. Divided and this application May 6, 1970, Ser. No. 35,238

Int. Cl. C07c *149/00, 149/20*

U.S. Cl. 260—479 R **12 Claims**

Compounds are prepared having the formula



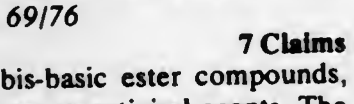
$$R_2SS-\left(\overset{R_1}{\underset{R_3}{C}}\right)_x-COR_4$$

where

R_1 and R_3 are selected from the group consisting of hydrogen, lower alkyl, carboxyl lower alkyl, carbocyclic aryl, carbocyclic haloaryl, haloalkyl, and ester of carboxy lower alkyl;

R_2 is selected from the group consisting of polyhaloethyl and polyhalovinyl;

R_4 is selected from the group consisting of OH, SH, alkyl, carbocyclic aryl, halocarbocyclic aryl, haloalkyl, and alkylthioalkyl,



where R_6 and R_7 are selected from the group hydrogen, alkyl and carbocyclic alkyl and R_6 and R_7 together with N complete a heterocyclic ring, and OMe where Me is selected from the group consisting of the metals of Groups I, II, VI, VII and VIII of the Periodic Table; and *x* is an integer from 1 to 2 inclusive. Such materials have been found useful to kill nematodes, fungi and undesirable plants. They are also useful as defoliating agents.

3,718,688
ALKYLIDINE AND ARYLIDINE AMINO ACID ESTERS, AND ALKYL AND ARYL AMINO ACID ESTERS

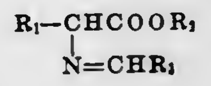
Jefferson W. Davis, c/o Radio-Carbon Lab., 1012 Washington Street, San Carlos, Calif.

Filed Oct. 18, 1967, Ser. No. 676,057

Int. Cl. C07c *101/14*

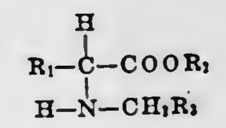
U.S. Cl. 260—482 R **3 Claims**

Several series of new organic compounds and methods of preparing same are disclosed. These include compounds of the general formula for alkylidine and arylidine amino acid esters:



$$R_1-\underset{\underset{N=CHR_3}{|}}{CH}COOR_2$$

and the general formula for alkyl and aryl amino acid esters:



$$R_1-\overset{H}{\underset{H-N-CH_2R_3}{C}}-COOR_2$$

For both these formulas, R_1 and R_3 are each of the group consisting of H, an aryl or alkyl radical, with or without other functional groups and R_2 is an alkyl radical or aryl radical with or without functional groups. The compounds are useful for identification of amino acids by gas liquid chromatography and as pharmaceuticals, and for the separation of L-amino acids from natural sources, such as protein and peptide hydrolysates.

3,718,689

PREPARATION OF TRISUBSTITUTED-HYDROXYALKYL ALKANOATES

James H. McCain, and Louis F. Thelling, both of Charleston, W. Va., assignors to Union Carbide Corporation, New York, N.Y.

Filed Feb. 10, 1972, Ser. No. 225,108
Int. Cl. C07c *67/00*

U.S. Cl. 260—494 **8 Claims**

A continuous process for producing high ratios of trisubstituted-hydroxyalkyl alkanoate product with relation to undesirable trisubstituted alkanediol by-product which comprises continuously subjecting, in a longitudinal-flow zone, an intimate liquid mixture comprising aldehyde and small amounts of relatively concentrated aqueous basic solution.

3,718,690

FORMATION OF NAPHTHALENE-2,6-DICARBOXYLIC ACID

Ronald D. Bushick, Glen Mills, Pa., and Oscar L. Norman, Wilmington, Del. (both % Sun Oil Company, P.O. Box 426, Marcus Hook, Pa. 19061), and Harry J. Spinelli, 14 New Almond St., Vineland, N.J. 08360
No Drawing. Filed Dec. 30, 1971, Ser. No. 214,467
Int. Cl. C07c *63/38*

U.S. Cl. 260—515 P **4 Claims**

A method of preparing pure naphthalene-2,6-dicarboxylic acid in high selectivity by reacting sodium-2-naphthoate with carbon monoxide, sodium carbonate and sodium formate at a temperature in the range of about 275 to 450° C. and in a carbon monoxide atmosphere at a gauge pressure of about 300 to 700 p.s.i.

3,718,691

REDUCTION OF AQUEOUS THIOSULFATE SOLUTIONS CONTAINING FORMATE WITH CARBON MONOXIDE

Paul M. Yavorsky, Monongahela, and Everett Gorin, Pittsburgh, both of Pa., assignors to Consolidation Coal Company, New York, N.Y.

Division of Ser. No. 128,750, March 29, 1971, Pat. No. 3,687,614, which is a continuation-in-part of Ser. No. 879,224, Nov. 24, 1969, Pat. No. 3,584,042, which is a continuation-in-part of Ser. No. 667,479, Sept. 13, 1967, abandoned. This application April 12, 1972, Ser. No. 243,259
Int. Cl. C07c *51/00*

U.S. Cl. 260—542 **7 Claims**

Sodium, potassium, or ammonium thiosulfate is converted in one stage to the corresponding formate and H_2S by heating the thiosulfate to an elevated temperature above 475°F. in the presence of carbon monoxide, steam, and one of the following: sodium, potassium, and ammonium formates.

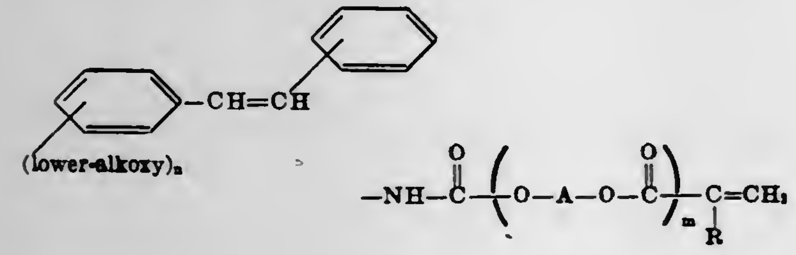
3,718,692

N-STILBENYLACRYLAMIDES

Durvasula V. Rao, Hamden, Henri Ulrich, Northford, and Fred A. Stuber and Adnan A. R. Sayigh, North Haven, Conn., assignors to The Upjohn Company, Kalamazoo, Mich.
No Drawing. Original application Oct. 6, 1969, Ser. No. 864,218, now Patent No. 3,583,940. Divided and this application Feb. 1, 1971, Ser. No. 111,692
Int. Cl. C07c *103/60*

U.S. Cl. 260—562 A **2 Claims**

Stilbenes of the formula



wherein *n* is an integer from 1 to 3, *m* is an integer from 0 to 1, A is lower-alkylene and R is hydrogen or lower-alkyl, are disclosed, as well as homopolymers of said compounds, and copolymers of said compounds with monomers containing a polymerizable $CH_2{=}C{<}$. The above stilbenes and the polymers derived therefrom are photosensitive and can be used in the preparation of photoresist systems.

3,718,693

MONOMERIC EMULSION STABILIZERS CONTAINING AN N-DIALLYLACETAMIDO OR N-DIMETHALLYLACETAMIDO RADICAL

Carlos M. Samour, Wellesley, and Mildred C. Richards, Wakefield, both of Mass., assignors to The Kendall Company, Walpole, Mass.

Filed May 26, 1970, Ser. No. 40,715
Int. Cl. C07c *103/30*

U.S. Cl. 260—561 A **11 Claims**

Quaternary ammonium salts having an N-diallylacetamido or N-dimethallylacetamido radical and a lipophilic radical covalently linked to the quaternized nitrogen are disclosed. These quaternary ammonium salts are useful as monomeric emulsion stabilizers.

3,718,694

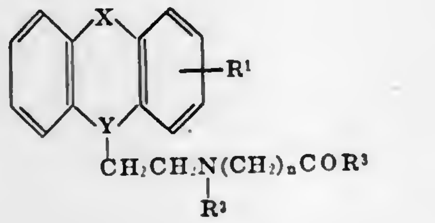
N-ARYLACYLAMINO-ALKYL- AND-ALKYLIDENE-DIBENZO [a,d]CYCLOHEPTENES AND-ANTHRACENES AND THE SALTS THEREOF

Edgar Eriksoo; Hans Jacob Fex; Knut Bertil Hogberg, all of Halsingborg; Henri Rene' Mollberg, Paarp, and Oskar Adolf Rohte, Raa, all of Sweden, assignors to Aktiebolaget Leo, Halsovagen, Halsingborg, Sweden

Filed Oct. 1, 1969, Ser. No. 862,918
Claims priority, application Sweden, Oct. 9, 1968, 13649/1968
Int. Cl. C07c *87/28*

U.S. Cl. 260—570.5 C **8 Claims**

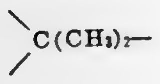
The new compounds of this invention correspond to the general formula



(I)

wherein

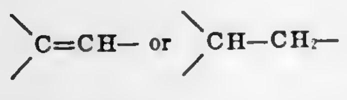
X represents the radicals $-CH_2-CH_2-$, $-CH{=}CH-$,



$>C(CH_3)_2-$

or —S— and

Y represents the radicals



$>C{=}CH-$ or $>CH-CH_2-$

(where the aromatic rings are attached to the same carbon atom),

n is 1, 2 or 3 (*n* = 1 is preferred),

R^1 represents H, F, or Cl,

R^2 represents an alkylgroup containing not more than four carbon atoms (methyl is preferred),

R^3 represents a phenyl, thienyl, furyl, or pyrryl group optionally substituted with not more than three, equal or different, substituents selected from the group consisting of F, Cl, OH, CF_3, as well as an alkyl and an alkoxy group containing not more than four carbon atoms; or a phenyl group substituted at 3,4-positions with an alkylidenedioxy (containing not more than six carbon atoms), cycloalkylidenedioxy (containing not more than six carbon atoms), cycloalkylidenedioxy (containing not more than six carbon atoms) or ethylenedioxy group, the compounds act on the C.N.S. as well as pharmaceutically acceptable acid addition salts thereof.

3,718,695

PURIFYING BIS(PERFLUOROALKYL) NITROXIDE

Russell R. Reinhard, Hopewell Junction, N.Y., and William D. Blackley, Lake Elmo, Minn., assignors to Texaco Inc., New York, N.Y.

Division of Ser. No. 811,119, March 27, 1969, Pat. No. 3,644,449. This application Feb. 11, 1971, Ser. No. 114,713
Int. Cl. C07c *87/22*

U.S. Cl. 260—583 D **2 Claims**

A method of purifying crude bis(perfluoroalkyl) nitroxide comprising contacting said crude nitroxide with mercury at a temperature between about −10 and 35°C. utilizing a reactant mole ratio of crude nitroxide of said mercury to said crude nitroxide of between about 1:10 and 100:1 to form a bis(perfluoroalkyl) nitroxide mercuride intermediate, separating said mercuride, and heating said separated mercuride at between about 50 and 100°C. to reform said mercury and bis(perfluoroalkyl) nitroxide and separating the reformed nitroxide from the reformed mercury.

3,718,696

PROCESS FOR THE PREPARATION OF MACROCYCLIC COMPOUNDS AND NOVEL COMPOUNDS PRODUCED THEREBY

Bradja D. Mookherjee, Matawan, and Ernst T. Theimer, Rumson, both of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Filed March 11, 1970, Ser. No. 18,757
Int. Cl. C07c *49/27, 45/02*

U.S. Cl. 260—586 A **1 Claim**

A process for preparing muscone for 1,9-cyclohexadecadiene involving a number of steps. Monoepoxidized 1,9-cyclohexadecadiene upon treatment with alkyl lithium is converted into an α,β-unsaturated alcohol and oxidized into the corresponding α,β-unsaturated ketone. This upon treatment with alkyl magnesium halide in the presence of cuprous chloride is converted to β-methyl-cyclohexadecenone and then hydrogenated to homomuscone (β-methyl-cyclohexadecanone). Homomuscone dibromide undergoes a Favorski rearrangement to produce a mixture β-and γ-methyl-cyclopentadecene-carboxylates (3:7) which on treatment with hydrazoic acid is converted into α-methyl-cyclopentadecanone and muscone, respectively.

3,718,697

NOVEL FRAGRANCE MATERIALS AND PROCESSES THEREFOR

Seymour Lemberg, 218 Heats Avenue, Elizabeth, N.J.

Continuation-in-part of Ser. No. 667,452, Sept. 13, 1967, abandoned. This application Aug. 13, 1968, Ser. No. 764,978
Int. Cl. C07c *45/02, 40/27*

U.S. Cl. 260—586 A **6 Claims**

Fragrance materials prepared by acylation with cyclization of trimethylcyclododecatriene, processes for producing same, and perfume compositions containing such materials.

3,718,698

ISOLONGIFOLENE PROCESSES AND PRODUCT

John B. Hall, Oakhurst, N.J., assignor to International Flavors & Fragrances Inc., New York, N.Y.

Filed Nov. 24, 1969, Ser. No. 879,543
Int. Cl. C07c *45/04*

U.S. Cl. 260—587 **11 Claims**

Novel processes for producing isolongifolene ketone and its epimer which comprise treating isolongifolene with a peroxygen compound under acidic conditions to obtain a substantially fully saturated ketone, as well as the saturated epimer, and perfume compositions containing such products.

3,718,699

PROCESS OF PREPARING 4,4'-DITHIOBIS (2,6-DI-t-BUTYLPHENOL)

Tamotsu Fujisawa and Mizuo Yamamoto, Sagamihara, Japan, assignors to Sagami Chemical Research Center, Tokyo, Japan
No Drawing. Filed Apr. 24, 1970, Ser. No. 31,756
Claims priority, application Japan, Apr. 30, 1969, 44/32,755
Int. Cl. C07c *149/38*

U.S. Cl. 260—608 **4 Claims**

A new process for the preparation of 4,4'-dithiobis(2,6-di-t-butylphenol) is disclosed.

Hindered phenol, 2,6-di-t-butylphenol, is reacted with sulfur monochloride in the absence or presence of a catalytic amount of iron powder or a Lewis acid. The process yields 4,4'-dithiobis(2,6-di-t-butylphenol) economically and in a high yield.

3,718,700

NEW AND USEFUL DITHIOLS, THEIR PREPARATION AND COMPOSITIONS MADE FROM THEM

Christian Esclamadon, 64 Billere; Yves Labat, 64 Pau, and Jean-Baptiste Signouret, 64 Billere, all of France, assignors to Societe Anonyme dite: Societe Nationale des Petroles D'Aquitaine, Tour Aquitaine, France

Filed Jan. 28, 1970, Ser. No. 6,553
Claims priority, application France, Jan. 31, 1969, 6902064
Int. Cl. C07c *149/14*

U.S. Cl. 260—609 R **3 Claims**

New dithiol compounds have formal and thioether groups and the general formula

$$HS-R-S-(CH_2)_3-O-CH_2-O-(CH_2)_3-S-R-SH$$

in which R is a divalent radical of from one to 10 carbon atoms; it can be a substituted or unsubstituted, linear or branched aliphatic group, a cycloalkyl group or an aromatic group, and it may comprise one or more thioether groups. These compounds are prepared by causing a dithiol of the formula HS—R—SH to react with a diallyl formal.

These new dithiol compounds are used for the plasticization of sulphur and for the production, as new industrial products, of plastic sulphur compositions.

3,718,701

PREPARATION OF MIXED UNSYMMETRICAL ETHERS

John M. Holovka, Englewood, and Edward Hurley, Jr., Littleton, both of Colo., assignors to Marathon Oil Company, Findlay, Ohio

Filed Feb. 18, 1970, Ser. No. 12,439
Int. Cl. C07c *41/10*

U.S. Cl. 260—611 R **8 Claims**

Salts of Group VIII, row 5 and 6, metals, e.g. ruthenium chloride, catalyze liquid phase homogenous catalysis reaction of alpha, alpha-disubstituted olefins with alcohols to produce mixed ethers. These ethers are widely used in the formation of resins, medicines, preservatives, dyes, plastics, solvents and chemical intermediates.

3,718,702

PROCESS FOR PRODUCING DILITHIO HYDROCARBONS

Thomas A. Antkowiak, Cuyahoga Falls, Ohio, assignor to The Firestone Tire & Rubber Company, Akron, Ohio

Filed April 14, 1971, Ser. No. 134,059

Int. Cl. C07f *1/02*

U.S. Cl. 260—665 R **5 Claims**

Dilithio hydrocarbons are produced by heating allyllithium or a hydrocarbon-substituted allyllithium for 20–200 hours at 50°–150° C. Substituted allyllithiums can have alkyl groups or aryl groups, but must have replaceable allylic hydrogen. The products are useful as iniators for polymerization.

3,718,703

BISORGANOALKALINE EARTH METAL COMPOUNDS AND A METHOD OF PREPARING SAME FROM BISORGANOMERCURIALS

Peter West, Wellesley, and Mary C. Woodville, Cambridge, both of Mass., assignors to The Dow Chemical Company, Midland, Mich.

Filed July 2, 1970, Ser. No. 52,082

Int. Cl. C07f *3/00, 3/04*

U.S. Cl. 260—665 R **23 Claims**

Novel bisorganoalkaline earth metal compounds are prepared by reacting bisorganomercurials with calcium, strontium or barium. The novel process is conducted in a solvent. As an example, dibenzylcalcium is prepared by reacting dibenzylmercury with calcium in tetrahydrofuran. The bisorganoalkaline earth metal compounds are useful as metallating reagents in organic synthesis and as initiators in the polymerization of vinyl monomers, such as styrene and butadiene.

3,718,704

METHYLATION PROCESS

Duane K. Chapman; John W. Newman, both of Ashland, Ky., and William S. Green, Columbus, Ohio, assignors to Ashland Oil Inc., Columbus, Ohio

Filed Jan. 8, 1971, Ser. No. 105,108

Int. Cl. C07c *3/52*

U.S. Cl. 260—671 M **23 Claims**

A process for methylating an organic compound which comprises contacting the organic compound with a carbon-oxide containing reactant gas in the presence of an oxide of a Group IB, IIB, and/or VIB metal containing catalyst, and at a temperature between about 400° F and about 1200° F.

3,718,705

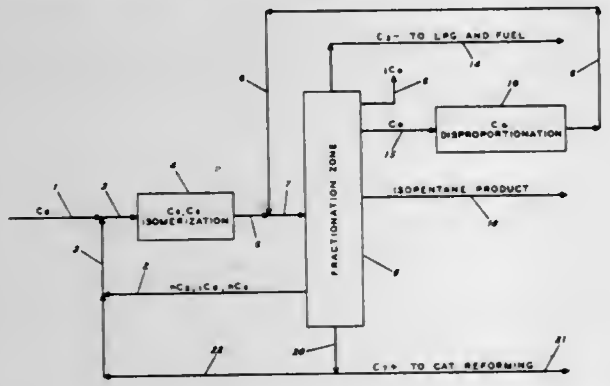
HEXANE CONVERSION

Jacob D. Kemp, El Cerrito, and Robert P. Sieg, Piedmont, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Jan. 18, 1971, Ser. No. 107,202

Int. Cl. C07c *9/00*

U.S. Cl. 260—676 R **12 Claims**



A process for producing isopentane which comprises: (a) isomerizing a C_6-rich hydrocarbon fraction in an isomerization zone to obtain at least isopentane and C_4 alkanes, (b) fractionating the isopentane from the C_4 alkane to obtain an isopentane product, (c) disproportionating at least a portion of the C_4 alkanes in a C_4 disproportionation zone to obtain at least n-pentane and C_3 hydrocarbons, and (d) isomerizing the n-pentane in the isomerization zone. Preferably, the isomerization zone uses a sulfactive isomerization catalyst so that the isomerization zone serves not only an isomerization function but also a purification function for subsequent disproportionation.

3,718,706

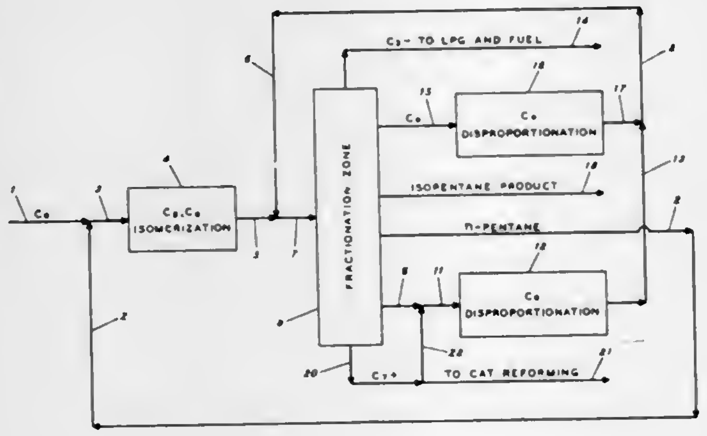
HEXANE CONVERSION

Robert P. Sieg, Piedmont, Calif., assignor to Chevron Research Company, San francisco, Calif.

Filed Jan. 18, 1971, Ser. No. 107,207

Int. Cl. C07c *9/00*

U.S. Cl. 260—676 R **14 Claims**



A process for producing isopentane which comprises: (a) isomerizing a C_6rich fraction in an isomerization zone to obtain at least isopentane and C_6 alkanes, (b) fractionating the isopentane from the C_6 alkane to obtain an isopentane product, (c) disproportionating at least a portion of the C_6 alkanes in a C_6 disproportionation zone to obtain at least n-pentane and C_7 hydrocarbons, and (d) isomerizing the n-pentane in the isomerization zone. Preferably, the isomerizing zone uses a sulfactive isomerization catalyst so that the isomerization zone serves not only an isomerization function but also a purification function for subsequent disproportionation. Normal butane produced in the C_6 disproportionation zone is preferably disproportionated in a separate disproportionation zone to produce normal pentane which is isomerized to isopentane. It is particularly preferred to further integrate the disproportionation with the isomerization using common fractionation facilities.

3,718,707

OXIDATIVE DEHYDROGENATION

James A. Knippa, Jr., and Andrew K. Schwartz, Jr., both of Houston, Tex., assignors to Petro-Tex Chemical Corporation, Houston, Tex.

Filed Feb. 19, 1971, Ser. No. 117,129

Int. Cl. C07c *5/18, 11/30*

U.S. Cl. 260—678 **7 Claims**

Oxidative dehydrogenation of hydrocarbons using oxygen and halogen and a catalyst of FeA_xMo_y with x being from 0.01 to 0.5 and y being from 0.001 to 0.1 and A being calcium, magnesium, strontium, barium or mixtures. n-Butane is dehydrogenated to a mixture of butadiene-1,3 and vinyl acetylene using a catalyst containing Fe, Mg, Ca and Mo.

3,718,708

METHOD AND APPARATUS FOR THERMAL CRACKING AND QUENCHING

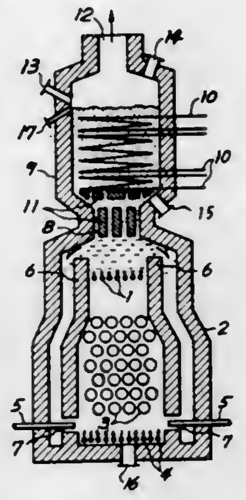
Tokuji Ozawa, Sakai, Mikio Uyeda, Amagasaki, and Shigenori Suzuki, Osaka, Japan, assignors to Mitsui Shipbuilding and Engineering Co., Ltd., Tokyo, Japan

Filed July 16, 1970, Ser. No. 55,403

Claims priority, application Japan, July 18, 1969, 44/56,987

Int. Cl. C07c *3/00*

U.S. Cl. 260—683 R **9 Claims**



Thermal cracking apparatus having a lower portion comprising a heating and reaction tower and an upper portion comprising a quenching tower. The lower portion includes spouting nozzles for dilution agents which cause circulation of the molten material in the tower, heating tubes, and raw material inlet nozzles, all arranged to be submerged in molten metal. The upper portion is provided with quenching tube bundles which are covered by fluidized solid grains or oils of high boiling point, the material being fluidized by the reaction products and diluents which are discharged from the lower portion.

3,718,709

PROCESS FOR PRODUCING ETHYLENE

Massimo Simonetta, Milan, Italy, assignor to Societa Italiana Resine S.I.R. S.p.A., Milan, Italy

Continuation-in-part of Ser. No. 705,578, Feb. 12, 1958, abandoned. This application July 31, 1970, Ser. No. 60,149

Claims priority, application Italy, Feb. 23, 1967, 12962 A/67

Int. Cl. C07c *3/00*

U.S. Cl. 260—683 R **7 Claims**

Hydrocarbons having a boiling point above 300° C (fuel oils) are vaporized by means of direct superheated steam; after separation of any liquid components a further amount of superheated steam is added to obtain a feed at 450°–550° C for a tubular pyrolysis reactor operating at 700°–800°C. The total steam content in the feed is 0.5 to 5.0 parts by weight steam per part by weight of the hydrocarbon.

3,718,710

HYDROTREATING AND HYDROISOMERIZING C_5 AND C_6 HYDROCARBON STREAMS

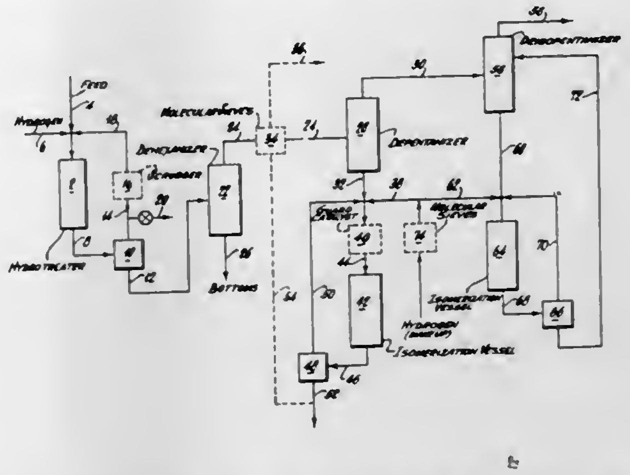
Robert E. Quisenberry, Port Arthur, Tex., assignor to Texaco, Inc., New York, N.Y.

Filed June 30, 1971, Ser. No. 158,308

Int. Cl. C07c *5/28*

U.S. Cl. 260—683.67 **12 Claims**

A process is provided for upgrading a light naphtha fraction containing impurities deleterious to isomerization catalyst life and major amount of C_5 and C_6 hydrocarbons into plurality of relatively high octane hydrocarbon streams by hydrotreating the naphtha fraction and recovering a C_5—C_6 isomerizable hydrocarbon stream, separating the C_5 hydrocarbons from the C_6 hydrocarbons and introducing into separate reaction zones the C_5 and C_6 hydrocarbons respectively along with hydrogen under isomerization conversion conditions allowing consistent production of high octane blending components, separating and recovering from each conversion zone the iso C_5 and iso C_6 products and recycling for introduction to the respective isomerization reaction zones unconverted normal C_5 and C_6 components.



3,718,711

POLYCHLORAL HOMOPOLYMERS CONTAINING POLYETHERS, POLYOLEFINS, OF POLYURETHANES

John C. Crano, Akron, Ohio, and Gerald M. Trenta, Norman, Okla., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed May 24, 1971, Ser. No. 146,522

Int. Cl. C08d *9/02*

U.S. Cl. 260—823 **16 Claims**

A polymer blend alloy comprising polychloral and an elastomer is disclosed. The polymer blend alloy is characterized by the presence of a single solid phase when viewed under an optical microscope at a magnification of 1,000 times and is particularly tough and durable. This chloral polymer is produced by polymerizing chloral in the presence of a dissolved elastomer.

3,718,712

PRESSURE-SENSITIVE ADHESIVES BASED ON CYCLIC TERPENE URETHANE RESIN

Leonard A. Tushaus, Bloomington, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed March 1, 1971, Ser. No. 119,838

Int. Cl. C08g *41/04, 22/16*

U.S. Cl. 260—858 **24 Claims**

Pressure-sensitive polyurethane adhesives having the combined properties of high peel adhesion, quick stick, shear strength, and resistance to hydrocarbon solvents comprise the crosslinked polyurethane reaction product of the in situ reaction of polyhydroxyl terminated polyethers and polyesters with polyisocyanates to provide a product having a molecular weight between crosslinks of about 6,000 to about 40,000 and a urethane group concentration of about 0.7 to 1.3 per 1000 gms of polymer, and tackifier comprising the reaction product of cyclic terpene alcohols and aromatic isocyanates.

3,718,713

THERMOPLASTIC POLYAMIDE POLYESTER URETHANE UREA RESIN

Atsushi Tanaka, Ibaraki-shi, and Hachiro Goto, Takatsuki-shi, both of Japan, assignors to Teijin Limited, Osaka, Japan

Filed April 26, 1971, Ser. No. 137,657

Claims priority, application Japan, April 28, 1972, 45/36628

Int. Cl. C08g *41/04, 22/10*

U.S. Cl. 260—858 **10 Claims**

A thermoplastic polyamide urethane urea resin derived from (A) a liner polyhydroxyl terminated prepolymer free from ethylene terephthalate units, which has an average molecular weight of 400 to 4,000 and is liquid at 80° C., (B) a linear hydroxyl-terminated polyester prepolymer, which has a molecular weight of 400 to 3,000 and a melting point of 50° to 220° C. and in which 35 to 95 percent by weight of the molecular chain consists of ethylene terephthalate units, (C) a linear polyamide prepolymer having an average molecular weight of 400 to 4,000 and a melting point of 100° to 200° C., in which at least 80 percent of the both terminal groups are amino groups, and (D) an organic diisocyanate; the composition of the reaction components (A), (B), (C) and (D) being as follows:

i. (D)/((A) + (B) + (C)) (mole ratio) 1
ii. ((B) + (C))/(A) (weight ratio) = 0.5 – 2
iii. (C)/((B) + (C)) (weight ratio) = 0.06 – 0.85
iv. (C)/((A) + (B) + (C) + (D)) (weight %) = 3 – 55.

3,718,714

UNSATURATED POLYESTER COMPOSITIONS

Lowell R. Comstock, South Charleston, and Percy L. Smith, Dunbar, W. Va., assignors to Union Carbide Corporation, New York, N.Y.

No Drawing. Filed Sept. 16, 1970, Ser. No. 72,798
Int. Cl. C08f *37/16, 43/08*
U.S. Cl. 260—862 23 Claims

The disclosure of this application is directed to unsaturated polyester compositions, containing a thermoplastic polymer of vinyl acetate having an average of at least one carboxyl group per molecule, which have particular utility in sheet molding applications to form thermoset articles characterized by excellent impact strength and by excellent surface properties such as excellent smoothness, excellent receptiveness to paints and excellent reproduction of the surface contours of the mold in which they are formed into shaped, thermoset articles.

3,718,715

BLENDS OF THERMOPLASTIC COPOLYESTER ELASTOMERS WITH VINYL CHLORIDE POLYMERS

Robert W. Crawford and William K. Witslepe, Wilmington, Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed May 19, 1971, Ser. No. 145,062
Int. Cl. C08g *39/10*
U.E. Cl. 260—873 14 Claims

A uniform blend of about 5–95% by weight vinyl chloride polymer having a tensile modulus of at least about 50,000 p.s.i. and about 95–5% by weight of at least one thermoplastic segmented copolyester polymer containing (1) about 5–90 weight percent long chain ester units derived from at least one long chain glycol having a molecular weight of about 600–6000 and at least one low molecular weight dicarboxylic acid having a molecular weight less than about 300, and (2) about 10–95 weight percent short chain ester units derived from at least one low molecular weight diol having a molecular weight of less than about 250 and at least one low molecular weight dicarboxylic acid having a molecular weight of less than about 300. These blends exhibit excellent abrasion resistance which is maintained even in the presence of a large amount of plasticizer, improved low temperature flexibility, impact resistance and increased scuff resistance. These blends also exhibit improved processing because of excellent thermal stability and low melt viscosity.

3,718,716

ACRYLIC FIBER AND A METHOD FOR MANUFACTURING THE SAME

Yasushi Joh, and Koji Mimura, both of Otake, Japan, assignors to Mitsubishi Rayon Company Limited, Tokyo, Japan

Filed Dec. 11, 1970, Ser. No. 97,330
Claims priority, application Japan, Dec. 11, 1969, 44/99728; March 31, 1970, 45/26553
Int. Cl. C08f *29/56*
U.S. Cl. 260—898 8 Claims

A novel acrylic fiber having enhanced hydroscopic and antistatic properties is obtained from a copolymer (A) comprising, as unit components, at least 10 percent by weight of acrylonitrile, 0.2 to 20 percent by weight of N-3-oxo-hydrocarbon-substituted acrylamide and balancing quantity of the third hydrophilic monomer.

The acrylic fiber may be prepared from a mixture of the copolymer (A) and another copolymer (B) which comprises, as a unit component, at least 85 percent by weight of acrylonitrile.

For convenience, the two carbon atoms of the main chain of the ethylene group in the R' group are numbered from the side of the nitrogen atom. In the case the carbon atom directly combined with the nitrogen atom is named as first carbon atom and another as the second carbon atom, R' may be selected from ethylene group and substituted ethylene groups having at least one lower alkyl group combined to the first carbon atom.

3,718,717

ACRYLONITRILE COPOLYMER THREADS AND FILMS CONTAINING A POLYMER OF VINYL METHYL FORMAMIDE

Heino Logemann, Leverkusen, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Sept. 24, 1971, Ser. No. 183,669
Claims priority, application Germany, Sept. 25, 1970, P 20 47 248.4
Int. Cl. C08f *29/56*
U.S. Cl. 260—898 6 Claims

Threads and films of acrylonitrile copolymers which contain 20 to 80 percent by weight of vinylidene chloride and/or vinyl chloride, which threads and films are free from vacuoles. The formation of vacuoles in threads or films of copolymers of acrylonitrile containing 20 to 80 percent by weight of vinylidene chloride and/or vinyl chloride can be substantially reduced or even completely prevented by adding homopolymers of vinyl methyl formamide or copolymers of vinyl methyl formamide with up to 90 mols percent of vinyl esters or acrylic acid esters to the spinning solutions of acrylonitrile copolymers and organic solvents in an amount of 0.5 to 20 percent by weight, based on the copolymer of acrylonirile and vinylidene chloride and/or vinyl chloride.

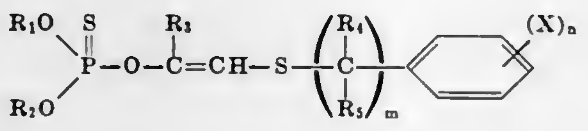
3,718,718

ARALKYLTHIOVINYL PHOSPHOROTHIOATES

Roger Williams Addor, Pennington, and Thomas Walter Drabb, Jr., Trenton, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 807,921, March 17, 1969, abandoned. This application Dec. 7, 1970, Ser. No. 95,908
Int. Cl. C07f *9/16;* **A01n** *9/36*
U.S. Cl. 260—948 7 Claims

The acaricidal and insecticidal compounds have the formula:



wherein:

R_1, R_2 and R_3 are each lower alkyl,
R_4 and R_5 are lower alkyl or hydrogen,
X is lower alkyl or halo,
m is 1 or 2, and
n is 0 to 3

The trans and cis isomeric forms of the above compounds as well as mixtures of the trans and cis forms are embraced with the scope of the above formula.

The compounds are prepared by reacting an α-aralkylthioketone with an 0,0-di(lower)alkyl phosphorohalothioate in the presence of a polar solvent and certain strong bases such as NaOH or KOH.

3,718,719

METHOD OF MAKING A COOL BURNING GUN PROPELLANT

Leslie R. Olsen, Barbados, West Indies, assignor to the United States of America as represented by the Secretary of the Navy

No Drawing. Filed Jan. 27, 1971, Ser. No. 110,330
Int. Cl. C06b *21/02*
U.S. Cl. 264—3 B 4 Claims

A cool burning single base gun propellant composition comprised of a blend 12.6 percent nitration level nitrocellulose and 11.0 percent nitration level nitrocellulose in sufficient quantities to provide an average nitration level of 12 percent and a solvent method for the manufacture of said propellant composition wherein a single solvent ratio of ether and alcohol are employed in the colloidization process.

3,718,720

METHOD FOR MANUFACTURING FIBROUS, CARBONACEOUS COMPOSITES HAVING NEAR ISOTROPIC PROPERTIES

Foraker Lambdin, Jr., Alcoa, and William W. Randles, Knoxville, both of Tenn., assignors to The United States of America as represented by the United States Atomic Energy Commission

Filed Jan. 12, 1971, Ser. No. 105,975
Int. Cl. B29c *25/00;* **C01b** *31/00, 31/07*
U.S. Cl. 264—29 3 Claims

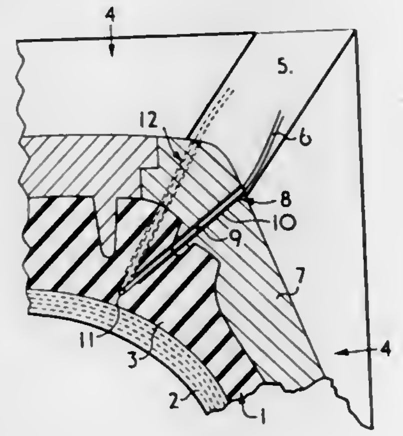
In the preparation of carbonaceous fiber composites a method has been found for controlling the orientation of the fibers whereby composites exhibiting near isotropic properties may be readily fabricated. The method comprises mixing discrete carbonaceous fibers with a particulate thermoplastic binder, heating the mixture sufficiently to melt the binder and attach the intermingled fibers at their nexus, cooling the attached fibers, crushing the fibrous mass into small agglomerates, forming the agglomerates into the desired shape, and thereafter heating the agglomerates to a temperature adequate for successively melting the binder to join together the fibers and converting the binder to carbon.

3,718,721

METHOD FOR CONTROLLING THE STATE OF CURE OF CURABLE ARTICLES

Eric G. Gould, and Edward P. Davis, both of c/o Fort Dunlop, Erdington, England

Continuation-in-part of Ser. No. 857,175, Sept. 11, 1969, Pat. No. 3,649,729, which is a continuation-in-part of Ser. No. 857,642, Sept. 10, 1969, abandoned, which is a continuation of Ser. No. 640,320, May 22, 1967, abandoned. This application Jan. 26, 1970, Ser. No. 5,492
Claims priority, application Great Britain, Feb. 6, 1969, 6,388/69
Int. Cl. B29h *5/02;* **G01n** *25/00*
U.S. Cl. 264—40 11 Claims



A method for controlling the state of cure of at least a part of a curable article during curing in a mould, in which a temperature sensing probe is inserted into a predetermined site in the article and the temperature of the site is monitored as a function of time. The state of cure of the site is computed from the temperature measurements and heating is discontinued when a predetermined state of cure has been reached, of which the following is a specification.

3,718,722

METHOD OF FORMING A POROUS CELLULOSE ACETATE MEMBRANE

Leonard A. Lee, Westfield, N.J., assignor to Celanese Corporation, New York, N.Y.

Continuation of Ser. No. 600,733, Dec. 12, 1966, abandoned. This application Sept. 17, 1970, Ser. No. 73,262
Int. Cl. B29d *7/02, 7/14*
U.S. Cl. 264—41 9 Claims

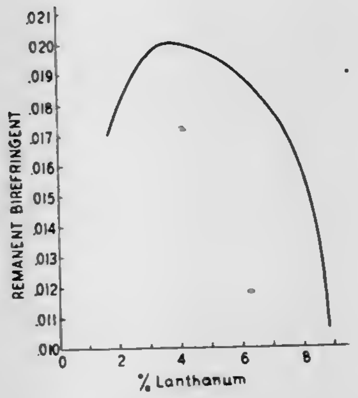
In the method of preparing a porous membrane adapted to separate a solute from a solution comprising: (a) dissolving a film-forming cellulosic ester in a solvent for said ester, (b) casting the resulting solution to form a membrane of substantially uniform thickness, (c) evaporating a portion of said solvent for a period of 0.5 to 5 minutes, (d) immersing the thus cast membrane in water, the steps which comprise: (e) annealing the membrane by initially heating it under tension to a temperature between about 70° and 90°C., which is about 5°–10°C. below the final annealing temperature and then by a final heat treatment without tension at the final annealing temperature from about 75° to 95°C.

3,718,723

USE OF WATER SOLUBLE LANTHANUM COMPOUNDS IN LEAD ZIRCONATE-LEAD TITANATE CERAMICS

David Bruce Fraser, Berkeley Heights, Henry Miles O'Bryan, Jr., Plainfield, and John Thomson, Jr., Spring Lake, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Oct. 23, 1970, Ser. No. 83,417
Int. Cl. C04b *33/12, 35/46, 35/48*
U.S. Cl. 264—61 3 Claims



Highly transparent and optically uniform ferroelectric ceramics in the lanthanum substituted lead zirconate-lead titanate system are produced using a water soluble lanthanum compound as one of the starting materials and processing the materials in accordance with narrowly defined procedures. A preferred class of ceramics is produced starting with materials whose anions are in the proportion; Pb:$(1-x+z)$, La:x, Zr:y and Ti:$(1-y)$ where

$$0.02\leq x\leq 0.12,\ \left(\frac{x}{4}\right)\leq Z\leq 0.8 \text{ and } 0.6\leq y\leq 0.7$$

The use of 2 to 6 percent of a water soluble lanthanum compound results in unexpectedly high remanent birefringence in the hot pressed ferroelectric ceramic body as compared with bodies in which the same amount of lanthanum was added as a finely divided oxide.

3,718,724
METHOD OF BLOW MOLDING HOLLOW THERMOPLASTIC BODIES

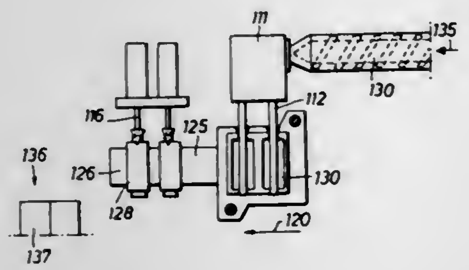
Rainer Holzmann, Roleber, Reiner Kader, Holzlar, and Alfred Thomas, Dambroich, Germany, assignors to Kautex-Werk Reinold Hagen, Hangelar uber Siegburg am Rhineland, Germany

Original application Apr. 28, 1969, Ser. No. 819,724, now Patent No. 3,583,031, dated June 8, 1971. Divided and this application Jan. 13, 1971, Ser. No. 106,187

Claims priority, application Germany, Apr. 6, 1968, P 17 78 404.2; Oct. 14, 1968, P 18 02 915.7–16, P 18 02 916.8; Dec. 7, 1968, P 18 13 367.0; Dec. 10, 1968, P 18 13 618.0

Int. Cl. B29c *17/06, 17/07, 23/00*

U.S. Cl. 264—98 **5 Claims**



For the blow molding of hollow articles there is provided a receiving station where parisons are prepared, a removing station where the blow molded articles are released from the mold and a depositing station where the articles are placed for transportation or treatment. A mold is movable between the receiving and the removing station and a gripper is movable between the removing and the depositing station. When the mold takes a parison in the receiving station, the gripper grasps a blow molded article in the removing station previously left there by the mold. When the mold opens and releases an article in the removing station, the gripper releases the previously grasped article in the depositing station.

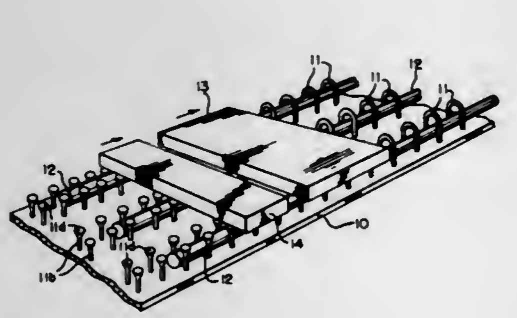
3,718,725
METHOD FOR MAKING HOOK FABRIC MATERIAL FOR FASTENERS

Hisashi Hamano, Soka-shi, Japan, assignor to International Knitlok Corporation, New York, N.Y.

Filed Nov. 17, 1970, Ser. No. 90,382

Int. Cl. B29d *5/00*

U.S. Cl. 264—163 **3 Claims**



Methods are disclosed including the use of heat and chemicals for converting loops upstanding from a base fabric into hook members suitable for use in hook and loop fasteners.

3,718,726
METHOD OF MAKING SHOE BOTTOM MOLD SEALS

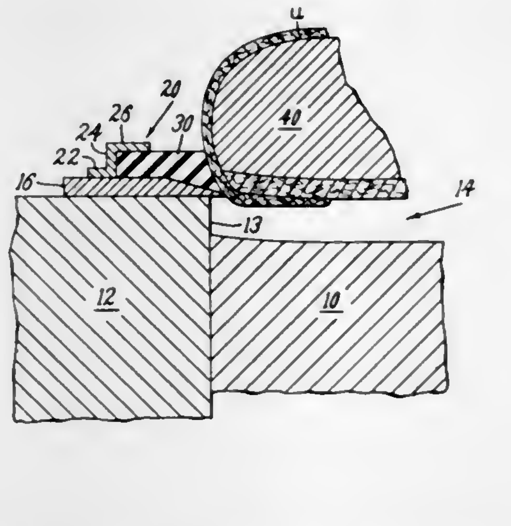
John J. Taylor, Leicester, England, assignor to USM Corporation, Boston, Mass.

Filed Jan. 21, 1971, Ser. No. 108,372

Claims priority, application Great Britain, Jan. 24, 1970, 3,537/70

Int. Cl. B29c *1/02;* **A43d** *65/00*

U.S. Cl. 264—219 **2 Claims**



A shoe sole mold having movable side mold members including plates engaging the side of a shoe with resilient sealing members on the plates and compressible against the shoe for sealing the mold cavity and a method of making said mold.

3,718,727
STRETCHING FILM OF PARTIALLY CRYSTALLINE POLYMERS

Eudaldo Sabater, 6733 Hassloch, and Lothar Schlemmer, 6701 Maxdorf, both of Germany, assignors to Badische Anilin-& Soda-Fabrik Aktiengesellschaft, Ludwigshafen/Rhein, Land Rheinland-Pfalz, Germany

Filed Oct. 5, 1970, Ser. No. 78,104

Int. Cl. B29d *7/24*

U.S. Cl. 264—289 **5 Claims**

Manufacture of stretched film of partially crystalline polymers such as polyamides wherein preformed film is transversely stretched at a temperature of from 80° to 210°C after forming a groove along an edge in the machine direction of the film, the depth of the said groove being from more than one tenth up to thirty times the tolerance of thickness variation of the film.

3,718,728
PROCESS FOR HEAT STABILIZING CELLULOSE TRIACETATE FILMS OR SHEETS

Robert W. Schrader, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 441, Jan. 2, 1970, abandoned. This application April 3, 1970, Ser. No. 25,568

Int. Cl. B29c *25/00;* **B29d** *7/02*

U.S. Cl. 264—346 **2 Claims**

It has been found that highly crystallized cellulose triacetate films or sheets having significantly improved dimensional stability at temperatures as high as 240°–250° C can be manufactured by heating the films or sheets at a temperature within the range of from about 230° C to about 270° C for a very short period of time (at most about 65 seconds) while the films or sheets are maintained under a lengthwise tension of at most about 0.035 pounds per inch.

3,718,729
DEFLUORINATION OF WET PROCESS PHOSPHORIC ACID

Ashok Babubhai Amin, Trenton, N.J., and Robert Lee Bristow, Lakeland, Fla., assignors to American Cyanamid Company, Stamford, Conn.

Filed March 15, 1971, Ser. No. 124,099

Int. Cl. C01b *25/16*

U.S. Cl. 423—321 **11 Claims**

A process for the defluorination of phosphoric acid containing dissolved aluminum is described.

3,718,730
METHOD OF TREATING BARIUM TITANATE

Dennis L. Frey, Metuchen; Sam Divita, West Long Branch, and Edward J. Smoke, Edison, all of N.J., assignors to The United States of America as represented by the Secretary of the Army

Filed June 23, 1971, Ser. No. 156,044

Int. Cl. C01f *11/00;* **C01g** *23/00*

U.S. Cl. 423—81 **1 Claim**

Barium titanate is upgraded by chemically treating the raw powder with acetic acid, ammonium hydroxide, or distilled water.

This invention relates in general to a method of upgrading the dielectric characteristics of ferroelectric materials and in particular to a method of upgrading commercial barium titanate.

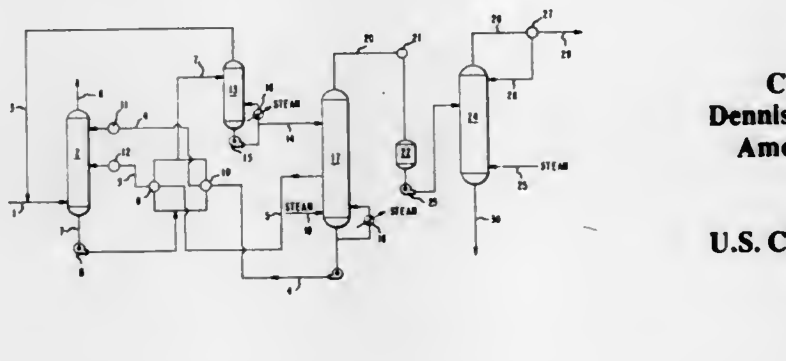
3,718,731
PROCESS FOR RECOVERING AMMONIA FROM A GASEOUS MIXTURE CONTAINING NH3 AND HCN

Harrison Cornforth Carlson, Newark, Del., and Wayne Thomas Hess, Memphis, Tenn., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Oct. 26, 1970, Ser. No. 83,727

Int. Cl. C01c *1/12, 3/04*

U.S. Cl. 423—238 **4 Claims**



An improved process of recovering ammonia from a mixture of gases containing ammonia and hydrogen cyanide is provided. In the process, substantially all of the ammonia and a minor portion of hydrogen cyanide are absorbed in an aqueous solution of ammonium hydrogen phosphate in an absorbing zone, the resulting solution is passed into a hydrogen cyanide removal zone so as to remove absorbed hydrogen cyanide and only a minor proportion of absorbed ammonia, the substantially hydrogen cyanide free solution is passed into a stripping zone to remove the remaining available ammonia, and then the stripped ammonia is collected. The improvement in this process comprises removing the solution from the stripping zone in two streams such that one stream is leaner in ammonia than the second stream and passing both streams to the absorbing zone at a temperature within the range of 40°–70° C., the stream leaner in ammonia passed into the absorbing zone at a point where most of the ammonia has been absorbed.

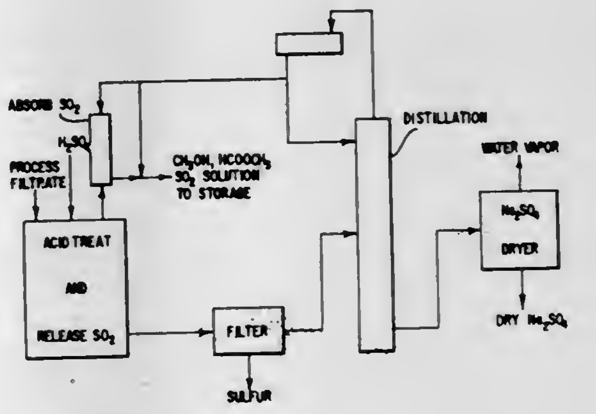
3,718,732
METHOD OF RECOVERING CHEMICAL VALUES FROM A FORMATE-SODIUM HYDROSULFITE REACTION MIXTURE

Charles E. Winslow, Jr., Norfolk, Jack Plentovich, Nanesmond County, and Mearl A. Kise, Portsmouth, Va., assignors to Virginia Chemicals Inc., Portsmouth, Va.

Filed Jan. 13, 1971, Ser. No. 106,179

Int. Cl. C01d *5/02*

U.S. Cl. 423—199 **14 Claims**



Method of recovering chemical values from a waste effluent such as a formate-sodium hydrosulfite reaction medium after removal of the sodium hydrosulfite. The method eliminates from the reaction medium residue those reducing agents which create a chemical oxygen demand in any body of water into which they might be discharged. The method includes: introducing sulfuric acid into the reaction medium; boiling to expel sulfur dioxide, continuing boiling and distilling with reflux of methyl alcohol and methyl formate; filtering the reaction medium residue to remove sulfur; and separating the residue salt from water after removing of sulfur.

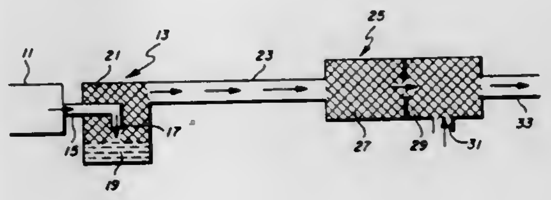
3,718,733
CATALYTIC TREATMENT OF EXHAUST GASES

Dennis C. Gehri, Granada Hills, Calif., assignor to North American Rockwell Corporation

Filed Feb. 20, 1970, Ser. No. 13,246

Int. Cl. B01d *47/02, 53/34*

U.S. Cl. 423—213 **14 Claims**



Nitrogen oxides are removed from a waste gas by reaction with carbon monoxide in the presence of a wire mesh selected from copper-containing alloys. Where the exhaust gas contains lead species or other impurities which tend to poison the catalyst, the exhaust gas contacts a molten alkali metal carbonate mixture which removes the lead species prior to the gas contacting the catalyst. Other poisonous impurities such as sulfur dioxide are also removed by the carbonate mixture.

3,718,734

HYDROGEN PURIFICATION

Robert I. Christensen, San Rafael, and David B. Larimore, Berkeley, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Nov. 16, 1970, Ser. No. 89,673

Int. Cl. C01b *17/16*

U.S. Cl. 423—228 **14 Claims**

In a hydrotreating process, the improvement is made which comprises contacting the recycle hydrogen-rich gas stream with an H_2S and NH_3 absorbent to thereby remove from the recycle hydrogen-rich gas at least 90 volume percent of both the H_2S and NH_3 before the recycle hydrogen-rich gas is recycled to the hydrotreating reactor, omitting aqueous injection into the hydrotreating reactor effluent between the reactor effluent withdrawal point and said high pressure separator, and maintaining conditions of temperature and partial pressures of H_2S and NH_3 above sublimation condition for NH_4SH between the reactor effluent withdrawal point and said high pressure separator.

3,718,735

PROCESS FOR THE PRODUCTION OF PERBORATES

Wolfgang Flatz, Basel, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

Filed July 6, 1970, Ser. No. 52,755

Claims priority, application Switzerland, July 29, 1969, 11519/69; Sept. 5, 1969, 13484/69; Sept. 10, 1969, 13650/69

Int. Cl. C01b *15/12*

U.S. Cl. 423—281 **5 Claims**

This invention relates to a process for the production of perborates by the reaction of dried borates, the particles of which have an inner surface area of at least 0.4 m^2/g, with hydrogen peroxide in an organic solvent.

3,718,736

PROCESS FOR THE MANUFACTURE OF HYDROGEN FLUORIDE

William E. Watson, Mount Tabor, and Richard P. Troeger, Chatham, both of N.J., assignors to Allied Chemical Corporation, New York, N.Y.

Continuation of Ser. No. 876,552, Nov. 13, 1969, abandoned. This application Sept. 20, 1971, Ser. No. 182,261

Int. Cl. C01b *7/22;* **C01f** *11/46*

U.S. Cl. 423—485 **4 Claims**

Hydrogen fluoride is produced continuously by reacting calcium fluoride (fluorspar) and sulfuric acid, at temperatures between about 250° and 600°F. in the presence of more than 3 parts calcium sulfate per part of by-product calcium sulfate produced from said reaction.

3,718,737

PROCESS OF TREATING BILE AND NOVEL IODINE-131 COMPLEX

Harry S. Penn, 2678 Glendower Street, Los Angeles, Calif.

Filed Oct. 20, 1967, Ser. No. 676,732

Int. Cl. A61k *27/04*

U.S. Cl. 424—1 **3 Claims**

This invention, in one aspect, provides a novel process for obtaining a derivative from bovine bile as well as the novel product itself, the latter assaying about 95 percent taurocholic acid; and in a further aspect, provides a novel process for complexing radioactive iodine with the aforementioned bile derivative through the intermediary of a blood-derived protein which is first combined with ^{131}I and then complexed with the derivative and, further, provides this product. The radioactive iodine-containing product is useful in diagnosing tumors since it selectively concentrates in the latter.

3,718,738

N-PHENYL SULFENAMIDES AND THEIR USE AS FUNGICIDES AND ONICIDES

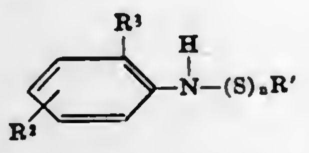
Joseph G. E. Fenyes, Oakland, Calif., assignor to Chevron Research Company, San Francisco, Calif.

No Drawing. Application Jan. 30, 1969, Ser. No. 795,360, now Patent No. 3,549,700, dated Dec. 22, 1970, which is a continuation-in-part of application Ser. No. 545,887, Apr. 28, 1966. Divided and this application Mar. 27, 1970, Ser. No. 29,721

Int. Cl. A01n *9/12, 9/20*

U.S. Cl. 424—32 H **8 Claims**

Compounds of the formula



wherein R^2 is a cyano or nitro group in the para or meta position or a trifluoromethyl group, R^3 is hydrogen or alkyl of 1 to 3 carbon atoms when R^2 is cyano or nitro and R^3 is hydrogen when R^2 is trifluoromethyl, R' is a polyhaloalkyl group having 1 to 2 carbon atoms and 3 to 5 halogens of atomic number 17 to 35, at least one of the halogens being bonded to the α carbon atom, a polyhalovinyl group wherein the halogens are of atomic number 17 to 35 or a 1-halo-1-nitroalkyl group having 2 to 4 carbon atoms wherein the halogen has an atomic number of 17 to 35 and n is 1 or 2 when R' is said polyhaloalkyl group and n is 1 when R' is said 1-halo-1-nitroalkyl group or said polyhalovinyl group. Compounds having the above formula are fungicidal and acarid ovicidal.

3,718,739

TREATING LACTASE DEFICIENCY WITH AN ACTIVE LACTASE

Theodore Cayle, Morganville, N.J., assignor to Baxter Laboratories, Inc., Morton Grove, Ill.

Division of Ser. No. 812,348, April 1, 1969, Pat. No. 3,629,073. This application June 15, 1971, Ser. No. 153,423

Int. Cl. A61k *19/00*

U.S. Cl. 424—94 **2 Claims**

This invention relates to the administration of lactase from *Aspergillus niger* to lactase-deficient mammals.

3,718,740

ANIMAL SEMEN PREPARATIONS OF INCREASED FERTILITY

Harold D. Hafs, and Louis J. Boyd, both of Okemos, Mich., assignors to Research Corporation, New York, N.Y.

Filed March 18, 1971, Ser. No. 125,861

Int. Cl. A61k *17/00*

U.S. Cl. 424—105 **5 Claims**

The fertility of animal semen preparations is increased by adding β-glucuronidase thereto.

3,718,741

N-1 AND N-2 FRACTIONS OF NEOCARZIONSTATIN

Yasuo Koyama, Tokyo, Japan, assignor to Kayaku Antibiotic Research Company, Ltd., Tokyo, Japan

Filed July 21, 1970, Ser. No. 56,874

Claims priority, application Japan, July 24, 1969, 44/58518

Int. Cl. A61k *21/00*

U.S. Cl. 424—118 **2 Claims**

A process of producing an antibiotic substance which comprises fractionating neocarzinostatin by passing an aqueous solution of said material through an ion exchange chromatography column or by electrophoresis and thereafter recovering at least one fraction characterized by a molecular weight of at least 9,000.

3,718,742

ANTIBIOTICS YL 704 AND PREPARATION THEREOF

Tomoharu Okuda and Shigemi Awataguchi, Tokyo, Japan, assignors to Tanabe Seiyaku Co., Ltd., Osaka, Japan

Filed May 13, 1970, Ser. No. 36,989

Claims priority, application Japan, May 19, 1969, 44/38,648

Int. Cl. A61k *21/00;* **C12d** *9/14*

U.S. Cl. 424—121 **19 Claims**

A process for producing an antibiotic, which comprises cultivating a YL 704-producing strain of *Streptomyces platensis* var. sp. in an aqueous nutrient medium under submerged aerobic conditions at about 25–35° C. for about 48 to 60 hours to produce a fermentation broth. The antibiotic is then recovered from the fermentation broth.

3,718,743

5-PHENYL-2-PIPERIDONES AND 5-PHENYL-2-THIOPIPERIDONES IN COMPOSITIONS AND METHODS FOR TREATING PAIN, FEVER AND INFLAMMATION

Tsung-Ying Shen, and Bruce E. Witzel, both of Westfield, N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 808,660, March 19, 1969, abandoned. This application Nov. 19, 1970, Ser. No. 91,175

Int. Cl. A61k *27/00*

U.S. Cl. 424—267 **20 Claims**

Novel 5-phenyl-2-piperidone and 5-phenyl-2-thiopiperidone compounds and the processes for preparing the same are disclosed. In addition the invention concerns piperidones and thiopiperidones which exhibit anti-inflammatory properties and also possess an effective degree of antipyretic and analgesic activity.

3,718,744

PHARMACEUTICAL COMPOSITIONS COMPRISING AN α-AMINOALKYL - 4-HYDROXY - 3 -CARBOALKOXYAMINOBENZYL ALCOHOL

Carl Kaiser, Haddon Heights, N.J., and Stephen T. Ross, Berwyn, Pa., assignors to Smith Kline & French Laboratories, Philadelphia, Pa.

No Drawing. Continuation-in-part of application Ser. No. 34,893, May 5, 1970, now Patent No. 3,657,319, dated Apr. 18, 1972. This application Dec. 3, 1971, Ser. No. 204,718

Int. Cl. A61k *27/00*

U.S. Cl. 424—300 **10 Claims**

Pharmaceutical compositions having β-adrenergic stimulant activity comprising an α-aminoalkyl-4-hydroxy-3-carboalkoxyaminobenzyl alcohol. The active ingredients are prepared from 3-amino-4-benzyloxyphenones by conversion to an isocyanate, reaction with a lower alkanol to give 3-carboalkoxyaminophenones, bromination of these phenones and treatment of the resulting α-bromo derivatives with an N-benzyl secondary amine, followed by catalytic hydrogenation to remove the benzyl groups and reduce the ketone moiety.

3,718,745

METHOD OF SEDATION

Koji Nakanishi, New York, and Jonas A. Gylys, Manilius, N.Y.; said Gylys assignor to Bristol-Myers Company, New York, N.Y.

No Drawing. Filed Feb. 9, 1972, Ser. No. 224,970

Int. Cl. A61k *27/00*

U.S. Cl. 424—311 **2 Claims**

The specification discloses the use of 3,5-dimethyl-5-hydroxy-2,4-dicarbethoxycyclohexanone as a sedative-hypnotic.

ELECTRICAL

3,718,746

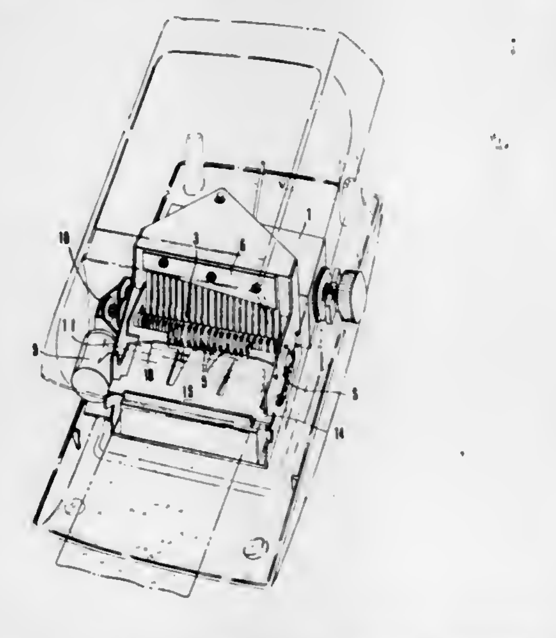
AUTOMATIC SOUND-REPRODUCING APPARATUS

Yoshio Kitamura, and Ikuo Suzuki, both of Suwa-gun, Nagano, Japan, assignors to Kabushiki Kaisha Sankyo Seiki Seisakusho, Suwa-gun, Naganom, Japan

Filed Aug. 28, 1970, Ser. No. 67,849

Int. Cl. G10f *1/06*

U.S. Cl. 84—101 **11 Claims**



An automatic sound-reproducing apparatus designed to cooperate with a relatively rigid music tape or strip on which music is recorded through perforations formed along staff lines that actuate the reproducer means. The automatic sound-reproducing apparatus includes a pair of motor-driven pinch rollers for moving the music tape or strip along its length or in the direction of the staff lines; reproducer means comprising a horizontal shaft driven simultaneously with the pinch rollers and a plurality of discs each having thereon circumferentially spaced, radially extended pins or fingers, said pinned discs being mounted on the horizontal shaft for relative rotation juxtaposed each with two adjacent discs spaced apart from each other at a pre-determined distance substantially equal to the distance between two adjacent lines of the staff; and a metal comb having metal reeds, the free ends of which are extended for contact by the pins or fingers on the discs. When any pin or finger of the pinned disc is brought into engagement with or aligned with the musical-note perforation in the punched music tape or strip which is moved in sliding contact with the discs of the reproducer means responsive to the motor driven pinch rollers, the disc is independently or selectively rotated so that any particular pin or finger thereof touches or plays the metal so as reed to reproduce the sound.

3,718,747

ELECTROCOUSTIC PIPES FOR ELECTRONIC ORGANS

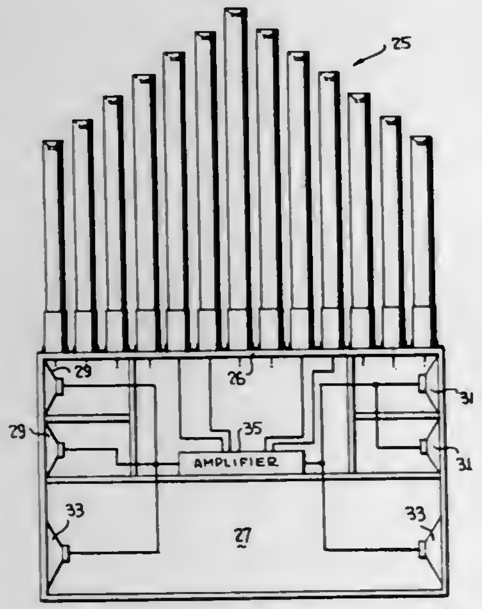
Daniel W. Martin, and John L. Stein, both of Cincinnati, Ohio, assignors to D. H. Baldwin Company, Cincinnati, Ohio

Filed July 29, 1971, Ser. No. 167,172

Int. Cl. G10h *1/00*

U.S. Cl. 84—1.01 **25 Claims**

An acoustic radiation system for an electronic organ, in which separate radiators are used for each tone color, the radiators being physically arranged as in a pipe organ and each including a cylindrical pipe having an upwardly directed loudspeaker in its upper end, the loudspeaker being of the minimum diameter capable of acoustically radiating the band of frequencies over which it may be driven, and the pipe having an enclosed volume appropriate to form a Helmholtz resonator tuned near the lowest frequency of the band, the pipe itself being mechanically rigid in terms of the material of which it is fabricated and also acoustically damped at higher frequencies by virtue of acoustical absorbent material which is distributed internally of the pipe so as to damp out standing waves. Each pipe may be provided with a mouth, shaped and positioned to simulate visually the mouth of a true organ pipe, but of a size acoustically selected to resonate with the pipe enclosure at the desired low frequency to flatten the frequency response over the radiated band of frequencies.

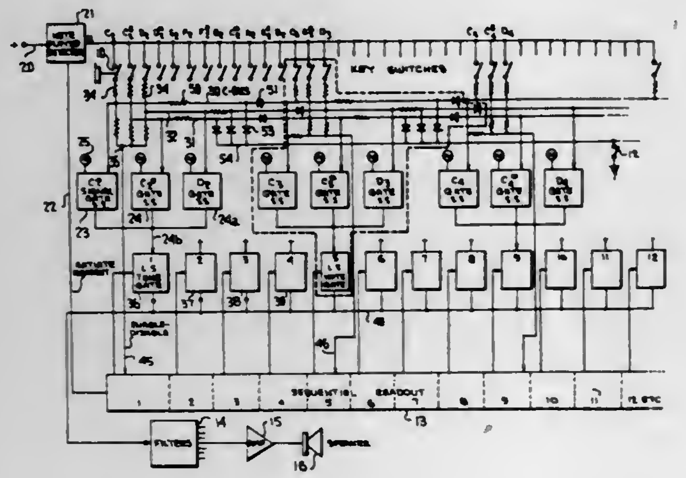


3,718,748
MULTI-TONE ARPEGGIO SYSTEM FOR ELECTRONIC ORGAN

David A. Bunger, Cincinnati, Ohio, assignor to D. H. Baldwin Company, Cincinnati, Ohio

Filed Aug. 16, 1971, Ser. No. 171,879
Int. Cl. G10h *1/02*

U.S. Cl. 84—1.24 **28 Claims**



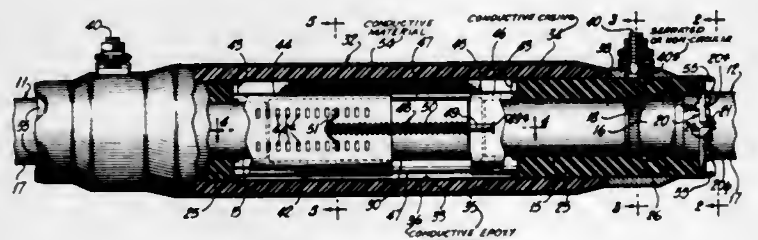
An automatic arpeggio system for an electronic organ, in which playing of a chord, or a single note, turns on tone signal gates for the played notes, and, at will, all octavely related notes, and initiates action of an asynchronous up-down multistage counter which sequentially reads out only the turned on gates, in sequence, either in an up-scan only, or up and then down. The gates lead to tone color filters, amplifiers and loudspeakers. Those counter stages which are selected to turn on gates are constrained to act as clock controlled bistable flip-flops, while the remainder act as monostable flip-flops with a time constant of the order of 30 microseconds, so that their set and reset involves inadequate time elapse to effect sounding of a note by closing of a tone gate.

3,718,749
DEVICE FOR COUPLING HIGH VOLTAGE CABLES

Francis V. Cunningham, Western Springs, Ill., assignor to Joslyn Mfg. and Supply Co., Chicago, Ill.

Filed July 19, 1971, Ser. No. 163,864
Int. Cl. H02g *15/08*

U.S. Cl. 174—73 R **15 Claims**



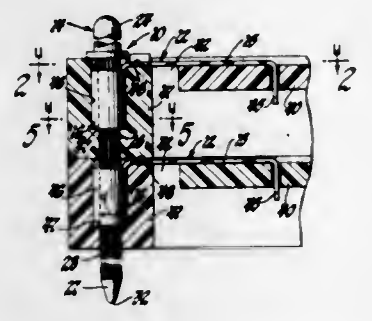
There is provided a coupling assembly for connecting high voltage cables and including a tubular housing of insulating material. A pair of tubular elastomeric insulating members are inserted into respective ends of the housing for receiving the end portions of a respective cable. Retainers close the opposite ends of the housing. A conductive inner shield is in the housing bore spaced from opposite ends of the housing. Suitable connector means connect the conductors of the cables in the end-to-end relation within the housing shield. The shield is electrically connected to the conductor so as to eliminate voltage gradient in the air spaces within the coupler. Means are provided within the housing resiliently loading the tubular elastomeric insulating members, thereby maintaining a void-free insulation and moisture seals throughout the thermal operating range of the coupler.

3,718,750
ELECTRICAL CONNECTOR

Eugene H. Sayers, Kokomo, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 12, 1971, Ser. No. 188,378
Int. Cl. H01r *5/08*

U.S. Cl. 174—94 R **3 Claims**



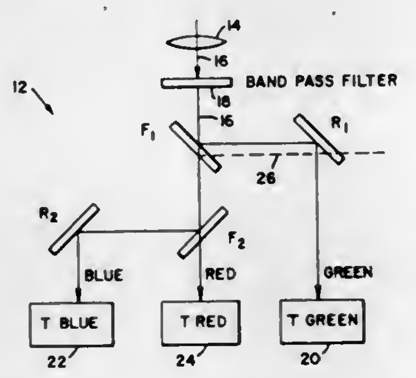
In a preferred form, this disclosure relates to an electrical connector means having a tin plated metal female terminal and a tin plated male terminal made from a metallic material which is softer than that of the female terminal. The female terminal has a body portion which is adapted to be connected with an electrical lead, such as a printed circuit on a printed circuit board, and an elongated ferrule portion which is C-shaped, as viewed in cross section. The male terminal is generally cylindrically shaped and has a knurled shank portion and with the apices of the individual knurls lying on a circumscribed diameter which is greater than the internal diameter of the C-shaped ferrule portion of the female terminal. The male terminal is connected to the female terminal by intersecting the same into the ferrule portion which causes the C-shaped ferrule portion to radially expand and the knurls on the shank portion to plastically deform whereby the male terminal is connected to the female terminal as a result of the contracting force exerted by the female terminal and the plastic deformation of the knurls of the male terminal.

3,718,751
OPTICS FOR HIGH SENSITIVITY COLOR TELEVISION CAMERA

John K. Landre, Menlo Park; Donald D. Kline, and Marc W. Broemmelsiek, both of Palo Alto, all of Calif., assignors to Commercial Electronics Incorporated, Mountain View, Calif.

Filed Oct. 12, 1970, Ser. No. 79,848
Int. Cl. H04n *9/08*

U.S. Cl. 178—5.4 E **18 Claims**



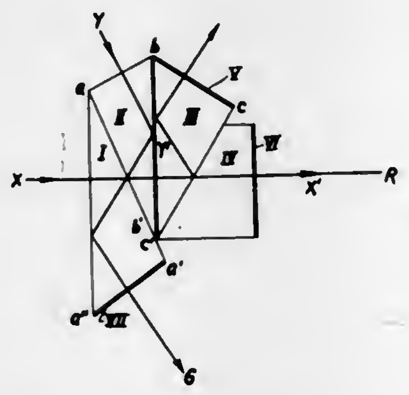
An optical system for high sensitivity television cameras employing parallel blue, green and red television tubes with one of the tubes being aligned with an optical aperture of the camera. A trichroic filter splits off a green image portion of the image received from the aperture and directs it via a green mirror to the green television tube. The remainder of the received image is passed to a dichroic filter which has a transmission cutoff point in the light wave band reflected by the trichroic filter and which reflects the blue image portion via a trim mirror to the blue television tube and transmits the red image portion to the red television tube. The reflecting surfaces of the filters and the mirrors are disposed at 45° to the incident light and are constructed so that their spectral transmission-reflection characteristics are insensitive to light polarization. The tubes, filters, mirrors and other components of the optical system are mounted to a relatively massive optical bench preventing image distortions and movement of the components under temperature changes, vibration, shock and the like. Means are also provided to operate the camera aperture, neutral density and color filters that can be swung into the light path through the camera from an end of the camera remote from the aperture.

3,718,752
COLOR TELEVISION CAMERA

Takashi Katsuta, Kenichi Kano, Mitsuru Kawasaki, and Yasuichi Ushiyama, all % Nippon Electric Company, Limited, 7-15 Shiba Gochome, Minato-ku, Tokyo, Japan

Claims priority, application Japan, Dec. 27, 1970, 46/938
Int. Cl. H04n *9/08;* **G02b** *27/14*

U.S. Cl. 178—5.4 TC **2 Claims**



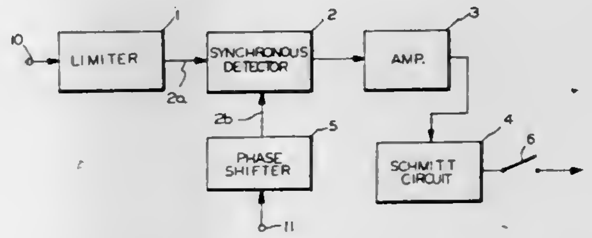
A color television camera employs a receiving lens system for directing light corresponding to a viewed subject along a first axis of a compound color separation prism. Also, auxiliary light from a source thereof, as for bias light purposes, is directed to the prism along an axis distinct from the first axis.

3,718,753
TINT-CONTROL INDICATING APPARATUS FOR COLOR TV RECEIVERS

Yoshitomi Nagaoka, Neyagawa-shi, and Takayuki Sagishima, Moriguchi, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Osaka, Japan

Filed Jan. 6, 1971, Ser. No. 104,250
Claims priority, application Japan, April 20, 1970, 45/34163
Int. Cl. H04n *9/12*

U.S. Cl. 178—5.4 HE **6 Claims**



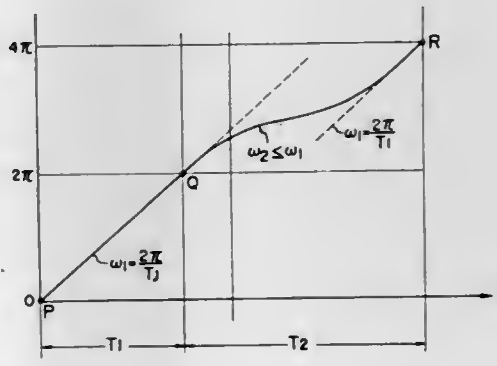
A tint-control indicating apparatus for color TV receivers has a phase detecting means for separating chrominance signal components having a phase within a selected narrow sector of the color-spectrum wheel from the chrominance signals. A pulse-forming means coupled to said phase detecting means generates a pulse in response to an output signal of the phase detecting means. An indicating means coupled to said pulse-forming means is caused by the pulse to produce a visible color change on the television screen.

3,718,754
VIDEO DISK SIGNAL RECORDING SYSTEM WITH CYCLICAL SPEED CONTROL

Takeshi Goshima, and Hideaki Sato, both of Ohta-ku, Tokyo, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 17, 1971, Ser. No. 115,999
Claims priority, application Japan, Feb. 20, 1970, 45/15056
Int. Cl. G11b *5/82, 19/28;* **H04n** *5/78*

U.S. Cl. 178—6.6 DD **10 Claims**



The video signals of the first or second field of a desired frame of the television signal may be recorded upon a circular track of an endless magnetic recording medium such as a magnetic recording disk which rotates at high speed in such a way that the starting points of the circular recording tracks may e axially aligned with one another. So a still picture may be reproduced without distortion thereof by reproducing the video signals of one field recorded upon one circular recording track, and further the reversed motion picture may be reproduced by reproducing the video signals in the reversed direction.

3,718,755

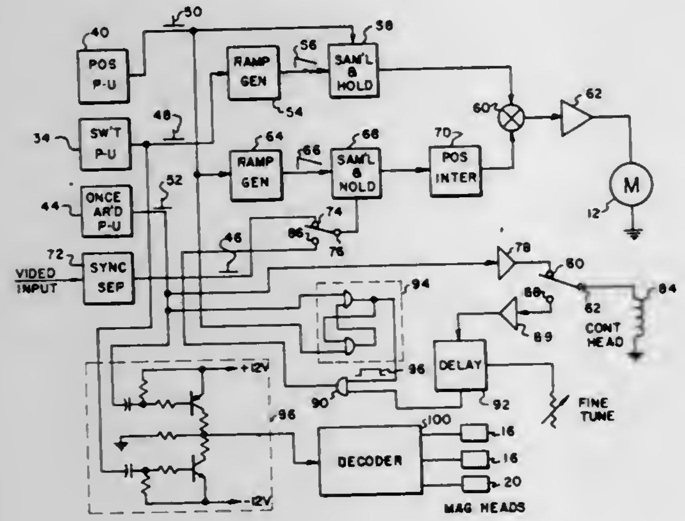
INTERLACING SYSTEM FOR SKIP-FIELD MAGNETIC RECORDING AND REPRODUCING

Philip M. Crosno, Cupertino, Calif., assignor to Cartridge Television, Inc., San Jose, Calif.

Filed June 26, 1970, Ser. No. 50,062

Int. Cl. H04n *5/06, 5/78;* **G11b** *19/28*

U.S. Cl. 178—6.6 SF **4 Claims**



A skip-field magnetic recording and reproducing system records each video field in one oblique track on a magnetic tape by means of rotary magnetic heads, only one of which records, while all of the heads play back to supply the skipped fields. Certain of the magnetic heads are axially and angularly misaligned so that playback of at least one of the heads is displaced by one-half a line in a conventional video field. Synchronization is achieved by substituting a position generated head switching signal for the vertical sync. This results in interlacing of the played back field.

3,718,756

MAPPING RECTIFIER OF EARTH'S SURFACE RADIATION SIGNALS SCANNED BY ARTIFICIAL SATELLITE

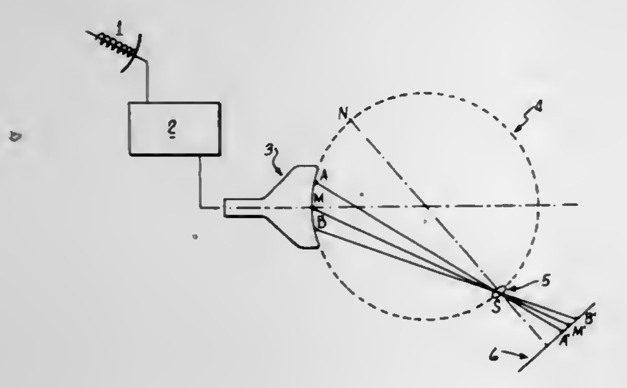
Kantaro Watanabe, Tokyo, Japan, assignor to Research Corporation, New York, N.Y.

Filed May 14, 1971, Ser. No. 143,453

Claims priority, application Japan, June 18, 1970, 45/52398

Int. Cl. G01s *7/06;* **G03b** *27/68;* **H04n** *1/24*

U.S. Cl. 178—6.7 R **7 Claims**



Disclosed is a device to obtain, through a special cathode-ray tube an optical system, a radiation image polarstereographically mapped directly from radiation scanning signals received from an artificial satellite.

3,718,757

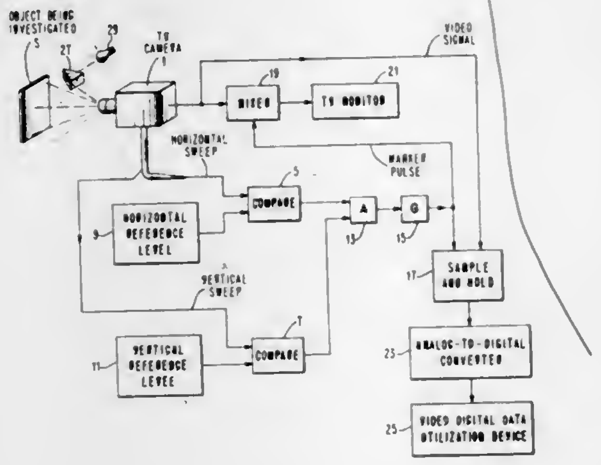
TEMPERATURE MONITORING

Louis Gullitz, Yorktown Heights; Theodore W. Kwap, Brewster, and Daniel F. O'Kane, Katonah, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 29, 1970, Ser. No. 102,488

Int. Cl. H04n *5/26, 7/18*

U.S. Cl. 178—6.8 **14 Claims**



A television camera, such as an infrared television camera, is positioned to view a hot surface, the temperature profile of which is to be monitored and the temperature at selected points of which is to be measured. The specific application to a Czochralski type crystal puller is described. A television monitor is employed to give the temperature profile and an indicator scheme is employed with the TV monitor to allow manual positioning of the indicator to visually chosen spots on the monitor whereby the temperature at those visually chosen spots is automatically provided. The horizontal and vertical voltage used to position the pointer is also used to control a sample and hold circuit to thereby allow the sampling and holding of the video signal corresponding to the selected point. The video signal sampled is converted to digital, which digital signal may be employed to provide a visual indication of the temperature at the selected point, or alternatively, to control a process or, for example, to be processed by a computer. The particular points chosen at which temperatures are to be determined, may systematically be achieved by way of a computer.

3,718,758

METHOD AND DEVICE FOR MONITORING THE WORKING OF A FURNACE

Nicolas Gerassimos Ponghis, and Claude Henri Osmael, both of Liege, Belgium, assignors to Centre National De Recherches Metallurgiques, Brussels, Belgium

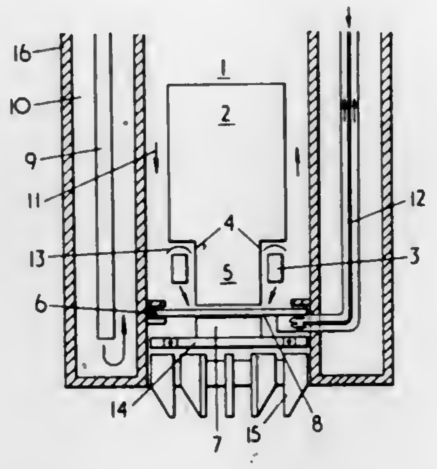
Filed June 29, 1970, Ser. No. 51,513

Claims priority, application Belgium, June 27, 1969, 42,230; July 11, 1969, 42,346; July 15, 1969, 42,349; July 15, 1969, 42,350; Sept. 30, 1969, 42,452; Jan. 23, 1969, 42,636

Int. Cl. H04n *5/26*

U.S. Cl. 178—6.8 **3 Claims**

A method and apparatus for monitoring the operation of a furnace, and more particularly of a blast furnace, by making a visual examination of the charge and/or the walls and internal accessories of the said furnace, in which a mobile probe including equipment to pick up optical rays that may comprise at least one television camera sensitive to the optical rays coming from the charge is inserted into the furnace charge and the rays coming from the said charge are received by means of the said pick-up equipment, giving a representative image of its and enabling the required characteristics to be deduced.



3,718,759

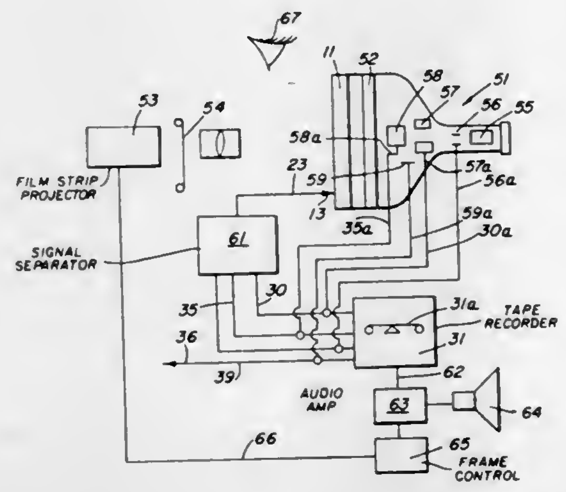
AUDIO-VISUAL TEACHING SYSTEM AND STUDENT RESPONSE APPARATUS

Leonard Reiffel, Chicago, Ill., assignor to Telestrator Industries, Inc., Chicago, Ill.

Continuation-in-part of Ser. No. 776,724, Nov. 18, 1968, abandoned. This application April 5, 1971, Ser. No. 131,523

Int. Cl. H01j *39/29;* **H04n** *7/18*

U.S. Cl. 178—6.8 **6 Claims**



An audio-visual teaching system whereby program-controlled responses in the form of linear drawings or notations or the like may be viewed as superimposed on a basic image and may be added by both the student and instructor with a probe member. Student must answer question correctly in some embodiments for program to proceed. In some embodiments, if the student answers incorrectly, a separate related system is energized which provides additional instruction leading toward the correct answer. System includes means for projecting a visual image onto a viewing face of a long residence time visual display plate and means for pre-recording at sub-video frequencies, dynamic linear additions to a background image as well as voice and other audio data. The background images are optionally used herewith. Such teaching system eliminates the necessity in certain instructional situations for using an electronic computer as required in the systems of the prior art and provides inexpensive programming and reproduction means.

3,718,760

SYSTEM FOR REPRODUCING MOTION PICTURES

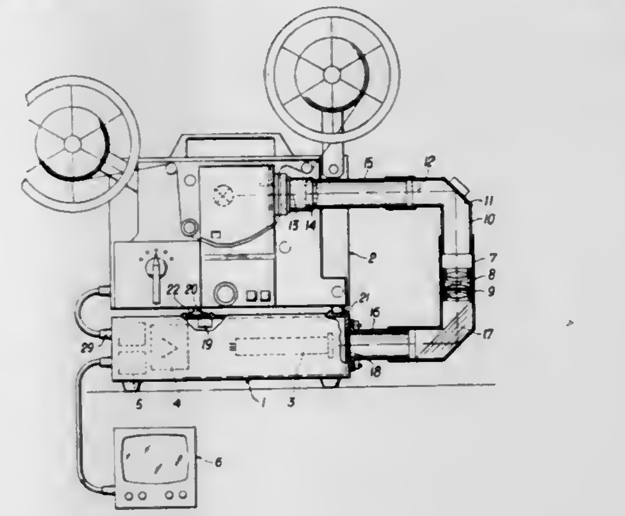
Gottfried Patels, and Erich Beck, both of Vienna, Austria, assignors to Karl Vockenhuber and Raimund Hauser, both of Vienna, Austria

Filed Oct. 26, 1970, Ser. No. 83,989

Claims priority, application Austria, Nov. 21, 1969, A 10923/69

Int. Cl. H04n *3/00*

U.S. Cl. 178—7.2 **3 Claims**



A television camera comprises a top wall and a camera tube having a light-sensitive surface. A motion picture projector is mounted on said wall and has a projector aperture, means for intermittently moving a film past said projector aperture, and illuminating means for illuminating a portion of said film in register with said projector aperture. Said camera has a telescopic optical system having an entrance opening approximately on the level of said projector aperture and adapted to form on said light-sensitive surface an image of a portion of said film which is illuminated in register with said aperture.

3,718,761

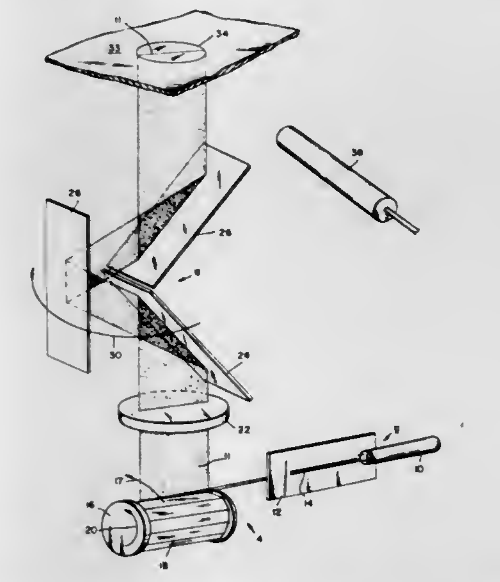
OMNIDIRECTIONAL PLANAR OPTICAL CODE READER

Jon H. Myer, Woodland Hills, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed March 27, 1968, Ser. No. 718,981

Int. Cl. H04n *1/04*

U.S. Cl. 178—7.6 **41 Claims**



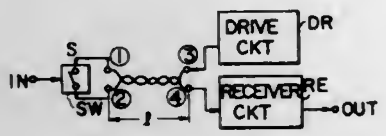
An optical system for reading graphic codes, regardless of their orientation in a plane, includes apparatus for generating a scan of a shaped light beam and rotating the scan on and across targets having a code for transmission of the code to a detector. Alternatively, the code of the target may be included within the beam which is scanned across and rotated on the detector. In both cases, the beam is so dimensioned as to enable proper reading of the code. Such reading is useful in inventorying, cataloging, and tabulating goods such as items in warehouses, factories, supply depots and various commercial retail outlets such as supermarkets.

3,718,762
PULSE TRANSMITTING APPARATUS

Kazuo Nezu, Hachioji; Ziro Imabayashi, Murayama-gun; Kazutaka Watanabe, Koganei; Tadamitsu Iritani, Shimorenjaku; Kouju Kataoka, Shimorenjaku, and Michio Yoshioka, Shimorenjaku, all of Japan, assignors to Yokogawa Electric Works, Ltd., Tokyo, Japan

Filed July 16, 1970, Ser. No. 55,412
Int. Cl. H04l *25/08*

U.S. Cl. 178—68 **6 Claims**



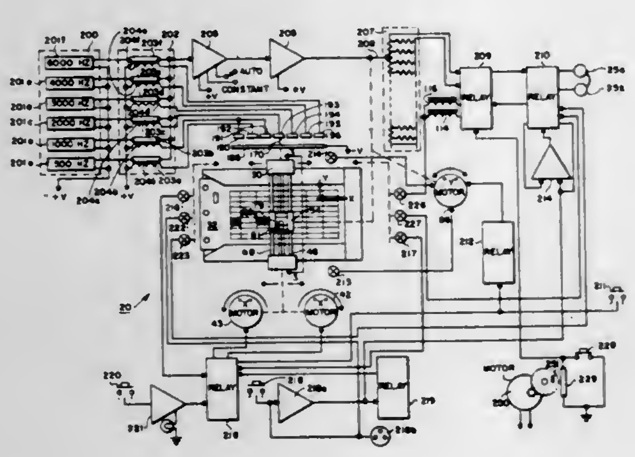
A pulse transmitting apparatus comprising a first transmission line connected to a current drive circuit at one end, a second transmission line stranded with the first and having an end connected to a receiver circuit located adjacent the drive circuit, and a pair of serial connected switches at the transmitting end of the apparatus for connecting together the other ends of the first and second transmission lines and sending a current pulse signal to the receiver circuit. The switches are operated simultaneously in response to an input signal and the apparatus contains means for absorbing pulses reflected back from the receiving end to the transmitting end of the apparatus.

3,718,763
AUDIOMETER APPARATUS

Vernon W. Cannon, Austin, Tex., and Gordon N. Stowe, Northbrook, Ill., assignors to Beltone Electronics Corporation, Chicago, Ill.

Filed Dec. 21, 1970, Ser. No. 100,054
Int. Cl. H04r *29/00*

U.S. Cl. 179—1 N **15 Claims**



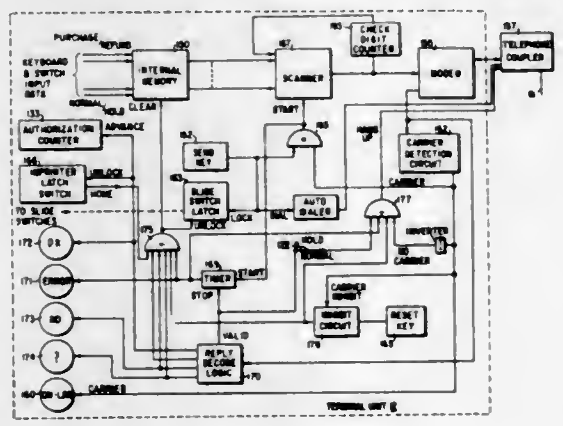
Disclosed is audiometer apparatus including a tone generator portion, attenuator network, accoustical transducer and two-dimensional plotting mechanism for automatically recording the subject's response to signals received at the transducer. The tone generator includes a plurality of continuous running oscillators whose discrete frequency signals are coupled through pulser circuitry to the attenuator by way of magnetic reed switches actuated by the movement of the plotter. Hearing loss information is plotted with a pair of different color ink pens disposed within a carriage on the plotting mechanism. Switching mechanisms control the movement of the plotter and the carriage in their respective directions, selectively move the pens into and out of contact with recording material, and switch the signals received by the transducer from one earpiece to the other. Random validity mechanism is incorporated with apparatus for periodically or manually inserting an additional intensity change to the generated tones. Pulser circuitry, utilizing a photoresistor, is adapted for periodic interruption of the generated signal, the rise and decay characteristics of the generated signal being controlled by the circuitry.

3,718,764
TERMINAL UNIT FOR CREDIT ACCOUNT MAINTENANCE SYSTEM

Raymond J. Deschenes, and Robert N. Macdonald, both of Atlanta, Ga., assignors to Data Coard Corporation, Minneapolis, Minn.

Filed March 11, 1970, Ser. No. 18,571
Int. Cl. H04m *11/06*

U.S. Cl. 179—2 DP **3 Claims**



A system for maintaining an up-to-date record of credit accounts at a central station includes terminal units at a plurality of remote stations. Each terminal unit selectively interrogates the credit account data stored at the central station by transmitting a message of inquiry regarding the particular account of interest to the central station. The central station responds to an inquiry message to access the pertinent data from the account record and to formulate a reply message advising the inquiring terminal unit of the status of the account. No inquiry message is transmitted until the data from which the message is assembled is entered into a data storage device in the terminal unit. Upon receiving a signal denoting establishment of a message communication path between the terminal unit and the central station and a concurrent signal signifying completion of entry of message data into the storage device, the terminal unit transmits the inquiry message to the central station. The reply message from the central station produces an appropriate visual signal at the terminal unit.

3,718,765
COMMUNICATION SYSTEM WITH PROVISION FOR CONCEALING INTELLIGENCE SIGNALS WITH NOISE SIGNALS

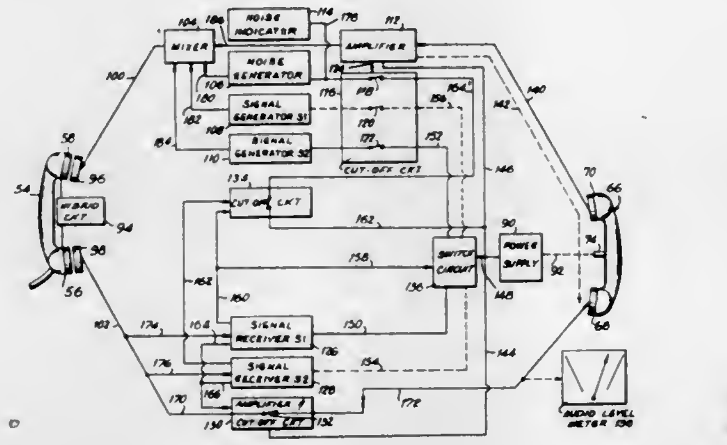
Josef Halaby, 1406 New York Ave., Brooklyn, N.Y.

Filed Feb. 18, 1970, Ser. No. 12,180
Int. Cl. H04m *1/70*

U.S. Cl. 179—1.5 M **12 Claims**

A communication system including phone stations, each of which includes a speaker-microphone arrangement with a noise generator and control circuits. The circuits are so connected that when the speaker-microphone portion of one station is transmitting intelligence to the other station, the first of these stations cannot transmit noise signals at the same time. However, this first station transmits a control signal to the other station to operate the control circuits therein to permit

the noise generator to transmit noise onto the connecting cable to conceal the intelligence signal originating with the first station. The apparatus employs a conventional phone installation, the handset of which is accommodated in a separate casing, which in turn has a handset accommodated in the cradle of the telephone installation. The casing accommodates the noise generator and the control circuits as well as certain speaker and microphone elements necessary to cooperate therewith.

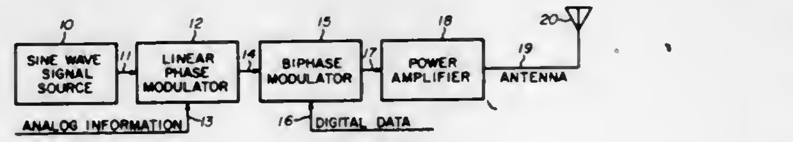


3,718,766
WIDE BAND MULTIPLEXING SYSTEM

Harris A. Stover, Cedar Rapids, Iowa, assignor to Collins Radio Company, Cedar Rapids, Iowa

Filed July 30, 1971, Ser. No. 167,728
Int. Cl. H04j *1/20*

U.S. Cl. 179—15 BM **12 Claims**



A communications system employs tandem phase modulation for multiplexing narrow band analog data with very high speed digital data. The narrow band data is applied as linear phase modulation of the system carrier, while the high speed digital data is applied as phase-shift modulation of the carrier.

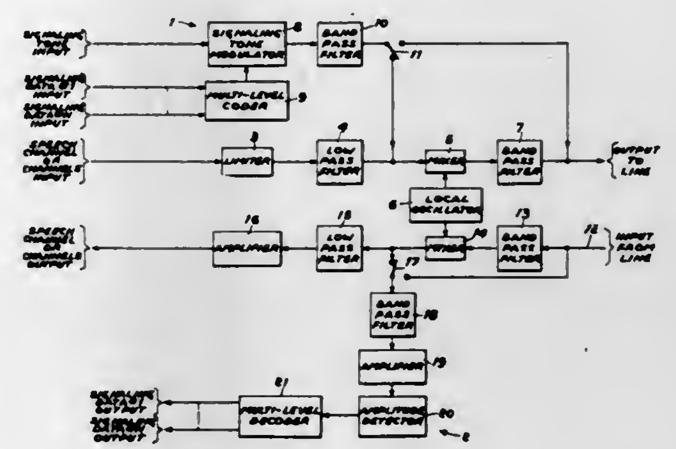
3,718,767
MULTIPLEX OUT-OF-BAND SIGNALING SYSTEM

Lynn W. Ellis, Westport, Conn., assignor to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed May 20, 1971, Ser. No. 145,138
Int. Cl. H04j *3/12*

U.S. Cl. 179—15 BM **9 Claims**

A multiplex out-of-band signaling system for a communication system having one or more frequency channels is disclosed. N signaling data gate N gated amplifiers coupled in common to a signaling tone having a frequency disposed outside the frequency channel or channels such that a different predetermined amplitude of the signaling tone is provided for each of the N signaling data according to a given amplitude code. These different amplitudes of the signaling tone are combined as a composite multi-level signal for transmission. At the receiver the composite signal is recovered and the levels therein are detected in a level decision circuit in accordance with the given amplitude code so that the N signaling data are separated and reproduced for utilization.

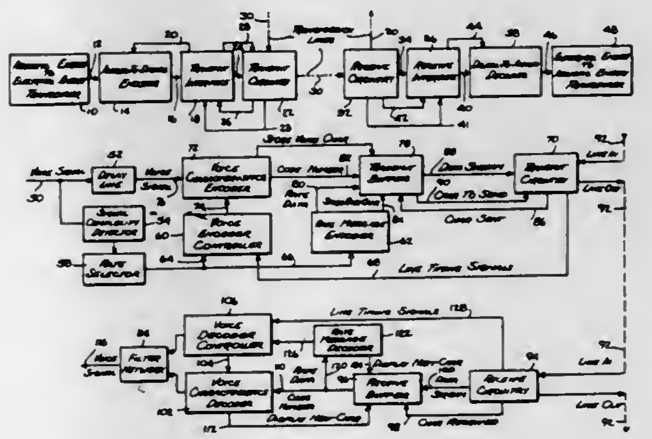


3,718,768
VOICE OR ANALOG COMMUNICATION SYSTEM EMPLOYING ADAPTIVE ENCODING TECHNIQUES

Carl Newton Abramson, and Douglas George Jones, both of Somerville, Mark T. Nadir, Warren, all of N.J., assignors to Adaptive Technology, Inc., Piscataway, N.J.

Filed Aug. 9, 1971, Ser. No. 169,993
Int. Cl. H04j *3/04*

U.S. Cl. 179—15 BA **31 Claims**



Voice and other analog information are transmitted from one to another of a plurality of stations in a communications system wherein, at the sending stations, an encoder samples the voice or other analog signal for sets of values of one or more characteristics, and assigned codes corresponding to the sampled sets of values are stored in sequence in a buffer. Each of the codes corresponding to the sample characteristics is assigned to respective ones of a multiplicity of discrete subperiods within each of a series of periods (P). Signal identifying receiving stations are inserted at indiscriminate rates on the transmission medium into the available subperiods having assigned meanings corresponding to the stored codes in a manner which removes the stored codes in sequence from the buffer.

Each receiving station detects its own identification signal on the transmission medium and correlates the subperiods in which the identification signals are detected with their respective assigned codes. A decoder converts such correlated codes to their respective assigned sets of sample values from which it reconstructs the original voice or other analog signal.

The system permits different and/or continuously varying sampling rates to be used by the stations without requiring fixed time or frequency channels. Thus, the system is generally insensitive to the kind of analog input signal waveform presented for encoding, or the type of encoding or decoding technique employed.

3,718,769
PATH FINDING SYSTEM FOR TIME-DIVISION MULTIPLEXED TELEPHONE COMMUNICATION NETWORK

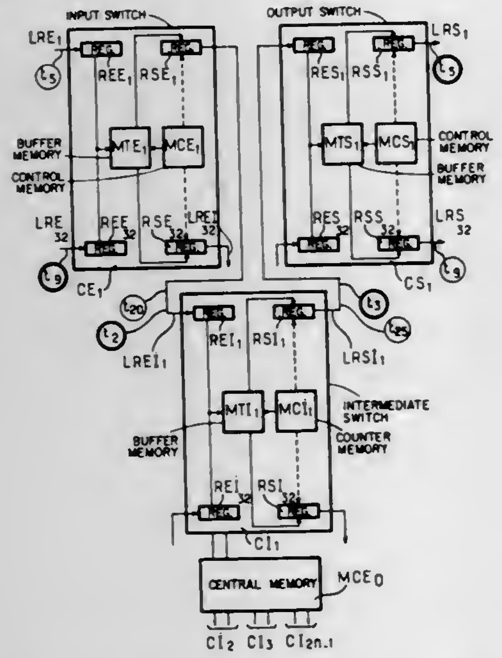
Jean-Baptiste Jacob, Saint-Quay-Perros, France, assignor to Compagnie Industrielle Des Telecommunications Cit-Alcatel, Paris, and Societe Lannionnaise D' Electronique Route de Perros-Guirec, Lannion, both of France

Filed June 29, 1970, Ser. No. 50,692

Claims priority, application France, June 27, 1969, 6921828

Int. Cl. H04q *11/04*

U.S. Cl. 179—18 J **8 Claims**



A path finding test device, more particularly for time switching, comprising input switches, intermediate switches and output switches, this device comprising a centralized memory representing the occupied or free state of all the intermediate switches so that the search for an available itinerary takes place by reading, in the memory, the free state of the intermediate switches.

The invention may be applied to the telecommunication industry.

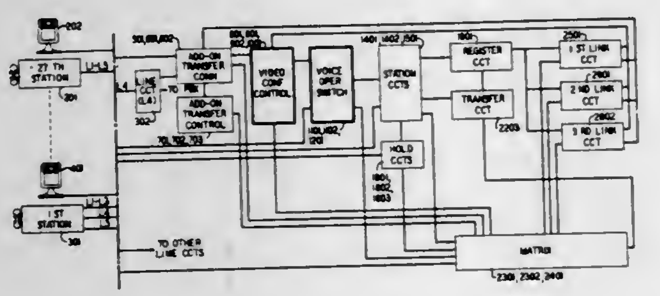
3,718,770
KEY TELEPHONE SYSTEM WIDEBAND CONFERENCING ARRANGEMENT

Randall Douglas Reese, Stanford, Calif., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Aug. 5, 1971, Ser. No. 169,329

Int. Cl. H04m *11/00, 3/56*

U.S. Cl. 179—18 BC **18 Claims**



Wideband conferencing service between stations served by a key telephone system intercom link is provided by a conference control circuit arranged to monitor the audio transmission from each station on a conference and to transmit wideband signals from a currently audioactive station to all other stations included in the conference. Wideband transmission from all other conference stations except from the last audioactive station is inhibited while the wideband transmission from the last audioactive station is transmitted to the currently audioactive station. In situations were two stations alternatively become audioactive, provision is made to ensure continuous uninterrupted bidirectional wideband transmission between those stations.

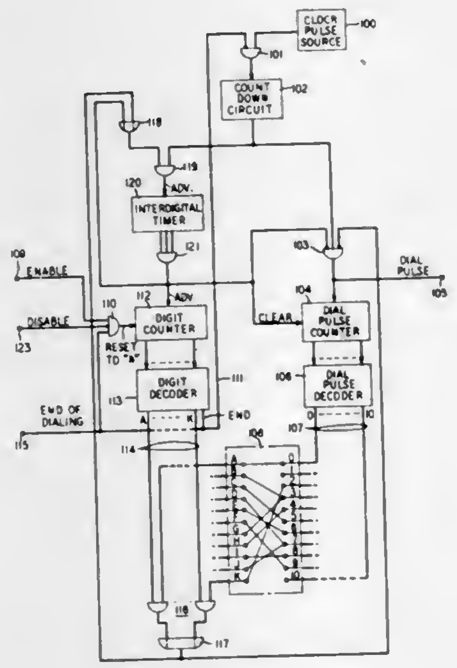
3,718,771
AUTOMATIC TELEPHONE CALLING APPARATUS UTILIZING DIGITAL LOGIC DEVICES

Gilbert Bank, Highland Park, N.J., assignor to National Midco Industries, Levittown, Pa.

Filed July 7, 1970, Ser. No. 52,934

Int. Cl. H04m *1/44*

U.S. Cl. 179—90 R **3 Claims**



An automatic telephone calling apparatus is disclosed in which a first counter counts dial pulses and a second counter counts the digits of a telephone number. A cross-wiring field permits the detection of coincidence between one of the outputs of each counter and one of the outputs of the other counter. When a coincidence is detected, the dial pulse counter is stopped at the desired number of dial pulses. An interdigital timer is then activated to time out a preselected interdigital interval. Thereafter, the dial pulse counter again begins to count dial pulses and again terminates when the particular count cross wired in the cross-wiring field is reached.

3,718,772
DYNAMIC EGG PRESENTATION

Clifford Sanctuary, Palos Verdes Estates, Calif., assignor to Del Mar Engineering Laboratories, Los Angeles, Calif.

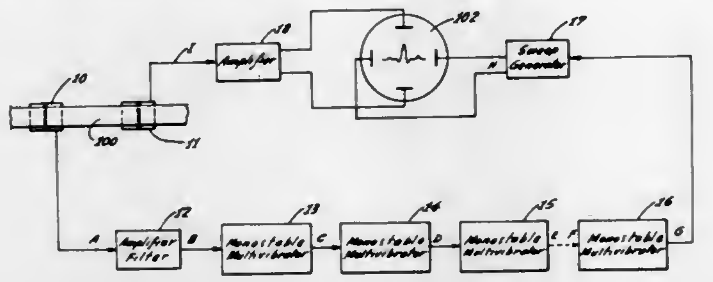
Filed Dec. 9, 1971, Ser. No. 206,485

Int. Cl. G11b *27/00, 31/00;* **A61b** *5/04*

U.S. Cl. 179—100.2 B **10 Claims**

A reproducing system for use as a high speed magnetic tape scanning instrument to provide for the superimposing of recurring signals such as ECG complexes on a visual indicator such as an oscilloscope from signals previously recorded for long time periods by a very slow single-track magnetic tape recorder. Trigger signals are developed from the reproduction by a first playback head of the ECG signals recorded on the

tape. The trigger signals are delayed a particular period to provide for control signals to control the activation of the oscilloscope sweep at the proper times to produce a stable superimposition of the ECG signals as reproduced by a second playback head spaced from the first playback head. The particular period of delay is provided electronically or electromechanically.



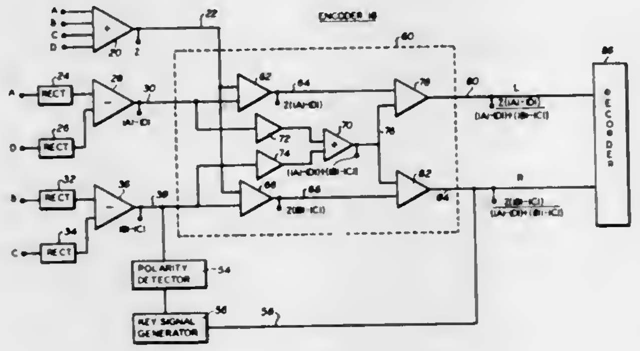
3,718,773
FOUR CHANNEL RECORDING AND REPRODUCING SYSTEM

Robert A. Berkovitz, Lexington, Mass., assignor to Russell D. Barnard, John Killion, Norman Dolph, and Peter F. Felfe, New York, N.Y., fractional part interest to each

Filed May 18, 1970, Ser. No. 38,084

Int. Cl. G11b *23/18;* **H04h** *5/00;* **H01j** *7/02*

U.S. Cl. 179—100.1 TD **22 Claims**



A method and apparatus for accurately reproducing in a first region a sound pattern representative of a sound pattern occuring in a second region comprising producing a first signal representing the total sound pressure at a point in the second region, a second signal representing the relative amount of sound energy flowing in a first path across the region and a third signal representing the relative amount of sound energy flowing in a second path across the region. The signals are combined to produce at least first and second output signals wherein the first output signal is directly proportional to the first and second signals and the second output signal is directly proportional to the first and third signals. Decoding is provided to decode the first and second output signals to produce the sound pattern in the first region.

3,718,774
INSTRUCTIONAL TAPE RECORDER FOR PREVENTING ERRONEOUS ERASURE ON A DOUBLE TRACK MAGNETIC TAPE USING TWO SENSING MEANS

Masahiro Kosaka, Hirakota-shi Osaka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Rsaka, Japan

Claims priority, application Japan, Aug. 21, 1969, 44/66983; Aug. 21, 1969, 44/66984

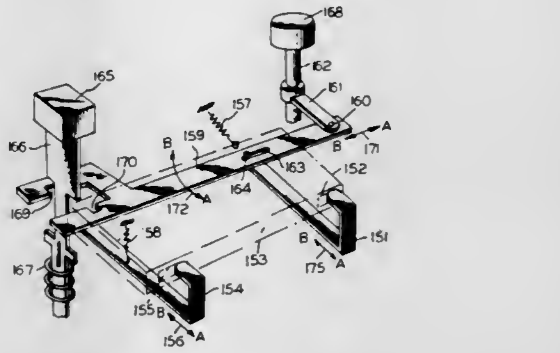
Filed Aug. 13, 1970, Ser. No. 63,485

Int. Cl. G11b *15/04;* **G09b** *5/04*

U.S. Cl. 179—100.2 D **3 Claims**

An instructional tape recorder comprises a recording and a reproducing means for recording and reproducing an instructional tape which has an instructional program recorded intermittently thereon and an oral response of a student made to said instructional program. Said instructional tape recorder can be used as a conventional tape recorder and as an instructional tape recorder by operating a selecting switch.

Said magnetic tape having said instructional program is protected from an erroneous erasure by detecting a break out lug made in the back edge of a tape case containing said magnetic tape.



Said magnetic tape is divided into two recording tracks, and each of which is used for recording and reproducing said instructional program and an oral response of a student.

3,718,775
TAPE RECORDERS PROVIDING REPLAY WITHOUT STOPPING OR REWINDING

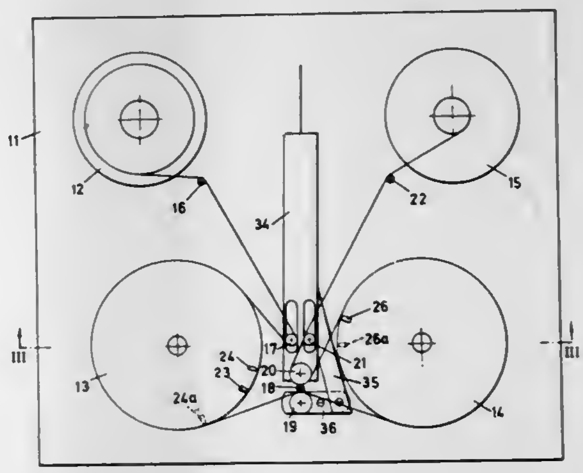
Paul Bernard Clements, Hove, Sussex, England, assignor to Words on Wheels Limited, London, England

Filed Aug. 7, 1970, Ser. No. 61,952

Claims priority, application Great Britain, Aug. 15, 1969, 40,958/69; Sept. 10, 1969, 44,686/69

Int. Cl. G11b *27/36, 21/12, 23/16*

U.S. Cl. 179—100.2 T **6 Claims**



A tape recorder particularly for use in language laboratories, with a facility for providing a replay of a short section, such as a phrase up to 15 seconds in length, without reversing the tape. This facility is achieved by providing a play head which is mounted in a spool over which the tape runs and which is adapted to drive against the advance direction of the tape to traverse the head back along the tape. In one form of the invention, the tape is stationary during replay and in a second form, the forward drive of the tape continues.

3,718,776

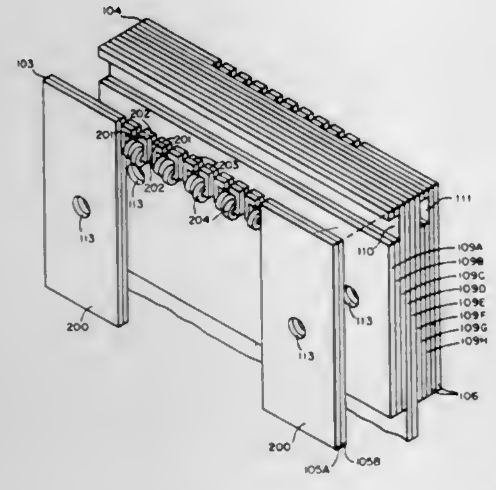
MULTI-TRACK OVERLAPPED-GAP MAGNETIC HEAD, ASSEMBLY

Geoffrey Bate; Robert H. Echelmeier, both of Boulder; Larry H. Everett; William D. Kehr, both of Longmont; Joseph E. Schaps, Boulder; Gerald Taylor, Longmont, and Richard F. M. Thornley, Boulder, all of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 11, 1970, Ser. No. 97,208

Int. Cl. G11b *5/16*

U.S. Cl. 179—100.2 C **10 Claims**



A magnetic head reads and writes a plurality of information tracks, recorded as magnetization patterns on a magnetic recording medium, with two magnetic sheets mounted in a supporting frame. Complementary sheets each define a number of alternating three-sided and two-sided figures aligned along a subsequently formed head face. A gap-forming non-magnetic material is placed along one leg of each figure on one of the sheets, and the sheets are placed together, welded, encapsulated and ground to form a head. Preformed windings slip over one leg of each of the three-sided figures and preformed shielding cans surround the magnetic elements.

3,718,777

MAGNETIC TAPE RECORDER HAVING A FRICTION WHEEL DRIVE FOR THE TAPE REEL CARRIER SHAFTS

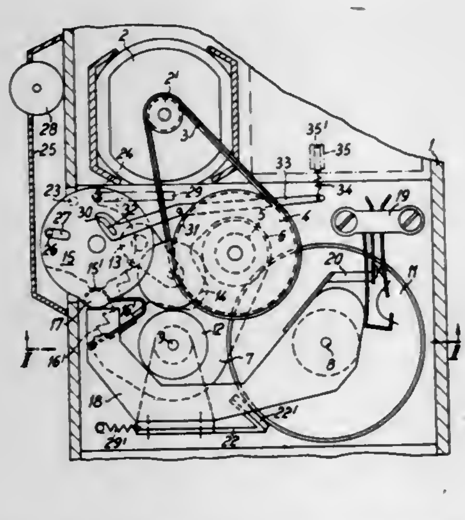
Manfred Paul Tupaj, 8031 Grobenzell, and Heinz Engert, 8 Munich, both of Germany, assignors to Sud Atlas Werke G.m.b.H., Munich, Germany

Filed Jan. 15, 1971, Ser. No. 106,780

Claims priority, application Germany, Jan. 24, 1970, P 20 03 154.3

Int. Cl. G11b *15/02, 15/28*

U.S. Cl. 179—100.2 R **3 Claims**



A pair of friction wheels are combined with a belt pulley to form a flywheel driven from a motor output shaft by resilient power transmission means. The friction wheels and the belt pulleys are rotatably mounted on a setting lever pivoted about the rewind carrier shaft and operated by an angularly displaceable cam in turn operated by a slide whose movement is effected by rotation of a switching or setting wheel. In the forward setting, a smaller diameter friction wheel engages a counterwheel secured to the feeding carrier shaft and, in another position, a larger diameter friction wheel engages an intermediate wheel in turn engaged with a counterwheel secured to the rewind carrier shaft. The levers cooperable with the angularly displaceable cam control the switches for recording and playback, as well as a switch controlling energization of the driving motor.

3,718,778

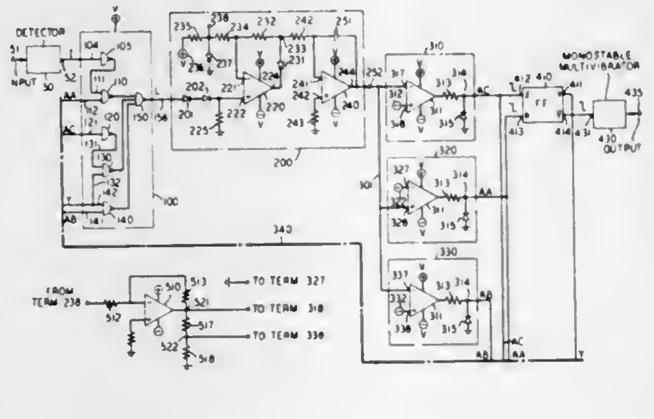
PULSE TRAIN CHECKING CIRCUIT

Peter Harold Anderson, Howell Township, Monmouth County, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 23, 1971, Ser. No. 211,236

Int. Cl. H04l *25/02;* **H04m** *1/24*

U.S. Cl. 179—175.2 A **15 Claims**



An arrangement for checking that specified minima are met by the pulse, interpulse and pulse repetition periods of a pulse train, including first and second timing circuits normally operative during the interpulse and pulse periods respectively, for defining timing intervals corresponding to the respective minima specified therefor. Upon a satisfactory check of the interpulse period, the first timing circuit operates for a predetermined period corresponding to the difference between the specified repetition period minimum and the sum of the pulse and interpulse minima to inhibit the operation of the second timing circuit. The latter provides an output signal only if it "times out" before the pulse period has terminated, thereby indicating that all three minima have been met.

3,718,779

LOUDSPEAKER DIAPHRAGM HAVING MARGINAL AIR RELEASE PASSAGES AND CENTER HIGH FREQUENCY PROPAGATOR

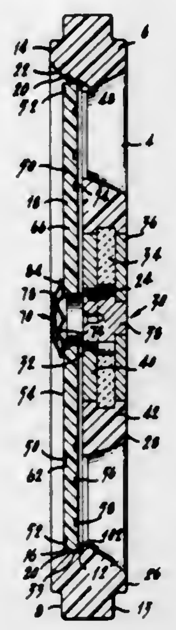
Herbert Schoengold, Mount Vernon, N.Y., assignor to Electronic Research Associates, Inc., Cedar Grove, N.J.

Original application July 22, 1967, Ser. No. 648,089. Divided and this application Oct. 29, 1970, Ser. No. 85,140

Int. Cl. H04r *1/24, 7/04, 9/06*

U.S. Cl. 179—115.5 R **10 Claims**

Sound reproducing equipment comprising a frame having a diaphragm supported at its peripheral edges by said frame. The diaphragm is preferably mounted on the frame in a manner to permit movement of the diaphragm as a complete entity at low frequencies. At the same time the diaphragm is provided with a high frequency propagator which cooperates with the voice coil and diaphragm to increase the range of the vibrations produced by the equipment without introducing feed-back or distortional characteristics during operation. As a result the combination



serves to extend the frequency response of the equipment and increase the fidelity of the sound reproduction.

3,718,780

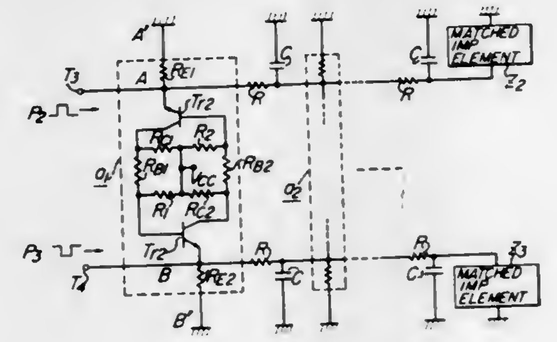
ACTIVE PULSE TRANSMISSION CIRCUIT FOR AN INTEGRATED CIRCUIT

Yuichiro Oya, Kodaira, and Akio Hayasaka, Kokubunji, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 23, 1971, Ser. No. 117,915

Int. Cl. H04b *3/38*

U.S. Cl. 179—170 G **14 Claims**



An active pulse transmission circuit for an integrated circuit comprising a plurality of T-shaped networks connected in series to each other, each having series input and output resistances and a parallel combination of a capacitance and a negative resistance device comprising two transistors cross-connected to each other and a plurality of resistances.

3,718,781

INTEGRITY CHECK EQUIPMENT FOR AUTOMATIC TRUNK SUBSTITUTION

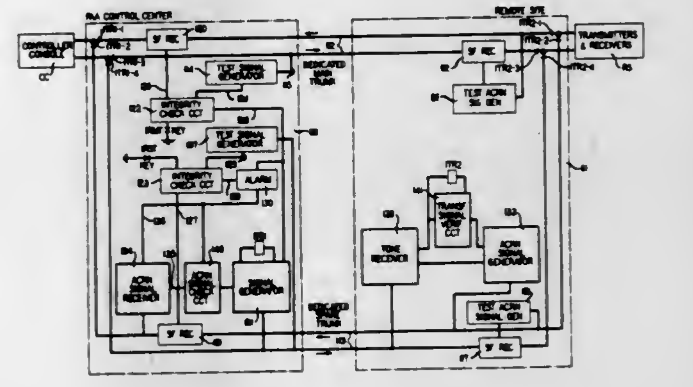
Ronald Joseph Angner, Freehold, and Phillip Paul Daniele, Oceanport, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 30, 1971, Ser. No. 214,140

Int. Cl. H04b *3/46*

U.S. Cl. 179—175.3 **14 Claims**

This specification discloses equipment for checking the integrity of trunk substitutions accomplished by circuitry which automatically tests trunks for defects that impair communications and then automatically substitutes a spare trunk for a defective trunk. The equipment includes check circuits for trunk substitution acknowledgment signals, coded multidigit trunk substitution control signals and further includes automatic test circuits for reattempting trunk substitution when an acknowledgement signal



is not received to indicate a valid substitution. Circuitry is also disclosed for automatically indicating a trouble as a result of the automatic test procedures.

3,718,782

METHOD AND APPARATUS FOR DETECTING TERMINAL SIGNALS IN CENTRALLY CONTROLLED TELECOMMUNICATION INSTALLATIONS

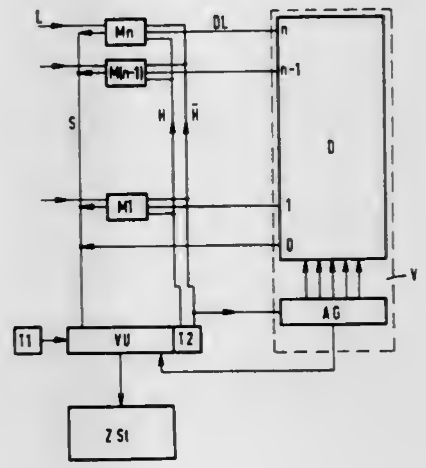
Fritz Giebler, Munich, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Dec. 2, 1970, Ser. No. 94,435

Claims priority, application Germany, Dec. 9, 1969, P 19 61 752.8

Int. Cl. H04q *3/00*

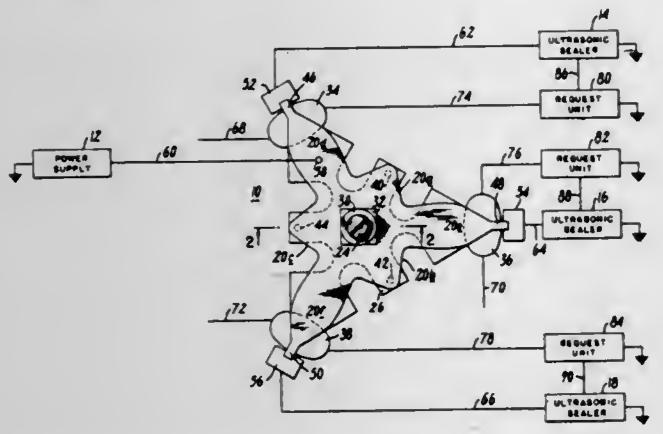
U.S. Cl. 179—18 J **12 Claims**



The duration of a terminal signal on a telecommunication line in a binary coded multiplex space division switching system is measured by counting synchronizing pulses occuring during receipt of the signal which has a known duration and polarity. A decentralized marker assigned to each line detects the first pulse. If a succeeding pulse is detected, a central counting stage is assigned to the line to determine if the requisite number of pulses to constitute a terminal signal are received, after which the central control terminates the connection.

3,718,783
SHARING APPARATUS AND SYSTEM

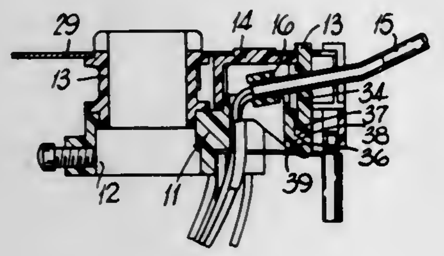
Miklos Kemenczky, Greenbrook, N.J., assignor to Paul Guilden, New York, N.Y.
Filed June 25, 1971, Ser. No. 156,838
Int. Cl. H01h *3/32*
U.S. Cl. 200—1 R **9 Claims**



A plurality of switches is associated with a plate pivotally movable for selective operation of the switches. Plate pivotal movements are controlled by a like plurality of controllers inducing pivotal movement of the plate and associated pivotal movement limiting elements. The switches are operated by the plate in sequence according to the sequence in which the controllers are energized. In a time-sharing system, a time-shared device is connected to the plate and dependent elements are connected to the device through the switches.

3,718,784
VEHICLE DIRECTION SWITCH WITH AUTOMATIC RETURN AND HEADLIGHT DIMMER CONTROL

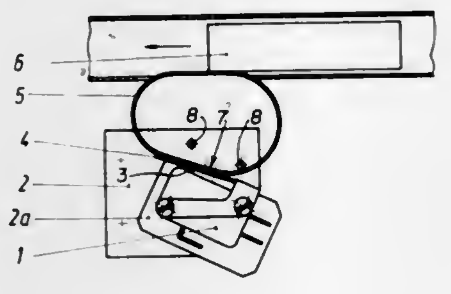
Norman Wilkinson, Barrowford, near Nelson, Lancashire, England, assignor to Joseph Lucas (Industries) Limited, Birmingham, England
Filed June 11, 1970, Ser. No. 45,490
Claims priority, application Great Britain, June 25, 1969, 32045/69
Int. Cl. H01h *21/00*
U.S. Cl. 200—61.27 **9 Claims**



An electrical switch including a base having a rotor mounted for angular movement thereon. A first set of electrical contacts is operable by angular movement of the rotor relative to the base, and an operating lever is pivotally mounted on the rotor for movement relative to the rotor about an axis at right angles to the axis of movement of the rotor. The lever is coupled to a slider capable of sliding movement relative to the base, and further electrical contacts are operable by the slider in response to sliding movement thereof. The operating lever is coupled to the slider in such a manner that movement of the lever in a direction parallel to its pivot axis takes place relative to the slider, and so moves the rotor relative to the base to operate the first set of contacts.

3,718,785
MICROSWITCH WITH IMPROVED FLEXIBLE LOOP SENSING MEANS FOR DETECTING TRANSIENT OBJECTS

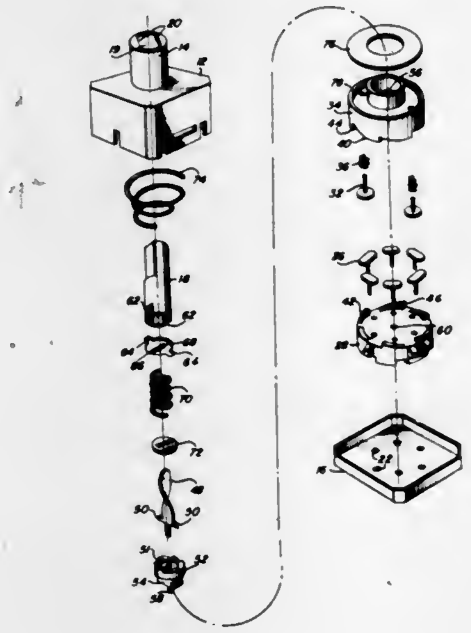
Hans Kudritzki, Berlin, Germany, assignor to International Standard Electric Corporation, New York, N.Y.
Filed Nov. 2, 1971, Ser. No. 194,970
Int. Cl. H01h *3/16*
U.S. Cl. 200—61.41 **4 Claims**



A commercially available micro switch is provided with a lever clamped at one end. Near the free end and the point of contact with the switch rod, there is mounted an annular loop consisting of a flexible material.

3,718,786
ROTARY SWITCH ASSEMBLY

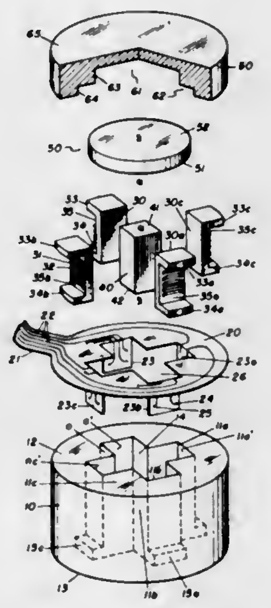
Dominick Fila, Shelton, Conn., assignor to Tri-Line Electric Co., Inc.
Filed Aug. 5, 1971, Ser. No. 169,360
Int. Cl. H02h *19/58*
U.S. Cl. 200—63 **10 Claims**



A multi-purpose switch assembly comprising a plurality of stationary contacts mounted in a base having a first set of circumferentially spaced ratchet-like surfaces thereon, a movable rotor carrying a pair of movable contacts adapted to engage the stationary contacts and including a second set of ratchet-like surfaces operatively associated with the first set of ratchet-like surfaces such that rotation effects axial movement of the rotor sufficient to separate the contacts with wiping and lifting action. The movable contacts biasingly engage the stationary contacts, and rotor rotation is effected by a spiral drive or rotating knob member operatively connected to the rotor. When the spiral drive is used, rotation is initiated through depression of a push button reciprocally mounted in a housing of the switch assembly.

3,718,787
MAGNETIC SETBACK-CENTRIFUGAL SWITCH

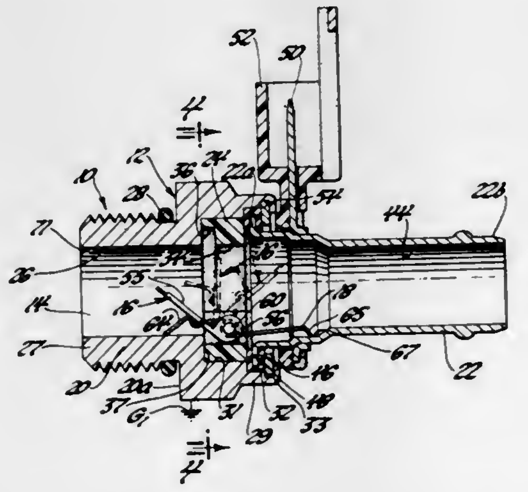
Seymour Levine, Dover, N.J., assignor to the United States of America as represented by the Secretary of the Army
Filed Dec. 4, 1971, Ser. No. 204,223
Int. Cl. H01h *35/10*
U.S. Cl. 200—80 **5 Claims**



This invention relates to a magnetic setback-centrifugal switch for simultaneously closing a plurality of circuits in a spin stabilized projectile after it has been launched. The device utilizes a housing means, a printed circuit means operatively positioned in the housing, a fixed magnet means operatively positioned intermediate to the housing and the printed circuit means, and an inertial pole means magnetically held adjacent to the fixed magnet and slidably removable therefrom by the sequentially applied linear and angular accelerating forces caused by setback and spin of the projectile.

3,718,788
FLOW SWITCH ASSEMBLY

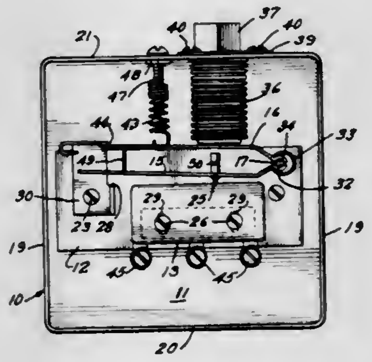
Alton A. Roth; Don L. Dzioba, both of Saginaw, and John F. Yonger, Frankenmuth, all of Mich., assignors to General Motors Corporation, Detroit, Mich.
Filed Sept. 20, 1971, Ser. No. 181,883
Int. Cl. H01h *35/40*
U.S. Cl. 200—81.9 R **3 Claims**



In a preferred form, this disclosure relates to a flow switch assembly comprising a housing means having a pair of hollow metal housing members which are insulated from each other and which define a flow passage therethrough. The assembly also includes a vane member which is pivotally supported for movement between first and second positions and a spring member which biases the vane member to its first position and normally has its opposite ends engaged with the metal members to provide a conductive path therebetween. The housing means has a recess which extends radially from the flow passage at a location between the first and second positions of the vane member. The vane member is moved from its first toward its second position in response to a fluid flow in excess of a first predetermined magnitude flowing therethrough to break the conductive path and, when the flow decreases to below a second predetermined magnitude less than the first, the vane member moves toward its first position. The recess provides an instantaneous increase in the flow passage area available for fluid flow when the vane member moves toward its first position and is aligned therewith to enable the spring member to rapidly shift the vane member to is first position.

3,718,789
PRESSURE SWITCH WITH OVERTRAVEL MEANS ON SWITCH ACTUATING ARM FOR MAINTAINING LOAD ON SWITCH DURING SMALL PRESSURE FLUCTUATIONS

Melvin S. Hook, La Salle, Ill., assignor to Burns Machine Co., Ottawa, Ill.
Filed April 15, 1971, Ser. No. 134,318
Int. Cl. H01h *35/32, 3/48*
U.S. Cl. 200—83 R **2 Claims**

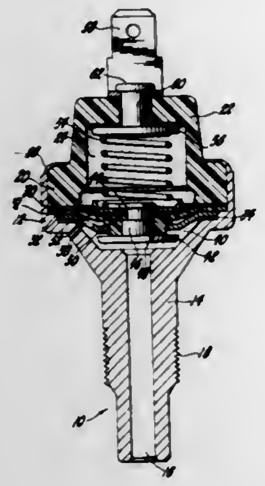


Switch operated by fluid under pressure such as the pressure of pressurized lubricating oil used in lubricating an internal combustion engine or other pressure lubricated device. The switch includes a pivoted switch arm overlying and adapted to depress a switch button, and coaxially pivoted actuator arm overlying the switch arm and operated by an extensible fluid pressure operated device. A spring biased plunger is connected between the switch arm and switch button and is loaded with sufficient strength when the switch is closed to retain the switch button in a depressed actuated condition, upon surges in pressure in the pressure line.

3,718,790
PRESSURE RESPONSIVE SWITCH

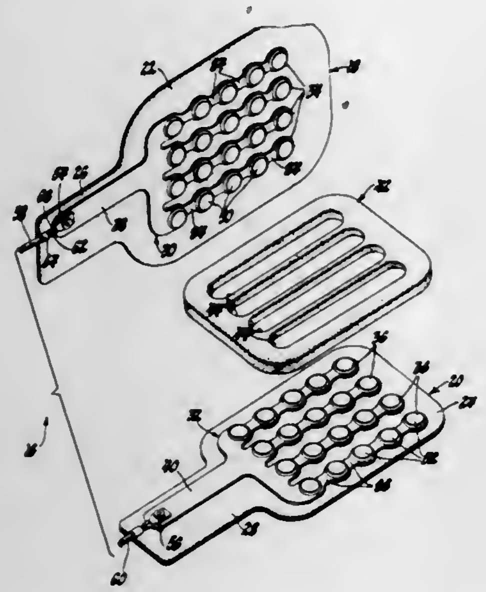
Donald J. Zelenka, Flushing, Mich., assignor to General Motors Corporation, Detroit, Mich.
Filed Oct. 4, 1971, Ser. No. 186,024
Int. Cl. H01h *35/34*
U.S. Cl. 200—83 V **3 Claims**

This invention relates to a normally open pressure responsive electrical switch. Such a switch can be used in an automobile transmission as part of the transmission control spark advance systems presently found on automobiles.



3,718,791
PRESSURE RESPONSIVE SWITCH

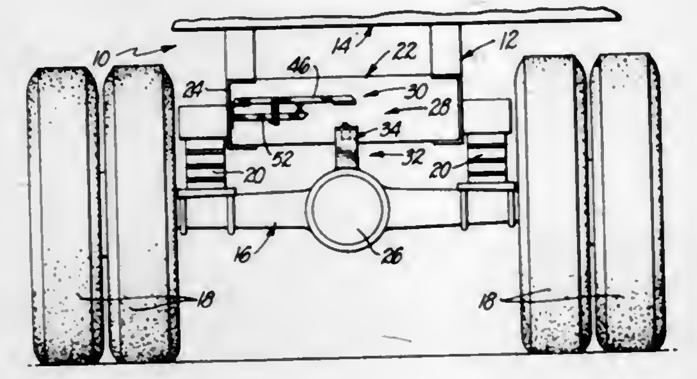
Teofil Szablowski, Warren, Ohio, assignor to General Motors Corporation, Detroit, Mich.
Filed Sept. 16, 1971, Ser. No. 181,013
Int. Cl. H01h *3/02*
U.S. Cl. 200—85 A **11 Claims**



A normally open pressure responsive switch includes spaced first and second substantially planar members having opposed paddle-like configurations and composed of a dielectric generally flexible material such as plastic. First and second planar contacts of fork-like configurations are respectively laminated to the opposed faces of the planar members. The members and contacts are stamped to form depressions of frustoconical configuration. First and second terminals for connecting the switch to an electric circuit are respectively connected laterally spaced to handle portions of the contacts. The lateral spacing prevents engagement of the terminals and resultant closing of the switch. A resilient foam pad positioned between and adhesively bonded to the blade portions of the planar members includes a plurality of apertures of variable configuration whose opposite ends open to the tine portions of the respective contacts. The foam pad normally maintains a spaced relationship between the frustoconical apexes of the depressions respective the opposite ends of each aperture and deflects to allow engagement of these apexes and closing of the switch when the planar members are subjected to a normal pressure above a predetermined value.

3,718,792
OVERLOAD INDICATOR

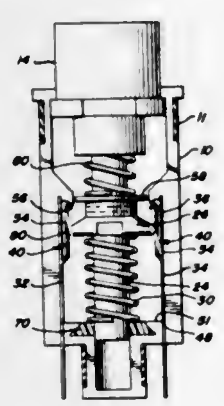
Jack R. Stagner, 13708 Shaver, La Puente, Calif.
Filed May 12, 1972, Ser. No. 252,556
Int. Cl. H01h *3/14*
U.S. Cl. 200—85 R **13 Claims**



An overload indicator for a cargo handling vehicle, such as a truck, trailer, or the like, having a chassis mounting a cargo receiver and supported on wheel axles by springs which yield under the cargo weight with resultant lowering of the chassis toward the axles. The indicator has two separate parts to be attached to one axle and the chassis, respectively, in such a way that the chassis part lowers into contact with the axle part to actuate an overload signal upon loading of the vehicle to a predetermined cargo weight. The indicator is adjustable to vary the cargo weight at which the overload signal is actuated and is designated to avoid damage to the indicator in the event of deflection of the vehicle springs beyond the point at which the chassis part initially engages the axle part due to continued loading of the vehicle or bouncing of the vehicle chassis and axle in travel.

3,718,793
HIGH SPEED PUSH BUTTON SWITCH

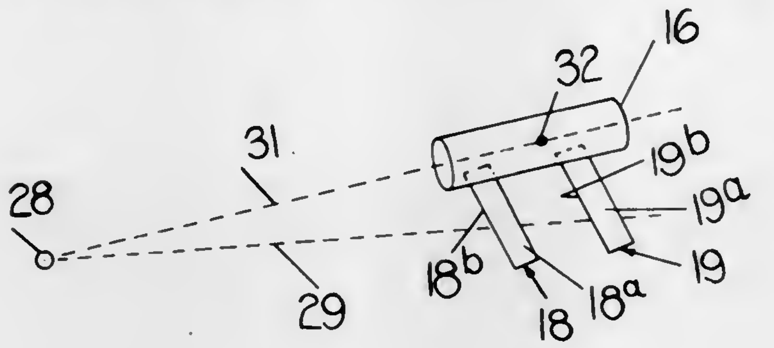
Theodore J. Obszarny, Chicago, Ill., assignor to Guardian Manufacturing Company, Chicago, Ill.
Filed Aug. 9, 1971, Ser. No. 170,206
Int. Cl. H01h *15/18*
U.S. Cl. 200—160 **27 Claims**



A normally open, momentary, double make, push button contact switch includes a push button which is biased outward by a spring. Upon depression of the push button, a cam surface on the push button engages and separates a pair of flexible legs which hold a contact disc in a fixed non-circuit position. After the legs are separated, a spring drives the contact disc downward to engage a pair of spaced, flexible contact blades. Momentary electrical connection of the blades is provided by the passing disc. Upon release of the push button, a collar associated with the push button separates the contact blades so that the assembly may reassume its original, unactivated position without again making an electrical circuit.

3,718,794
ELECTRICAL SWITCH HAVING ANGULARLY ORIENTED RECTANGULAR CONTACTS

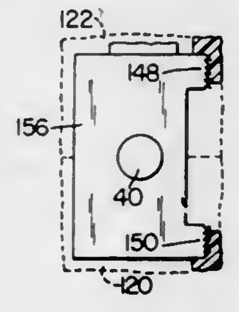
Steven John Tregurtha, Oswaldtwistle, England, assignor to Joseph Lucas (Industries) Limited, Birmingham, England
Filed March 1, 1972, Ser. No. 230,624
Claims priority, application Great Britain, March 5, 1971, 6,217/71
Int. Cl. H01h *9/00*
U.S. Cl. 200—166 BB **4 Claims**



An electrical switch in which pairs of fixed contacts are mounted in the switch body which supports a rotor carrying a roller contact for each pair of fixed contacts. Each of the fixed contacts is disposed at an acute angle to a line extending from a pivot axis of the rotor through that contact so that the portion of the surface of the roller which engages a fixed contact moves axially along the roller as the roller is moved angularly over the contact.

3,718,795
ELECTRIC SWITCHING CONSTRUCTION HAVING BARBED MEANS FOR LOCKING TOGETHER THE CASING PARTS THEREOF

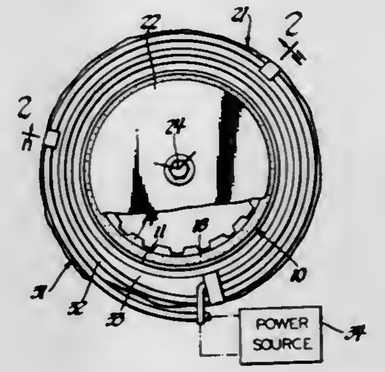
Arthur L. Good, Elkhart, Ind., assignor to Robertshaw Controls Company, Richmond, Va.
Division of Ser. No. 781,307, Dec. 5, 1968, Pat. No. 3,576,416. This application Jan. 22, 1971, Ser. No. 109,016
Int. Cl. H10h *9/02*
U.S. Cl. 200—168 R **2 Claims**



A versatile single pole, double throw switching mechanism is provided with two removable terminal connections to upper and lower stationary contacts. Either contact with its terminal connector may be removed and replaced by an electrically isolated "dead" stop member to produce a single pole, single throw switching mechanism. The vacancy produced by such removal may be covered by a cover plate. One of the stationary contacts is adjustable by a sew member. A cam member adjusts the flexing of the snap blade. Another screw member adjusts the bias of the actuator blade. Two or more switching mechanisms may be unitarily mounted side by side. The casing may be formed by two abutting casing cups. Barbed switch members hold the cup members together. A flat actuating plunger has dirt removing recesses.

3,718,796
METHOD OF MANUFACTURING WAVED AND CONED FRICTION MATERIAL FACED FRICTION PLATES

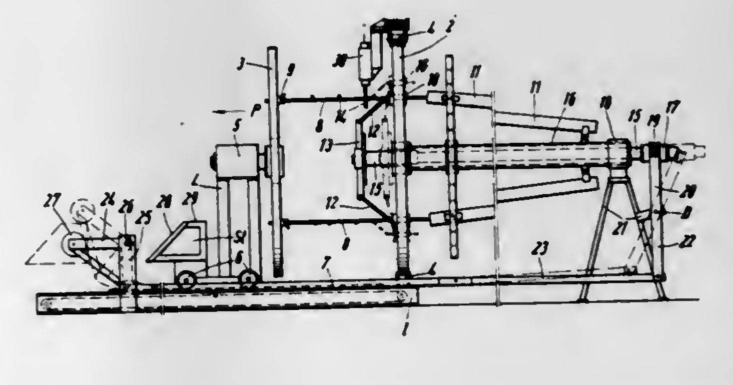
Charles Schade, Speedway, and Jack F. Staley, Alexandria, both of Ind., assignors to General Motors Corporation, Detroit, Mich.
Filed March 3, 1972, Ser. No. 231,526
Int. Cl. H05b *5/00*
U.S. Cl. 219—10.41 **6 Claims**



The waved or coned organic friction material faced steel plates are manufactured by stamping sheet steel to provide flat annular steel plates with spline teeth thereon. Then, while flat, organic annular friction material facings are adhesively bonded to the steel plates. The flat faced plate is clamped in a dielectric material stress intensifying fixture placed in a high frequency concentrating induction heating coil with an annular intensifier plate aligned with the outer edge of the steel friction plate to concentrate the heat at the outer edge of the annular friction plate. The coil is briefly energized by an induction heater generator to provide concentrated heating at the adjacent edge of the friction plate to induce a high radial temperature gradient in the steel plate without excessively heating the facing or the adhesive bond to cause impairment. If the intensifier fixture contacts and restrains both sides of the friction plate uniformly about the inner portion of its perimeter, a coned plate is formed. If the intensifier clamping fixture engages one plate in face relation and the other at peripherally spaced portions, a waved plate is formed.

3,718,797
LAPPING MACHINE FOR THE PRODUCTION OF REINFORCEMENT BASKETS WITH BELL SLEEVE

Georg Pfender, Kisslegg, Germany, assignor to Firma Wehrle-Werk AG., Emmendingen, Germany
Filed Feb. 22, 1971, Ser. No. 117,320
Claims priority, application Germany, Feb. 21, 1970, P 20 08 095.9; Feb. 21, 1970, P 20 08 094.8; March 26, 1970, P 20 14 719.7
Int. Cl. B23k *9/00*
U.S. Cl. 219—56 **13 Claims**



A lapping machine for the production of reinforcement baskets with a bell sleeve for concrete pipes and the like, which comprises longitudinal rods and an armament wire wound about the longitudinal rod. Two synchronously driven driver disks for holding and guiding, respectively, are provided. One of the disks is longitudinally displaceable in a machine frame and support the ends of the longitudinal rods. The other of the disks is immovable and axially guides the longitudinal rods. Radially adjustable guide means are pivotally connected to radial arms of a central holding disk. The arms extend along a conical jacket, so that an axial movement of the holding disk results in a simultaneous radial displacement of the guide means for the longitudinal rods and means are arranged for controlling the axial movement of the holding disk in dependency upon the path of the supporting disk.

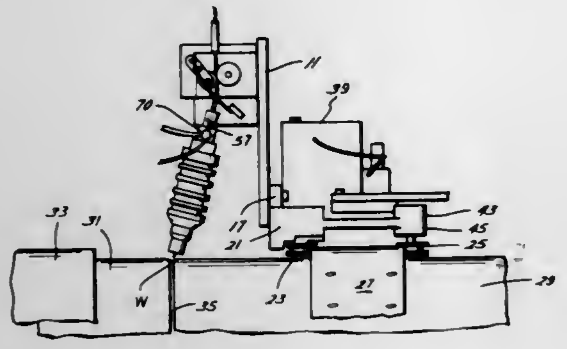
3,718,798
TRAVELING WELDING APPARATUS

James B. Randolph, Columbus, Ohio; Jerome W. Nelson; Joe R. Paysinger, both of Houston, and E. Eugene Crump, Richmond, all of Tex., assignors to CRC-Crose International, Inc., Houston, Tex.

Continuation of Ser. No. 830,369, June 4, 1969, abandoned. This application June 21, 1971, Ser. No. 155,320

Int. Cl. B23k *9/02*

U.S. Cl. 219—60 A **10 Claims**



A welding apparatus adapted to travel along a predetermined path, form a weld along such path, includes a welding head, means for mounting the head on a traveling carriage, means for supplying electrode material to said head, and means for continuously and/or occasionally changing the alignment and/or angular position of the head with respect to the work being welded in order to apply molten electrode material in a variable pattern and/or at variable angles of projection.

3,718,799
APPARATUS FOR ELECTRICALLY BONDING CEMENTED CARBIDE ELEMENTS TO THE TEETH OF A SAW BLADE

Mitsuyoshi Sawamura, 56 Hata-machi, Ono, Japan, and Takeshi Hihara, 6–8–4 Shinjinno, Jinno-cho, Kakogawa, Japan

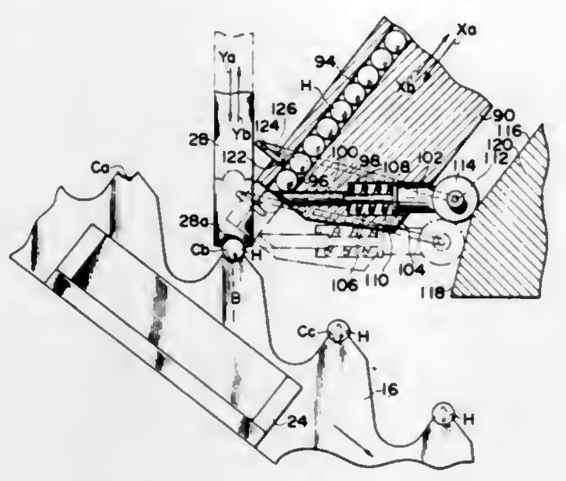
Filed June 30, 1971, Ser. No. 158,264

Claims priority, application Japan, July 22, 1970 (utility model), 45/72,632

Int. Cl. B23k *9/04*

U.S. Cl. 219—77 **6 Claims**

An apparatus for electrically bonding cemented carbide elements to the teeth of a saw blade, including a feed mechanism cooperating with guides to intermittently advance the saw blade past a work station. A releasable holding mechanism holds the blade at the work station and serves as a stationary electrode which cooperates with another movable electrode to bond the carbide elements into recesses in the blade teeth. The carbide elements are individually presented to the point of application by a feed mechanism also located at the work station.



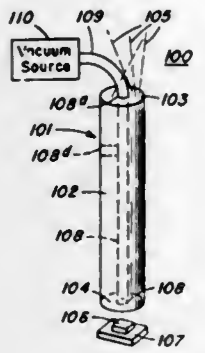
3,718,800
INFRARED HEATING APPARATUS

Bernard J. Costello, Ringoes, N.J., assignor to Argus Engineering Company, Inc., Hopewell, N.J.

Original application Mar. 5, 1968, Ser. No. 710,546, now Patent No. 3,522,407, dated Aug. 4, 1970. Divided and this application Mar. 20, 1970, Ser. No. 24,963

Int. Cl. B23k *1/04;* **G02b** *5/14*

U.S. Cl. 219—85 **1 Claim**



Apparatus employed in conjunction with a radiation source for heating or soldering electronic components wherein the apparatus is provided with one or more chambers having highly reflective surfaces aligned relative to one another so as to direct radiation entering into the chamber downwardly through the chamber so as to be emitted through the bottom opening of the chamber and thereby greatly improve the uniformity of distribution of the radiation to irradiate a region of a workpiece being soldered such that the configuration of the irradiated region is exclusively determined by the configuration of the exit opening provided in the reflective chamber. The structure comprising the chamber may also be employed to hold and accurately position the electronic component as well as masking the component from radiation and hence undue heating.

3,718,801
ARC STARTING STUD WELDING METHOD

Hideyuki Yoshida, Amagasaki, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

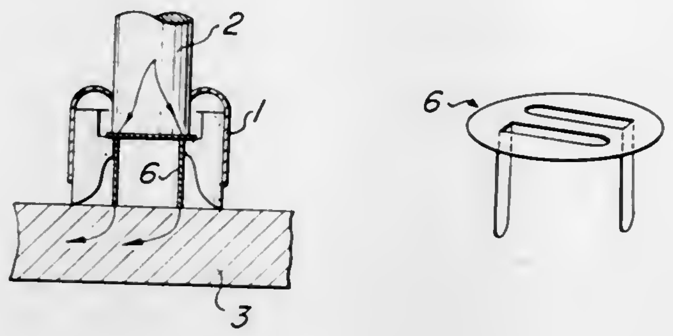
Filed April 12, 1971, Ser. No. 133,010

Claims priority, application Japan, April 17, 1970, 45/33231

Int. Cl. B23k *9/20*

U.S. Cl. 219—99 **1 Claim**

An arc stud welding method providing a metal piece between a stud and a base metal for generating an arc and for deoxidation so as to improve the arc generation effect while protecting the arc from the atmosphere whereby the characteristics of the welded metal is improved. Further, using said metal piece the length of the arc can be maintained as constant so that the uniformity of the stud welding is improved.



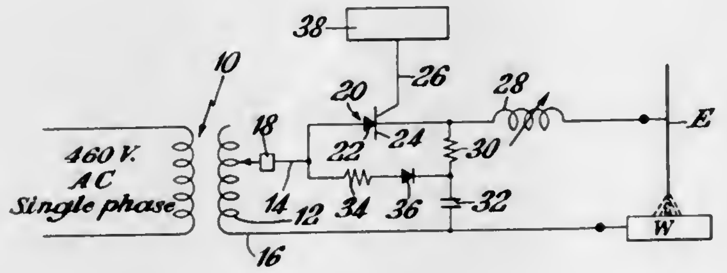
3,718,802
RIPPLE CONTROL FOR ELECTRIC ARC WELDING POWER SUPPLY APPARATUS

August Frederick Manz, Union, N.J., assignor to Union Carbide Corporation, New York, N.Y.

Filed June 30, 1971, Ser. No. 158,395

Int. Cl. B23k *9/10*

U.S. Cl. 219—131 WR **4 Claims**



Power supply apparatus for producing a continuous ripple direct current comprising a single phase A.C. source of power, a series connected parallel network consisting of a variable inductor in parallel with a series connected resistor and capacitor, a silicon controlled rectifier interposed between the power source and the parallel network and charging means for charging the capacitor during the positive half-cycle of alternating input current.

3,718,803
APPARATUS AND METHOD FOR FABRICATING A CONTAINER

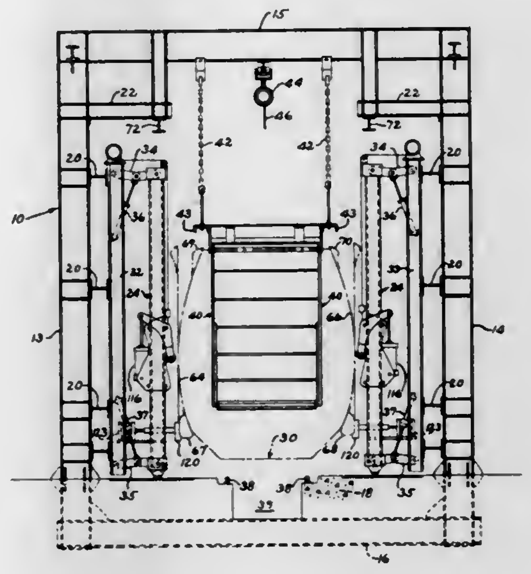
William R. Evans, Florissant, Mo., assignor to ACF Industries, Incorporated, New York, N.Y.

Filed June 9, 1971, Ser. No. 151,395

Int. Cl. B21j; B23k *31/02;* **B21d** *7/02*

U.S. Cl. 219—158 **36 Claims**

Apparatus and method for folding railway hopper car sides in a curved relation about transverse bulkheads for welding by welders supported on collapsible scaffolds within the hopper car, which also hold the bulkheads in position for welding. Rollers are mounted on carriages on vertical frames and the height of each carriage is manually controlled by the welder. The rollers are positioned on the outer surface of the car sides directly opposite the position along the bulkheads being welded. The rollers exert pressure against the car sides to press the car sides tightly against the curved bulkheads when the bulkheads are being welded to the sides.



3,718,804
FIXING HEAT-GENERATING PIPE UTILIZING SKIN EFFECT CURRENT

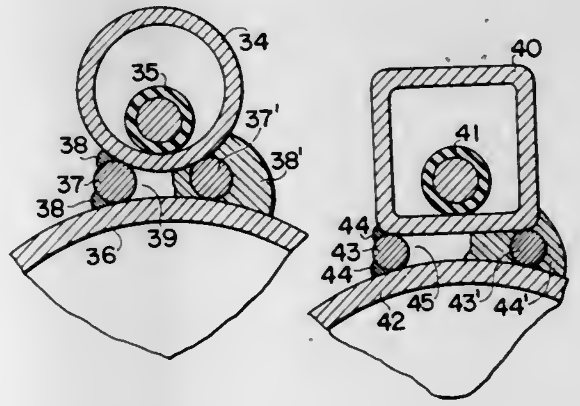
Masao Ando, Kohokuku, Yokohamashi, Japan, assignor to Chisso Corporation, Osaka, Japan

Filed July 2, 1971, Ser. No. 159,398

Claims priority, application Japan, July 16, 1970, 45/62239

Int. Cl. H05b *3/00*

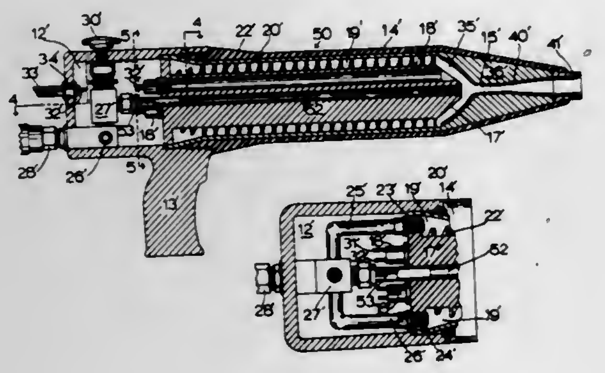
U.S. Cl. 219—301 **6 Claims**



A heat-generating pipe arrangement utilizing skin effect current includes a ferromagnetic pipe and an insulated conductor line passing through the interior of the pipe and having such a circuit therewith that current is concentrated and passed only through the inner surface of the pipe when an alternating current is passed through the circuit. The heat-generating pipe is spaced apart from the outside wall of a pipeline to be heated by interposed spacing means whereby a small clearance of about a millimeter is created and maintained over the entire length of the ferromagnetic pipe to protect the pipeline from being damaged by a possible arc in the event of a failure of the insulation on the conductor inside the ferromagnetic pipe.

3,718,805
HEATED FLUID GUN

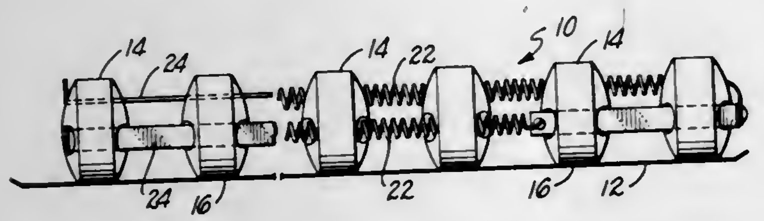
**Eldridge D. Posey, 411 Rushwood Drive,
Murfreesboro, Tenn. 37130
Original application Nov. 12, 1969, Ser. No. 875,898.
Divided and this application Jan. 13, 1971, Ser.
No. 106,266
Int. Cl. B05b *1/24;* H05b *1/00*
U.S. Cl. 219—305 3 Claims**



A portable gun housing including an elongated heat-conductive core through which is formed a central elongated straight central fluid passage surrounded by a helical fluid passage and with both fluid passages communicating with a discharge orifice in the front of the housing. At least one elongated electrical heating element extends longitudinally through the core between the straight fluid passage and the helical fluid passage, and an electrical supply conduit is provided for energizing the heating element. A control valve located within the breech or rear chamber of the housing has an inlet connected to a fluid supply conduit and outlets connected to the fluid passages. The valve has a closed position wherein fluid is directed solely to the helical passage, a fully open position wherein the fluid is directed substantially solely through the straight passage and variable intermediate positions between the closed and open positions wherein fluid is directed simultaneously through both passages in proportionate amounts corresponding to the intermediate position.

3,718,806
ELECTRIC RESISTANCE HEATER WITH SPACED INSULATORS AND AN INTER-CONNECTABLE FLEXIBLE METALLIC BASE STRIP

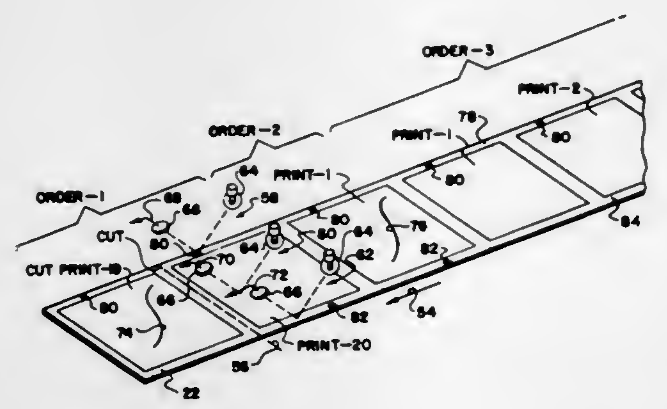
**Paul H. Potter, 544 Fantasy Street, Palmdale, Calif.
Filed July 7, 1971, Ser. No. 160,467
Int. Cl. H05b *3/02*
U.S. Cl. 219—550 2 Claims**



An electric heater comprising a flexible base strip, insulators spaced apart along and having flats seated on one side of the base strip, each insulator being provided intermediate its ends with an aperture generally perpendicular to and having an end adjacent the base strip, each of the insulators being provided between the aperture and the respective ends of the insulator with shoulders which extend to the aperture and which face away from the base strip, the base strip having two integral prongs within the aperture of each insulator and respectively bent toward opposite ends of such insulator over the shoulders thereof to secure same to the base strip, and electrical resistance elements threaded through openings in the insulators.

3,718,807
METHOD AND APPARATUS FOR FACILITATING THE PACKAGING AND PRICING OF PHOTOGRAPHIC PRINTS

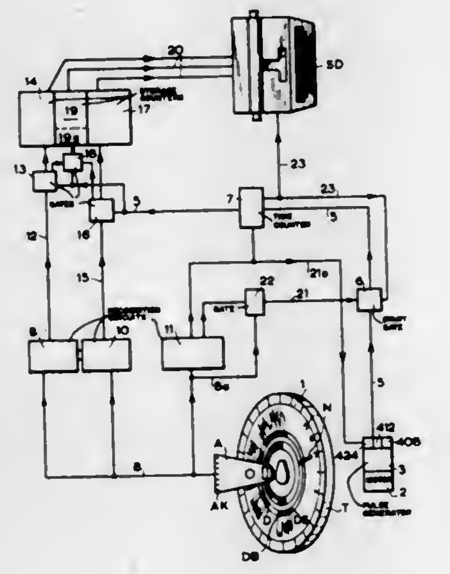
**Thomas W. Bracken and Thomas C. Laughon, Rochester, and Gerald C. Smith, Honeoye, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.
Filed Apr. 16, 1971, Ser. No. 134,786
Int. Cl. G07c *3/10*
U.S. Cl. 235—92 PD 5 Claims**



A finishing operations workcenter includes apparatus for cutting and sorting prints, cutting and stacking negative filmstrips, correlating "marked" prints with the negative filmstrip containing the corresponding print, counting the prints and displaying the price to be charged for the prints. The print cutter and sorter apparatus advances a strip of photographic prints from a print roll through a print cutting blade that severs each print. Prior to the severance of each print, the strip of prints are scanned for unacceptable prints denoted by a mark placed thereon by a print inspector. Unacceptable prints are automatically separated from acceptable prints in response to the detector marks. Simultaneously, the negative filmstrip of each customer order of prints is cut into a number of predetermined lengths and stacked in a predetermined manner by the automatic filmstrip cutting and stacking apparatus. A marked print is correlated with the negative filmstrip in the stack that contains the corresponding negative. Furthermore, the total number of prints made from each customer's order is counted and displayed on the price display apparatus which also indicates the price to be charged for printing the customer order. When the last of each customer's order of prints and negative filmstrips are cut, the respective cutting apparatus cease operation. The operator of the finishing operations workcenter gathers the acceptable prints, inserts them into an envelope obtained from an envelope dispenser, removes the stacked negative filmstrips from the print cutting apparatus, inserts the negative filmstrips into the envelope, notes the price displayed by the automatic print counting and price display apparatus and marks the envelope with the indicated price. When marked prints have been detected, the operator separates the marked prints and corresponding negative filmstrips, inserts the good prints and negative filmstrips into the envelope and attaches the marked prints and corresponding negative filmstrips to the envelope. These orders are set aside for reprinting. Upon the removal of the stack of negative filmstrips from the automatic film cutting and stacking apparatus, the print counter and the correlator display are reset and the print and film cutting apparatus are energized to cut the next customer order of prints and negative filmstrips.

3,718,808
APPARATUS FOR TIME-DEPENDING EVALUATION OF A DIAGRAM CARRIER

**Heinz Kelch, Buchenberg, and Siegfried Spauszus, Villingen, Germany, assignors to Kienzle Apparate G.m.b.H., Villingen, Germany
Filed Feb. 22, 1972, Ser. No. 227,738
Claims priority, application Germany, Feb. 19, 1971,
P 21 07 976.5
Int. Cl. G06k *11/00*
U.S. Cl. 235—92 T 21 Claims**

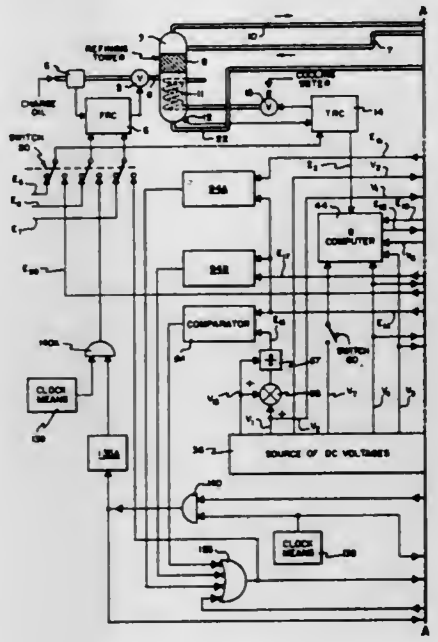


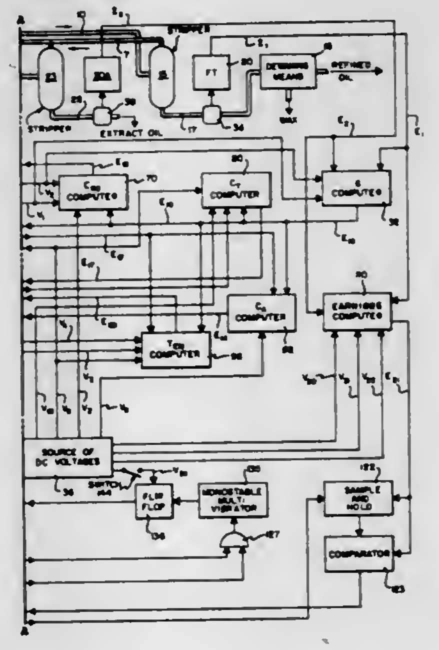
An apparatus for evaluating at least one recording on a rotary diagram carrier which has a starting mark and is sensed by scanning means distinguishing different sections of the recording, and producing a start signal when sensing the start mark. A pulse generator generates time pulses which are counted by a time counter producing an end signal when a predetermined number of time pulses, corresponding to 24, or 12 hours, for example, is counted. While sensing the different sections of the recording, the scanning means transmit different signals representing the respective sections of the recording, to distributing gates which permit the passage of corresponding numbers of time pulses to different storage counters which are separately read out when the end signal is produced after 24, or 12 hours, for example.

3,718,809
MEANS AND METHOD FOR CONTROLLING A SOLVENT REFINING UNIT TO PROVIDE OPTIMUM YIELDS OF REFINED OIL AND EXTRACT OIL

**Robert A. Woodle, Port Arthur, Tex., assignor to Texaco Inc., New York, N.Y.
Filed April 21, 1971, Ser. No. 136,003
Int. Cl. G06g *7/58;* C10g *21/00*
U.S. Cl. 235—151.12 12 Claims**

A solvent refining unit is initially operated at a predetermined solvent dosage and a predetermined extract-mix temperature to yield refined oil of a desired quality from charge oil. A quality constant is determined from the initial operation of the refining unit. Limitations on a selectivity characteristic of the solvent, defining an area of feasible operation, are determined from various maximum operating characteristics and equations, hereinafter disclosed. The charge oil flow rate is repeatedly increased in a stepping fashion and an actual solvent selectivity characteristic for each step is calculated using the solvent dosage and the quality constant. An earnings position for the refining unit is determined for each step. When the earnings position for a current step is less than the earnings position for the previous step, or when the actual solvent selectivity characteristic for the current step does not lie within the area of feasible operation, the charge oil flow rate is decreased to the flow rate for the next previous step.

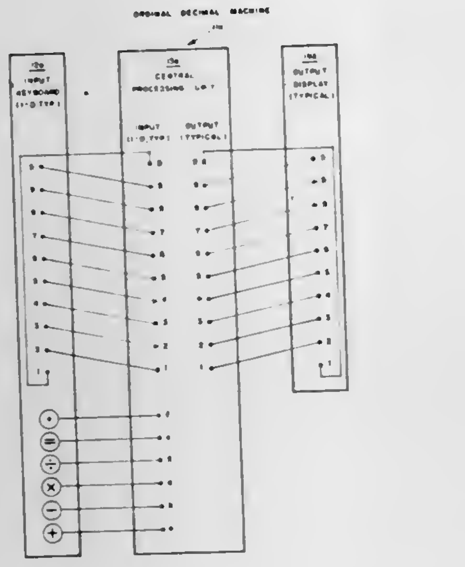




3,718,810
CARDINAL-ORDINAL DIGITAL CALCULATORS AND COMPUTERS

**Paul K. Myers, Seattle, Wash., assignor to Cardinal-Ordinal Corporation, Seattle, Wash.
Filed July 29, 1971, Ser. No. 167,387
Int. Cl. G06f *7/38, 3/00*
U.S. Cl. 235—156 26 Claims**

A calculator comprising a conventional cardinal calculator having an input keyboard unit, a central processing unit input and output, and an output display unit wherein the connections on the central processing unit input from all terminals on the input keyboard unit are shifted down to that of the next lower numeral in the central processing unit input. The connections on the output display unit from all terminals on the central processing unit output are shifted up to that of the next upper numeral in the output display unit resulting in an ordinal calculator for producing an ordinal number sum, difference, product, or quotient answer from an input and subsequent computation of two ordinal numbers. With the addition of a gang switch for shifting all these connections by one terminal, a cardinal-ordinal calculator results for utilizing either or both cardinal and ordinal numbers. Two modifications of the ordinal calculator and two modifications of the cardinal-ordinal calculator are disclosed. For computer use it is only necessary that the computer program instruct the operator when to shift from cardinal to ordinal operation or vice versa.



3,718,811
ELECTRONIC TAXIMETER DEVICE

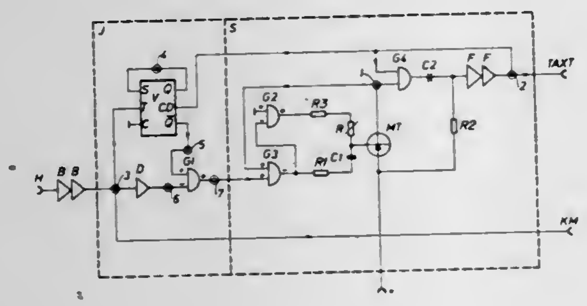
Carl Ib Peder Larsen, Stenstuegade, Denmark, assignor to Haldex Aktiebolag, Halmstad, Sweden

Filed July 23, 1971, Ser. No. 165,039

Claims priority, application Denmark, Aug. 12, 1970, 11,027

Int. Cl. G07b *13/00*

U.S. Cl. 235—30 R **4 Claims**



An electronic taximeter comprising circuitry for generation of a single pulse train by an oscillating means constructed so as to emit oscillations in the form of constant frequency pulses applied to charge counter means when the speed of the taximeter carrying vehicle is below a predetermined value, and to emit speedometer governed pulses, obtained by a synchronizing process involving speedometer sensor means feeding triggering pulses to the above-mentioned oscillating means, when the vehicle speed is above the aforementioned value. The pulses are hereby received at a constant rate below this speed and at a variable rate above this speed, and comprise a certain number of pulses per travelled distance applied to the same charge counter means. The electronic circuitry merely changes automatically, and without any pulse loss, the rate of the pulse train applied to the charge counter means and establishes, with reference to the predetermined speed, a time dependent fare below and a distance dependent fare above this speed.

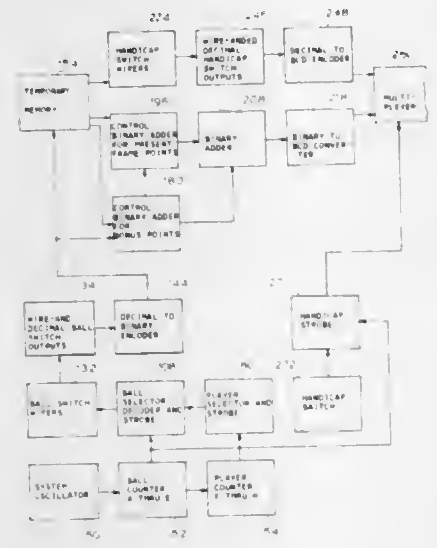
3,718,812
BOWLING SCORE COMPUTER

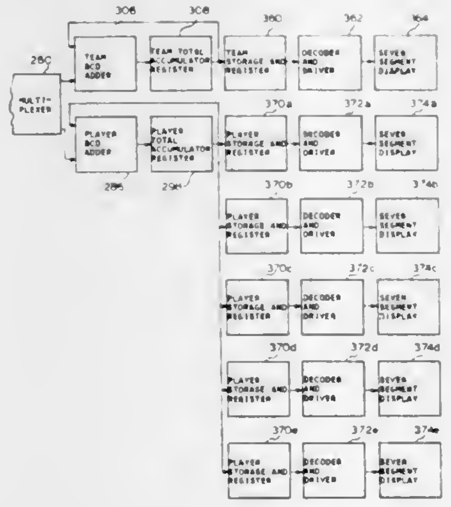
Herman L. Tillman, 2626 N.E. 49th Street, Plantation, Fla., and Ralph E. Booth, 691 N.W. 65th Avenue, Fort Lauderdale, Fla.

Filed June 14, 1971, Ser. No. 152,833

Int. Cl. G06f *7/50, 15/20;* **A63d** *5/04*

U.S. Cl. 235—168 **9 Claims**




MULTIPLEXER
TEAM BCD ADDER
TEAM TOTAL ACCUMULATOR REGISTER
TEAM STORAGE AND REGISTER
DECODER AND DRIVER
SEVEN SEGMENT DISPLAY
PLAYER BCD ADDER
PLAYER TOTAL ACCUMULATOR REGISTER
PLAYER STORAGE AND REGISTER

A bowling score computer system having manual input of pinfall data via thumb-wheel switches. The switches are sequentially scanned to derive data for use by a solid-state electronic computer to derive individual and team scores. At regular periodical intervals, the switches are rescanned to derive up-to-date output values in case the output should be changed. The system has the capability of operating in a handicap mode or in a scratch mode. The input switches serve as an input storage memory and eliminate the need for most other internal memory within the system.

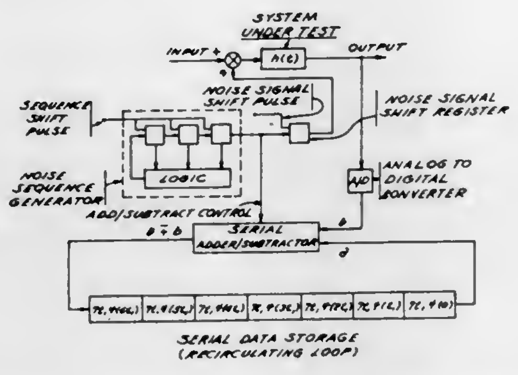
3,718,813
TECHNIQUE FOR CORRELATION METHOD OF DETERMINING SYSTEM IMPULSE RESPONSE

Olin A. Williams, Jr., 4480 Lashaly Drive, Tucker, Ga. 30084, and John B. Peatman, Georgia Tech, Atlanta, Ga. 30302

Continuation-in-part of abandoned application Ser. No. 47,502, June 18, 1970. This application Jan. 19, 1972, Ser. No. 218,981

Int. Cl. G06f *7/19;* **G01r** *27/28*

U.S. Cl. 235—181 **9 Claims**



Improved method for making real time system impulse response measurements which involves the use of binary pseudo-random noise sequences as test signals.

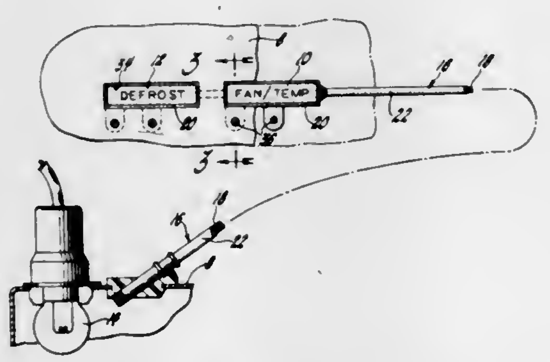
3,718,814
FIBER OPTIC ILLUMINATOR AND METHOD OF MAKING SAME

Allan S. Van Slyke, Southington, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed March 27, 1972, Ser. No. 238,457

Int. Cl. B60q *3/04*

U.S. Cl. 240—8.16 **4 Claims**



A conventional fiber optic light conductor comprising a bundle of filaments arranged in a generally circular cross-section and covered with an opaque jacket, has a portion thereof formed into a flat large area illuminator emitting light laterally of the axis of the bundle by removing the jacket from the portion of the bundle where the illuminator is desired, spreading the filaments out into a flat array and securing the filaments to a flat retaining member. The low index of refraction coating of the filaments is at least partially disrupted to allow escape of light laterally from the filaments.

3,718,815
PHOTOGRAPHIC FLASHLAMP UNIT WITH FLASHED LAMP INDICATOR AND METHOD OF MAKING SAME

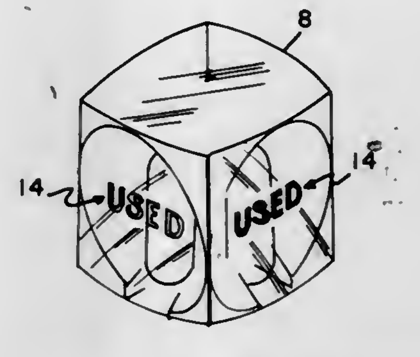
Thomas B. McDonough, Allenwood, and John W. Shaffer, Williamsport, both of Pa., assignors to GTE Sylvania Incorporated

Filed March 9, 1971, Ser. No. 122,454

Int. Cl. F21k *5/02;* **G03b** *15/02*

U.S. Cl. 240—1.3 **11 Claims**

A flashcube having a flashed lamp indicator comprising a spot of dried paste composed of blue powder, a meltable red dye, a meltable organic compound which in the molten state functions as a solvent for the dye, and a binding resin. The paste is prepared as an aqueous dispersion and, in the process of making the flashcube, may be applied on the inside surface of each of the flashcube windows.



3,718,816
ILLUMINATION DEVICE

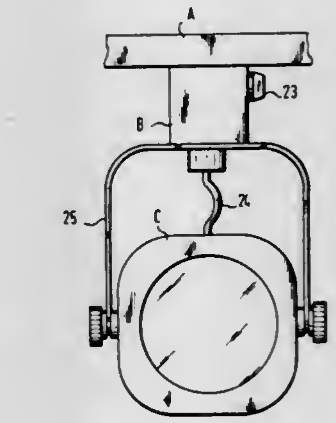
Heinz Seelbach, Kierspe, and Gerhard Eversberg, Ludenscheid, both of Germany, assignors to FA. Reininghaus & Co., Ludenscheid, Germany

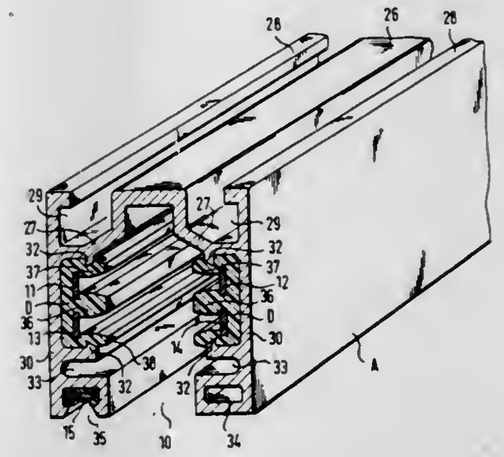
Filed June 17, 1971, Ser. No. 153,980

Claims priority, application Germany, June 18, 1970, G 70 22 809.0

Int. Cl. F21v *21/00;* **H01r** *13/00*

U.S. Cl. 240—52 R **6 Claims**





An illumination device comprising a support rail, a terminal box insertable therein, and receiving on both sides therein a conduit rail carrier having a plurality of electrical conduit rails. A plurality of spring holding and contact-tongues in the terminal box, operatively cooperating with said conduit rails. A pole contact tongue cooperates in one of the insert positions of the terminal box with a pole conduit of one current circuit of one of the conduit rail carriers of one current circuit, while in another insert position turned 180° relative to the first insert position cooperating with the pole conduit of the other current circuit of the other of the conduit rail carriers. The terminal box has in each insert position one grounding pin of two grounding pins cooperating with a grounding rail of the support rail, while the other grounding pin on an opposite side being free from the grounding rail being pressed into the housing of the terminal box, and support rail securing means for a direct securing of the support rail and hook stays for securing of the support rail over suspension profile rails with securing engagement planes of the latter being on a joint level.

3,718,817

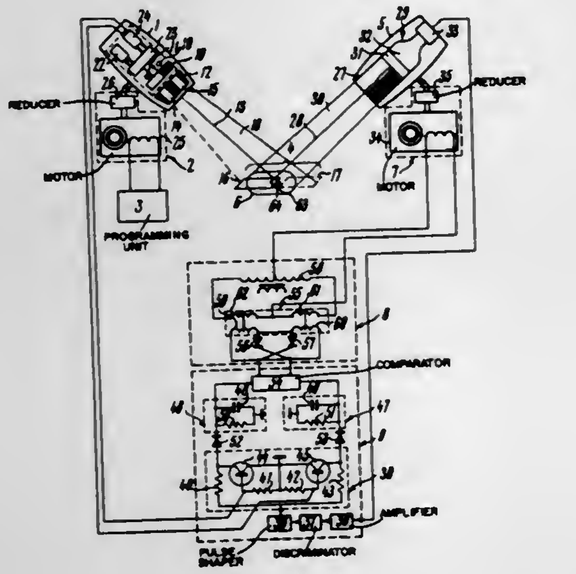
DEVICE FOR DETERMINING THE LEVEL AND SURFACE PROFILE OF MATERIALS UTILIZING HARD RADIATION

Vadim Nikolaevich Afanasiev, Bolotnikovskaya ulitsa, 40, korpus 4, kv. 23, Moscow; Jury Pavlovich Belyaev, ulitsa Sechenova, 58, kv. 30, Zhdanov; Vladimir Olegovich Gaiduchik, Mariupolskaya ulitsa, 4, kv. 47, Moscow; Pavel Lukich Gruzin, polschad Pryamikova, 6, kv. 21, Moscow; Nikolai Alexandrovich Konkin, Aviamotornaya ulitsa, 49/1, kv. 102, Moscow; Valery Vasilievich Megarsky, Verkhnaya Pervomaiskaya ulitsa, 24/17, kv. 17, Moscow; Boris Nikolaevich Okunev, ulitsa zoi i Alexandra Kos-modemyanskikh, 35/1, kv. 19, Moscow, and Jury Alexandrovich Trokin, Baikalskaya ulitsa, 40/17, kv. 70, Moscow, all of U.S.S.R.

Filed Nov. 27, 1970, Ser. No. 93,280

Int. Cl. G01n *21/24*

U.S. Cl. 250—43.5 FL **2 Claims**



The invention relates to devices for determining the level and surface profile of materials.

The device according to the invention is characterized in that it contains a collimated hard electromagnetic radiation source complete with a servo drive, a collimated reflected radiation reciever also with a servo drive and a means for determining the relative position of the irradiated zone on the inspected surface and the receiving zone. The collimated radiation receiver also with a servo drive and a means for tion of the hard electromagnetic radiation flux relative to the axis of collimation. The means for determining the relative position of the irradiated and receiving zones comprises a phase detector which is electrically connected to the means for periodically varying the position of the radiation flux and serves to route the signal coming from the collimated radiation receiver in accordance with the phase of the control signal coming from the means for periodically varying the position of the radiation flux, and at least two integrating networks which are electrically connected to the phase detector and each of which accepts the signal from the phase detector in accordance with the phase of the control signal.

3,718,818

MEASURING CERENKOV RADIATION PRODUCED BY CHARGED PARTICLES PASSING THROUGH A GAS AS INDICATIVE OF THE ENERGY OF THE CHARGED PARTICLES

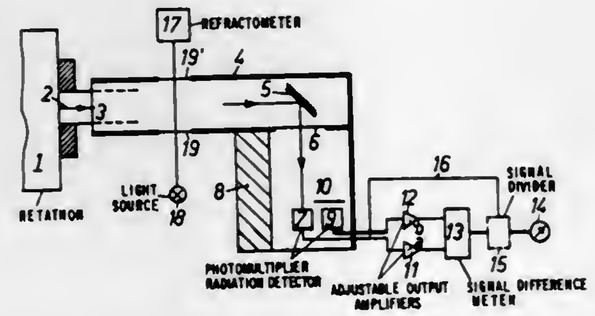
Arnold von Arx, Olten, and Klaus Kuphal, Staretschwil, both of Switzerland, assignors to Aktiengesellschaft Brown, Boveri & Cie, Baden, Switzerland

Filed Sept. 24, 1970, Ser. No. 75,147

Claims priority, application Switzerland, Sept. 29, 1969, 14624/69

Int. Cl. G01t *1/20*

U.S. Cl. 250—71.5 R **2 Claims**



A device for determining the energy of electrically charged particles emanating from a particle accelerator such as a Betatron used for radiation therapy includes a gas interval traversed by the accelerated particles for producing a Cerenkov radiation whose optical index of refraction is variable. First and second adjacently located detectors are disposed in the path of Cerenkov radiation, both of these detectors being exposed to the same dispersed and secondary particle radiation but one detector being shielded from the direct Cerenkov radiation. The respective outputs from the detectors are led through amplifiers whose amplification factors are adjustable into a difference meter, and the output of the difference meter is applied to a measuring instrument.

3,718,819

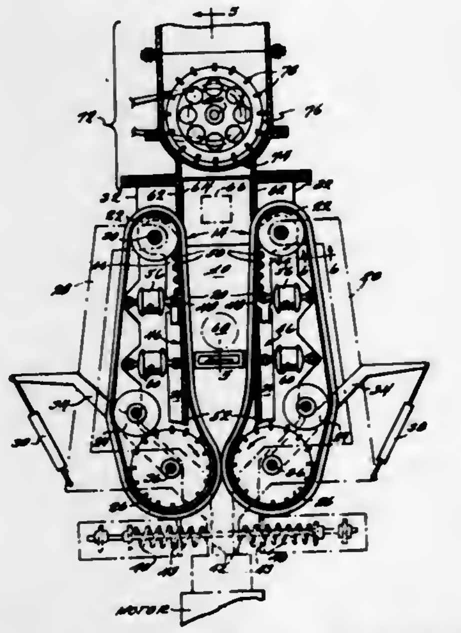
FEEDING AND PARTICLE SIZE MEASUREMENT OF COMMINUTED SOLIDS

Frank J. Miksitz, 603 Barrymore Street, Phillipsburgh, N.J.

Continuation-in-part of Ser. No. 753,505, Aug. 19, 1968, abandoned, which is a continuation-in-part of Ser. No. 547,627, May 4, 1966. This application Feb. 12, 1971, Ser. No. 115,051

Int. Cl. G01n *23/12*

U.S. Cl. 250—43.5 D **12 Claims**



This invention relates to the feeding and analysis of particulate material and in particular to (1) the feeding of such materials at controlled rates, (2) the continuous dynamic measurement of particle size and other properties of the material being conveyed and (3) the provision of a chemical processing environment through which the material is conveyed under controlled conditions.

3,718,820

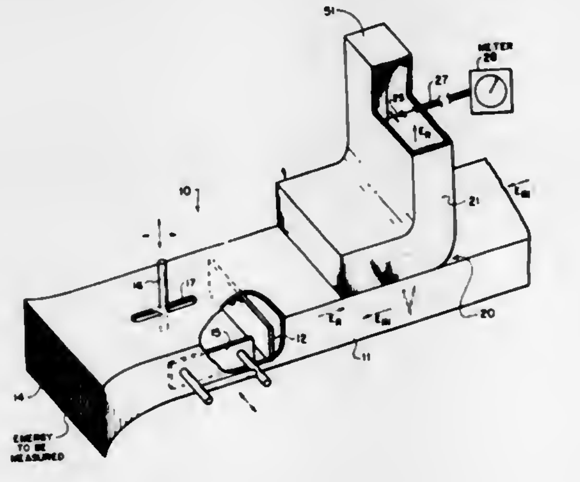
PHOTON RADIATION DETECTOR

Harold Jacobs, West Long Branch, N.J., assignor to the United States of America as represented by the Secretary of the Army

Filed May 25, 1971, Ser. No. 146,766

Int. Cl. G01f *1/16*

U.S. Cl. 250—83.3 H **17 Claims**



A sensitive detector of incoming radiation, for example, infrared radiation, having a thin panel of a semiconductor material, the conductivity of which is a function of intensity of said incoming radiation, placed across a microwave waveguide into which microwave energy is supplied. If the waveguide is provided with tuning elements to control both attenuation and line-length in the region between the semiconductor panel and a microwave short, a lossy reflection cavity is formed and, by proper adjustment of said tuning elements, the microwave power reflected from the semiconductor panel and coupled through a directional coupler to an indicating device can be minimized. Conductivity changes in the semiconductor material resulting from exposure to said incoming radiation cause corresponding changes in the reflected electric field to occur which is proportional to the conductivity, and the consequent change in reflected power propagating through the directional coupler can be detected by conventional microwave detecting means and supplied to an indicating device calibrated to read intensity of the incoming radiation.

3,718,821

AUTOMATICALLY ADJUSTING PHOTOELECTRIC POSITION DETECTOR

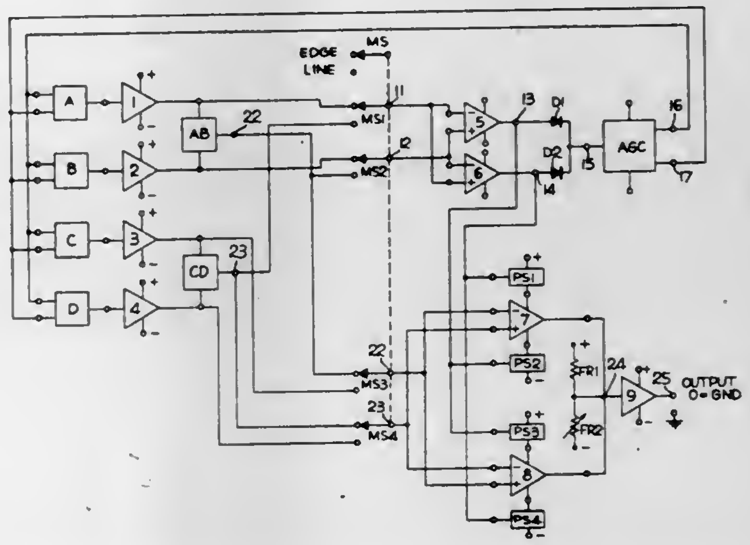
George Vischulls, W172 N9409 Shady Lane, Menomonee Falls, Wis.

Filed Oct. 29, 1971, Ser. No. 193,822

Int. Cl. G06k *11/02*

U.S. Cl. 250—202 **43 Claims**

A photoelectric position detector for a line or edge target provides an output of the same polarity when the target deviates in a given direction from the reference position regardless of whether the target is a left edge or a right edge or a line and irrespective of the orientation of the high reflectivity and low reflectivity portions of the target. Optic fibers transmit light reflected from discrete areas of the target to a plurality of detector photocells, means responsive to the output of at least two photocells derive a contrast signal proportional to the relative intensity of light reflected from different areas of the target, and an automatic gain control amplifier responsive to the contrast signal supplies voltage to the detector photocells and continuously adjusts its gain to a constant value so that the response of the photocells for a given target deviation is substantially constant regardless of target contrast.



3,718,822

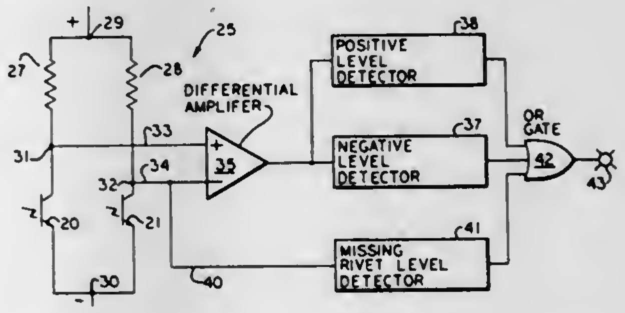
RIVET CENTER DETECTING MECHANISM

Larry B. Pascoe, National City, Calif., assignor to Rohr Industries, Inc., Chula Vista, Calif.

Filed April 23, 1971, Ser. No. 136,771

Int. Cl. G06m *7/00;* **H01j** *39/12*

U.S. Cl. 250—210 **7 Claims**

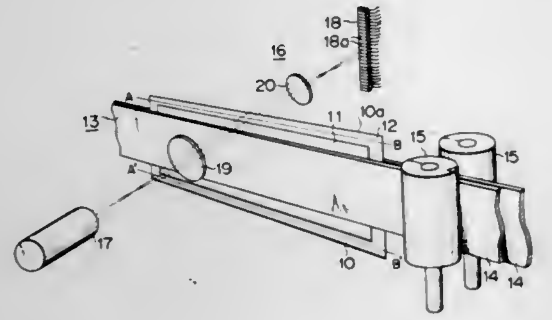


To determine whether or not a rivet has been delivered to, and is properly centered between, the rivet holding fingers of an automatic riveting machine, a light beam is directed from a light source on one side of a selected rivet position, past such selected position toward two photocells, so positioned that both photocells are fully exposed to the beam when the fingers are empty; both photocells are shielded equally from the beam when a rivet is held in properly centered position between the fingers; and one of the photocells is exposed to the beam to a greater degree than the other when a rivet is in improperly centered position between the fingers. The photocells are embodied in a bridged circuit having three detectors responsive thereto, the detectors being actuated selectively according to the relatively illuminated condition of the photocells.

3,718,823
OPTICAL DETECTORS FOR INSPECTING THE CONDITION OF SAMPLES

Isamu Niikura, Hiratsuka, and Hirosi Arita, Yokohama, both of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan

Filed Nov. 8, 1971, Ser. No. 196,293
Claims priority, application Japan, Nov. 11, 1970, 45/111205
Int. Cl. H01j *39/12*
U.S. Cl. 250—223 R **10 Claims**



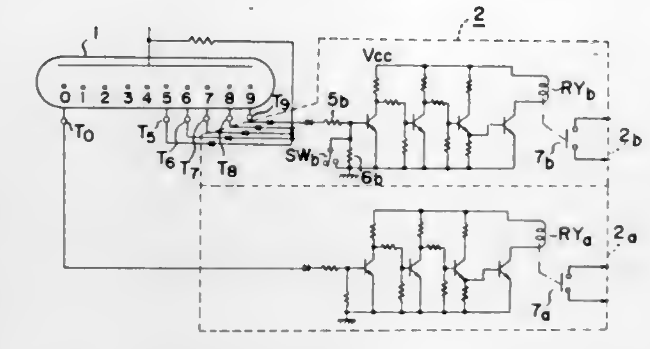
To inspect the condition of a sample, for example a paper money, there are provided a conveyor for successively conveying the sample along a predetermined path; optical means including a source of light disposed on one side of the conveyor for projecting light upon a predetermined area containing a predetermined portion, e.g., the margin of the sample, and a photoelectric transducer on the opposite side and including a plurality of juxtaposed unit elements for producing electric outputs proportional to the quantity of light impinging thereon; and a selection circuit responsive to the outputs from respective unit elements for selecting the output only from a particular unit element corresponding to the predetermined portion of the sample irrespective of the deviation of the position of the sample from said path.

3,718,824
SYSTEM OF DATA DISCRIMINATION IN MONEY DISPENSING MACHINE

Yoshihiro Hatanaka, and Hideto Shigemori, both of Himeji, Japan, assignors to Glory Kogyo Kabushiki Kaisha, Himeji-shi, Japan

Filed Dec. 28, 1971, Ser. No. 213,019
Claims priority, application Japan, Dec. 28, 1970, 45/120345; Dec. 29, 1970, 45/121645
Int. Cl. H01h *47/32*
U.S. Cl. 307—149 **5 Claims**

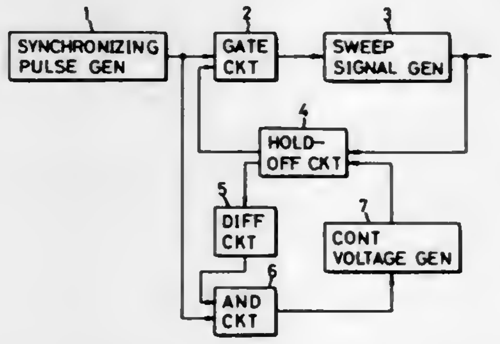
For discriminating the respective digits that are exhibited by indicator tubes of a money dispensing machine to indicate an amount of money to be released, there are provided with a plurality of first detecting circuits each having an input connected to the output terminal of each of the indicator tubes which corresponds to the digit "0" to be exhibited thereby. Each of second detecting circuits cooperating with the first detecting circuits has an input connected to the output terminals of each indicator tube which are provided correspondingly to preselected ones of the remaining digits, usually from "1" to "9." An output signal of each indicator tube is produced only from the output terminal corresponding to the digit being exhibited at the moment. The second detecting circuits, or both the first and the second detecting circuits, may be each equipped with a switch whereby the circuit can be rendered operative or inoperative as desired.



3,718,825
SWEEP CIRCUIT EXHIBITING ELIMINATED JITTER

Hideo Matsuoka, Tokyo, Japan, assignor to Iwatsu Electric Co., Ltd., Tokyo, Japan

Filed Dec. 17, 1970, Ser. No. 99,208
Claims priority, application Japan, Dec. 27, 1969, 45/1,065, 45/1,066
Int. Cl. H03k *4/10*
U.S. Cl. 307—228 **14 Claims**

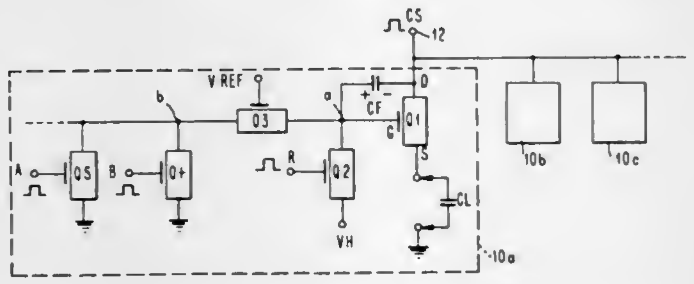


A sweep circuit wherein a signal is derived at the end of the hold-off signal and gated with the synchronising pulses (or signals derived therefrom) to provide an output pulse which automatically adjusts the timing of the end of the hold-off signal, thereby to eliminate jitter automatically.

3,718,826
FET ADDRESS DECODER

Nicholas M. Donofrio, Wappingers Falls, and Richard H. Linton, Poughkeepsie, both of N.Y., assignors to International Business Machines Corp., Armonk, N.Y.

Filed June 17, 1971, Ser. No. 154,103
Int. Cl. H03k *17/00*
U.S. Cl. 307—251 **8 Claims**

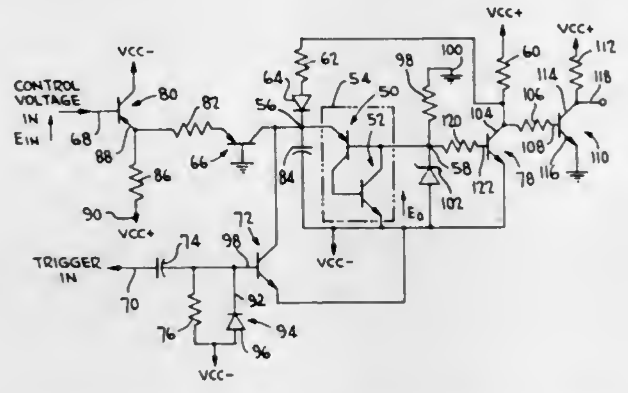


This specification described a logic circuit having a capacitor coupled between the gate and the drain of an FET. The capacitor used is a polarized voltage dependent capacitor and the voltage across this capacitor is controlled to render the FET conductive or nonconductive to selectively gate or not gate pulses applied to the drain of the FET through the FET to a load connected to the source of the FET. When signals are not to be gated through the FET the voltage across the capacitor is maintained at zero potential and the capacitor exhibits substantially zero capacitance. When signals are to be gated through the FET a voltage of a particular potential and polarity is maintained across the capacitor so that the capacitor exhibits a high capacitance. In operation this logic circuit does not form a significant load on the source of potential driving it when the FET is gated nonconductive.

3,718,827
VOLTAGE-CONTROLLED ONE-SHOT

Charles W. Ragsdale, Laramie, Wyo., assignor to the United States of America as represented by the Secretary of the Army

Filed Sept. 14, 1971, Ser. No. 180,297
Int. Cl. H03k *3/26*
U.S. Cl. 307—273 **3 Claims**

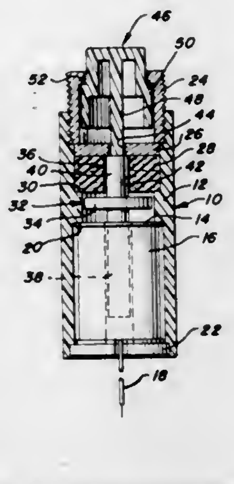


A monostable multivibrator which has two inputs. The first input is for trigger pulses which determine the operating frequency of the circuit. A second input applies a pulse-width control voltage to the circuit. Upon coincidence of the two inputs, an output signal is produced which exhibits a reciprocal relationship between the output pulse width and the applied control voltage.

3,718,828
PUSH BUTTON PULSE SIGNAL GENERATOR

Leon R. Britton, Chicago; Frank S. Vojir, Bwewyn, and William W. Wright, Wheaton, all of Ill., assignors to Guardian Electric Manufacturing Company, Chicago, Ill.

Filed Aug. 11, 1971, Ser. No. 170,729
Int. Cl. H02k *35/06*
U.S. Cl. 310—15 **4 Claims**

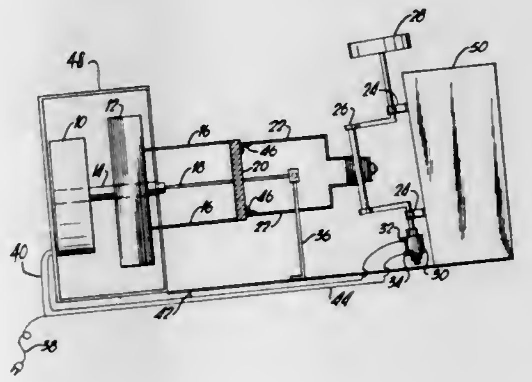


A pushbutton signal generator includes a coil mounted in a cylindrical housing with a plunger positioned in the center of the coil. The plunger is held in a fixed position by a permanent magnet within the housing. A push button may be depressed to drive the plunger through the coil thereby generating a pulse signal in the coil when the coil is placed in a circuit.

3,718,829
RECIPROCATING MOTOR WITH CONDUCTIVE DISC ARMATURE

Arthur L. Wilson, Winthrop Harbor, Ill., assignor to The Raymond Lee Organization, Inc., New York, N.Y.

Filed Dec. 8, 1970, Ser. No. 96,115
Int. Cl. H02k *33/00*
U.S. Cl. 310—27 **7 Claims**

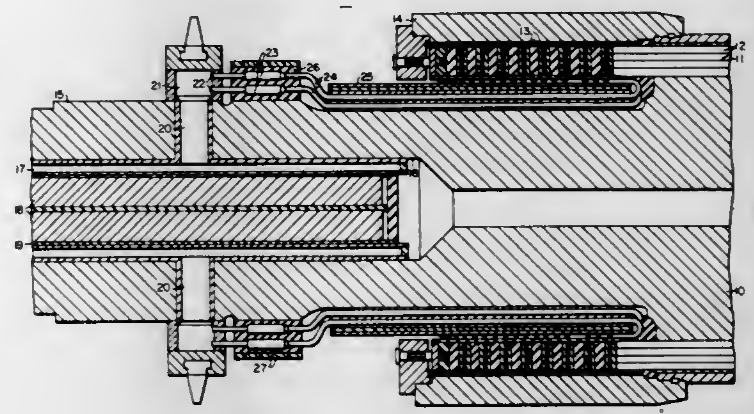


An alternating current operated motor which cuts off current flow during alternate half cycles to produce a reciprocating movement between a coil and a movable member. This movement is applied to a crank shaft to convert reciprocating motion into rotary motion.

3,718,830
LIQUID COOLED ROTOR FOR DYNAMOELECTRIC MACHINES

Harold M. Philofsky, Pittsburgh; Sui-Chun Ying, Monroeville, and Jacob Chottiner, McKeesport, all of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed July 8, 1971, Ser. No. 160,648
Int. Cl. H02k *1/32*
U.S. Cl. 310—64 **5 Claims**



A cooling system is provided for liquid cooled rotors including an improved insulating hose member incorporated in the cooling system to supply coolant liquid to the rotor winding. The improved hose member is a plastic tube with metal fittings enclosed in and reinforced by a glass filament wound housing which extends over the tube and axially beyond the metal fittings to form a substantially rigid, leak-proof, insulating hose member.

3,718,831

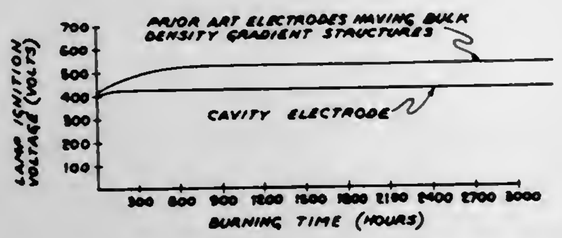
CAVITY PELLET EMISSIVE ELECTRODE

Donald A. Butter, Beverly, Mass.; Edmund R. Kern, Hampton, N.H., and Richard A. Menelly, Danvers, Mass., assignors to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed March 31, 1972, Ser. No. 240,110

Int. Cl. H01j *1/30, 1/38*

U.S. Cl. 313—346 R **10 Claims**



An emissive electrode of the type utilized in fluorescent lamps having a conic section cavity formed therein, said electrode having a bulk density gradient structure. The electrode includes a fused pellet and a metal lead extending therefrom. The pellet contains a fused mixture of electron emissive material and a metal having a high melting point and a low vapor pressure at the operating temperature of the lamp.

3,718,832

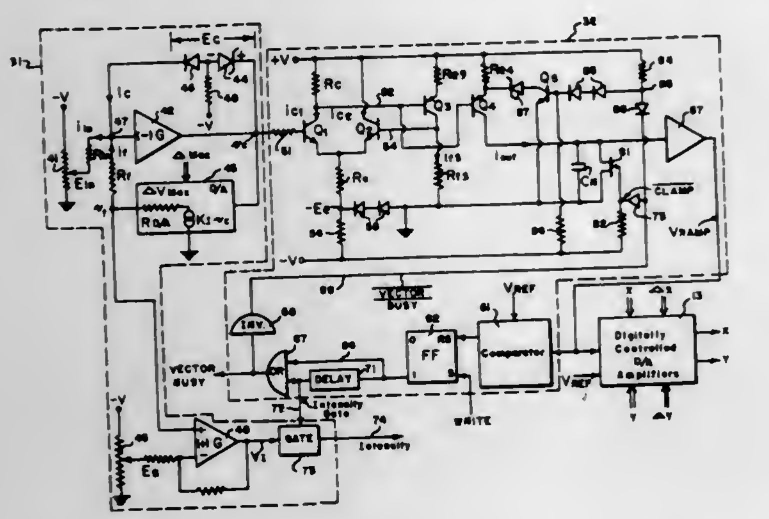
APPARATUS FOR PRODUCING RAMP SIGNALS AND AN INTENSITY CONTROL SIGNAL IN RESPONSE TO DIGITAL DATA, PARTICULARLY FOR A CRT VECTOR GENERATOR

Brian Allan Premru, Ridgefield, Conn., and James H. Nash, Jr., Hawthorne, N.Y., assignors to Information Displays, Inc., Mt. Kisco, N.Y.

Filed Aug. 21, 1970, Ser. No. 65,779

Int. Cl. H01j *29/70*

U.S. Cl. 315—18 **13 Claims**



A vector generator is described operating on a constant writing speed basis for larger vectors and on a constant time basis for small vectors. The generator utilizes X,Y. ΔX, ΔY and ΔMax digital data, ΔMax being the greater in magnitude of ΔX and ΔY. A feedback control amplifier supplied with a constant input signal has two feedback loops. One loop includes a D/A attenuator supplied with ΔMax and the other includes a bias source which limits the output to a predetermined value for small values of ΔMax. The output of the D/A attenuator is used to produce an intensity control signal which varies with vector length in the region where limiting takes place. The control amplifier output is fed to a difference amplifier having a transistor-controlled feedback circuit to produce a current accurately proportional to the control amplifier output, and another transistor having an input circuit like that of the feedback transistor and supplied with the same input supplies charging current to a ramp capacitor. The ramp signal is compared with a reference to produce a ramp stop signal. Ramp start and stop signals are delayed and gate the intensity control signal, and the delayed stop signal is used to terminate the ramp rise. The ramp signals are supplied to D/A amplifiers controlled by the ΔX and ΔY digital data to produce CRT deflection waves.

3,718,833

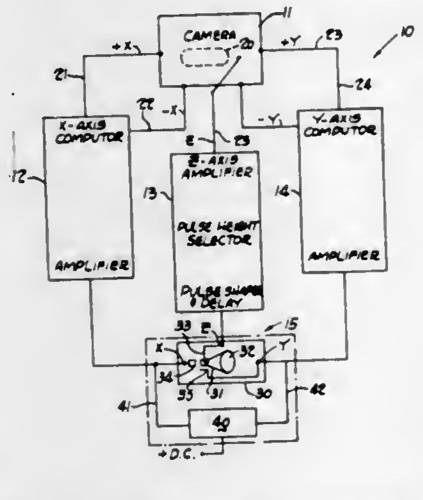
SCINTILLATION CAMERA SYSTEM

Ronald J. Martone, Cheshire; Peter G. Mueller, Guilford, and Homer M. Bailey, North Haven, all of Conn., assignors to Picker Corporation, White Plains, N.Y.

Filed June 18, 1969, Ser. No. 834,478

Int. Cl. H01j *29/70*

U.S. Cl. 315—18 **13 Claims**



A scintillation camera system includes an oscilloscope for producing visible indications at discrete, separate positions on a screen of a cathode ray tube in response to scintillations at corresponding locations in a scintillator. The oscilloscope includes an electron gun and beam deflecting elements which direct an electron beam to particular positions on the screen in response to scintillations. Circuitry is providing for diffusing the individual visible indications on the screen thereby reducing separations between these positions.

3,718,834

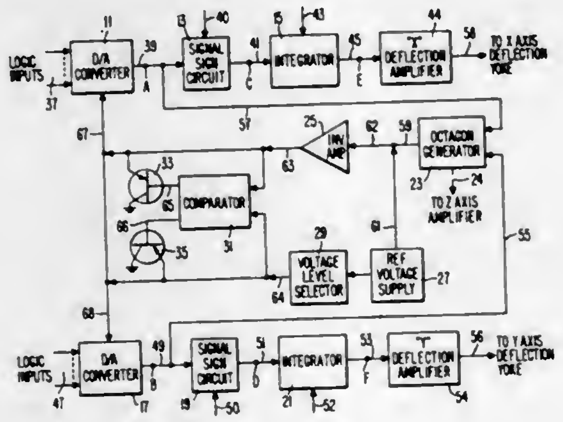
LINE GENERATOR FOR CRT DISPLAY SYSTEMS

James R. Bacon, Erdenheim, George H. Barnes, Philadelphia, and John C. Schott, Paoli, Pa., assignors to Burroughs Corporation, Detroit, Mich.

Filed Sept. 8, 1971, Ser. No. 178,620

Int. Cl. H01j *29/70*

U.S. Cl. 315—22 **7 Claims**



A vector generator for CRT display systems that limits the display length of vectors to a predeterminable maximum length and permits display of vectors having lengths less than the predetermined maximum length at a constant display intensity. Digital logic words representative of the components of the vector to be generated are converted into analog signals which are integrated to form ramp signals for driving deflection coils in a CRT. A control circuit, monitoring the analog signals, converts these signals to an approximation of the square root of the sum of the squares of the received signals. The result is summed with an adjustable voltage to establish an adjusted reference signal to the D/A converters for causing a vector of predetermined length to be displayed. An independent reference signal permitting vectors shorter than the predetermined maximum length to be displayed is constantly compared with the adjusted reference signal and is automatically substituted therefor when and as long as the magnitude of the adjusted signal, as derived from the input digital logic words to the D/A converters is greater than the magnitude of the independent reference signal.

3,718,835

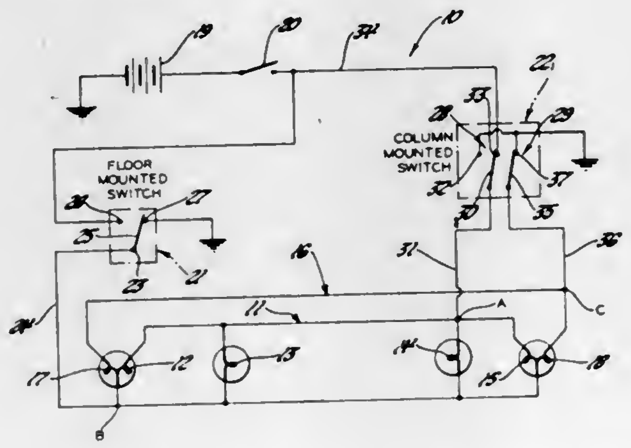
DUAL DIMMER SWITCH CIRCUIT

George R. Stoughton, Anderson, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 23, 1971, Ser. No. 173,831

Int. Cl. B60q

U.S. Cl. 315—83 **1 Claim**



A vehicle lighting system for lighting the roadway ahead of a vehicle. The system includes arrays of high and low beam headlamps and provides for selectively energizing either array. Floor mounted and the steering column mounted dimmer switches each having first and second switch settings control energization of the lamp arrays by a power source. Changing the setting of either dimmer switch in any sequence alternately energizes the lamp arrays.

3,718,836

MULTIPACTOR ION GENERATOR

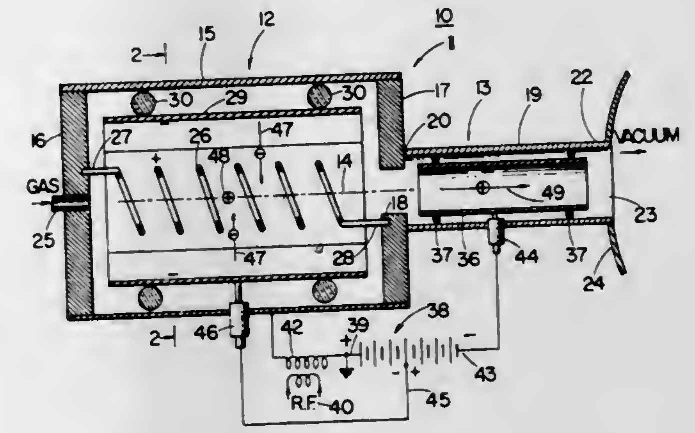
George W. Bain, Salt Lake City, Utah, and Fred C. Haak, Fort Wayne, Ind., assignors to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed Nov. 18, 1970, Ser. No. 90,587

Int. Cl. H01j *7/24*

U.S. Cl. 315—111 **13 Claims**

An electrostatic, transverse axis, multipactor ion gun having an anode in the form of a helically coiled element defining a cylinder having an axis, the turns of the anode element being axially spaced-apart to provide an open anode structure. An elongated dynode sleeve concentrically surrounds the anode, being radially spaced therefrom, the interior surface of the dynode sleeve having secondary emissive properties. The anode and dynode sleeve are supported within the first section of an enclosing envelope which has a gas inlet therein for admitting ionizable gas at an ionizing pressure thereto. An elongated accelerating electrode sleeve is provided supported within a second section of the envelope and coaxial with the axis, the accelerating electrode sleeve being axially spaced from the anode and dynode sleeve. The second envelope section has a coaxial opening therein through which the ions which are generated by the gun axially flow. Progressively lower direct current potentials are applied to the anode, dynode sleeve and accelerating electrode so as to cause circulatory electron flow within the dynode sleeve through the anode generally transverse to the axis, such circulatory electron flow causing generation of ions in the region of the axis which are caused to flow axially toward and through the envelope opening by the accelerating electrode. The interior surface of the dynode sleeve is formed as a plurality of axially extending, abutting segments which are triangular in cross-section, and which have their apices extending radially outwardly with respect to the axis, so that a preponderance of the electrons which flow through the anode bypass the region immediately surrounding the axis, thereby reducing losses due to recombination of ions and electrons.



3,718,837

CONTROL SYSTEM FOR AN EXTRACTION TURBINE SYSTEM

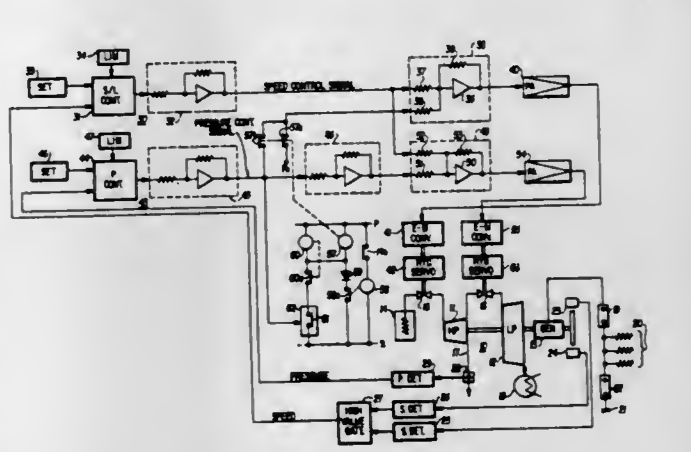
Mitsuhisa Yokota, and Hiroya Sato, both of Yokohama, Japan, assignors to Tokyo Shibaura Electric Company Limited, Kawasaki-shi, Japan

Filed April 17, 1972, Ser. No. 244,796

Claims priority, application Japan, April 19, 1971, 46/25133

Int. Cl. H02h *7/06*

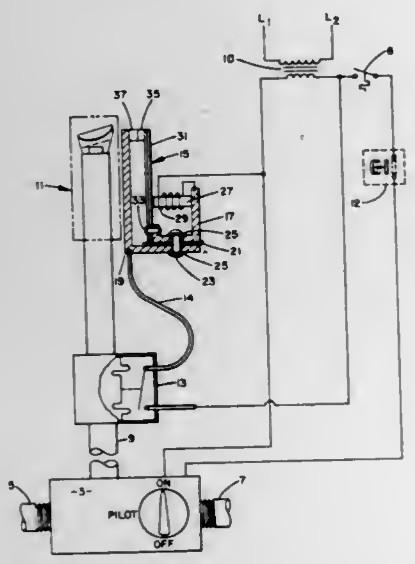
U.S. Cl. 317—13 R **2 Claims**



A control system for an elastic fluid turbine having a high pressure turbine stage and a motive fluid flow thereto regulated by a main control valve, and a low pressure turbine stage to which the flow of motive fluid is controlled by an interstage control valve. A speed/load control arrangement controls the main and interstage control valves in the same directions responsive to rotational speed of the turbine and a pressure control arrangement controls the valves respectively in opposite directions responsive to the pressure of extracted motive fluid. The control of the main control valve by the pressure control arrangement is interrupted when the load of the turbine system is lost, to prevent overspeed upon such occurrence.

3,718,838
IGNITION DEVICE FOR A GAS FIRED APPLIANCE

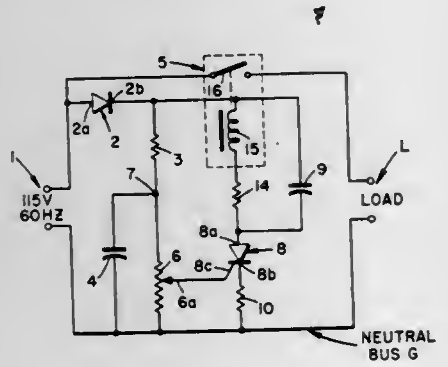
William H. Branche, Indianapolis, Ind., assignor to Carrier Corporation, Syracuse, N.Y.
Filed July 28, 1971, Ser. No. 166,893
Int. Cl. F23g *3/00*
U.S. Cl. 317—93 **2 Claims**



Spark generation means for igniting a gas flame, one of the contacts of the spark generator contact set being mounted on a bimetallic element to hold the contacts open when the bimetallic element is heated.

3,718,839
UNDER-VOLTAGE PROTECTION DEVICE

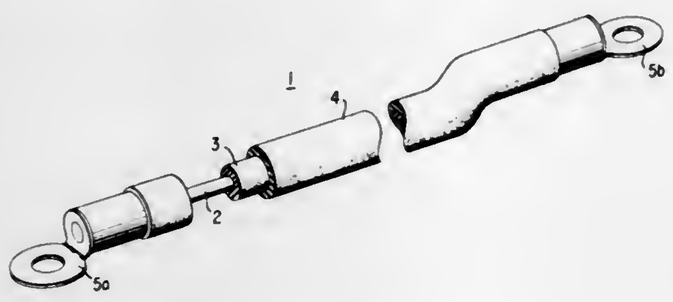
Donald J. Conti, 626 Bergen Boulevard, Ridgefield, N.J., and Thomas L. Reilly, 66 Raymond Avenue, Nutley, N.J.
Filed July 30, 1971, Ser. No. 167,591
Int. Cl. H02h *3/24*
U.S. Cl. 317—31 **9 Claims**



An under-voltage protection device including an A.C. source connected across a load; a series combination of a line switch and a control rectifier connected between the A.C. source and the load; and a series combination of a rectifier and voltage divider connected across the A.C. source; wherein the control electrode of the control rectifier is connected to an adjustable terminal of the voltage divider.

3,718,840
CURRENT LIMITING ELEMENT

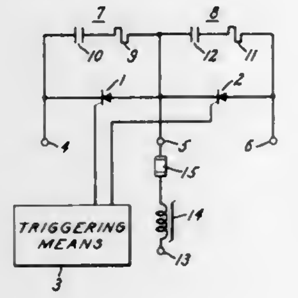
Hideo Tanaka; Yasutaka Imajyo; Ikuo Takano, all of Tokyo; Jiro Takahashi, Yokohama, and Kazumichi Oka, Tokyo-to, all of Japan, assignors to Tokyo Shibaura Electric Company, Ltd., Kawasaki-shi, Japan
Filed Sept. 23, 1971, Ser. No. 183,014
Claims priority, application Japan, Oct. 8, 1970, 45/87906
Int. Cl. H02b *1/18*
U.S. Cl. 317—99 **15 Claims**



A current limiting element is disclosed which includes an electrical conductor consisting of one or more wires formed of a metal having a high temperature coefficient of resistance. The conductor is surrounded by a heat-resistant coating, and the heat-resistant coating is in turn surrounded by an electrically insulating coating. The current limiting element may be coupled between a power source and a circuit breaker to reduce the current delivered to the circuit breaker under overload or short circuit conditions.

3,718,841
MODULAR RECTIFIER HOLDING ASSEMBLY WITH HEAT SINK SUPPORTING CIRCUIT PROTECTING MEANS

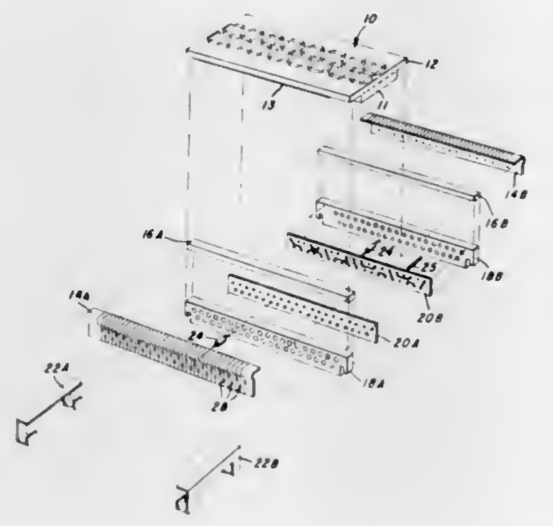
Albert R. Frederick, Folsom; Joseph L. Paine, and Daniel B. Rosser, both of Springfield, all of Pa., assignors to General Electric Company
Filed July 9, 1971, Ser. No. 161,229
Int. Cl. H01l *1/12*
U.S. Cl. 317—100 **7 Claims**



Disclosed is a modular semiconductor rectifier mounting unit adapted for disposition within a cavity in an insulative supporting structure through which a cooling fluid is passed. The unit includes heat dissipating electrodes which are connected to the cathode and anode terminals of a pair of mounted rectifiers. Termination means are connected to the electrodes and extend in the same direction away therefrom. The termination means are adapted for directly supporting thereon a circuit isolating fuse. A reverse voltage protecting circuit is mounted on the module via a heat dissipating electrode. Frame means are provided disposed about the electrodes to space them from the support structure and to increase the creep distance therebetween.

3,718,842
LIQUID CRYSTAL DISPLAY MOUNTING STRUCTURE

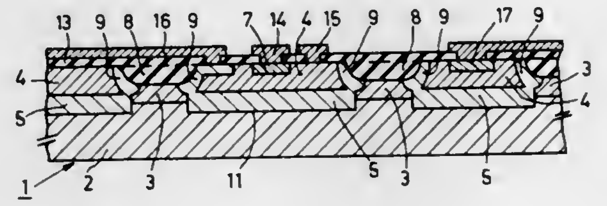
Charles P. Abbott III, Dallas, and John M. Reilly, Garland, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.
Filed Apr. 21, 1972, Ser. No. 246,207
Int. Cl. H05k *1/64*
U.S. Cl. 317—101 CC **4 Claims**



A liquid crystal display mounting structure wherein the electrical contacts on the back side of a liquid crystal display panel are held in pressure contact with a flat flexible cable which provides electrical connection to a matrix of diodes within a pair of diode boats or holders; interconnections between the diodes and other circuits are provided by etched circuit boards.

3,718,843
COMPACT SEMICONDUCTOR DEVICE FOR MONOLITHIC INTEGRATED CIRCUITS

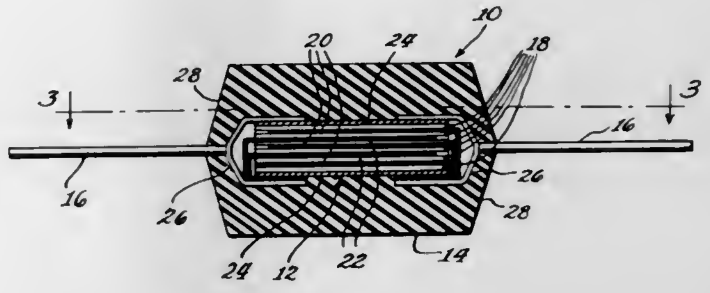
Else Kooi, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Filed July 8, 1971, Ser. No. 160,653
Claims priority, application Netherlands, July 10, 1970, 7010205
Int. Cl. H01l *19/00*
U.S. Cl. 317—235 R **7 Claims**



A semiconductor device having a semiconductor body which comprises an island-shaped region of a first conductivity type which is fully surrounded within the body by a region, preferably a buried layer, of the second conductivity type and an adjoining surface zone of the second conductivity type. According to the invention said surface zone is formed by a preferably diffused zone which adjoins an inset oxide pattern which fully surrounds the island. As a result of this, monolithic circuits of high packing density can be obtained, the buried layer with the island and a further surface zone of the second conductivity type present therein preferably forming a transistor.

3,718,844
CAPACITOR WITH TERMINAL CLIPS

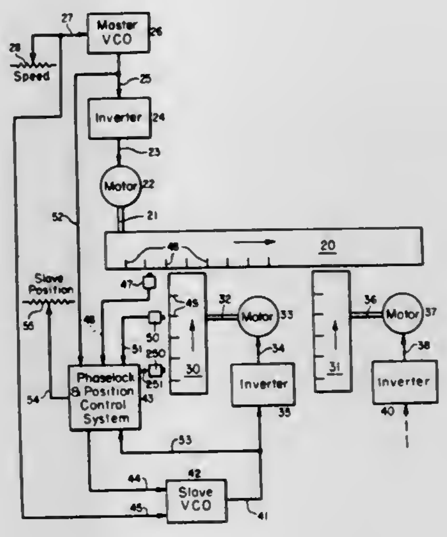
Robert Leo Brazier, Pickens, S.C., assignor to Sangamo Electric Company, Springfield, Ill.
Filed Jan. 22, 1971, Ser. No. 108,908
Int. Cl. H01g *1/14*
U.S. Cl. 317—258 **9 Claims**



A capacitor having superimposed silvered mica sheets secured by end clips to which conductor lead wires are connected with their axes coinciding with the center axis of the assembled sheets, the sheets and lead wires being encased centrally within a cylindrical insulating casing with the lead wires extending axially outwardly of the casing.

3,718,845
VARIABLE SPEED MASTER-SLAVE MOTOR CONTROL SYSTEM WITH CONTINUOUS POSITION ADJUSTMENT

Benton Bejach, Santa Ana, and Earl T. Bernhardt, Costa Mesa, Calif., assignors to Borg-Warner Corporation, Chicago, Ill.
Filed June 22, 1971, Ser. No. 155,569
Int. Cl. H02p *5/46*
U.S. Cl. 318—78 **8 Claims**



A system for controlling the speed and synchronization of two A-C motors comprises a master VCO (voltage-controlled oscillator) for providing timing pulses to drive the master inverter which energizes the first A-C motor. A system speed control pot provides a speed set signal to the master VCO, and also to a slave VCO which controls the slave inverter that energizes the second A-C motor. A phase detector receives first and second low-frequency input signals from the loads driven by the motors. A count-up register receives high-frequency pulse signals from the master VCO and, through a DAC (digital-to-analog converter), provides a positive-going ramp signal which has its reset portion determined by an output signal from the phase detector. A count-down register receives high-frequency pulse signals from the slave VCO, through another DAC, provides a negative-going ramp signal which has its reset portion determined by a second reset signal from the phase detector. These opposite-slope ramp signals are summed with a signal from the phase detector to provide a D-C control signal which is used as a second input signal to the slave VCO, thus maintaining motor synchronization. An out-of-sync signal overrides the D-C control signal and provides a modified D-C signal to the slave VCO to drive the second motor toward synchronization. The D-C control signal can also be modified by a position control signal, to provide an unlimited position variation of the second A-C motor without disturbing the synchronized speed relationship of the two motors.

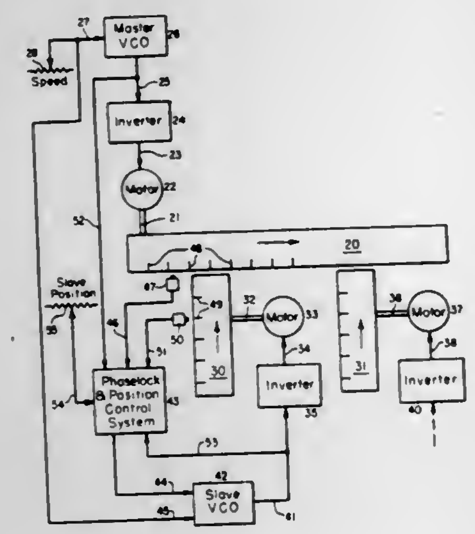
3,718,846
VARIABLE SPEED PLURAL MOTOR CONTROL SYSTEM WITH INCREMENTAL SPEED SYNCHRONIZATION

Benton Bejach, Santa Ana, Calif., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed April 13, 1971, Ser. No. 133,650

Int. Cl. H02p *5/46*

U.S. Cl. 318—85 **13 Claims**



A system for controlling the speed and synchronization of two a-c motors comprises a master vco (voltage-controlled oscillator) for providing timing pulses to drive the master inverter which energizes the first a-c motor. A system speed control pot provides a speed set signal to the master vco, and also to a slave vco which controls the slave inverter that energizes the second a-c motor. A phase detector receives first and second low-frequency input signals from the loads driven by the motors. A count-up register receives high-frequency pulse signals from the master vco and, through a dac (digital-to-analog converter), provides a positive-going ramp signal which has its reset portion determined by an output signal from the phase detector. A count-down register receives high-frequency pulse signals from the slave vco and, through another dac, provides a negative-going ramp signal which has its reset portion determined by a second reset signal from the phase detector. These opposite-slope ramp signals are summed with a signal from the phase detector to provide a d-c control signal which is used as a second input signal to the slave vco, thus maintaining motor synchronization. An out-of-sync signal overrides the d-c control signal and provides a modified d-c signal to the slave vco to drive the second motor toward synchronization. The d-c control signal can also be modified by a position control signal, to provide an incremental position variation of the second a-c motor without disturbing the synchronized speed relationship of the two motors.

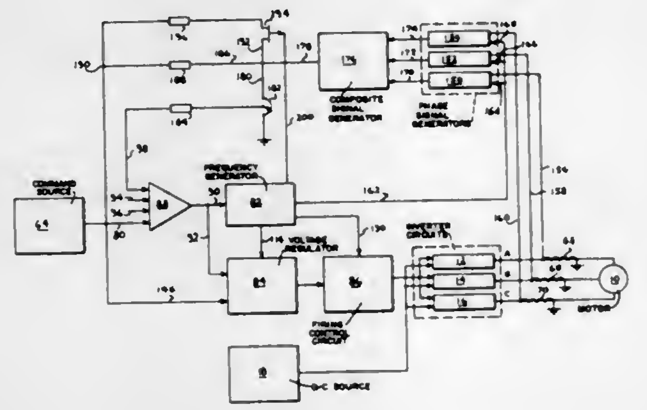
3,718,847
ADJUSTABLE SPEED POLYPHASE A-C MOTOR DRIVE UTILIZING AN IN-PHASE CURRENT SIGNAL FOR MOTOR CONTROL

Carlton Eugene Graf and Einar Aasen Skogsholm, Erie, and Werner Karl Volkmann, Fairview, Pa., assignors to General Electric Company

Filed May 28, 1971, Ser. No. 147,771

Int. Cl. H02p *5/40*

U.S. Cl. 318—227 **5 Claims**



The current and voltage to each phase of an A-C motor are sensed and utilized to produce a phase control signal having an average value proportional to the average magnitude of the in-phase current within that phase. The phase control signals are summed to produce a composite signal indicative of certain motor operating characteristics, including slip and torque, the composite control signal being supplied to the control of an inverter which produces variable frequency alternating current electric power for driving the A-C motor. In response to variations in the composite control signal, the fundamental frequency and the average voltage of the alternating current power are adjusted by the control.

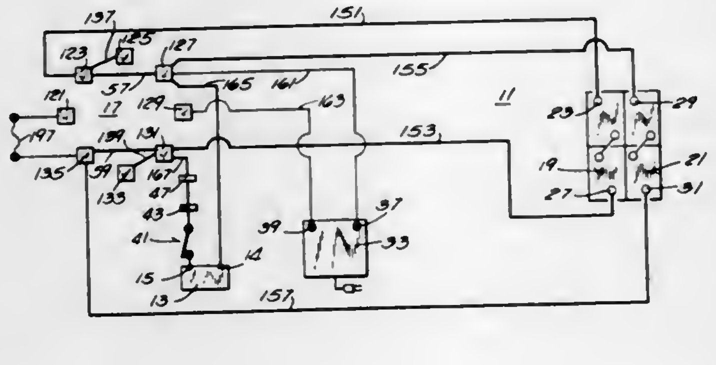
3,718,848
SERIES-PARALLEL BATTERY SYSTEM AND SWITCH THEREFORE

Charles E. Hines, Lincoln, Nebr., assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed March 29, 1971, Ser. No. 128,928

Int. Cl. H02j *7/00*

U.S. Cl. 320—7 **9 Claims**



Disclosed herein is a vehicle including an electrical system comprising a direct current drive motor, first and second battery sets, a charger adapted to be plugged into an alternating current source, and a selector switch movable between first and second positions and operable, when in the first position, to connect the first and second battery sets in parallel relation to the motor operable, when in the second position, to connect the first and second battery sets in series relation to the motor and to the charger. In addition, the electrical system includes an "off-on" switch interposed between the motor and the selector switch and operable to selectively open and close the connection of the motor to the selector switch whereby, when the "off-on" switch is opened, and the selector switch is in the second position, the charger can be plugged into an alternating current source to charge the battery sets and whereby, when the selector switch is in the first position, the charger is electrically disconnected from the battery sets.

3,718,849
VOLTAGE REGULATORS FOR USE IN BATTERY CHARGING SYSTEMS

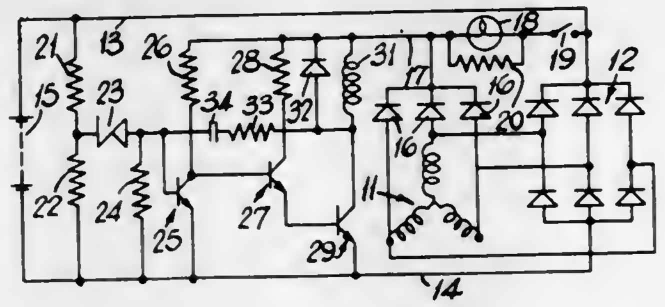
Roger William Nolan, Redditch, and Maurice James Wright, Quinton, both of England, assignors to Joseph Lucas (Industries) Limited, Birmingham, England

Continuation-in-part of Ser. No. 93,876, Nov. 30, 1970, abandoned, which is a continuation of Ser. No. 701,892, Jan. 31, 1968, abandoned. This application June 3, 1971, Ser. No. 149,585

Claims priority, application Great Britain, Feb. 6, 1967, 5,566/67

Int. Cl. H02j *7/10*

U.S. Cl. 320—61 **4 Claims**



A voltage regulator is disclosed for varying the output of a generator of a road vehicle by changing the current flow in its field winding. The voltage regulator device includes, as is common, a Zener diode or equivalent break-down device which, as known, conducts at a predetermined battery voltage, and serves to render a transistor conductive, which transistor, when rendered conductive, acts through further components to reduce the current flow in the field winding.

In systems of this type it is commonplace to provide for temperature compensation by providing a thermistor or equivalent device in the circuit. Such device, in a known manner, serves to compensate for changes in battery temperature, as well as for the changes in temperature coefficient of the Zener diode and the transistor so utilized. However, in accordance with the instant invention, such temperature compensation is achieved by means of a simple impedance network interconnecting the Zener diode or equivalent device and the transistor, such impedance network, in effect, serving to multiply the net negative inherent temperature characteristics of the transistor by a selected amount to compensate for the net positive temperature coefficient of the Zener diode, the resultant characteristics of the voltage regulator circuit with respect to temperature being desirably negative or, at least, zero. In the specific preferred embodiment, a resistor is disposed across the base-emitter of the transistor, and another resistor is disposed in series circuit with the Zener diode. The ratio of these two resistors substantially defines a multiplication factor which enhances the net negative temperature coefficient of the transistor and serves to overcome the net positive temperature coefficient of the Zener diode.

3,718,850
SEMICONDUCTOR RECTIFIER DEVICE

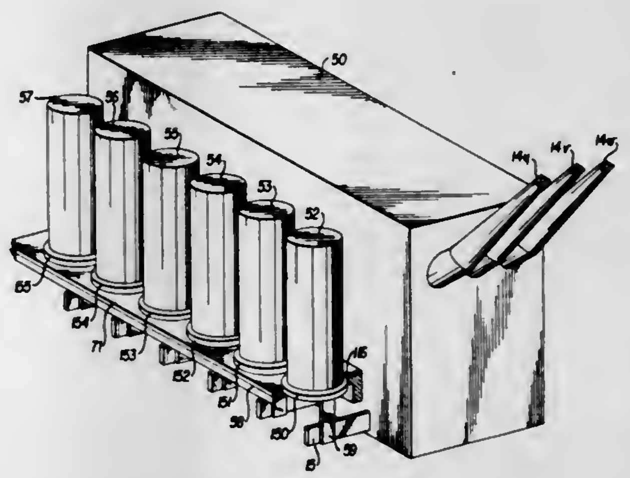
Isao Juri, Kazuo Koguchi, Toshimi Kuroiwa, and Tomoyuki Koken, all of Tokyo, Japan, assignors to Tokyo Shibaura Electric Company, Ltd., Kawasaki-shi, Japan

Filed July 15, 1971, Ser. No. 163,006

Claims priority, application Japan, July 17, 1970, 45/62314; July 17, 1970, 45/62315; July 17, 1970, 45/62317

Int. Cl. H02m *7/00*; **H02b** *1/00*; **H01f** *17/00*

U.S. Cl. 321—8 C **6 Claims**



A semiconductor rectifier device includes a transformer enclosure having a transformer therein and a plurality of separate rectifier unit tanks. A plurality of output terminals each of which corresponds to a phase winding of the transformer are provided and extend through at least one of the side walls of the transformer enclosure. Each of the rectifier unit tanks contains semiconductor rectifier elements therein for rectifying a given phase of the output of the transformer and is mounted on the side wall of the transformer enclosure. The input terminals to the unit tanks are respectively connected to the output terminals of the transformer.

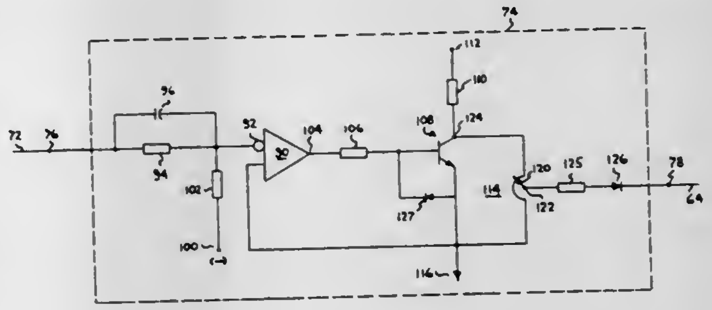
3,718,851
MEANS RESPONSIVE TO AN OVERVOLTAGE CONDITION FOR GENERATING A FREQUENCY INCREASING CONTROL SIGNAL

Carlton Eugene Graf, and Einar Aasen Skogsholm, both of Erie, Pa., assignors to General Electric Company

Filed Aug. 16, 1971, Ser. No. 172,113

Int. Cl. H02m *7/52*, *1/18*; **H02p**

U.S. Cl. 321—12 **11 Claims**



The d-c voltage of reversible d-c to a-c power conversion apparatus is continuously sensed and utilized to produce an overvoltage signal when and only when the d-c voltage is equal to or greater than a pre-determined level. The overvoltage signal is transmitted to the control means for the power conversion apparatus as a control signal, the magnitude and polarity of the overvoltage signal being such that the operating frequency of power conversion means is increased.

3,718,852

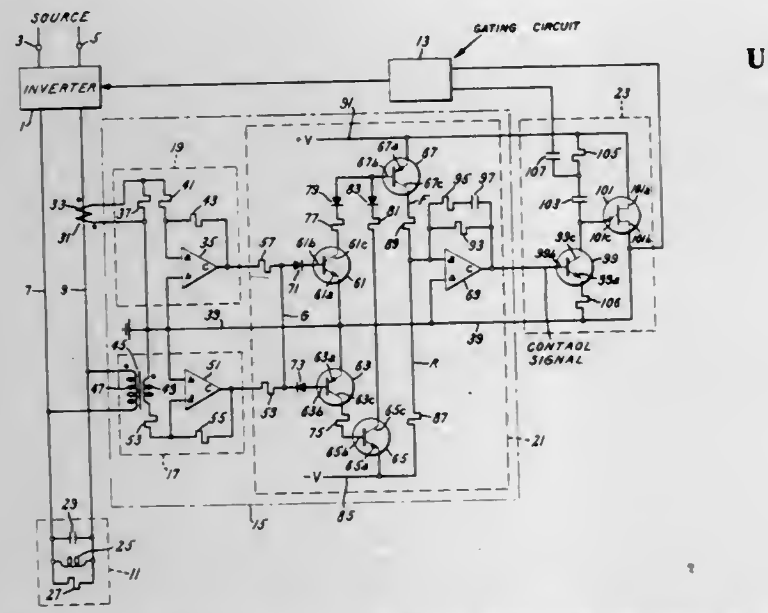
PHASE ANGLE REGULATOR FOR HIGH FREQUENCY INVERTER

Ronald B. Bailey, Kennett Square, Pa., assignor to General Electric Company,

Filed July 14, 1971, Ser. No. 162,430

Int. Cl. H02m *7/52*

U.S. Cl. 321—19 **5 Claims**



In a static inverter, phase angle error detection circuitry is used to control the operating frequency of the inverter as a function of the phase displacement between the alternating current supplied to a tank load and the alternating voltage across that load, thereby regulating the power factor of the load circuit.

3,718,853

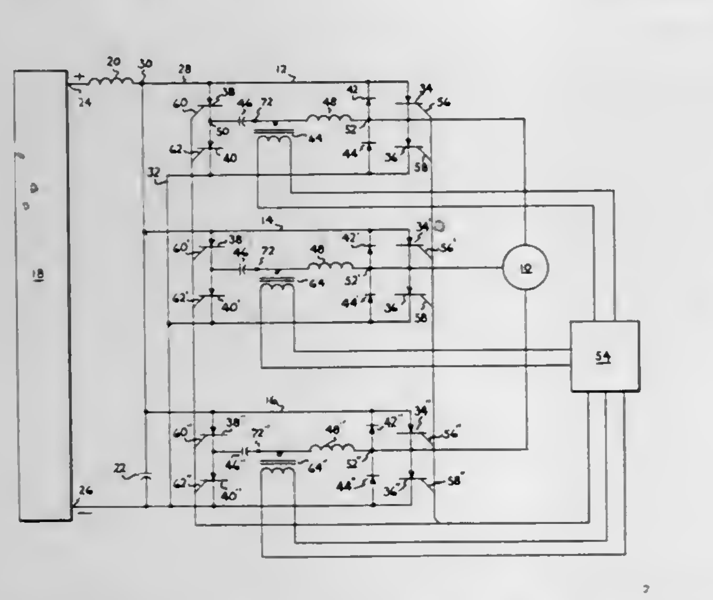
PULSE WIDTH LIMITING MEANS FOR INVERTER CIRCUITS

Carlton Eugene Graf, Erie, Pa., assignor to General Electric Company

Filed Aug. 16, 1971, Ser. No. 171,970

Int. Cl. H02m *1/18, 7/52*

U.S. Cl. 321—12 **14 Claims**



An inverter circuit utilizing gate controlled load rectifiers for changing direct current electric power to alternating current electric power and gate controlled commutating rectifiers for commutating the respective load rectifiers is provided with control apparatus for sensing commutating current during the commutation of a first load rectifier and blocking commutation of a second load rectifier (through the firing or turning "on" of the respective commutating rectifier) during a blocking time interval including a variable commutation interval during which commutating current is sensed and a fixed delay interval following the commutation interval.

3,718,854

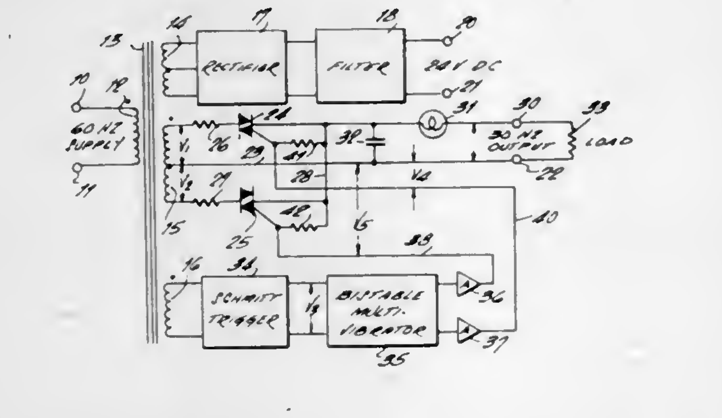
FREQUENCY CONVERTER CIRCUIT WITH MULTIVIBRATOR CONTROL

Constantine A. Spyrou, Clifton Heights, Pa., and George P. Klein, Haddonfield, N.J., assignors to Electrospace Corporation, Westbury, N.Y.

Filed Oct. 29, 1971, Ser. No. 193,823

Int. Cl. H02m *5/30*

U.S. Cl. 321—69 R **6 Claims**



A non-resonant circuit using the switching functions of a pair of controlled double rectifiers and the dividing characteristic of a bistable multivibrator. A single sixty hertz transformer is used to provide all the power necessary for operating the device. Bidirectional gates, or triacs, are controlled by the multivibrator to pass a full cycle of current from one side of a secondary winding and then switch to a full cycle from the other side of the winding. The result is an alternating current of half the frequency of the supply current.

3,718,855

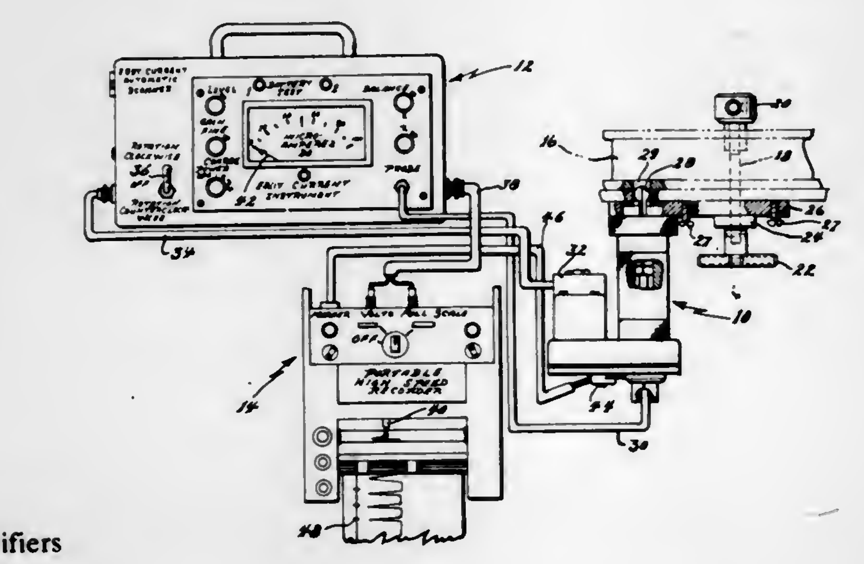
EDDY CURRENT FLAW DETECTION SYSTEM

Albert P. Rogel, 2655 Ellenbrook Drive, Rancho Cordova, Calif., and Joseph J. Scalese, 9507 Bullion Way, Orangevale, Calif.

Filed Nov. 30, 1970, Ser. No. 93,676

Int. Cl. G01r *33/12*

U.S. Cl. 324—37 **9 Claims**



An automatic eddy current flaw detection system including a measuring instrument with a chart recorder and a flaw sensing device having an eddy current probe in a housing attached to the work piece and driven by a reversible motor along a helical path into an opening in the work piece. The housing contains a standard calibration unit which the probe passes and thereby allows for instrument standarization facilitating the reproducibility of inspection conditions.

3,718,856

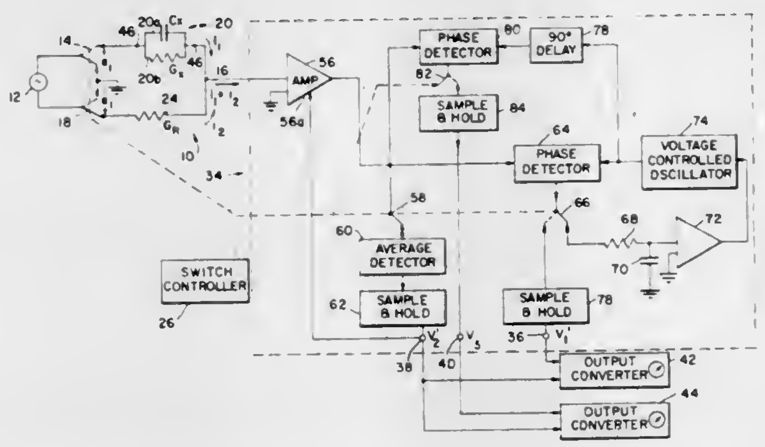
INDUCTANCE AND CAPACITANCE REACTANCE MEASURING INSTRUMENT HAVING MINIMAL INCLUSION OF STRAY REACTANCES

Jozef H. Hendriks, Wakefield, Mass., assignor to Teradyne, Inc., Boston, Mass.

Filed Dec. 2, 1970, Ser. No. 94,308

Int. Cl. G01r *27/00*

U.S. Cl. 324—57 R **13 Claims**



An impedance-measuring electrical circuit modulates a high frequency current alternately with the unknown impedance being measured and with a reference impedance. A detector synchronized with the alternation of the modulation detects the resultant modulated current to produce a measure of the resistive and reactive components of the unknown impedance element relative to the corresponding components of the known reference impedance element. The modulating portion of the circuit is constructed with minimal stray reactances that effect the modulated output current, but the other portions of the circuit are essentially free of this restriction.

3,718,857

TESTING DEVICE FOR DIFFERENTIAL AMPLIFIERS

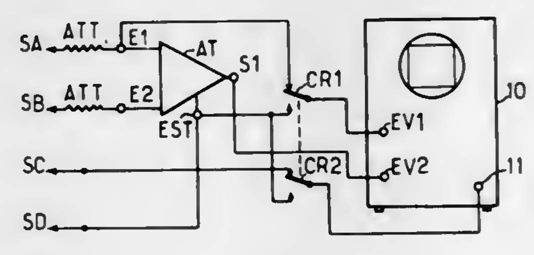
Marcel Bernard, Angers, France, assignor to Societe Industrielle Honeywell Bull (Societe Anonyme), Paris, France

Filed May 24, 1971, Ser. No. 146,404

Claims priority, application France, May 29, 1970, 7019839

Int. Cl. G01r *27/00*

U.S. Cl. 324—57 R **8 Claims**



A device for verifying the response time of a differential amplifier, wherein recurrent pulses are applied to input terminals of a differential amplifier under test and a visual testing instrument is coupled to respond to such input pulses and the consequent output pulses of the amplifier to provide a display of the response time of the amplifier, and wherein a signal is applied between the two input terminals of the amplifier to effectively cancel the unbalanced voltage between such two terminals in the absence of test pulses.

3,718,858

ELECTRICAL TESTING METHODS AND APPARATUS

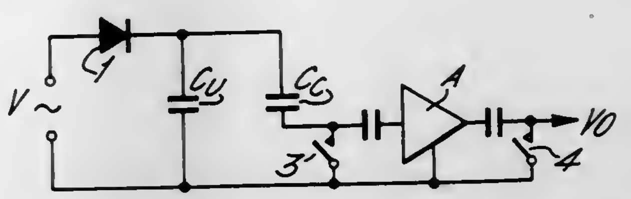
David Adams Gilmor Tait, 34 Mount Street, Dorking, Ireland

Filed April 27, 1971, Ser. No. 137,891

Claims priority, application Great Britain, April 27, 1970, 20,185/70

Int. Cl. G01r *27/26*

U.S. Cl. 324—60 C **19 Claims**



A method and means for insulation resistance testing wherever a unidirectional test voltage is intermittently applied to a capacitive circuit under test connected in shunt to a high quality coupling capacitor serving as a reference and connected to a chopper amplifier operated at half the frequency of the supply voltage source and active only during the measuring period when the test voltage is removed. A bias current is injected at the amplifier input or output to set a reference level of resistance, and a toggle device responds when the test circuit fails to reach the standard required.

3,718,859

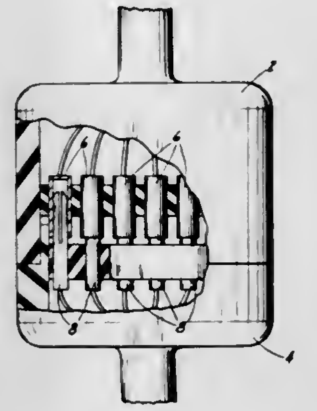
ELECTRIC CIRCUIT TEST ELEMENT FOR USE WITH A PAIR OF ELECTRICAL CONNECTORS

Michael S. Arlow, Livonia, Mich., assignor to The United States of America as represented by the Secretary of the Army

Filed Feb. 1, 1971, Ser. No. 111,296

Int. Cl. H01r *13/50;* **G01r** *31/02*

U.S. Cl. 324—72.5 **5 Claims**



A pair of harness connectors have sandwiched between them a test connector or element which carries on its external cylindrical surface a number of test circuit terminals, one for each pin in the test element. The leads between the test circuit terminals and the test element pins, as well as the terminals themselves, may be printed circuits. A meter is tapped onto any given test circuit terminal and is provided with a probe so it can be grounded. The test element is divided into two or three discs so it can accommodate a greater number of circuits to be tested.

3,718,860

REAL TIME DIGITAL ENERGY METER

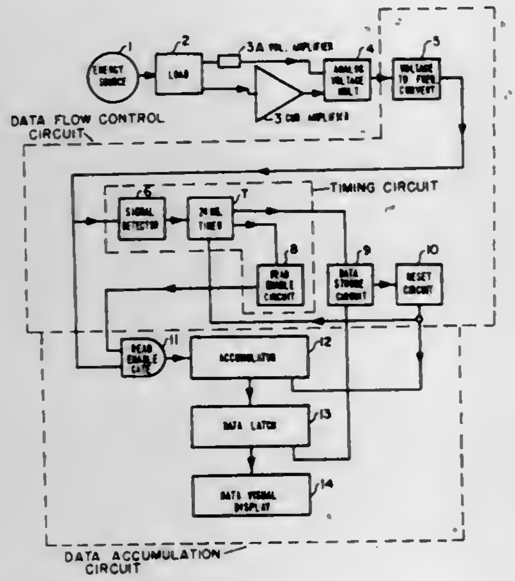
Victor B. Kwast, Union; Douglas A. Morlock, Lake Hopatcong, and Richard G. Saiz, Succasunna, all of N.J., assignors to The United States of America as represented by the Secretary of the Army

Filed Aug. 25, 1971, Ser. No. 174,834

Int. Cl. G01r *21/00*

U.S. Cl. 324—142 **4 Claims**

A real-time digital energy meter particularly suited for measuring electrical energy in a non-linear load, comprising: volt-



age sensing means, said means connected across said load; current sensing means, said current sensing means connected into said load for current measurement and said current sensing means having a voltage output proportional to its current input; electronic multiplication means having two inputs, the two inputs being the respective outputs of said voltage and current sensing means, wherein said multiplication means produces a voltage output proportional to the product of its two inputs; and a time-integrating digital voltmeter having as its input the output of said multiplication means, and having a selectable period of time integration wherein the output of said integrating voltmeter is proportional to the energy dissipated within said load during said period of integration.

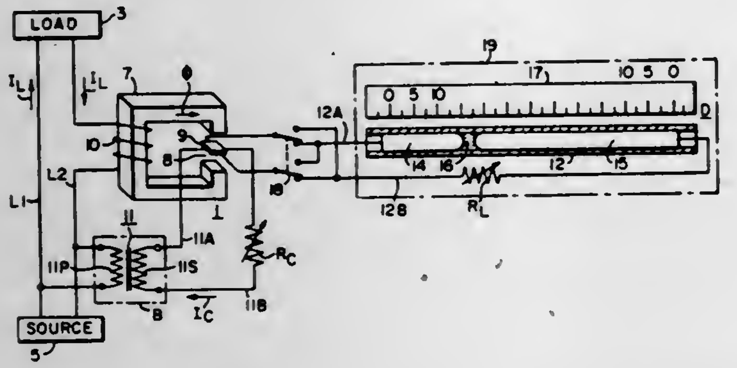
3,718,861
ELECTROLYTIC CAULOMETER FOR INTEGRATING VOLTAGE AND CURRENT COMPONENTS OF POWER

James E. Ramsey, Jr., Raleigh, N.C., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 793,052, Jan. 22, 1969, abandoned. This application Dec. 17, 1970, Ser. No. 99,093

Int. Cl. G01r *21/00, 11/44*

U.S. Cl. 324—142 **4 Claims**



A device for measuring the quantity of a direct current flow therethrough comprises a glass tube having a body of mercury at each end which serves as an electrode. The two electrodes are separated by an electrolyte such as a mercury-salt solution. For integrating a function of the voltage and current in an electric circuit a transducer such as a Hall generator converts the function into an output current having a direct-current component which is passed through the contents of the tube. The mercury-salt solution then moves in a direction dependent on the direction of the direct current passing therethrough. The position of the mercury-salt solution represents the desired integration. The direction of the current through the tube may be reversed after each reading or it may be reversed when the mercury-salt solution arrives at predetermined positions respectively adjacent the ends of the tube.

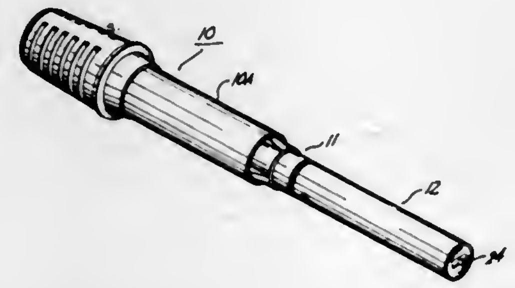
3,718,862
WIRELESS MICROPHONE AND ADAPTER KIT

Elwood G. Norris, Seattle, Wash., assignor to Sound Systems International, Inc., Seattle, Wash.

Filed June 30, 1969, Ser. No. 837,809

Int. Cl. H04b *1/02*

U.S. Cl. 325—111 **7 Claims**



A wireless microphone assembly is disclosed which uses a frequency modulated transmitter having improved radiation characteristics and eliminates the need for a separate external antenna. An adapter unit is disclosed as being connectable to a conventional microphone with the adapter unit including a transmitting oscillator having its input circuit coupled with the conventional microphone output circuit via plug connectors and with the output circuit of the frequency modulated oscillator being connected via a grounding terminal to the case of the conventional microphone. The case of the conventional microphone then acts as a radiating antenna giving rise to high strength signals without the need for any protruding antenna arrangements. Mechanical construction details as well as schematic circuit diagrams are provided.

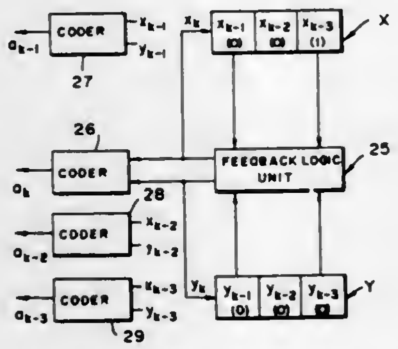
3,718,863
M-ARY LINEAR FEEDBACK SHIFT REGISTER WITH BINARY LOGIC

James C. Fletcher, Administrator of the National Aeronautics and Space Administration with respect to an invention of, and Marvin Perlman, 1100 Dempsey Ave., Granada Hills, Calif.

Filed Oct. 26, 1971, Ser. No. 192,101

Int. Cl. G11c *19/00;* H03k *23/00*

U.S. Cl. 328—37 **11 Claims**



A family of *m*-ary linear feedback shift registers with binary logic is disclosed. Each *m*-ary linear feedback shift register with binary logic generates a binary representation of a nonbinary recurring sequence, producable with a *m*-ary linear feedback shift register without binary logic in which *m* is greater than 2. The state table of a *m*-ary linear feedback shift register without binary logic, utilizing sum modulo *m* feedback, is first tabulated for a given initial state. The entries in the state table are coded in binary and the binary entries are used to set the initial states of the stages of a plurality of binary shift registers. A single feedback logic unit is employed which provides a separate feedback binary digit to each binary register as a function of the states of corresponding stages of the binary registers. The stages of the binary registers which are fed back depend upon the stages which are fed back through nonzero multipliers in the *m*-ary linear feedback shift register, utilizing sum modulo-*m* feedback.

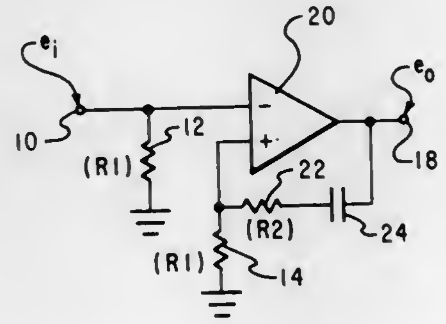
3,718,864
CROSSOVER DETECTOR

William J. Kelly, Sauquoit, and Warren A. Reynolds, Ilion, both of N.Y., assignors to Cogar Corporation, Wappingers Falls, N.Y.

Filed Feb. 26, 1971, Ser. No. 119,109

Int. Cl. H03k *5/20*

U.S. Cl. 328—115 **7 Claims**



A crossover detector utilizing an operational amplifier, a first input of which is connected through a resistor to ground and the second input of which is connected to the signal source. The output is fed back through an RC circuit to the first input. The time constant of the RC circuit is such that the prior art hysteresis time-delay error is eliminated because a hysteresis effect is introduced only immediately after a crossover is detected; the hysteresis effect decays exponentially and is essentially totally absent by the time that the next crossover occurs.

3,718,865
DEVICE FOR ACCELERATING CHARGED ATOMIC PARTICLES INCLUDING A PAIR OF HIGH FREQUENCY RESONATORS

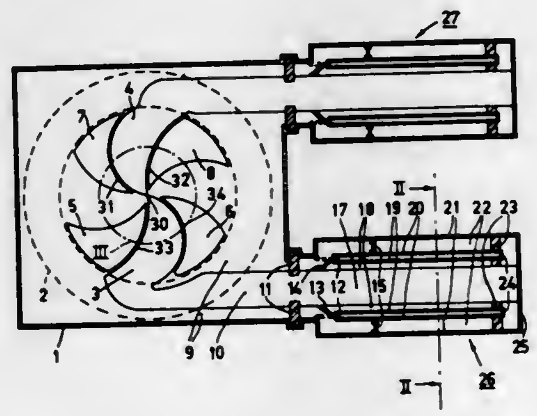
Derk Wierts, Emmasingel, Eindhoven, and Pieter Boomsma, Beekbergen, both of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed April 8, 1971, Ser. No. 132,326

Claims priority, application Netherlands, April 29, 1970, 7006247

Int. Cl. H05h *13/00*

U.S. Cl. 328—234 **1 Claim**



An electric high-frequency resonator for accelerating charged atomic particles, comprising a first hollow conductor, a second hollow conductor extending within the first hollow conductor, a third hollow conductor extending within the second hollow conductor and a fourth hollow conductor extending within the third hollow conductor. The second and third hollow conductors and the first and fourth hollow conductors are connected respectively to form first and second waveguides for the propagation of high-frequency waves. Input coupling means are employed to connect the interposed first and second waveguides in series thereby providing increased electrical length characteristics for the propagation of high-frequency electric waves without increasing the structual length of the resonator.

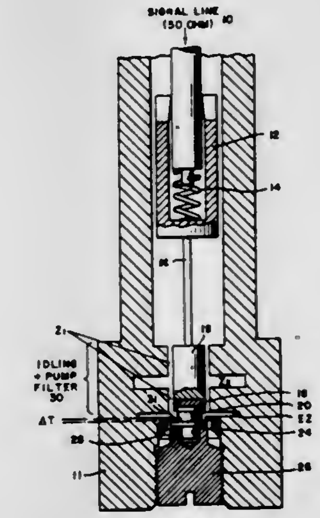
3,718,866
NON-DEGENERATIVE PARAMETRIC AMPLIFIER

Jochen Edrich, Denver, Colo., assignor to the United States of America as represented by the Secretary of the Navy

Filed Mar. 22, 1972, Ser. No. 236,935

Int. Cl. H03f *7/04*

U.S. Cl. 330—4.9 **5 Claims**



A low noise, cooled or uncooled parametric amplifier especially suited for radio astronomy receivers. The amplifier employes a novel diode mount, a pump, an idling filter, and an impedance transformer for a single ended amplifier so as to produce large bandwidth and a wide tuning range.

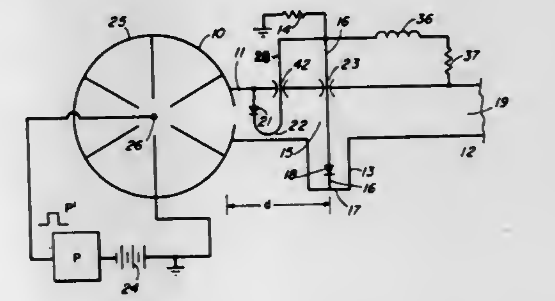
3,718,867
NOISE LIMITERS FOR ELECTRONIC HIGH-FREQUENCY OSCILLATORS

Robert Tenenholtz, Framingham, Mass., assignor to Microwave Associates, Inc., Burlington, Mass.

Filed Feb. 17, 1972, Ser. No. 227,176

Int. Cl. H03b *9/10*

U.S. Cl. 331—91 **9 Claims**



Pulse-operated electronic high-frequency oscillators, such as magnetrons, employed in a radio transmitting system which applies to the oscillator a constant DC pedestal voltage of a first magnitude and which superposes on said pedestal voltage an operating voltage pulse of a second magnitude for generating RF transmission energy, are operated more stably with reduced noise by a quarter-wave transmission-line stub branchingly coupled to the output transmission line an optimized distance from the oscillator. The stub is open-circuited at its free end and a normally-open switch, which is closed in the presence of RF power above a certain threshold, is coupled across the open end.

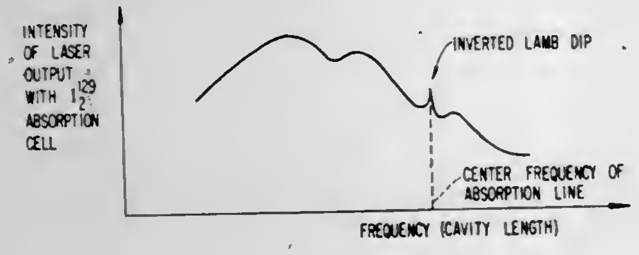
3,718,868
I_2^{129} INVERTED LAMB DIP STABILIZED HE-NE LASER

Yoh-Han Pao, and Joseph Dale Knox, both of Cleveland Heights, Ohio, assignors to Case Western Reserve University, Cleveland, Ohio

Filed July 20, 1970, Ser. No. 56,520

Int. Cl. H01s *3/02, 3/22*

U.S. Cl. 331—94.5 **7 Claims**



An extremely accurately resettable He-Ne laser including a gaseous I_2^{129} absorption cell in the laser cavity, and a method of stabilizing a He-Ne laser on an Inverted Lamb Dip of I_2^{129}. The laser gain tube and absorption cell are enclosed in a novel laser cavity apparatus. The cavity mirrors are positioned by novel mirror adjusting means which permits the laser to be tuned very quickly.

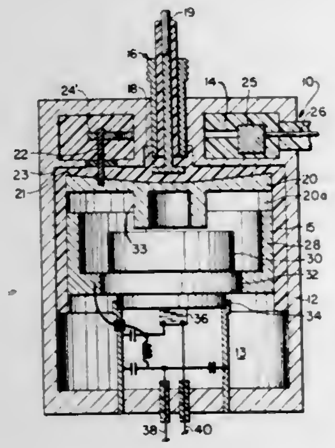
3,718,869
MICROWAVE OSCILLATOR WITH COAXIAL LEAKAGE OUTPUT COUPLING

Horst W. A. Gerlach, Bethesda, Md., assignor to The United States of America as represented by the Secretary of the Army

Filed March 29, 1971, Ser. No. 128,843

Int. Cl. H03b *5/18, 7/14*

U.S. Cl. 331—96 **5 Claims**



An improved coupling arrangement between a cavity resonator with associated microwave generator and the load. The cavity includes a radial line coupling in the form of a disc capacitively coupled to a planar load terminal. The disc is concave relative to the load terminal in order to effect a uniform impedance at all radial portions of the coupling and to provide the optimum impedance match.

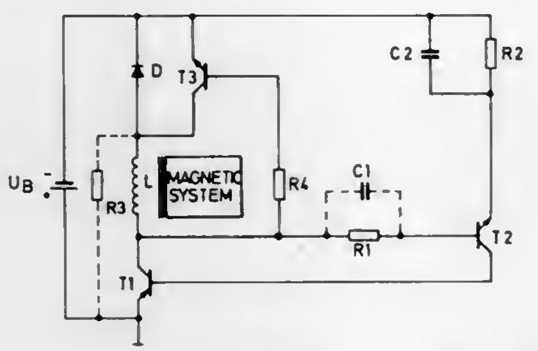
3,718,870
DRIVING CIRCUIT FOR ELECTRO-MECHANICAL OSCILLATORS

Hans Keller, D78 Freiburg, Germany, assignor to ITT Industries, Inc., New York, N.Y.

Filed Aug. 12, 1971, Ser. No. 171,580

Int. Cl. H03b *5/30*

U.S. Cl. 331—116 M **6 Claims**



This invention relates to a circuit for driving an electromechanical oscillator (balance wheels, pendula, tuning forks) in an electronic watch. In a circuit with only one coil and two transistors, a forward biased diode is provided in series with the coil which results in sparing one of two batteries.

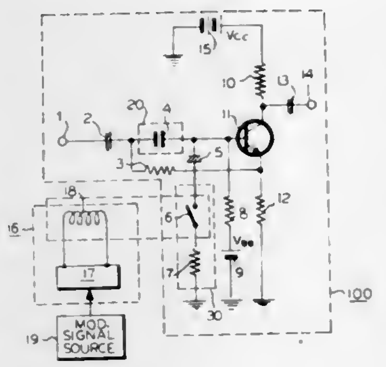
3,718,871
PHASE MODULATING DEVICE

Kinji Kawamoto, Kyoto, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed July 23, 1971, Ser. No. 165,558

Int. Cl. H03c *3/12*

U.S. Cl. 332—16 T **21 Claims**



A phase modulating device for an electronic musical instrument has at least one phase shifting means essentially composed of at least one resistive branch and at least one reactive branch. The resistive branch has a resistive element and a switching means connected in series. The switching means is turned on and off alternatively by an actuating means at a frequency higher than twice that of an input signal to be modulated. The ratio of an on-period plus an off-period to the on-period changes according to a modulating signal generated by a modulating signal source. The phase characteristic of the device is changed in response to the modulating signal by the switching means actuated by the actuating means in order that the input signal be phase modulated.

3,718,872
MAGNETIC MODULATING SYSTEM

Shinjiro Takeuchi, Toda, Japan, assignor to Mishima Kosan Co., Ltd., Kitakyushu, Fukuoka Prefecture, Japan

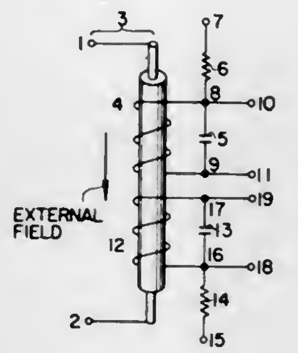
Filed June 7, 1971, Ser. No. 150,532

Claims priority, application Japan, Dec. 3, 1970, 45/107,018

Int. Cl. H03c *1/00*

U.S. Cl. 332—51 R **1 Claim**

A magnetic modulating system has a magnetic core and two resonant circuits which are supplied with an alternating exciting current and an input signal. An alternating driving magnetic field is applied to the magnetic core and an alternating bias current is applied to a nonlinear inductance element of a differential output circuit consisting of two resonant circuits composed of the nonlinear inductor and a condenser. The output signal of the differential output circuit can be controlled according to the input signal so as to modulate the output signal with high sensitivity by means of a very small input signal.



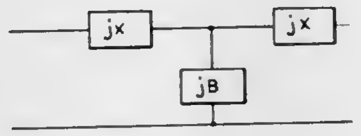
3,718,873
PHASE SHIFTER HAVING AT LEAST ONE T-SECTION LC CIRCUIT

Robert V. Garver, Boyds, Md., assignor to the United States of America as represented by the Secretary of the Army

Filed June 28, 1971, Ser. No. 157,518

Int. Cl. H01p *1/18;* **H03h** *7/34*

U.S. Cl. 333—31 R **3 Claims**



The present invention sets forth design criteria and generic LC circuit configurations for two types of phase shifters. The first type accomplishes variable phase shifting by employing a T-section circuit using fixed inductors and variable capacitors in the series leg of the circuit while a parallel connection of fixed inductor and variable capacitor exists in the shunt leg of the circuit. In the second type, digital phase shift is accomplished by sequentially switching between low and high pass T-section filters.

3,718,874
ETCHED INDUCTANCE BANDPASS FILTER

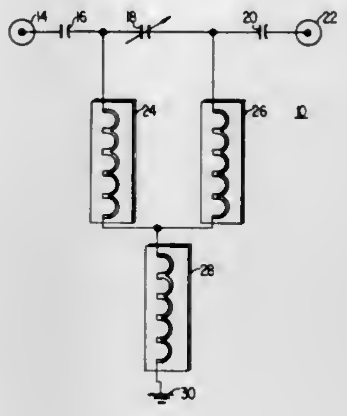
Robert B. Cooper, Jr., Oklahoma City, Okla., assignor to Edwin J. Sossen, Oklahoma City, Okla. a part interest

Filed Dec. 29, 1970, Ser. No. 102,450

Int. Cl. H01p *1/20, 3/08;* **H03h** *7/14*

U.S. Cl. 333—73 S **13 Claims**

A bandpass filter of one or more stages using etched inductors and designed for use in the VHF or UHF ranges is disclosed. Three etched inductors are used in each stage, and a variable capacitor is used to tune the stage. Alternatively, the variable capacitor may be replaced by a fixed capacitor, and a variable inductor may be substituted for one of the fixed inductors. Coaxial cable may be used to couple stages together. A modified filter stage is also disclosed to simplify tuning procedures when filters having three cascaded stages are assembled.



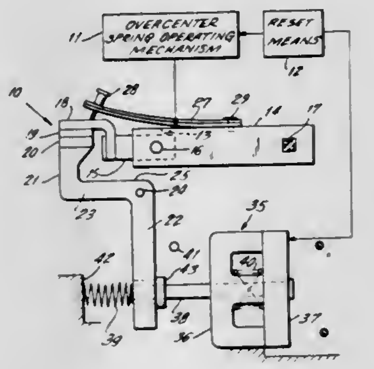
3,718,875
CURRENT LIMITING CIRCUIT BREAKER WITH MAGNETIC LATCH

Frank W. Kussy, Haverford, and Gustave E. Heberlein, Jr., King of Prussia, both of Pa., assignors to ITE Imperial Corporation, Philadelphia, Pa.

Filed July 2, 1971, Ser. No. 159,171

Int. Cl. H01h *73/00*

U.S. Cl. 335—18 **9 Claims**



A very fast opening current limiting circuit breaker is provided by utilizing a permanent magnet latch to maintain a semi-stationary contact in its operative position against the force of a biasing spring tending to move this contact to an inoperative position in which it is disengaged from the movable contact and is not engageable by the latter. The permanent magnet latch is released by a bucking flux generated in response to detection, by a monitoring means, of a current rate of rise in the circuit breaker which exceeds a prededermined value.

3,718,876
SEALED CONTACT MATRIX SWITCH HAVING A FLEXIBLE MEMBRANE AT A CROSSPOINT OPENING

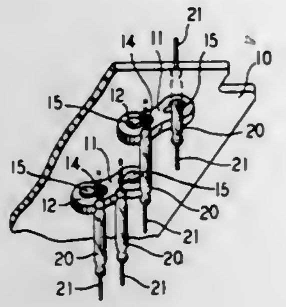
Roger Florin Fletcher, Columbus, Ohio, assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed March 15, 1972, Ser. No. 234,909

Int. Cl. H01h *67/30*

U.S. Cl. 335—152 **8 Claims**

A flexible membrane is disclosed which extends over an aperture in a support plate in an electromagnetic sealed contact matrix or ferreed type switch. The ferreed switch includes at least one circuit path element and the flexible membrane joins the circuit path element to the support plate and extends the circuit path element over the aperture to a point of rigid



contact with a conductor lead projecting from an associated sealed contact switch.

3,718,877
SWITCH FOR PUSH KEY

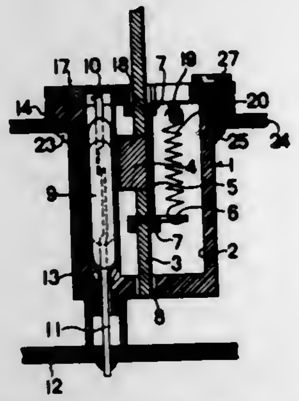
Akira Matsushima, Chiba, Japan, assignor to Kabushiki Kaisha Hattori Tokeiten, Tokyo, Japan

Filed Sept. 16, 1971, Ser. No. 181,080

Claims priority, application Japan, Sept. 22, 1970, 45/93517

Int. Cl. H01h *9/08, 3/12*

U.S. Cl. 335—205 **6 Claims**



A switch for a push key of a calculator or the like comprising, a switch case with built-in members and a cover. Hooks projecting downwardly from the cover engage with edges of an upper flange of the switch case and the extreme ends of said hooks fit into positioning holes bored in a supporting plate on the calculator. This enables the key-top to be mounted at a desired position.

ERRATUM

For Class 337—94 see:
Patent No. 3,718,162

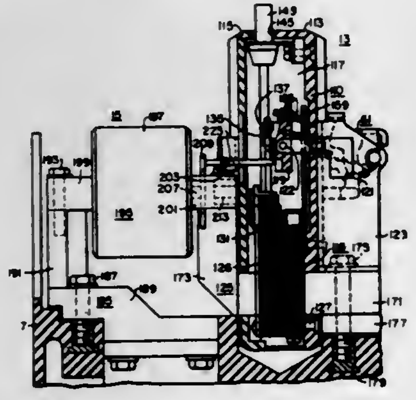
3,718,878
FUSED CIRCUIT BREAKER

James C. Wilson, Beaver, Pa., assignor to Matsushita Electronics Corporation, Osaka, Japan

Filed March 8, 1972, Ser. No. 232,794

Int. Cl. H01h *85/50*

U.S. Cl. 337—7 **10 Claims**



A multi-pole fused circuit breaker, of the type comprising current limiting fuses and a removable enclosed multi-pole trip device, comprises improved coordinating means for tripping the breaker when any of the fuses is actuated.

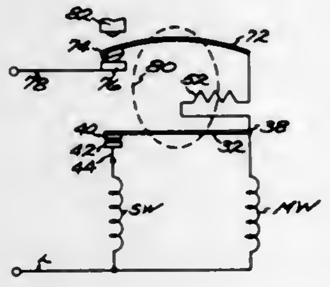
3,718,879
APPARATUS FOR STARTING AND PROTECTING OF ELECTRICAL MOTORS

Frederick G. Perry, Norton, Mass., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed May 19, 1971, Ser. No. 144,959

Int. Cl. H01h *61/06*

U.S. Cl. 337—95 **17 Claims**



A combined relay and protector is shown particularly suitable for starting and protecting electrical equipment having a main winding and a start winding comprising two thermal elements mounted along side one another with a combination heater located in heat transfer relation with both elements. A preferred embodiment shows one of the thermal elements as a creep acting blade connectable to the start winding and the other thermal element as a snap acting disc connectable to deenergize the motor. A second embodiment includes a shunt heater connected across the creep acting blade.

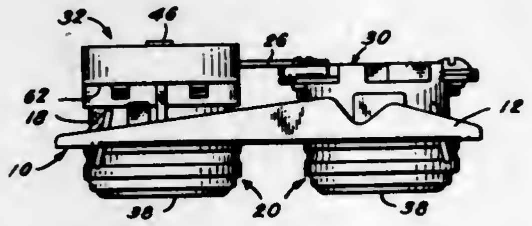
3,718,880
THERMOSTATIC DEVICE AND MEANS FOR MOUNTING SAME

John Pringle, Elizabeth Vale, and Guillermo Eugene Pecker, Elizabeth, both of Australia, assignors to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 836,354, June 25, 1969, Pat. No. 3,609,622. This application Nov. 4, 1970, Ser. No. 86,959

Int. Cl. H01h *37/04*

U.S. Cl. 337—380 **5 Claims**



A thermostatic device including a housing containing a bimetallic disc or strip which engages a cruciform shaped member, the cross arm of which engages a pair of pins which bear against leaf spring-type movable contact arms while the stem of the cruciform shaped member can form reset means providing a simple means for resetting the disc. Means for mounting the thermostatic device include a plate supporting a plurality of springs, each spring in turn urging a housing of the thermostatic device in a direction away from the plate of the device so that when the plate is secured to a surface the temperature of which is to be sensed, the springs urge the thermostatic housing into contact with the surface.

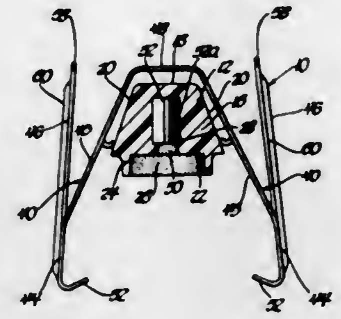
3,718,881
DETACHABLE FASTENING CLIP

Roy G. Szanny, Hubbard, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed March 27, 1972, Ser. No. 238,383

Int. Cl. H01c *7/04*

U.S. Cl. 338—22 **4 Claims**



This disclosure relates to a one-piece detachable fastening clip for retaining two mating bodies in engagement with each other. The clip comprises two integral and resilient bent arm members which terminate in free ends and which have tangs struck therefrom and which are bent inwardly toward each other for receiving and retaining one of the mating bodies between the arm members. The free ends of the arm members are bent inwardly toward each other, and handles or control arms are struck from the arm members and bent outwardly therefrom and extend away from the free ends. The free ends are deflected outwardly away from each other and against the self-biasing force of the arm members when the control arms are pinched toward each other to thereby allow the other of the mating bodies to be received between the arm members and to mate with the one mating body. The inherent biasing forces of the arm members causes the free ends to move inwardly when the control arms are released to detachably engage the other mating body.

3,718,882
MAGNETIC SWITCHING APPARATUS

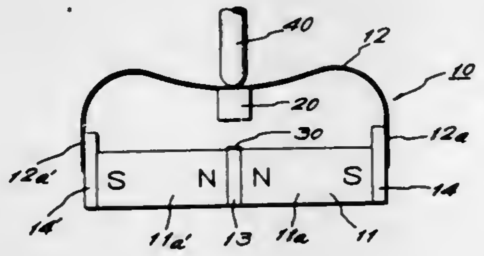
Noboru Masuda, Kawaguchi, and Tunekazu Kobayashi, Kawasaki, both of Japan, assignors to Denki Onkyo Co. Ltd., Tokyo, Japan

Filed Oct. 23, 1970, Ser. No. 83,302

Claims priority, application Japan, Oct. 25, 1969, 44/101034; Oct. 25, 1969, 44/101035

Int. Cl. H01c *7/16*

U.S. Cl. 338—32 H **11 Claims**



A switching apparatus comprised of a base containing two magnets, the same poles of which are coupled, a magnetic frame which is extended across both ends of the two magnets to form an endless magnetic loop in conjunction with the base, a galvano-magnetro effect device which is positioned on the coupled portion of the magnetic poles of the base so that the magnetic flux of the two magnets is concentrated on the galvano-magnetro effect device when the galvano-magnetro effect device is magnetically short-circuited at the middle portion of the frame.

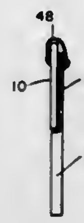
3,718,883
ELECTRICAL COMPONENTS WITH FLEXIBLE TERMINAL MEANS

Abraham Berman, Tel Aviv, Israel, and George V. Gerber, Chester Springs, Pa., assignors to Vishay Intertechnology, Inc., Malvern, Pa.

Filed Oct. 15, 1971, Ser. No. 198,552

Int. Cl. H01c *1/14*

U.S. Cl. 338—322 **12 Claims**



Improved means of attaching electrical connectors to miniaturized electrical components are disclosed. Flexible leads separately attached to the front of an electrical component are attached at their opposite ends to more rigid electrical connectors on the reverse side of the electrical component. The electrical connectors and the electrical component are preferably bonded together for improved stability. The resulting electrical component is typically surrounded with at least one protective covering.

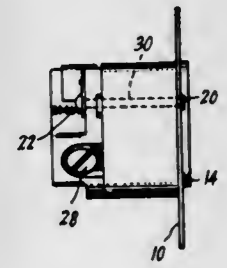
3,718,884
GROUNDED FLANGED WIRING DEVICE

Luther M. Sheldon, Cranston, R.I., assignor to General Electric Company

Filed June 24, 1971, Ser. No. 156,180

Int. Cl. H01r *3/06*

U.S. Cl. 339—14 R **1 Claim**



A grounded flanged wiring device is provided in which the grounding is achieved with reliability and economy by incorporating a grounding strap into the grounding line of the connector and using the structural support member to effect a grounding connection to a metal flange and from this flange to the housing of an instrumentality to be grounded.

3,718,885
MULTIPLE CONNECTOR

Hendrik Dorjee, and Jan Lesterhuis, both of Emmasingel, Eindhoven, Netherlands, assignors to North American Philips Co., Inc., New York, N.Y.

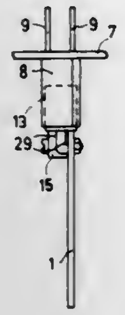
Continuation of Ser. No. 696,822, Jan. 10, 1968, abandoned. This application May 12, 1970, Ser. No. 37,411

Claims priority, application Netherlands, Jan. 14, 1967, 6700633

Int. Cl. H01r *13/64, 13/26*

U.S. Cl. 339—17 LC **4 Claims**

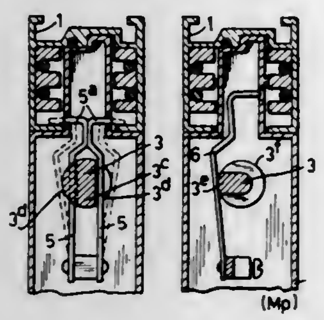
A connector assembly for securing a printed circuit board into a module. A multiple pin connector is attached to a plate or circuit board within a module. A circuit board with a female connector attached thereto is provided. The connector structure provides a compact, reliable and economical connector assembly.



3,718,886
CONNECTION PLUG FOR A CURRENT SUPPLY RAIL

Hansmartin Hoffmeister, Ludenscheid, Germany, assignor to Oy Nokia AB Finnish Cable Works, Helsinki, Finland

Filed June 1, 1970, Ser. No. 42,257
Claims priority, application Germany, May 31, 1969, P 19 27 940.4
Int. Cl. H01r *9/00*
U.S. Cl. 339—21 R **9 Claims**



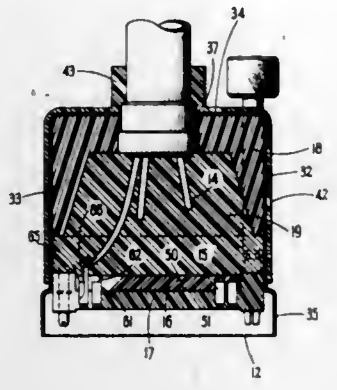
A connection plug is provided for a current supply rail. The plug comprises contact springs actuated by a control shaft between a protruding contact position and a retracted inoperative position. The control shaft is formed with guiding surfaces angularly displaced with respect to each other so that the contact springs are selectively actuated and brought to protruding contact position by the control shaft.

3,718,887
CONNECTOR

William E. Solomon, Raynham, and Arthur V. Healey, Eastondale, Mass., assignors to Component Manufacturing Service, Inc., Component Park, West Bridgewater, Mass.

Filed June 14, 1971, Ser. No. 152,669
Int. Cl. H01r *13/40*
U.S. Cl. 339—92 M **17 Claims**

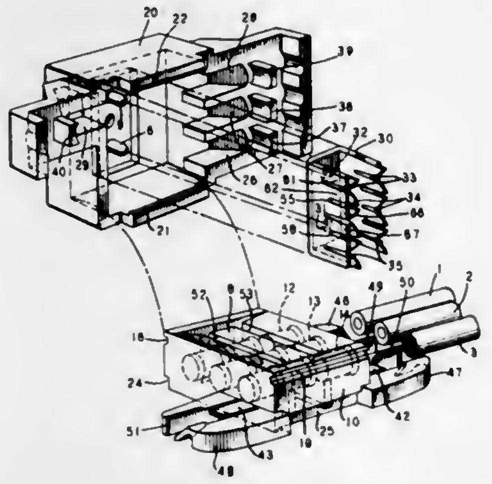
An electrical connector has a housing formed of radio frequency interference shielding. A plural lead, shielded cable is joined to the housing with an end passing therein. Leads of the cable are joined to individual connector pins located at a connection end of the housing. Premolded insulating fillers are used to fill some of the space within the housing in conjunction with in situ molded insulating material. The connector pins are preferably mounted on a terminal board with locking means for preventing disarray of the connector pins during in situ molding and thereafter. A strain relief member is preferably molded over the cable and housing for strain relief and environmental control. Preferably jack screw means are fixed in position for rotation within the housing to secure the connector to an attached terminal board or similar mating connector.



3,718,888
UNIVERSAL CONNECTOR FOR CABLE CONDUCTORS

John Paul Pasternak, Plainfield, N.J., assignor to Bell Telephone Laboratories, Incorporated, Berkeley Heights, N.J.

Filed Jan. 4, 1971, Ser. No. 103,687
Int. Cl. H01r *11/20*
U.S. Cl. 339—98 **10 Claims**

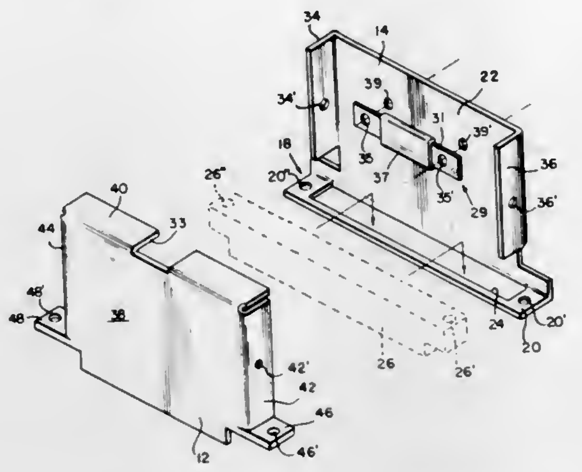


An electrical connector is disclosed having a capability for both butt-splicing and bridge-splicing a plurality of insulated wires with solderless connections. The connector includes a metallic contact containing a plurality of tapered slots, the sidewalls of which are formed to pierce the insulation on the wire. The portion of the contact at the entrance to the slots is formed into a shoulder transverse to the axis of the slots. As a result, when insulated wires are forced into the slots of the contact, the insulation is pierced, the shoulder holds the insulation to prevent it from being drawn into the slot, and positive electrical contact is established between the conductors of the wires and the metallic contact. A retainer is also provided to hold the wires in place prior to being forced into the slots and to provide mechanical support for the wires after the connection is made.

3,718,889
TERMINAL BLOCK COVERING MEANS

Kenneth D. Bartlett, R.R. No. 1, Box 101, Camby, Ind.

Filed March 2, 1971, Ser. No. 120,262
Int. Cl. H01r *13/58*
U.S. Cl. 339—103 R **5 Claims**

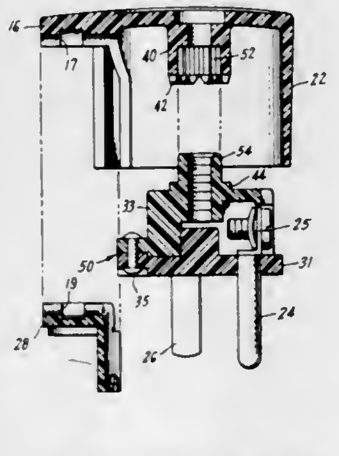


Cooperating first and second case members provide a compartment enclosing the terminals of a terminal block and the electrical leads connected thereto, one of the case members having a shelf for carrying the terminal block.

3,718,890
DIRECTION LOCK FOR ANGLE PLUG

Luther M. Sheldon, Cranston, R.I., assignors to General Electric Company

Filed July 29, 1971, Ser. No. 167,390
Int. Cl. H01r *13/58*
U.S. Cl. 339—107 **1 Claim**



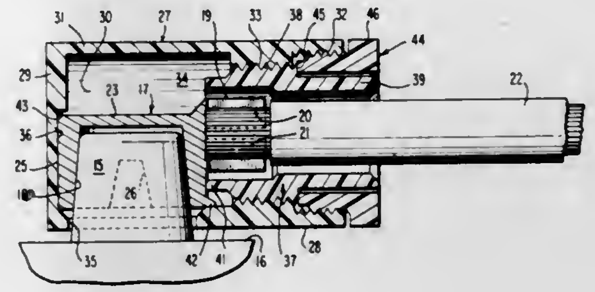
An angle cap having power blades extending generally at right angles to a power supply cable is provided with a means for disposing the cable at a number of radial angles relative to the blade orientation. Cooperation between the cover of the cap and the blade housing permits angular positioning of the blades relative to the cable so that once the blades are inserted in a stationary wall receptacle the cable will be positioned to lie in a preselected downward or sideward or upward orientation. The cooperating angular indexing means includes an integrally formed collar of the cover and integrally formed post of the blade housing.

3,718,891
BATTERY TERMINAL CONNECTOR AND HOUSING MEANS

Richard R. Wening, 2113 N. Eastside, Santa Ana, Calif. 92701

Filed June 21, 1971, Ser. No. 154,737
Int. Cl. H01r *11/26*
U.S. Cl. 339—116 R **10 Claims**

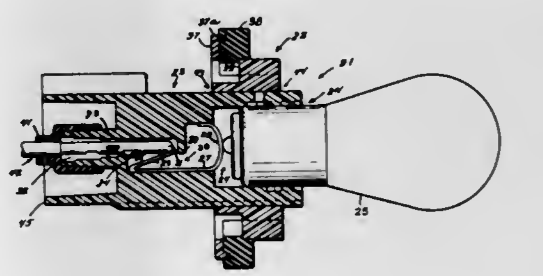
A battery terminal post receives thereon a connector cap formed of a similar metal to avoid electrolysis and corrosion. The terminal post and cap are received within a non-metallic corrosion-resistant housing and the housing in turn receives a threaded sleeve for applying clamping pressure to the connector cap and a locking nut to prevent movement of the sleeve. The housing, connector cap and pressure-applying sleeve have interfitting parts which resist movement of the cap while the sleeve is being tightened and thereafter.



3,718,892
LAMP SOCKET

James P. Burgess, Brighton, and Melvin W. Polkinghorn, Livonia, Mich., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Sept. 25, 1969, Ser. No. 861,113
Int. Cl. H01r *13/32, 13/66*
U.S. Cl. 339—126 R **35 Claims**



A lamp socket structure adapted to lockably receive wire harness terminal plugs therein and maintain such terminals in positive wire harness strain-free contact with bulb contact elements positioned within the lamp socket structure. An annular flange, a compression ring and annular shoulders provided on the lamp socket body housing cooperate to provide fool-proof housing panel orientation during installation and positive pressure interlock with the panel housing regardless of housing panel thickness or material. The lamp socket structure has a built-in fibre optic channel which provides one standard ferrule position for all focal lengths and provides for quick insertion, precise aiming and positive locking of the fibre optic wire. The relative axial positioning of the annular flange, compression ring and annular shoulders on the lamp socket body housing can be changed so that the lamp socket structure is axially adjusted relative to the housing panel, thus providing for a variety of focal ranges while maintaining the same basic internal structural features and component interrelationship within the lamp socket structure. A unique boot seal cooperates with socket extension towers on the lamp socket structure to provide for positive individual wire lead sealing.

3,718,893

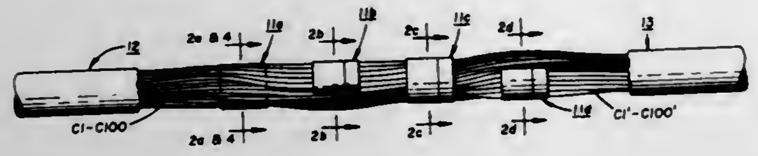
MULTIPLE CONNECTOR ASSEMBLY SYSTEM FOR INTERCONNECTING STRANDS OF CABLES WITHOUT CREATING A SUBSTANTIALLY ENLARGED SECTION THEREIN

Albert Holler, Mount Prospect, Ill., assignor to Western Electric Company, Incorporated, New York, N.Y.

Filed July 30, 1971, Ser. No. 167,650

Int. Cl. H01r *13/50*

U.S. Cl. 339—176 M **5 Claims**



A system for interconnecting respective electrical conductors of two cables of substantially equal radius, without creating a substantially enlarged section in the cables, includes a plurality of longitudinally spaced connector assemblies. Each connector assembly includes first and second plug members connected to respective groups of conductors and connectable to one another to interconnect the conductors. A first portion of each plug member is defined by an outwardly facing curved surface generated by a radius substantially equal to the radius of the cables. A second portion of each plug member is disposed radially inward with respect to the circumference of the cables to define an area in which remaining electrical conductors of the cables can bypass the connector assembly to the other connector assemblies, without projecting substantially radially outward beyond limits defined by the circumference of the cables. Thus, each connector assembly and its associated bypassing conductors have a combined peripheral configuration substantially corresponding in size and shape to that of the cables. The resulting cable connection is enclosed in a protective covering, such as a heat-shrinkable sleeve.

3,718,894

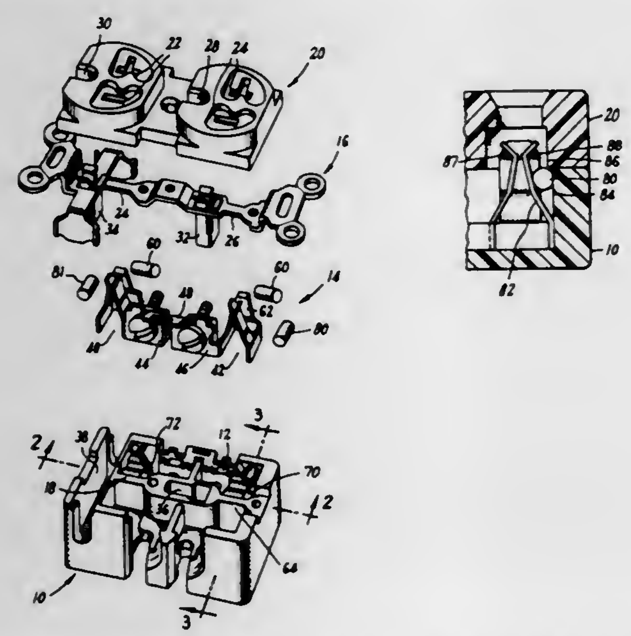
RESILIENTLY REINFORCED NEMA CONTACT

Walter C. Schumacher, Warwick, R.I., assignor to General Electric Company

Filed Jan. 29, 1971, Ser. No. 110,892

Int. Cl. H01r *9/08*

U.S. Cl. 339—217 PS **3 Claims**



Improved contact pressure on power blades of an electrical cap is provided by an electrical contact formed to accept power blades in two orientations at right angles. The contact is made of a strip of metal of high conductivity and low spring properties and is reinforced by a resilient element acting between the contact and insulating housing.

3,718,895

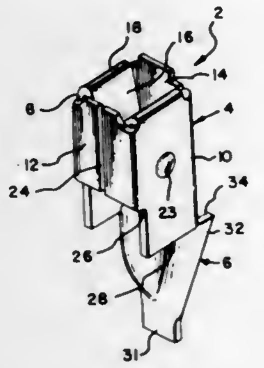
CONNECTING DEVICE FOR PRINTED CIRCUIT BOARD

Charles Edward Reynolds, Camp Hill, and Eugene Leonard Gombar, Harrisburg, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Feb. 1, 1971, Ser. No. 111,402

Int. Cl. H01r *5/04, 9/12;* **H05k** *1/02*

U.S. Cl. 339—258 R **6 Claims**



Connecting device which is adapted to be mounted on a printed circuit board comprises a box-like receptacle portion which is adapted to receive an electrical lead and a mounting portion extending from one side of the receptacle portion. The mounting portion is cupped along its length in the general form of a hemi-ellipsoid. The interior of the ellipsoidal mounting portion faces laterally with respect to the box-like receptacle portion and is so dimensioned that it will fit snugly within a hole in a printed circuit board. The relationship of the mounting portion to the receptacle portion is such that solder flow into the receptacle portion, when the board is dip soldered or wave soldered is prevented.

3,718,896

GUIDING DEVICES

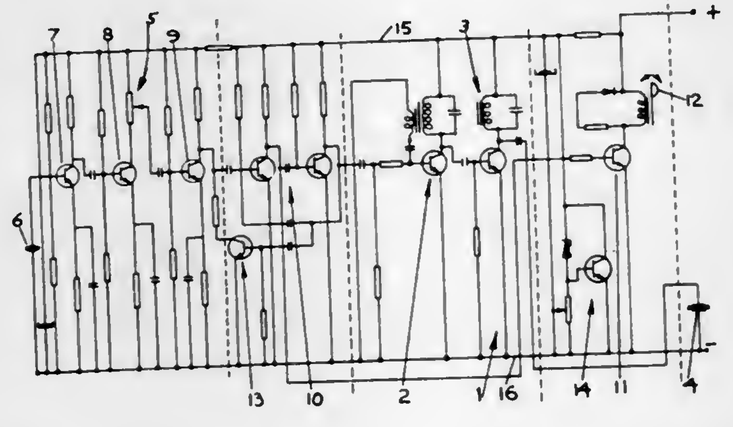
Geoffrey C. Mowat, 37 Cliff Road, St. Heliers, New Zealand

Filed March 27, 1970, Ser. No. 23,283

Claims priority, application New Zealand, March 31, 1969, 155980

Int. Cl. G01s *9/68*

U.S. Cl. 340—1 R **5 Claims**



A blindman's cane has contained within it a transmitter that transmits pulses of energy in a directional manner and also a receiver which accepts the first returned pulse of those transmitted and rejects all others for a predetermined period. The first returned pulse activates a device such as a vibrator to give the user an indication of an approaching object. The rate of vibration of the vibrator alters to give an indication of the closeness of the object.

3,718,897

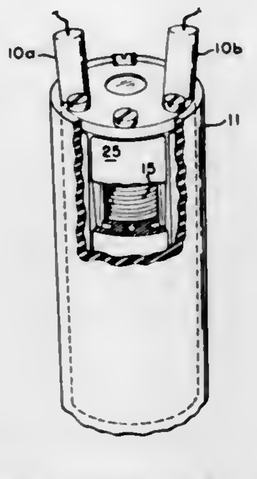
HIGH FIDELITY UNDERWATER MUSIC PROJECTOR

Frank R. Abbott, 3953 Wildwood Road, San Diego, Calif. 92107

Filed May 27, 1971, Ser. No. 147,573

Int. Cl. H04b *13/00*

U.S. Cl. 340—8 R **10 Claims**



A ferroelectric stack, polarized for axial excursions to transfer signals representative of acoustic energy, is held in compression by cap members mounted on its opposite ends to transfer received or projected acoustic energy through circumferentially enclosing longitudinally running ribs. Because of their cross-sectional configuration and because they are coupled in a particular angle with respect to the cap members, the stack's axial excursions are converted to magnified radial displacements when the transducer is used in the transmit mode. In addition, greater sensitivity to impinging acoustical energy is provided by the large receiving surfaces presented by the outer surfaces of the ribs when the transducer functions in the receive mode.

3,718,898

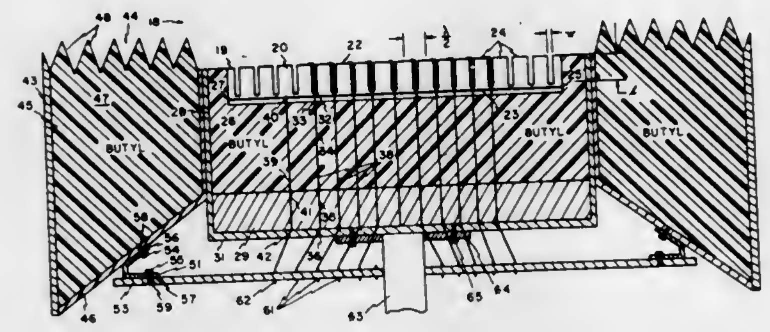
TRANSDUCER

Rufus Lee Cook and Donald L. Folds, Panama City, Fla., assignors to the United States of America as represented by the Secretary of the Navy

Filed Dec. 13, 1971, Ser. No. 207,266

Int. Cl. H04b *13/00*

U.S. Cl. 340—10 **12 Claims**



An electroacoustical transducer is disclosed which incorporates a diced piezoelectric crystal backed by a phenolic disc, a resilient pressure release Butyl rubber cup, an aluminum block, and a metallic cup that contains said crystal, disc, rubber cup, and aluminum block. Electrodes are connected to all of the active end faces and the base of said diced piezoelectric crystal, and electrical wire conductors are connected to each of said face electrodes and said base electrode. A Butyl rubber baffle extends around and radially from said diced piezoelectric crystal, and a liquid acoustical lens is effectively associated therewith. A mounting pipe and flange are effectively connected to said lens and metallic cup for the mounting thereof on a utilization apparatus.

3,718,899

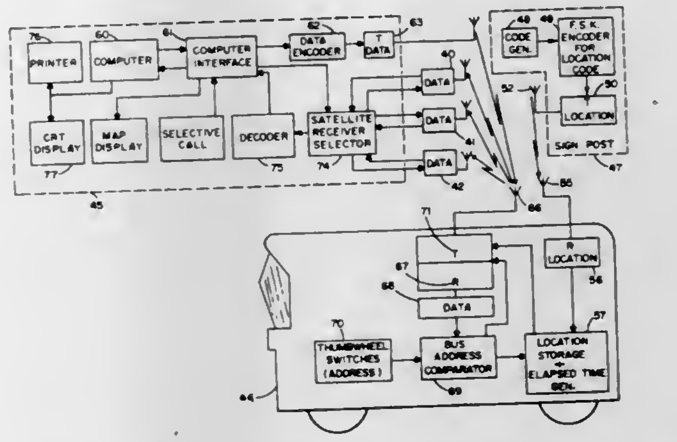
VEHICLE MONITORING SYSTEM INCLUDING AUTOMATIC PRESELECTION OF DESIRED SATELLITE RECEIVER

Thomas J. Rollins, Arlington Heights, Ill., assignor to Motorola, Inc., Franklin Park, Ill.

Filed Apr. 5, 1971, Ser. No. 131,121

Int. Cl. G08g *1/12*

U.S. Cl. 340—23 **16 Claims**



A satellite receiver selection system for a vehicle monitoring system where the vehicle to be monitored travels along a predetermined route. The vehicle includes storage circuitry for storing information signals indicative of its position as it moves along the route, and a transmitter in the vehicle transmits the information signals at particular times. A number of satellite receivers are located along the route for receiving the vehicle's transmitted information signals. These satellite receivers are coupled to a central control station that includes a memory or storage device containing information as to the schedule and position of the vehicle as it travels along the predetermined route. The information signals are coupled from the satellite receiver stations to the central control station where they are compared with the stored information to develop a comparison signal that is used to selectively operate the satellite receiver nearest the vehicle at the time of the next transmission from the vehicle.

3,718,900

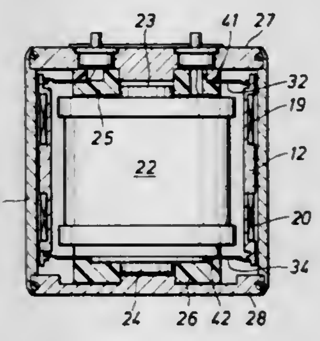
SEISMOMETER WITH SPRING SPIDER SUSPENSION

Robert C. Holmes, Jr., Houston, Tex., assignor to Mark Products, Inc., Houston, Tex.

Filed April 15, 1970, Ser. No. 28,675

Int. Cl. G01v *1/16;* **F16f** *1/34*

U.S. Cl. 340—17 **8 Claims**



Spring spiders support one element of a seismometer, the coil-mass assembly, for movement relative to another element, the magnet assembly. The outer portion of each of the spring spiders is connected to the coil-mass assembly by outwardly extending tabs integrally connected to the outer portion. The outer portion and tabs are bent up and down to position the tabs successively on opposite sides of an annular flange on the coil-mass assembly. This type of connection allows the elements to rotate relatively around their central concentric axes and also reduces substantially the transverse bending of the outer portion of the spiders as the spring arms of the spiders flex, thereby substantially reducing the distortion in the output signal due to such bending.

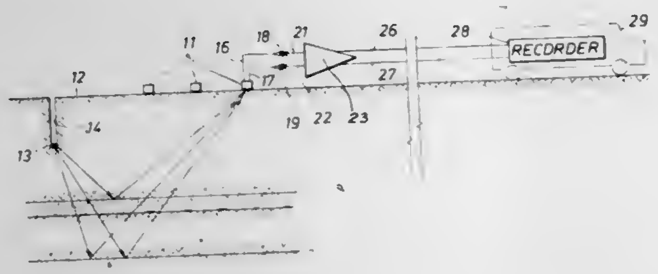
3,718,901
TRANSDUCER AMPLIFIER SYSTEM

Warren B. Davis, Houston, Tex., assignor to Superior Oil Company, Houston, Tex.

Filed Oct. 7, 1970, Ser. No. 78,831

Int. Cl. G01v *1/16*

U.S. Cl. 340—17 **10 Claims**



A transducer amplifier system including a transducer having connectors affixed to the leads thereof and an amplifier circuit having mating connectors for selectively being connectable to said transducer, the amplifier circuit including a battery and semiconductive switching facilities for automatically connecting the battery to the amplifier when the transducer is connected to the amplifier and for disconnecting the battery from the amplifier when the transducer is disconnected to avoid battery drain.

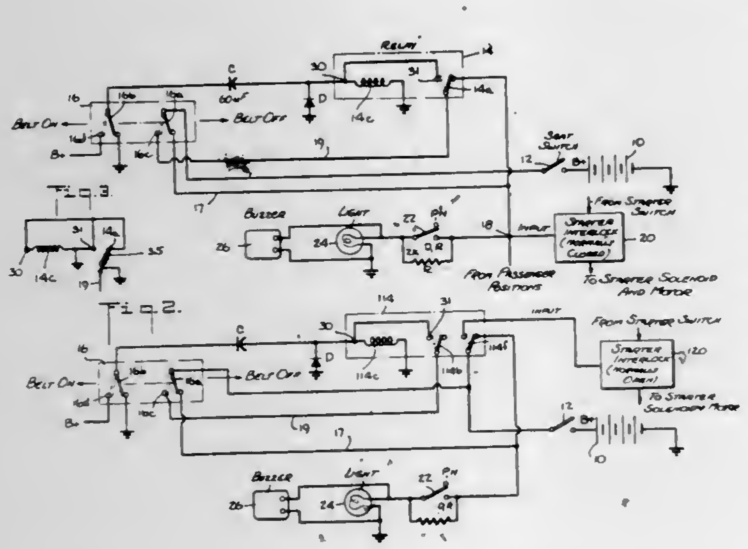
3,718,902
VEHICLE SEAT BELT ALARM AND STARTER INTERLOCK CONTROL SYSTEM

Gerald Robert Pearsall, Farmington, Mich., assignor to Irvin Industries Inc., Greenwich, Conn.

Filed Dec. 6, 1971, Ser. No. 205,209

Int. Cl. B60r *21/10*

U.S. Cl. 340—52 E **16 Claims**



A source of voltage is connected to a starter interlock through a normally open seat switch and a first normally closed seat belt actuated switch. Closing of the seat switch when a passenger sits connects the voltage to the interlock and disables the starter mechanism. Buckling the seat belt opens the seat belt actuated switch and enables the starter mechanism. The voltage is also connected to the starter interlock through the series combination of the normally opened seat switch and a normally closed relay switch. Battery voltage is coupled to the relay switch coil through a second normally open seat belt actuated switch and a capacitor in series. Buckling of the seat belt causes a pulse of current to be transmitted through the capacitor to energize the relay coil thereby opening the normally closed relay switch. A holding circuit through the seat switch maintains the relay switch open. Thus, the seat belt must be buckled after sitting down in order to provide the pulse of current to initially close the relay switch and to provide the continuing current to keep the relay closed. While the vehicle is in use, a warning buzzer and warning light are actuated by the same voltage source which disables the starting circuit.

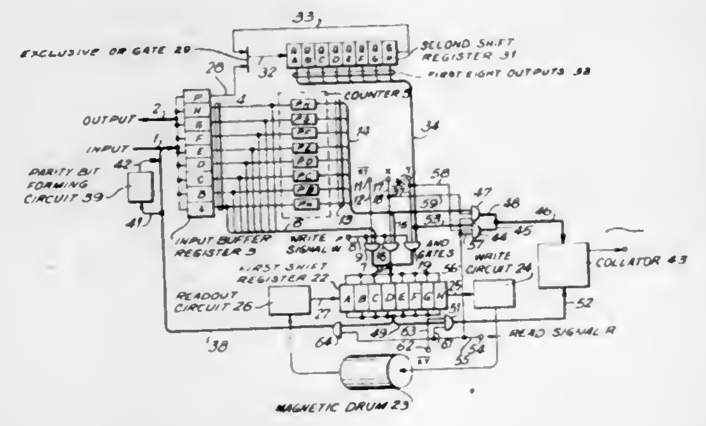
3,718,903
CIRCUIT ARRANGEMENT FOR CHECKING STORED INFORMATION

Mitsuo Oiso, and Yasuo Endo, both of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Continuation-in-part of Ser. No. 670,545, Sept. 26, 1967, abandoned. This application Nov. 18, 1970, Ser. No. 90,670

Int. Cl. G06f *11/10*

U.S. Cl. 340—146.1 AL **9 Claims**



A counter counts specific bits in each of the digits of information and indicates specific bits to form check bits. An input supplies stored information of N digits each including a determined number of bits to the inputs of the counter. A first shift register has inputs coupled to the outputs of the counter for determining a first check digit by counting the supplied information and storing the output of the counter. A write circuit is connected to an output of the first shift register and is positioned in operative proximity with a magnetic storage for recording the first check digit in the magnetic storage. A readout circuit is connected to an input of the first shift register and is positioned in operative proximity with the magnetic storage for reading out information from the magnetic storage. A second shift register has an input coupled to the input and outputs coupled to the inputs of the first shift register for determining a second check digit by counting determined digits of the supplied information and transferring the counted determined digits to the first register. The write circuit records the second check digit in the magnetic storage. A collator has inputs coupled to the input and to the outputs of the counter and of the first shift register for collating the first check digit in the output of the counter with the first check digit read out from the magnetic storage and for collating the second check digit in the output of the second shift register with the second check digit read out from the magnetic storage. A feedback coupled between the outputs of the first shift register and the input adds parity bits to the stored information. An output connected to the feedback provides the stored information with the included parity bits.

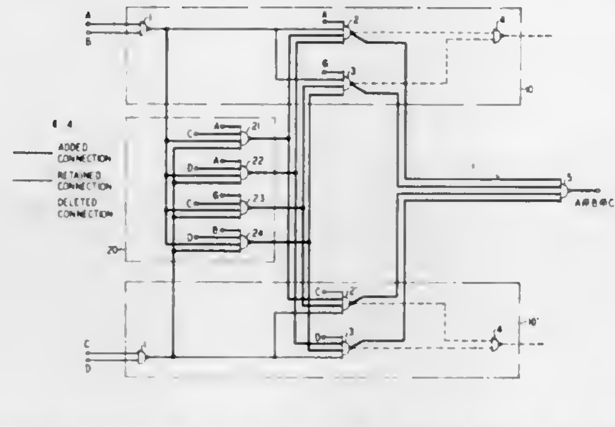
3,718,904
NAND GATE REALIZATION OF THE N-INPUT PARITY FUNCTION

Andrew Frederick Bulfer, Oceanport, and Enn Tammaru, Matawan, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill and Berkeley Heights, N.J.

Filed Sept. 1, 1971, Ser. No. 176,819

Int. Cl. G06f *11/10*

U.S. Cl. 340—146.1 AG **10 Claims**



A generalized, recursive, design procedure is taught for synthesizing a parity checking circuit comprised solely of NAND gates and having any arbitrary, integral number *k*, greater than three, of parallel, binary inputs. Increased operating speed is achieved by interconnecting plural logic levels together through a level of interactive NAND gate logic to reduce the number of logic levels which are normally required to implement such a circuit.

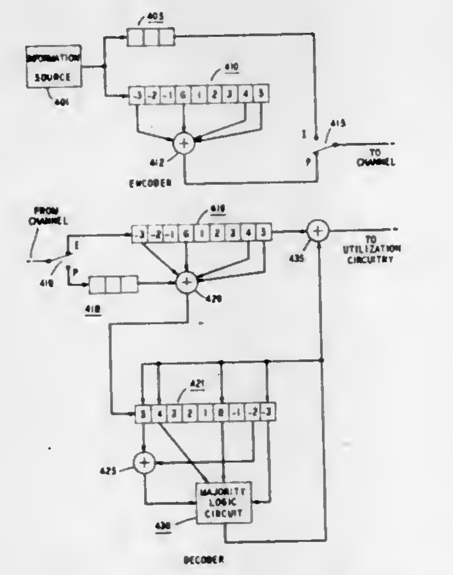
3,718,905
ERROR CORRECTING SYSTEMS UTILIZING ONE-HALF OPTIMUM DIFFUSE CODES

Shih Yung Tong, Middletown, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Sept. 1, 1971, Ser. No. 176,823

Int. Cl. G06f *11/12*

U.S. Cl. 340—146.1 AQ **9 Claims**



Sequences of information bits, encoded in an orthogonalizable convolutional code of rate $\frac{1}{2}$ and transmitted via a communication channel, are decoded to correct t random errors and bursts of B blocks where each block is 2 bits in length. The interconnections between an information bit shift register in the encoder and decoder and their respective parity check bit generating circuits and between a syndrome register and a majority logic circuit in the decoder are specified by relatively simple formulas which are functions of t and B. The apparatus of the present invention is optimized for correcting random errors.

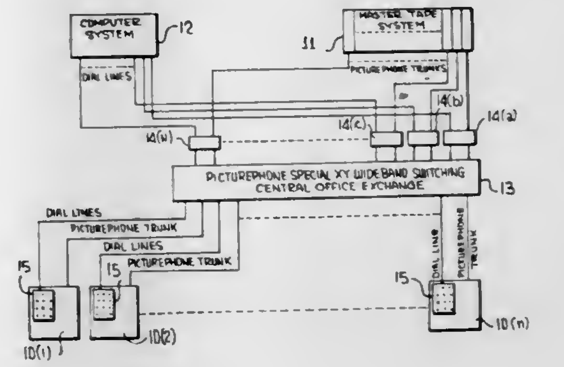
3,718,906
VENDING SYSTEM FOR REMOTELY ACCESSIBLE STORED INFORMATION

Robert W. Lightner, 85 N. Atlantic Avenue, Cocoa Beach, Fla.

Filed June 1, 1971, Ser. No. 148,714

Int. Cl. G11b *15/02;* **H04m** *17/02;* **H04q** *9/00*

U.S. Cl. 340—147 R **23 Claims**



A vending system includes a central station at which various information stored on master recordings can be selectively accessed by purchasers from any of multiple remote vending machines, the accessed information being reproduced on cartridge-type storage media at that vending machine. The cartridge, upon receiving all of the selected information, is ejected from the vending machine for the permanent use of the purchaser. In a preferred embodiment the master recording medium comprises a plurality of endless master tapes continuously driven by a common capstan. The master tapes may contain commercially recorded music which is selectively transferred to a magnetic tape cassette at a vending machine. The master tapes may contain complete albums of recordings which are automatically produced on the cassette, or alternatively may contain a variety of solo recordings which can be individually selected to create a new album of the purchaser's choice.

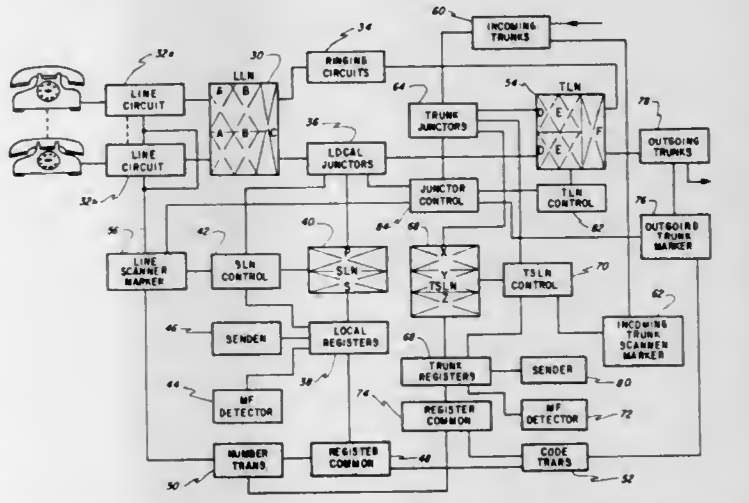
3,718,907
SCANNER CIRCUIT

Otto Altenburger, Rochester, N.Y., assignor to Stromberg-Carlson Corporation, Rochester, N.Y.

Filed June 15, 1971, Ser. No. 153,234

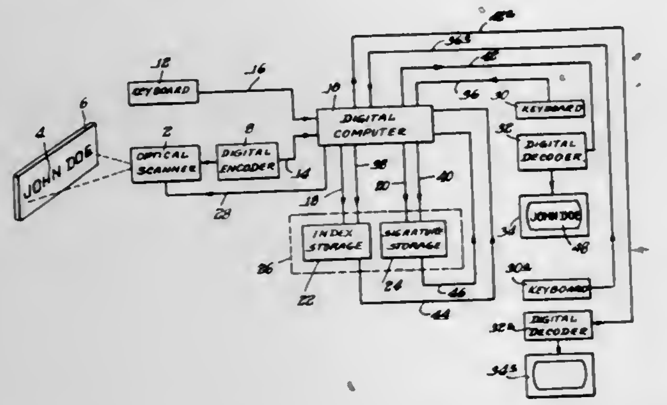
Int. Cl. H04q *3/00*

U.S. Cl. 340—147 R **15 Claims**



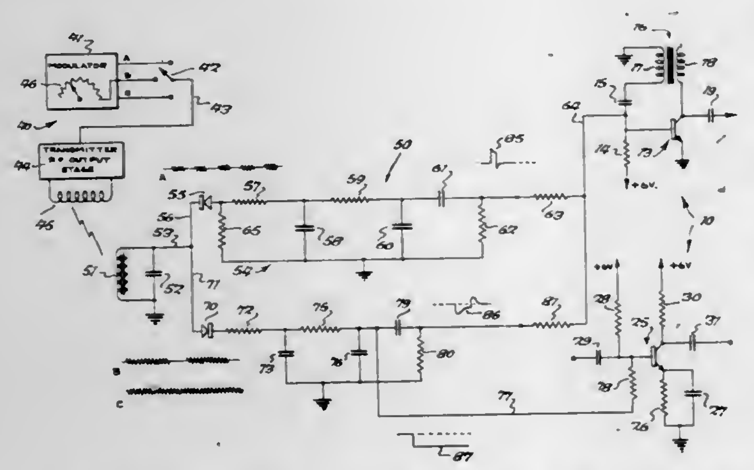
The scanner circuit includes a counter that provides sequential scanning pulses. In response to a current pulse, the counter circuit is stopped. The counter is enabled to start a preset number of scanning or counting cycles in a scanning sequence. Prior to the first scanning cycle, a memory circuit presets the counter. At the end of the first scanning cycle the counter presets the memory circuit. The arrangement is such that the first scanning cycle of each new scanning sequence begins at the count at which the counter stopped at the end of the first scanning cycle of the prior counting sequence. If no current pulse is detected when the counter reaches a preset count limt a preset number of times in one scanning cycle, the scanner circuit is reset.

3,718,908
SIGNATURE STORAGE AND RETRIEVAL SYSTEM
Richard W. Bloomstein, 1443 Cavell,
Highland Park, Ill. 60035
Filed Nov. 30, 1970, Ser. No. 93,587
Int. Cl. H04n *7/18*
U.S. Cl. 340—149 A **5 Claims**



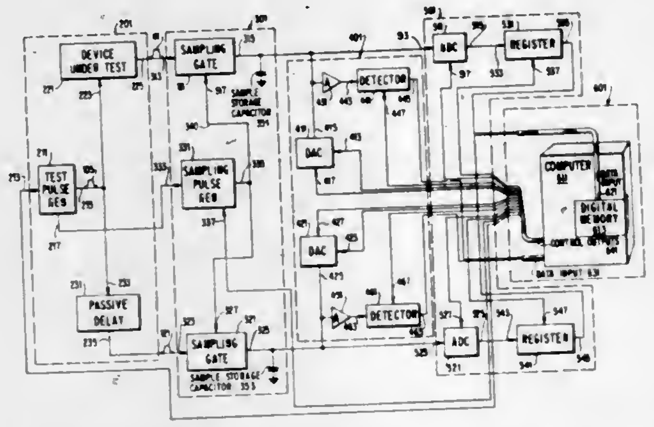
A signature storage and retrieval system comprises an arrangement where signatures are optically scanned and digitally coded, and together with digitally coded correlative information, such as bank account numbers, are stored on data processing recording media. A signature may be verified by keying into the data processing file the bank account number or other correlative information code which causes the data processing equipment to retrieve the signature data which is then decoded, and the signature is displayed on the screen of a cathode ray tube.

3,718,909
RATE CONTROLLER AND CHECKER FOR PULSE GENERATOR MEANS
Wilson Greatbatch, Clarence, N.Y., assignor to Medtronic, Inc., Minneapolis, Minn.
Filed June 18, 1970, Ser. No. 47,198
Int. Cl. A61n *1/36*
U.S. Cl. 340—167 A **6 Claims**



A remotely-operated control for and electrical pulse generating means, such as a cardiac pacer including timing means controlling the generation of pulses and signal responsive means for resetting the timing means in response to a ventricular electrical signal. A remote, portable transmitter selectively generates a plurality, preferably about three, radio frequency signals having different envelope durations, the signal of longest duration being a continuous or carrier wave signal. Coupled to the pulse generator or pacer is a circuit responsive to the radio frequency signals which rectifies, detects and filters them to produce corresponding command signals. Two of the command signals corresponding to the relatively shorter r.f. signals can be applied to the pacer oscillator in a manner increasing or decreasing the rate of pulse generation. The command corresponding to the continuous r.f. signal can be utilized to temporarily inhibit operation of the pacer signal responsive means to check the viability of this function. In addition, this command signal can be applied to a switching means to reduce the capacitance in the timing means to in turn reduce the width of the pacer output pulse for testing the patient's response to reduced energy pulses. In addition, this same command signal can be applied to a semiconductor switching means for reducing the gain of the amplifier in the ventricular signal responsive means for testing the sensitivity thereof.

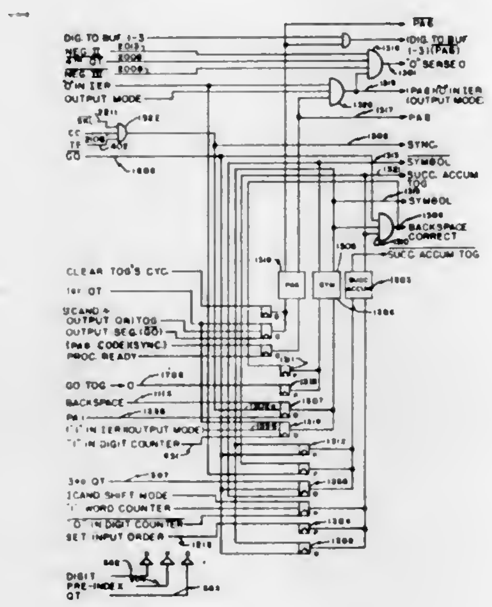
3,718,910
TIME COHERENT SAMPLING SYSTEM FOR ELIMINATING THE EFFECTS OF TEST SYSTEM JITTER AND PROVIDING A SIMPLIFIED SINGLE TRANSIENT THRESHOLD TEST
Eugene J. Scray, Jr., Burlington, and Donald L. Wilder, Colchester, Vt., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Sept. 30, 1970, Ser. No. 76,914
Int. Cl. G06f *1/00*
U.S. Cl. 340—172.5 **11 Claims**



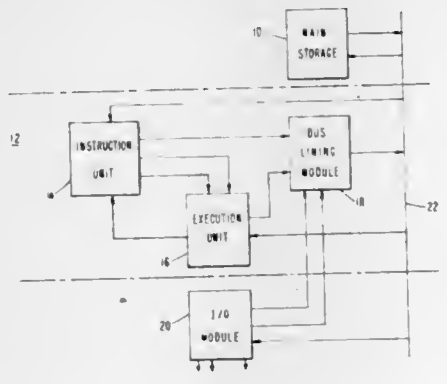
A sampling system obtains simultaneous time coherent samples from multiple waveforms. For processing, the samples are transferred to a permanent storage means, while retaining their time coherency. The retained time coherency allows the processing to remove the effects of test system jitter. The sampling system also provides a simplified threshold test to determine whether a single transient exceeds a threshold voltage at a predetermined time. A sample storage capacitor connected to the output of a sampling gate is preset to the threshold voltage and the sampling gate is momentarily closed at the predetermined time. The direction of any voltage change on the capacitor during the time the sampling gate is closed is detected as an indication of whether the threshold is exceeded. Simultaneous time coherent threshold determinations are obtained by the sampling system.

3,718,911
CARRIAGE-POSITION MODIFICATION OF EXTERNAL PROGRAM
Winsor Soule, Jr., Berkeley, and John Efstathiou, Oakland, Calif., assignors to SCM Corporation, New York, N.Y.
Original application Feb. 23, 1965, Ser. No. 434,265, now Patent No. 3,522,416. Divided and this application Mar. 24, 1970, Ser. No. 24,906
Int. Cl. G06f *9/04, 15/00*
U.S. Cl. 340—172.5 **9 Claims**

Controls for positioning data entry and for clearing instructions and data in an externally programmed computer, particularly applicable to one having a typewriter as an input-output unit and a record reader as the program source. The novel controls provide interaction between the typewriter carriage and keyboard and the program in the reader.

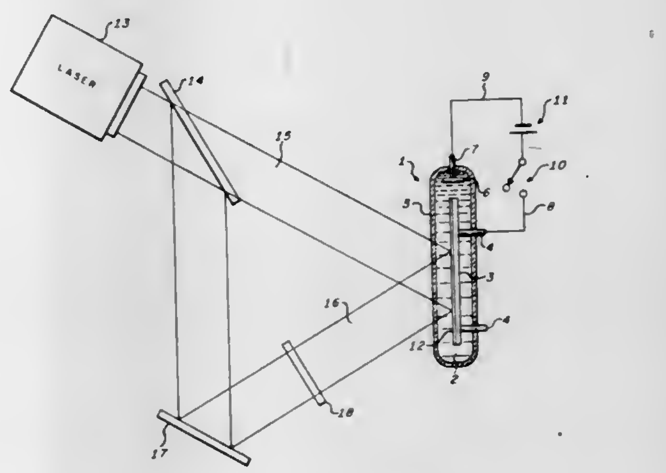


3,718,912
INSTRUCTION EXECUTION UNIT
Leo J. Hasbrouck; Bill C. Madden, both of Saratoga; Robert P. Rew, San Jose, all of Calif.; Edward H. Sussenguth, Cary, N.C., and John R. Wierzbickl, Saratoga, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Dec. 22, 1970, Ser. No. 100,704
Int. Cl. G06f *9/19*
U.S. Cl. 340—172.5 **23 Claims**



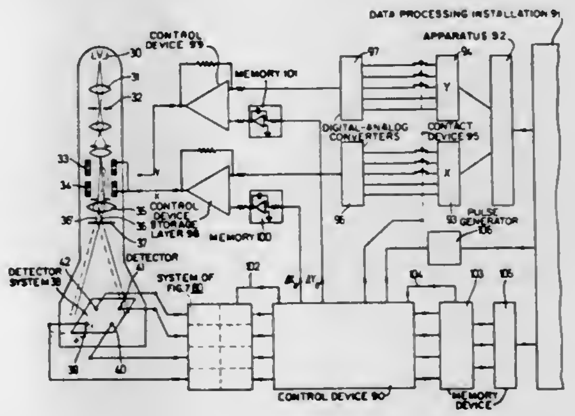
An execution system for instructions having source and sink operand designations includes an arithmetic unit, execution means for holding an instruction for controlling the arithmetic unit and a plurality of operand registers, each having tag means associated therewith for indicating the nature of data stored therein. Instruction modification logic, on the basis of indications of availability of the operand registers, inserts modified source and sink operand register designations in instructions which are then stored in an instruction register stack. Interlock logic controls the transfer of instructions from the instruction register stack to the execution means as a function of the source and sink operand register designations in the modified instructions and the data tags associated with the operand registers.

3,718,913
ERASABLE OPTICAL RECORDING SYSTEM
William T. Maloney, Sudbury, and James B. Thaxter, Townsend, Mass., assignors to Sperry Rand Corporation, New York, N.Y.
Filed Apr. 6, 1972, Ser. No. 241,720
Int. Cl. G11c *13/02*
U.S. Cl. 340—173 CH **9 Claims**



A method and apparatus of erasable optical recording wherein the apparatus comprises a sealed container filled with an electrolyte in which an anode and a cathode electrode are immersed, the anode being reactive with the electrolyte under a condition of applied direct current excitation while the cathode is essentially inert whereupon application of electrical excitation to the electrodes induces electrolytic action causing deposition of an oxide coating on the anode. Thereafter, with the electrical excitation removed, information is recorded on the oxide coating by light energy incident thereon causing vaporization of the coating at localized regions in proportion to the magnitude of the light intensity thereat for a given exposure time. Reapplying the electrical excitation causes erasure of the recorded information by depositing additional oxide coating material in the vaporized regions. Readout may be performed at any time between recording and erasing simply by illuminating the recorded coating in conventional manner with a readout optical beam.

3,718,914
DATA STORAGE SYSTEM UTILIZING PARTICLE BEAM FOR READING INFORMATION
Karl-Heinz Müller, Berlin, Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Germany
Filed Jan. 22, 1970, Ser. No. 4,914
Claims priority, application Germany, Feb. 3, 1969, P 19 05 894.7
Int. Cl. G11c *11/26, 11/42*
U.S. Cl. 340—173 CR **9 Claims**



A data storage system comprises a particle beam which scans the data and a storage layer transparent to the beam.

The storage layer has markings each of which represents a corresponding data element. Electron beam deflecting means are arranged in the beam direction ahead of the storage layer. A detector device is provided behind the storage layer. The cross-section of the beam in the plane of the storage layer is such that it penetrates one component block of the storage layer having a plurality of markings, and projects the same enlarged onto the plane of the detector device. The detector device is designed so that it reads the markings of the penetrated block, separately.

3,718,915

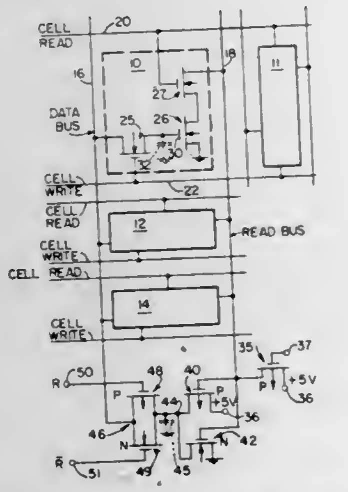
OPPOSITE CONDUCTIVITY GATING CIRCUIT FOR REFRESHING INFORMATION IN SEMICONDUCTOR MEMORY CELLS

William W. Lattin, Phoenix, Ariz., assignor to Motorola, Inc., Franklin Park, Ill.

Filed June 7, 1971, Ser. No. 150,423

Int. Cl. G11c *7/00, 11/24;* **H03k** *17/60*

U.S. Cl. 340—173 R **12 Claims**



Circuit for refreshing information provided as different potentials in semiconductor cells of a dynamic metal oxide semiconductor (MOS) random access memory array with greater speed and less critical clock pulse timing. The circuit is also used for reading information from the cells. The circuit may be used in a memory with a plurality of cells provided on semiconductor chip, as for example, 1,024 cells arranged in 32 rows and 32 columns, each providing one information bit. The memory may be of the dual rail type or the single rail type, and is illustrated as a dual rail memory with a DATA bus which applies potentials to the cells in each column, and a READ bus for indicating the information in the cells. The cells may include silicon gate field-effect transistors (FET) which are all of the same conductivity type, with the circuit for refreshing the information being formed by devices of complimentary types. A first pair of complimentary MOS FET's form a pair of gates selectively rendered operative by the READ bus for applying one of the two potentials which form the information bits in the cells to an interim storage point. A transmission gate applies the stored potential to the DATA bus to refresh the information potential in the cell. A single circuit restores the potentials of all the cells in a column at high speed, with low voltage operation and non-critical timing of clock pulses.

3,718,916

SEMICONDUCTOR MEMORY ELEMENT

Toshio Wada; Sho Nakanama, and Tohru Sujide, all of Tokyo, Japan, assignors to Nippon Electric Company, Limited, Tokyo, Japan

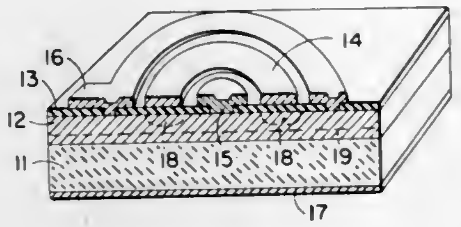
Filed Feb. 10, 1971, Ser. No. 114,304

Claims priority, application Japan, Feb. 12, 1970, 45/12183

Int. Cl. G11c *11/40, 5/02, 11/00*

U.S. Cl. 340—173 R **9 Claims**

A semiconductor memory element for use in a memory device having high speed data read out. A semiconductor region of one conductivity type is provided on a substrate of an opposite conductivity. A first electrode is in ohmic contact with the semiconductor region and a second electrode is coupled to the semiconductor region through a rectifying barrier such as a Schottky barrier or a PN Junction.



3,718,917

DRIVING SYSTEM OF MAGNETIC THIN FILM MEMORY

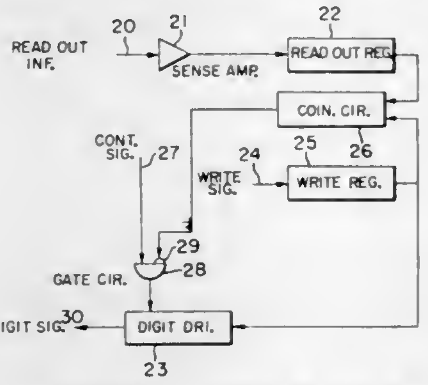
Shiro Nakagawa, Chiba, and Mutsuo Ishikawa, Nagareyama, both of Japan, assignors to T. D. K. Electronics Corporation, Tokyo, Japan

Filed March 15, 1971, Ser. No. 123,978

Claims priority, application Japan, March 23, 1970, 45/24298

Int. Cl. G11c *15/00, 11/14*

U.S. Cl. 340—174 TF **1 Claim**



WRITE DRIVE SYSTEM FOR ONE DIGIT LINE

In a magnetic thin film memory, writing a word or information into a selected storage location will adversely affect the information stored in the adjacent storage locations. To overcome this problem, the information previously stored in a selected storage location into which new information is to be written is read out and compared with the new information so that only when the stored information does not coincide with the information to be written, the latter is written.

3,718,918

NUCLEAR EXPLOSION DETECTION SYSTEMS

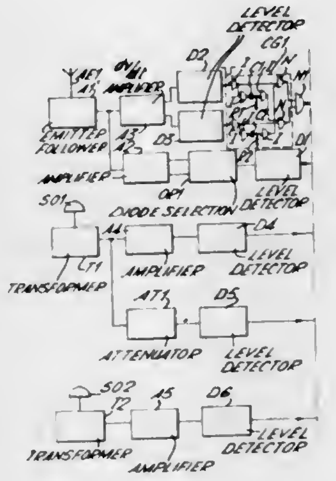
Reginald Allan Fothergill; Reginald Frank Charles Bennett, both of Basingstake; Gerald Thomas Risley, Thatcham, and William Stanley Weeks, Tadley, all of England, assignors to United Kingdom Atomic Energy Authority, London, England

Filed Dec. 1, 1969, Ser. No. 881,129

Int. Cl. G08b *21/00*

U.S. Cl. 340—213 R **17 Claims**

This nuclear explosion detection system receives the radiated transient radiofrequency signal and the fast-rising and slow-rising portions of the radiated transient optical signal, and indicates the occurrence of an explosion only if these signals satisfy selected criteria. The optical criteria include the relative durations of different parts of the optical signal and are checked by deriving time-intervals which include multiples of the durations of given parts of the optical signal, these derived time-intervals being compared with the durations of other parts. The time-intervals are derived by feeding clock pulses at suitable repetition frequencies to reversible counters in one direction during the given parts of the signal, and subsequently feeding clock pulses at appropriate submultiples of those repetition frequencies to the counters in the reverse direction to return them to predetermined conditions.



3,718,919

IONIZATION SMOKE DETECTOR

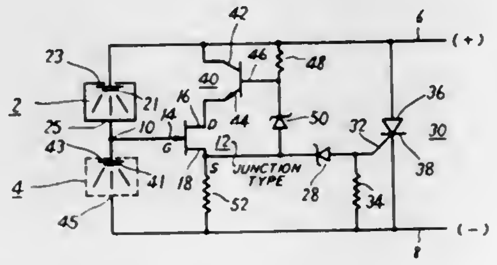
Koju Sasaki, Tokyo; Akihiro Kobayashi, Fujisawa, and Naoki Takahashi, Yokohama, all of Japan, assignors to Nittan Company, Limited, Tokyo, Japan

Filed March 17, 1970, Ser. No. 20,353

Claims priority, application Japan, June 16, 1969, 44/46886; June 16, 1969, 44/46887

Int. Cl. G08b *17/10*

U.S. Cl. 340—237 S **2 Claims**



An ionization smoke detector having an open and a closed chamber each including a pair of electrodes and a radioactive source. The chambers are connected in series across a power supply and the gate electrode of a junction type field effect transistor is connected to the junction of said chambers. The drain-source circuit of the field effect transistor includes means for limiting the current in that circuit to maintain the gate leakage current below a predetermined minimum and thereby avoid erroneous indications of the presence and absence of smoke.

3,718,920

POWER CONTROL SYSTEM HAVING FAULT SENSING MEANS

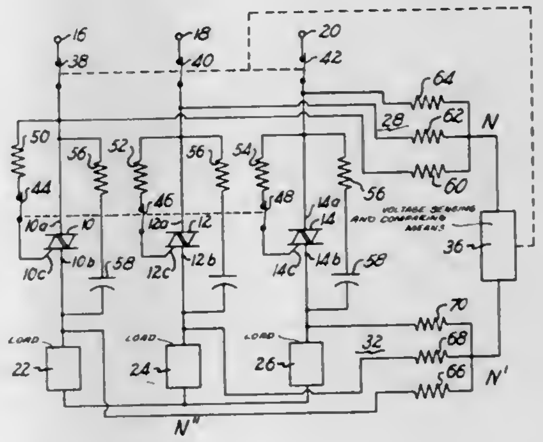
Aime J. Grenier, North Attleboro, Mass., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Sept. 21, 1971, Ser. No. 182,398

Int. Cl. G08b *21/00*

U.S. Cl. 340—248 E **15 Claims**

A system for controlling the supply of electrical power from a balanced polyphase power source to a load such as the phase windings of an electrical motor in which means are provided for sensing improper application of the power to the load. A plurality of selectively energizable A.C. power switches each having first and second power terminals and a control terminal are adapted to couple associated ones of the power terminals of the source to the load. A substantially non-reactive, high impedance line neutral sensing network having a junction defining a line neutral point is connected across the first power terminals of the A.C. power switches, while a similar load neutral sensing network having a junction defining a load neutral point is connected across the second power terminals of the A.C. power switches. Means are coupled between the line neutral junction and the load neutral junction for sensing a difference in electrical potential therebetween as an indication of system mis-operation.



3,718,921

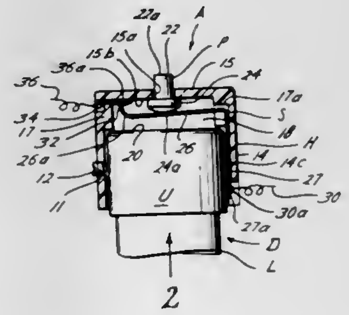
DRIVER ALERTNESS ALARM SYSTEM

Anna D. Johnson, 1249 Blalock, suite 201, Houston, Tex.

Filed Oct. 13, 1971, Ser. No. 188,945

Int. Cl. G08b *21/00*

U.S. Cl. 340—279 **14 Claims**



A method and apparatus for motor vehicle dimmer alert device utilizing a select switch to initiate operation of the alert and utilizing foot pressure of the driver to prevent the alert from becoming operational but wherein lessening of foot pressure causes operation of the alert to thereby gain the attention of the driver.

3,718,922

PRODUCT MONITORING APPARATUS, SYSTEM AND METHOD

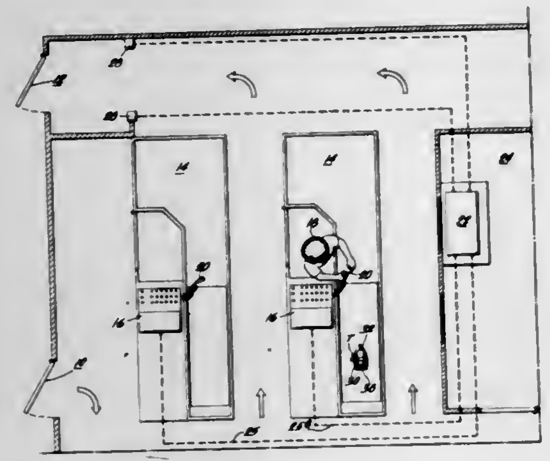
Allan L. Williams, 2620 Cumberland Ave., Mount Penn, Pa. 19606, and Lyle D. Heck, Reading, Pa.; said Heck assignor to said Williams

Filed Feb. 3, 1971, Ser. No. 112,355

Int. Cl. G08b *13/14*

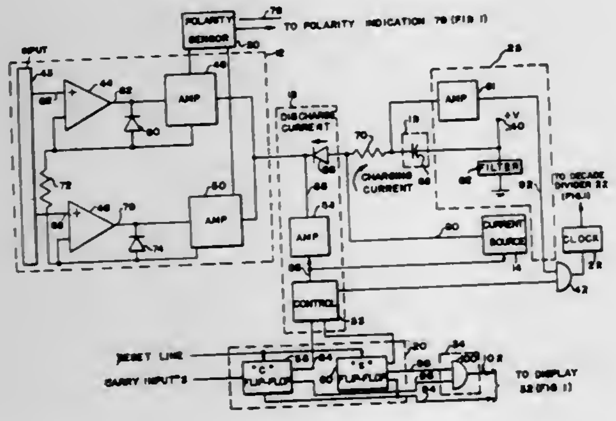
U.S. Cl. 340—280 **18 Claims**

Thefts of products from a store are prevented and records of sales of the products automatically obtained by means of an electrically releasable locking device which is secured to each product, which is readily detected by detection apparatus near the exits from the store, which can be released from the product by application thereto of an electrically-powered key, and which may contain data relating to the product which are read out automatically in the form of electrical signals to an appropriate electrical data-processing unit when the key is applied to unlock the locking device. Preferably the unlocking is produced by heating a bimetallic element within the unlocking device with electrical current applied by way of the key. The data relating to the product are stored in the locking device in coded form along a keyway therein, and as the key is moved along the keyway toward its unlocking position it causes read-out of the data to the data processing unit. The substrate bearing the data has an external portion protruding outside the locking device, on which portion there may be provided visually-observable information about the product.



3,718,923
BIPOLAR FLOATING INPUT, PARTICULARLY FOR DIGITAL PANEL METERS

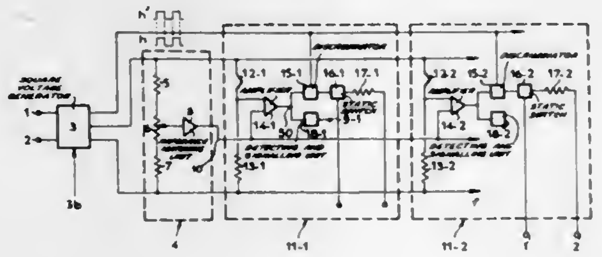
Joshua Horwitz and Bernard M. Gordon, Magnolia, and Brant W. Becker, Sudbury, Mass., assignors to Gordon Engineering Company, Wakefield, Mass.
Original application Aug. 25, 1969, Ser. No. 852,808. Divided and this application Mar. 17, 1971, Ser. No. 125,078
Int. Cl. G01r *19/14*
U.S. Cl. 340—347 NT **5 Claims**



In a bipolar floating input device, particularly for dual-slope integration digital panel meters, an analog voltage is applied to a bipolar floating input circuit and a digital form of the analog voltage is presented by a display.

3,718,924
ELECTRICAL DEVICE FOR MEASURING AND CONTROLLING THE TEMPERATURE AT A LARGE NUMBER OF POINTS

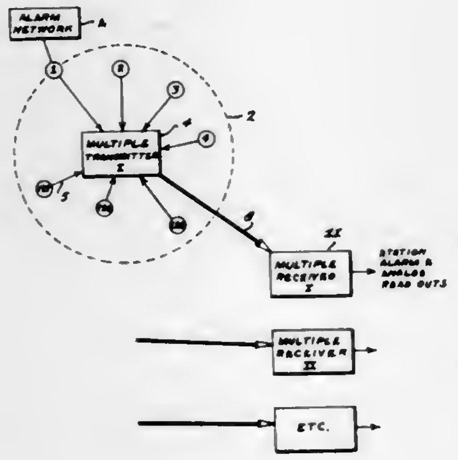
Georges Trubert, Grenoble, and Jean Louis Droulin, Courbevole, France, assignors to La Telemecanique Electrique, Nanterre, Hauts-de-Seine, France
Filed Oct. 27, 1970, Ser. No. 84,313
Claims priority, application France, Oct. 27, 1969, 6936715
Int. Cl. G08b *21/00*
U.S. Cl. 340—417 **10 Claims**



For the control of temperature on multiple processes, in particular the control of the temperature of threading heads of a textile machine, a device is provided having a multiple Wheatstone bridge in which each control arm comprises a static switching means, the bridge having common set means and being supplied by means of an unidirectional chopped current, means being provided for controlling the conduction angle of the static switching means and, therefore, the rate of heating through a control of the phase difference between the chopped current and the A.C. voltage supply. Alarm means are further provided for signalling the temperature defects, and logic circuits for automatically producing passage from an accelerated to a normal heating, once all the control points have reached a predetermined lower threshold temperature.

3,718,925
DIGITAL SURVEILLANCE SYSTEM

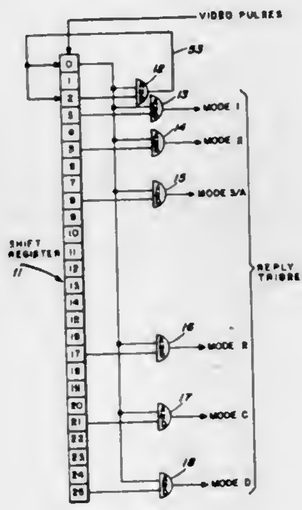
Edward S. Donn, 1222 Chambers Drive, and Ronald L. Knauber, 1331 N. 31st St., both of Colorado Springs, Colo. 80904
Filed Dec. 28, 1970, Ser. No. 101,505
Int. Cl. G08b *25/00*
U.S. Cl. 340—413 **13 Claims**



The present invention relates to electronic surveillance systems of the type having a central monitor station connected by a communications link to a plurality of remotely disposed transmitters, each of which receives digital information inputs through a short communications link from a plurality of interrogated points of interest. The system of the present invention includes means for temporarily terminating the scan of remote stations at such time as an alarm signal is detected from any point of interest and to utilize the communications links to convey analog information from the point of interest in alarm to the central monitoring station.

3,718,926
INSTANTANEOUS SIDELOBE INTERROGATION DECODE SUPPRESSOR

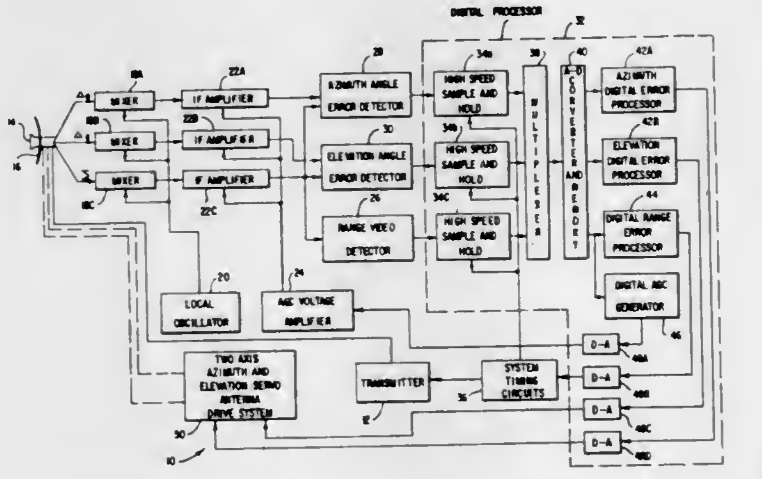
Carlyle V. Parker, Alexandria, Va., and Walton B. Bishop, Oxon Hill, Md., assignors to the United States of America as represented by the Secretary of the Navy
Filed July 31, 1970, Ser. No. 59,972
Int. Cl. G01s *9/56*
U.S. Cl. 343—6.8 LC **7 Claims**



A sidelobe suppression circuit for IFF transponders comprising a shift register or delay line in combination with AND gates for eliminating the current "dead-time" now experienced in IFF transponders receiving a sidelobe suppression signal.

3,718,927
AUTOMATIC DIGITAL ERROR DETECTOR FOR RADAR RANGE TRACKING

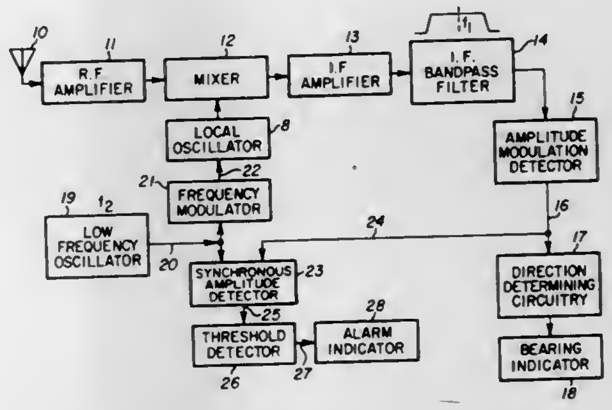
Dean D. Howard, and David C. Cross, both of Oxon Hill, Md., assignors to The United States of America as represented by the Secretary of the Navy
Filed April 23, 1971, Ser. No. 136,946
Int. Cl. G01s *9/22*
U.S. Cl. 343—7.4 **4 Claims**


DIGITAL PROCESSOR
MIXER
MIXER
MIXER
IF AMPLIFIER
IF AMPLIFIER
IF AMPLIFIER
AZIMUTH ANGLE ERROR DETECTOR
ELEVATION ANGLE ERROR DETECTOR
RANGE VIDEO DETECTOR
HIGH SPEED SAMPLE AND HOLD
HIGH SPEED SAMPLE AND HOLD
HIGH SPEED SAMPLE AND HOLD
MULTIPLEXER
A-D CONVERTER AND MEMORY
AZIMUTH DIGITAL ERROR PROCESSOR
ELEVATION DIGITAL ERROR PROCESSOR
DIGITAL RANGE ERROR PROCESSOR
DIGITAL AGC GENERATOR
LOCAL OSCILLATOR
AGC VOLTAGE AMPLIFIER
TWO AXIS AZIMUTH AND ELEVATION SERVO ANTENNA DRIVE SYSTEM
TRANSMITTER
SYSTEM TIMING CIRCUITS
D-A
D-A
D-A
D-A

This invention pertains to a new method of obtaining range, AGC and angle tracking error voltages employing digital methods of processing the receiver output of high range resolution monopulse tracking radars to generate these signals.

3,718,928
FALSE VOR BEARING INDICATION MONITOR

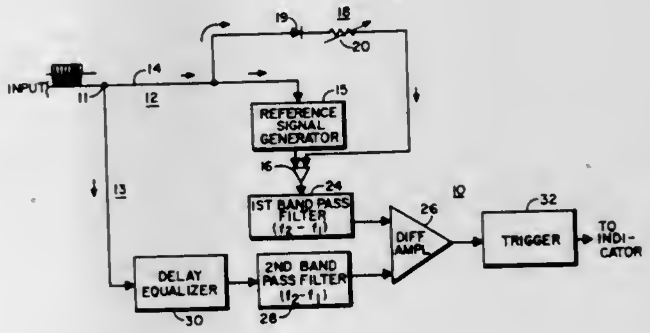
Harris A. Stover, Cedar Rapids, Iowa, assignor to Collins Radio Company, Cedar Rapids, Iowa
Filed Aug. 26, 1971, Ser. No. 175,262
Int Cl. G01s *1/44*
U.S. Cl. 343–106 R **7-Claims**



A monitoring means for detecting mistuning of a VOR receiver which, due to FM to AM conversion in the receiver IF bandpass filter, causes false bearing determination. Locally induced frequency modulation of the receiver intermediate frequency produces locally induced amplitude modulation which does not appear on the output of the receiver AM detector if the received signal is within the useful portion of the IF filter passband. Any such locally induced amplitude modulation at the AM detector output is indicative of receiver mistuning and detection of same may operate threshold sensitive alarm means.

3,718,929
PULSE CLASSIFICATION SYSTEM

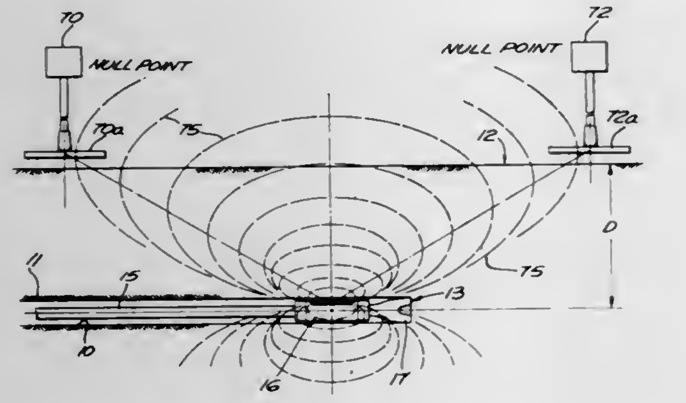
James H. Van Horn, Pittsford, N.Y., assignor to General Dynamics Corporation
Filed June 8, 1966, Ser. No. 556,093
Int. Cl. G01s *7/28*
U.S. Cl. 343—17.2 R **7 Claims**


INPUT
REFERENCE SIGNAL GENERATOR
1ST BAND PASS FILTER (f2 - f1)
2ND BAND PASS FILTER (f2-f1)
DELAY EQUALIZER
DIFF AMPL
TRIGGER
TO INDICATOR

A pulse classification system is described which in one embodiment includes a signal generator which is adapted to produce a reference signal having a predetermined frequency spectrum, with said reference signal being produced in timed relation with a received pulse signal, and means for comparing corresponding predetermined band-width portions of the pulse and reference signals to determine whether or not their energy levels correspond.

3,718,930
BORING BIT LOCATOR

Lester E. McCullough, Glendale, and Duane A. Ladine, Northridge, Calif., assignors to The Goldak Company, Inc., Glendale, Calif.
Filed July 6, 1970, Ser. No. 52,474
Int. Cl. G01s *5/02*
U.S. Cl. 343—112 R **3 Claims**



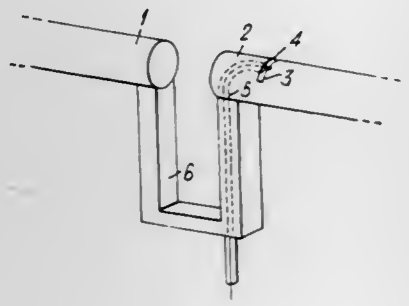
A bore pipe is rotatably driven to drive a horizontal bore below the earth's surface, and radio energy transmitted from a locator device is monitored on the ground surface by means of a radio receiver tuned to the same frequency. A boring bit locator is rigidly attached between the bore pipe and a boring bit, and carries a small battery powered transmitter. A single operator working on the surface of the ground with a single radio receiver is able to monitor the progress and location of the boring bit.

The boring bit locator has a water passageway which permits a stream of water delivered through the bore pipe to flow to the boring bit for the purpose of washing cuttings back through the hole.

The method of determining the position of the locator device takes advantage of the radiation pattern of the transmitter, which is so arranged as to be susceptible to being precisely measured.

3,718,931
AERIAL FIELD MONITORING

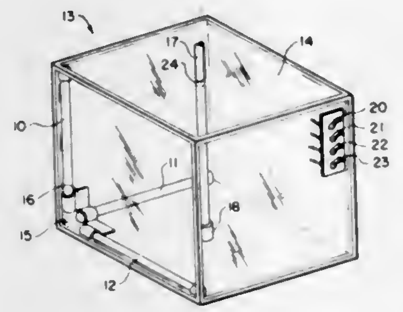
Robin Ashley Collins, Welwyn Garden City, England, assignor to International Standard Electric Corporation, New York, N.Y.
Filed July 21, 1971, Ser. No. 164,759
Int. Cl. G01r *1/24*
U.S. Cl. 343—703 **3 Claims**



The radiated field of a dipole at any point is directly related in amplitude and phase to the current in the dipole arms. This can be sampled by a slot cut in the dipole arm. The voltage across this slot is fed to a transmission line which may be matched to subsequent processing units by a suitable positioning of a resistor. This enables both the R.F. current from the power fed to the dipole, and the current produced by interaction with other radiating elements to be measured.

3,718,932
COMBINED MULTI-POLARIZATION LOOPSTICK AND WHIP ANTENNA

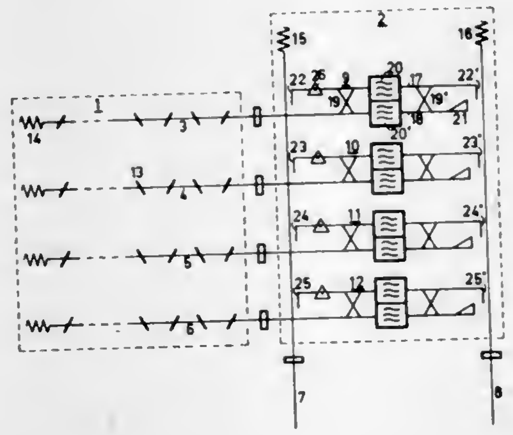
Kurt Ikrath, Elberon, and Morris Acker, Wanamassa, N.J., assignors to the United States of America as represented by the Secretary of the Army
Filed June 1, 1971, Ser. No. 148,755
Int. Cl. H01q *7/08*
U.S. Cl. 343—728 **5 Claims**



A receiving antenna assembly for mitigating signal fading and cancellation caused by the degrading effects of multipaths and scatter in jungle, mountain or urban environments which antenna has three mutually-perpendicular, multi-polarization ferrite loopsticks for sensing H field signal energy and a whip antenna for sensing E field signal energy, and selection means for choosing among the signal energies sensed by the ferrite loopsticks and the whip antenna.

3,718,933
MICROWAVE ANTENNA

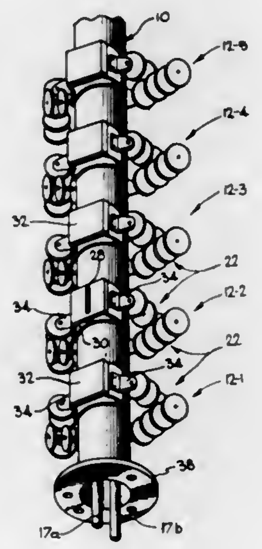
Hendrik Teunis Huele, Hengelo, Netherlands, ~~assignor~~ to N.V. Hollandse Signaalapparaten, Hengelo, Netherlands
Filed Aug. 11, 1971, Ser. No. 170,711
Int. Cl. H01q *13/10*
U.S. Cl. 343—768 **3 Claims**



A microwave antenna of the array antenna type is provided with a transmission line network comprising two supply lines for producing a corresponding number of beams. The antenna is formed by various parallel linear arrays. A separate frequency band is allocated to each of the supply lines. The supply lines are connected to all linear arrays by means of frequency-selective couplers (e.g. diplexers), each so designed that they feed the combined signals of various frequency bands to be transmitted to the associated linear arrays, while they feed the received signals separated according to frequency band to the various supply lines.

3,718,934
BROADCAST ANTENNA ASSEMBLY

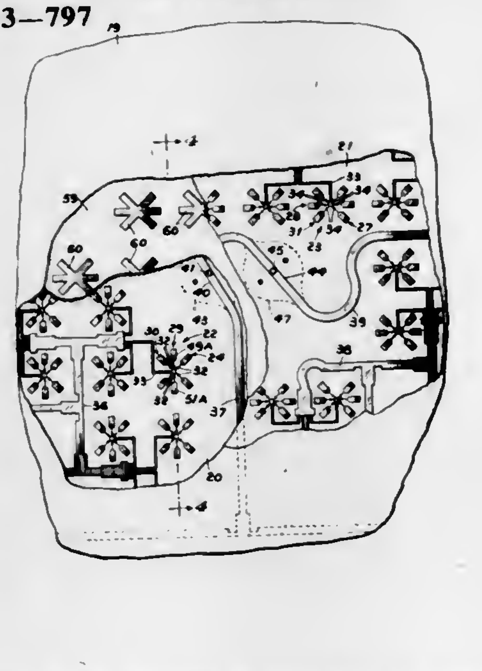
Richard D. Bogner, Roslyn, N.Y., assignor to Ampex Corporation
Continuation-in-part of Ser. No. 661,625, Aug. 18, 1967, Pat. No. 3,587,108. This application Feb. 24, 1971, Ser. No. 118,436
Int. Cl. H01q *13/10, 19/10, 15/14*
U.S. Cl. 343—770 **13 Claims**



A pair of back-to-back and interlaced antenna arrays, including end-fire parasitic directors, are supported by a common structure and perform almost independently with very little coupling or interaction despite their proximity. Each antenna array may provide an omnidirectional radiation pattern.

3,718,935
DUAL CIRCULARLY POLARIZED PHASED ARRAY ANTENNA

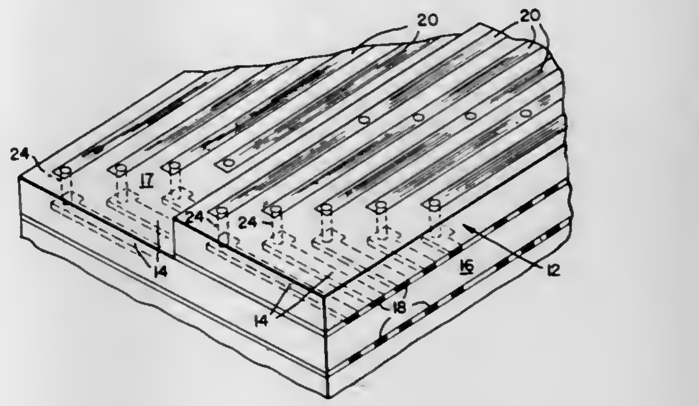
Joseph C. Ranghelli, Belleville, and Emmanuel Perrotti, Ramsey, both of N.J., assignors to International Telephone and Telegraph Corporation, Nutley, N.J.
Filed Feb. 3, 1971, Ser. No. 112,192
Int. Cl. H01q *21/26*
U.S. Cl. 343—797 **15 Claims**



A phased array antenna is provided by stacking two PC boards in a superimposed relationship above the base of a housing for the antenna. Each of these PC boards contain therein a symmetrical arrangement of photo etched or printed mat-strip power division networks and a plurality of radial arrangements each including a plurality of photo etched or printed mat-strip dipole elements having a given angular relationship therebetween. The dipole elements of the radial arrangements on one PC board are orthogonally related to the dipole elements of the radial arrangements on the other PC board. RF switching means control the orthogonally related dipole elements of each of the PC boards that are connected to the power division network so that the phase of the dual circularly polarized radiation pattern can be controlled in quantized steps determined by said given angular relation. The ground plane for the lower PC board is the housing and the ground plane for the radial arrangements of dipole elements on the upper PC board is provided by parallel, space conductive members in a superimposed, parallel relationship with each of the radial arrangements. Each of the power division networks is fed by a double ended balun. The two baluns are in turn fed from a quadrature hybrid.

3,718,936
ELECTROSTATIC MATRIX HEAD CONSTRUCTION

Philip J. Rice, Jr., Atherton, Calif., assignor to American Express Investment Management Company, San Francisco, Calif.
Filed June 16, 1971, Ser. No. 109,072
Int. Cl. G01d *15/08*
U.S. Cl. 346—74 ES **9 Claims**



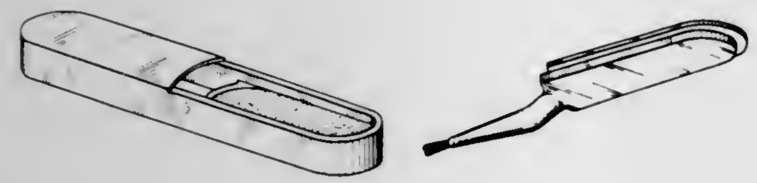
A matrix head for use in electrostatic printing is formed from a plurality of stacked printed circuit boards. Each circuit board is printed on both sides with conductive strips, the strips on one side being perpendicularly aligned to the strips on the other side. The conductive strips on one side terminate at a common edge to form a plurality of printing elements, i.e., discharge points. Each strip is electrically connected to a conductive strip on the other side of the board by means of a front-to-back conductively plated hole. The stacked boards provide along one side an array of character printing areas, the discharge points of each area are controlled by electrical leads to the conductive strips on the circuit board.

DESIGNS

FEBRUARY 27, 1973

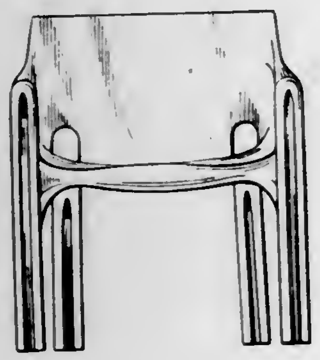
226,362
COSMETIC CONTAINER
David Seidler, Forest Hills, N.Y.
(527 Lexington Ave., New York, N.Y. 10017)
Filed Apr. 15, 1971, Ser. No. 134,541
Term of patent 14 years
Int. Cl. D4—*02*

U.S. Cl. D4—20



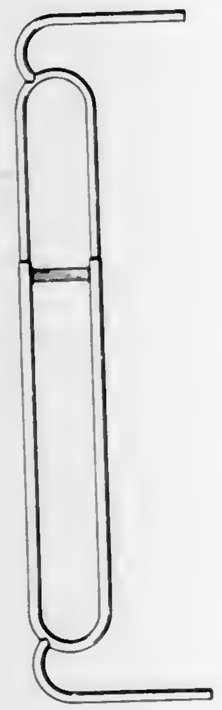
226,363
ARMCHAIR
Lodovico Magistretti, Via Conservatorio 20, Milan, Italy
Filed Mar. 10, 1971, Ser. No. 123,125
Claims priority, application Italy Nov. 21, 1970
Term of patent 14 years
Int. Cl. D6—*02*

U.S. Cl. D6—65



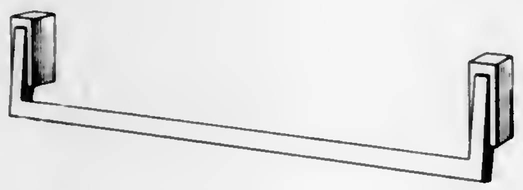
226,364
BEDSIDE RAIL
Morton I. Thomas, 125 South St., Monroe, N.Y. 10027
Filed Aug. 5, 1971, Ser. No. 169,594
Term of patent 14 years
Int. Cl. D6—*06*

U.S. Cl. D6—198



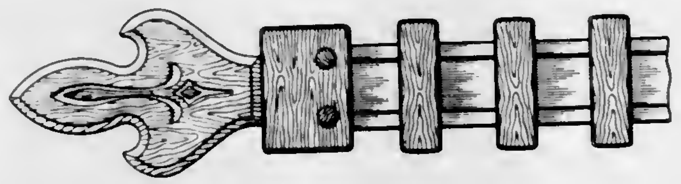
226,365
PANIC DOOR HANDLE
William J. Horgan, Jr., Pittsburgh, Pa., assignor to Blumcraft of Pittsburgh, Pittsburgh, Pa.
Filed Sept. 30, 1970, Ser. No. 25,284
Term of patent 14 years
Int. Cl. D8—*06*

U.S. Cl. D8—149



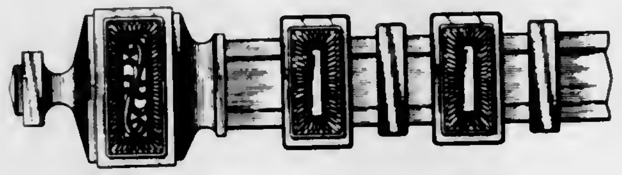
226,366
TRAVERSE ROD
Robert Fisher, Whitestone, N.Y., and Willfred Goldschmidt, Cos Cob, Conn., assignors to Kenney Manufacturing Company, Warwick, R.I.
Filed July 2, 1971, Ser. No. 159,578
Term of patent 14 years
Int. Cl. D8—*09*

U.S. Cl. D8—210



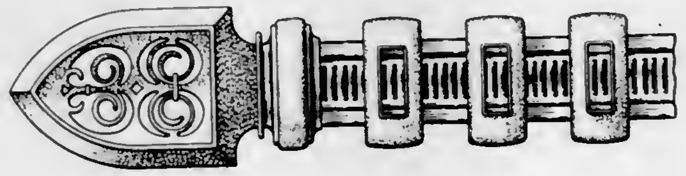
226,367
TRAVERSE ROD
Ronald Emmerling, New City, and Robert Fisher, Whitestone, N.Y., assignors to Kenney Manufacturing Company, Warwick, R.I.
Filed July 2, 1971, Ser. No. 159,577
Term of patent 14 years
Int. Cl. D8—*09*

U.S. Cl. D8—210



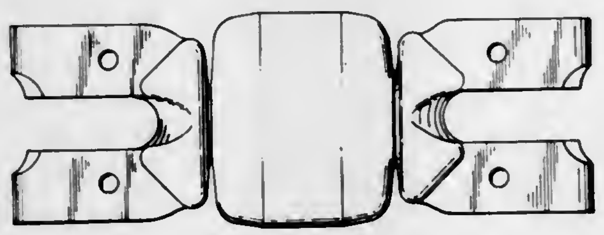
226,368
TRAVERSE ROD
Ronald Emmerling, New City, and Robert Fisher, Whitestone, N.Y., assignors to Kenney Manufacturing Company, Warwick, R.I.
Filed July 2, 1971, Ser. No. 159,579
Term of patent 14 years
Int. Cl. D8—*09*

U.S. Cl. D8—210



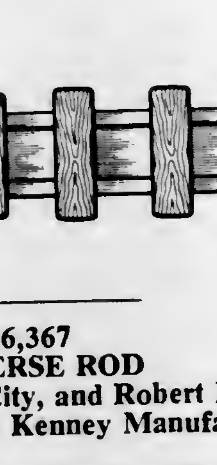
226,369
SWIVEL CONNECTOR FOR JOINING ENDS OF CHAINS OR THE LIKE
Walter Ronald Draper and Thomas Alfred Poulton, Stourport-on-Severn, England, assignors to Parson Chain Company Limited, Stourport-on-Severn, England
Filed Aug. 5, 1971, Ser. No. 169,589
Term of patent 14 years
Int. Cl. D8—*08*

U.S. Cl. D8—252



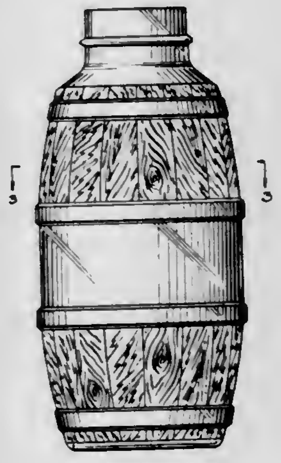
226,370
BOTTLE OR SIMILAR ARTICLE
Michael D. Cromb, Shrewsbury, N.J., assignor to Midland Glass Company, Inc., Cliffwood, N.J.
Filed May 10, 1971, Ser. No. 142,085
Term of patent 14 years
Int. Cl. D9—*01*

U.S. Cl. D9—1



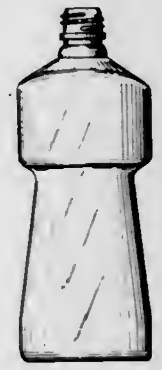
226,371
BOTTLE
Howard Cooper, 175 E. Delaware, Suite 7707, Chicago, Ill. 60611
Filed Nov. 18, 1971, Ser. No. 200,280
Term of patent 14 years
Int. Cl. D9—*01*

U.S. Cl. D9—28



226,372
BOTTLE
Jorgen Lauridsen, Roskilde, Denmark, assignor to Colgate-Palmolive Company, New York, N.Y.
Filed June 10, 1971, Ser. No. 152,019
Claims priority, application Denmark Jan. 13, 1971
Term of patent 14 years
Int. Cl. D9—*01*

U.S. Cl. D9—89

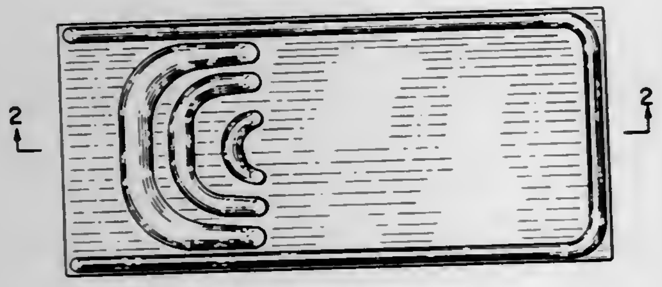


226,373

COMBINED DISPLAY AND PACKAGING TRAY FOR MEAT OR THE LIKE

Paul Joonase, Taylors, and Richard R. Perdue, Greer, S.C., assignors to W. R. Grace & Co., Duncan, S.C.
Filed May 22, 1972, Ser. No. 255,934
Term of patent 14 years
Int. Cl. D9—*03*

U.S. Cl. D9—242

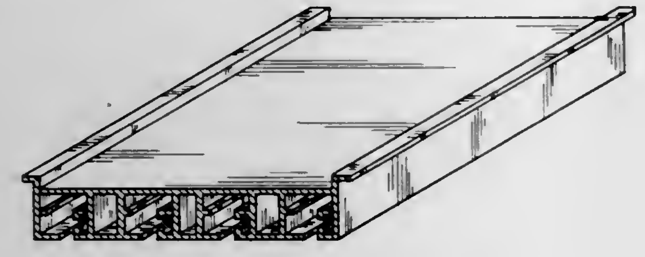


226,374

EXTRUDED PLASTIC HEADER TRACK FOR A WINDOW UNIT

Dominique Dallaire, 635a Commerciale St., and Raymond M. Dallaire, 587 de la Falaise St., both of St. David, Quebec, Canada
Filed Jan. 13, 1971, Ser. No. 106,298
Term of patent 14 years
Int. Cl. D25—*01*

U.S. Cl. D13—6

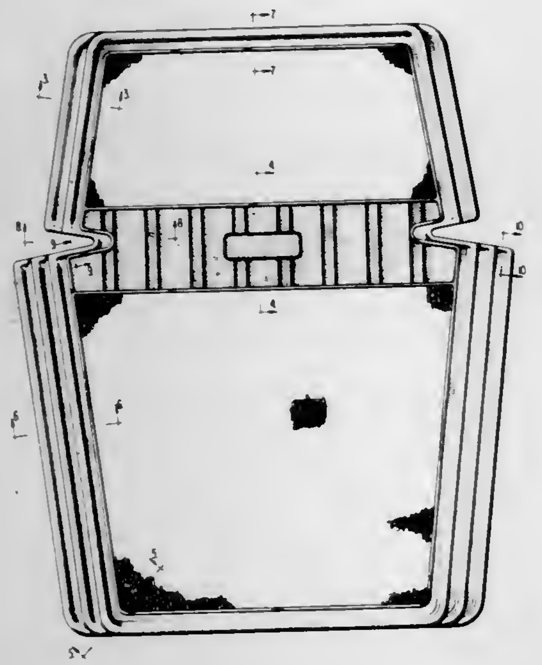


226,375

AUTOMOBILE FLOOR MAT

Charles A. Wells and Raymond A. Krusinski, Coshocton, Ohio, assignors to Pretty Products, Inc., Coshocton, Ohio
Filed July 2, 1971, Ser. No. 159,576
Term of patent 14 years
Int. Cl. D6—*11*

U.S. Cl. D14—5

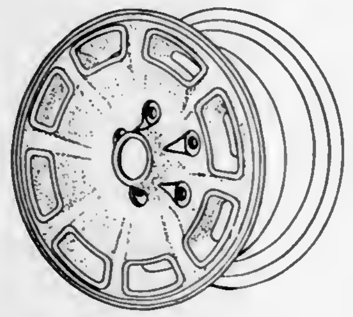


226,376

WHEEL

John A. Main, East Lansing, and Millard Fillmore Harty, Jr., Bloomfield Hills, Mich., assignors to Motor Wheel Corporation, Lansing, Mich.
Original design application Apr. 23, 1970, Ser. No. 22,592, now Patent No. 221,934. Divided and this application June 21, 1971, Ser. No. 155,398
Term of patent 14 years
Int. Cl. D12—*16*

U.S. Cl. D14—30 R

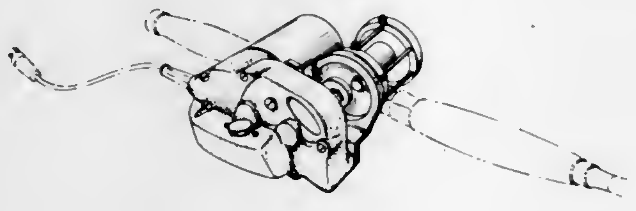


226,377

ELECTRIC FISHING REEL

Peck T. Huffman, Greensboro, N.C., assignor to Electric Fishing Reel Systems, Inc., Greensboro, N.C.
Filed Sept. 20, 1971, Ser. No. 182,305
Term of patent 14 years
Int. Cl. D22—*05*

U.S. Cl. D22—25

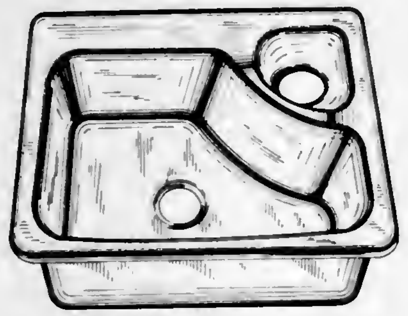


226,378

COMBINED SINK AND DISPOSAL WELL

Donald W. Doman, Janesville, Wis., assignor to Kohler Co., Kohler, Wis.
Filed Dec. 16, 1971, Ser. No. 209,016
Term of patent 14 years
Int. Cl. D23—*02*

U.S. Cl. D23—62

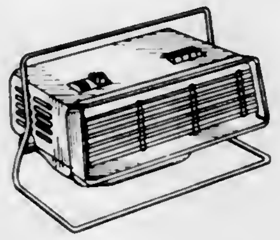


226,379

FAN HEATER

Petrus Joannes Stut, Eelde, Netherlands, assignor to U.S. Philips Corporation
Filed Sept. 23, 1970, Ser. No. 25,153
Claims priority, application Switzerland Mar. 23, 1970
Term of patent 14 years
Int. Cl. D23—*03*

U.S. Cl. D23—73

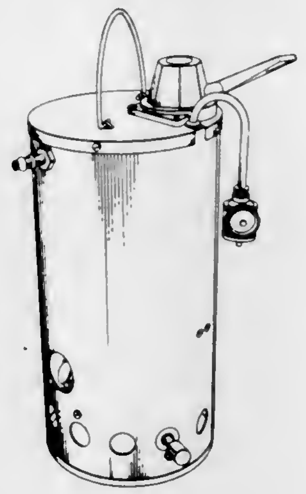


226,380

PORTABLE WATER HEATER

James E. Watts, Bountiful, Utah, assignor to Litton Systems, Inc., Beverly Hills, Calif.
Filed Aug. 2, 1971, Ser. No. 168,522
Term of patent 14 years
Int. Cl. D23—*03*

U.S. Cl. D23—88

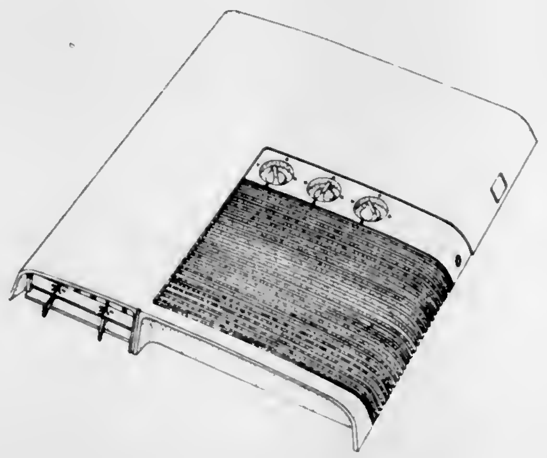


226,381

AIR DISTRIBUTION UNIT FOR ROOF-MOUNTED VEHICLE AIR CONDITIONER

Millard Fillmore Harty, Jr., Bloomfield Hills, Mich., assignor to Motor Wheel Corporation, Lansing, Mich.
Filed Aug. 25, 1971, Ser. No. 175,015
Term of patent 14 years
Int. Cl. D23—*04*

U.S. Cl. D23—142

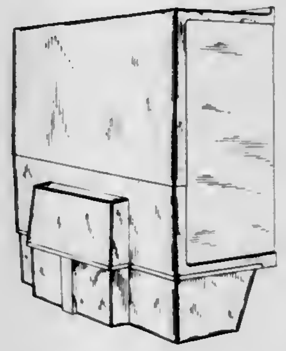


226,382

CASING FOR A HUMIDIFIER

Dana W. Mox, Glenview, Ill., assignor to Research Products Corporation, Madison, Wis.
Filed Aug. 12, 1971, Ser. No. 171,419
Term of patent 14 years
Int. Cl. D23—*99*

U.S. Cl. D23—147

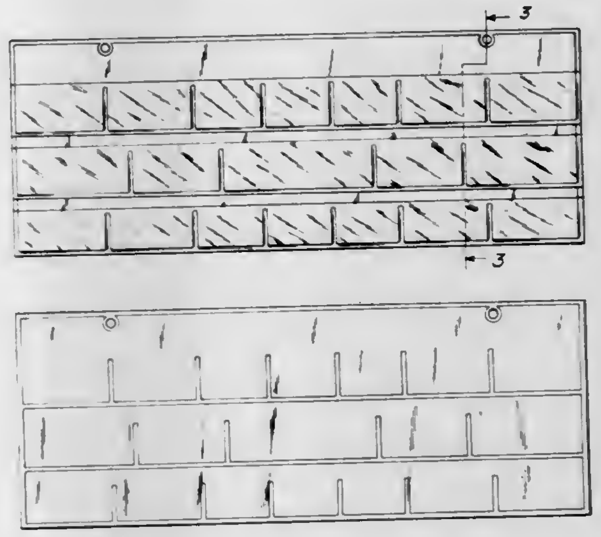


226,383

DENTAL X-RAY COLLATOR/INDEX

Anne E. Loughran, Centralia, Ill., assignor to Thann Products Company, St. Louis, Mo.
Filed Jan. 28, 1972, Ser. No. 221,853
Term of patent 14 years
Int. Cl. D24—*02*

U.S. Cl. D24—1 R

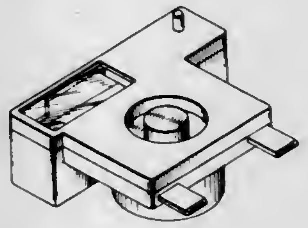


226,384

COIL AND SWITCH COMBINATION

Dean W. Johnson, Mishawaka, Ind., assignor to Burcliff Industries, Mishawaka, Ind.
Filed Dec. 10, 1971, Ser. No. 206,977
Term of patent 14 years
Int. Cl. D13—*03*

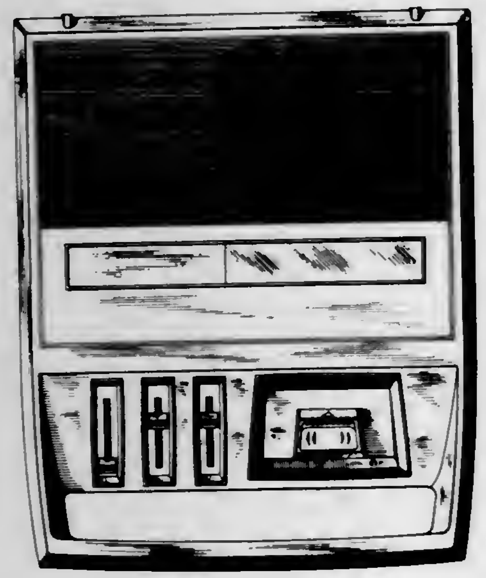
U.S. Cl. D26—13 R

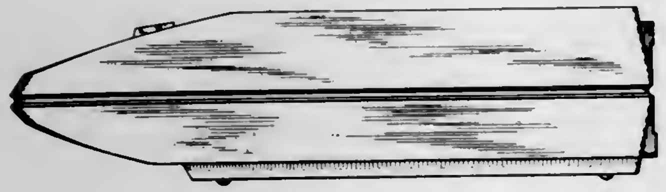


226,385

CASSETTE TAPE RECORDER

John S. Maliskas, North Syracuse, N.Y., assignor to General Electric Company
Original design application June 5, 1970, Ser. No. 23,335, now Patent No. 222,360. Divided and this application July 28, 1971, Ser. No. 176,422
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D26—14 B

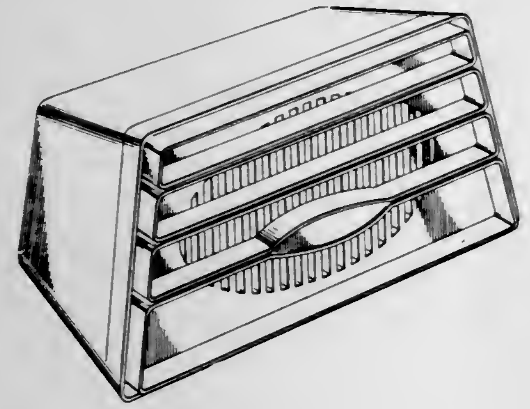


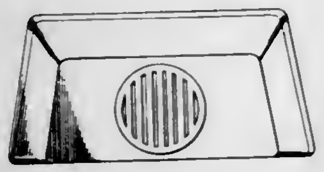


226,386

LOUDSPEAKER

William B. Sandler, 70 Clements Road, Newton, Mass. 02158
Filed July 10, 1972, Ser. No. 270,154
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D26—14 G

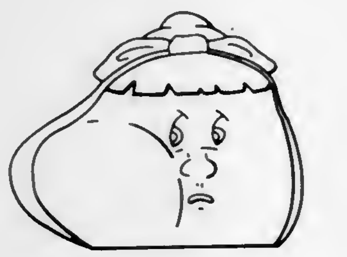




226,387

FIGURINE

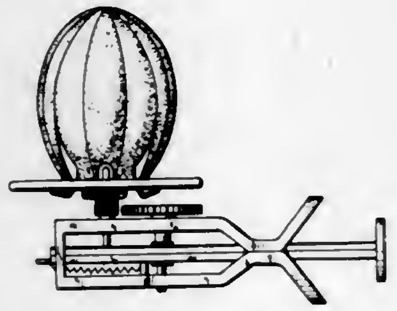
Mary B. Johns, 413 South St., Cambridge, Ohio 43725
Continuation of abandoned design application Ser. No. 10,058, Feb. 9, 1970. This application Feb. 25, 1971, Ser. No. 119,072
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D29—23 E



226,388

TOY SPINNER WITH OPENABLE PETALS

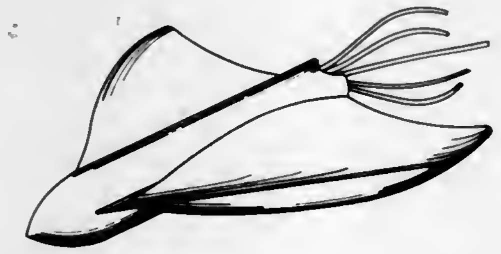
Perry Feuer, Roslyn, N.Y., assignor to Creative Creations, Inc., New York, N.Y.
Filed Feb. 25, 1971, Ser. No. 119,076
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 W



226,389

INFLATABLE MISSILE KITE

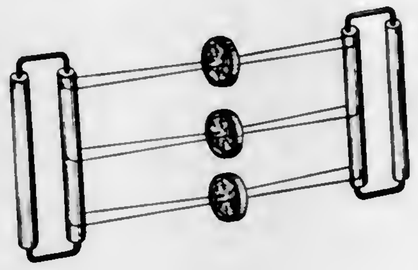
Calogero Madonia, 6250 E. 36th St., Tulsa, Okla. 74135
Filed Oct. 28, 1971, Ser. No. 193,615
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 AF



226,390

COMBINED EXERCISER AND WHIRLING TOY

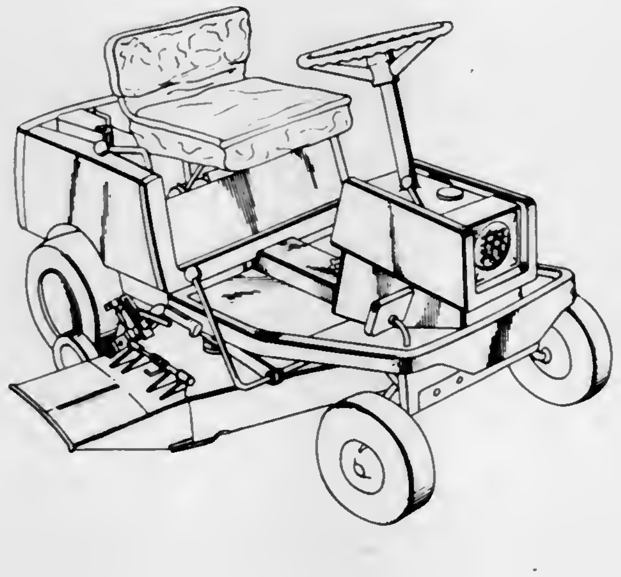
William Margolin and Mildred Margolin, both of 829 Coffman Drive, Montebello, Calif. 90640
Filed Nov. 29, 1971, Ser. No. 203,125
Term of patent 14 years
Int. Cl. D21—*01, 02*
U.S. Cl. D34—15 BB



226,391

RIDING MOWER

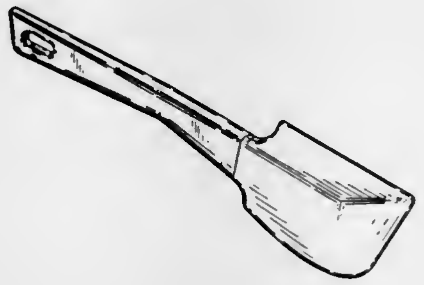
Viktor Schreckengost, Cleveland Heights, Ohio, assignor to The Murray Ohio Manufacturing Co., Nashville, Tenn.
Filed June 19, 1972, Ser. No. 264,009
Term of patent 14 years
Int. Cl. D15—*03*
U.S. Cl. D40—1 D



226,392

SCRAPER

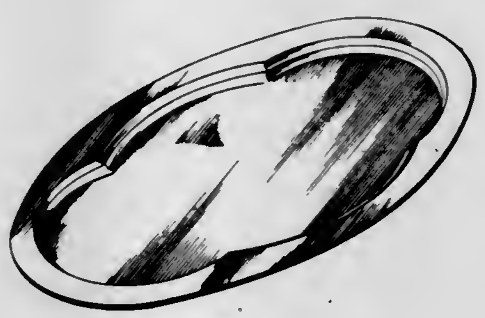
Per Lindbo, Oslo, Norway, assignor to A/S W. Jordan Borste & Penselfabrik, Oslo, Norway
Filed June 24, 1971, Ser. No. 156,602
Term of patent 14 years
Int. Cl. D7—*06*
U.S. Cl. D44—1 R



226,393

SERVING TRAY

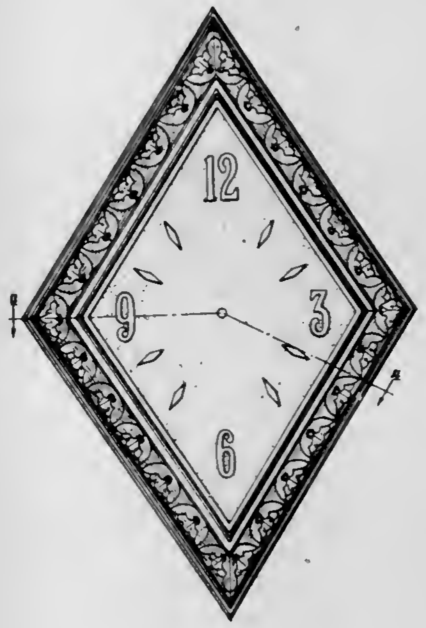
Benjamin Greenstein, Forest Hills, N.Y., assignor to Daher Company, Inc., Long Island City, N.Y.
Filed Mar. 12, 1971, Ser. No. 123,926
Term of patent 14 years
Int. Cl. D7—*99*
U.S. Cl. D44—10 E



226,394

CLOCK CASING

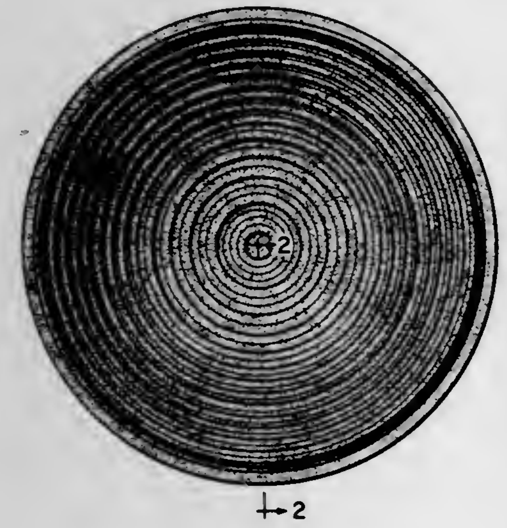
Richard K. Thomas, Elk Grove Village, Ill., assignor to Sunbeam Corporation, Chicago, Ill.
Filed Sept. 27, 1971, Ser. No. 184,332
Term of patent 14 years
Int. Cl. D10—*01*
U.S. Cl. D42—7 R



226,395
FRESNEL LENS

William H. Dorman, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.
Filed May 24, 1971, Ser. No. 146,582
Term of patent 14 years
Int. Cl. D26—*05, 06*

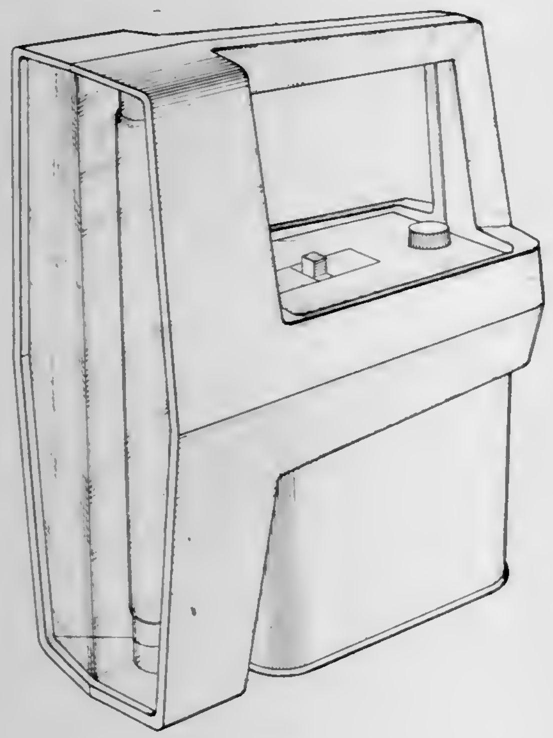
U.S. Cl. D48—16 A



226,396
PORTABLE FLUORESCENT LIGHT

Donald Wayne Doman, Janesville, Wis., assignor to Gould Inc., Mendota Heights, Minn.
Filed June 24, 1971, Ser. No. 156,587
Term of patent 14 years
Int. Cl. D26—*02*

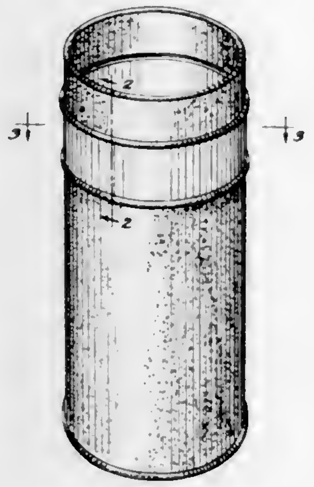
U.S. Cl. D48—24 R



226,397
SAND URN OR SIMILAR ARTICLE

Leon H. Franklin, 217–21 N. Jefferson St., Chicago, Ill. 60606
Filed June 9, 1970, Ser. No. 23,407
Term of patent 7 years
Int. Cl. D7—*99*

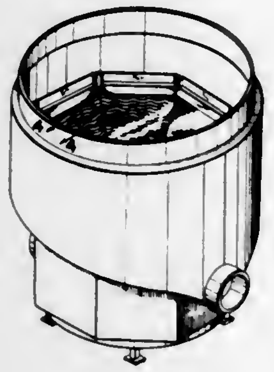
U.S. Cl. D49—35



226,398
HOPPER TYPE SCREEN UNIT FOR CLASSIFYING AND SEPARATING LIQUIDS AND SOLIDS

Marvin E. Ginaven, Springfield, Ohio, assignor to The Bauer Bros. Co., Springfield, Ohio
Filed Sept. 15, 1971, Ser. No. 180,935
Term of patent 14 years
Int. Cl. D15—*99*

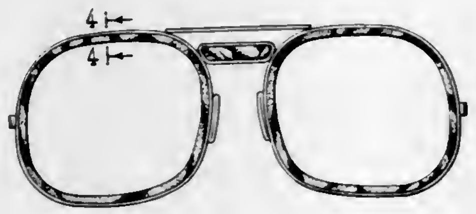
U.S. Cl. D55—1 R



226,399
SPECTACLE FRAME OR SIMILAR ARTICLE

Jack G. Mark, Bayside, N.Y., assignor to Whitney Optical Co., Inc., Woodside, N.Y.
Filed Nov. 19, 1971, Ser. No. 190,472
Term of patent 14 years
Int. Cl. D16—*06*

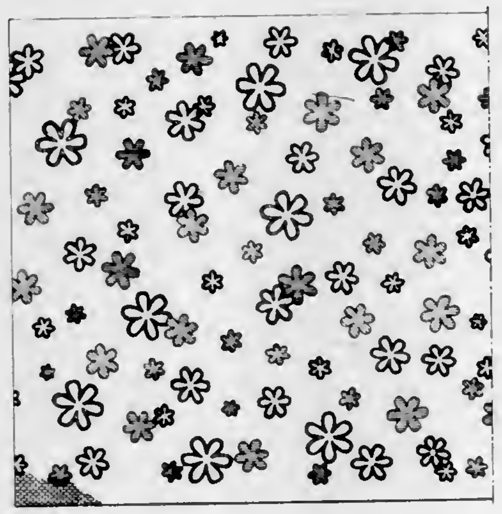
U.S. Cl. D57—1 F



226,400
PAPER TOWELING

Nancy L. Joski, Green Bay, Wis., assignor to Fort Howard Paper Company
Continuation-in-part of design application Ser. No. 25,890, Nov. 9, 1970. This application July 15, 1971, Ser. No. 165,861
Term of patent 14 years
Int. Cl. D6—*13*

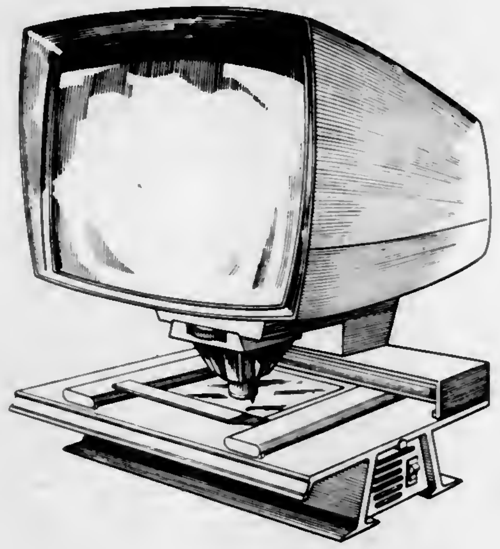
U.S. Cl. D59—2 A



226,401
MICROFICHE VIEWER

Donald Stanlev, Poway, and Maurice H. Artaud, Spring Valley, Calif., assignors to Stromberg DatagraphiX, Inc., San Diego, Calif.
Filed Mar. 10, 1971, Ser. No. 123,115
Term of patent 14 years
Int. Cl. D16—*03*

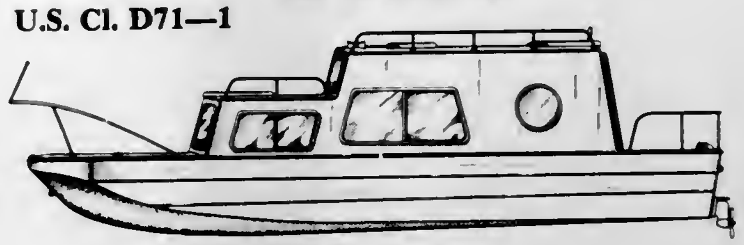
U.S. Cl. D61—1 N



226,402
BOAT

Kenneth W. Krutz, 498 Uppermill Heights, Salina, Kans. 67401
Filed Mar. 15, 1971, Ser. No. 124,624
Term of patent 14 years
Int. Cl. D12—*06*

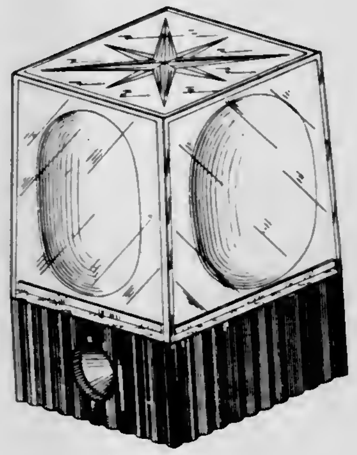
U.S. Cl. D71—1



226,403
PENCIL SHARPENER

Ronald B. Rosson, Roslyn Estates, N.Y. (℅ ADI, Inc., 1535 Decatur St., Ridgewood, Brooklyn, N.Y. 11221)
Filed Nov. 5, 1971, Ser. No. 196,262
Term of patent 7 years
Int. Cl. D19—*99*

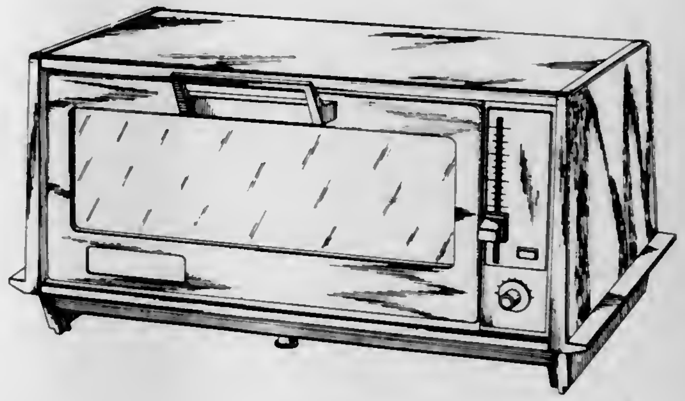
U.S. Cl. D74—21 B



226,404
ELECTRIC OVEN TOASTER OR SIMILAR ARTICLE

Max C. Hauenstein, Monroe, Conn., assignor to General Electric Company
Filed Nov. 18, 1971, Ser. No. 200,277
Term of patent 14 years
Int. Cl. D7—*02*

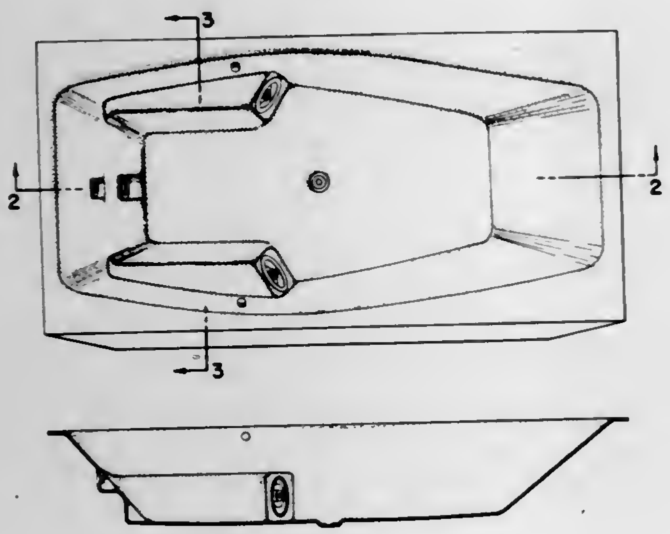
U.S. Cl. D81—10 N



226,405
HYDROMASSAGE BATHTUB

Roy A. Jacuzzi, Moraga, and Peter L. Kosta, Lafayette, Calif., assignors to Jacuzzi Research, Inc.
Filed Jan. 26, 1972, Ser. No. 221,129
Term of patent 14 years
Int. Cl. D23—*02*

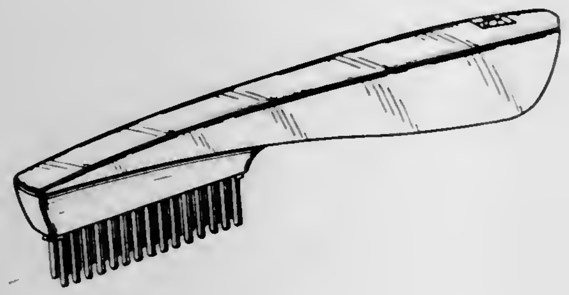
U.S. Cl. D83—1 C



226,406
ELECTRIC COMB

Douglas G. Long, Lombard, Ill., assignor to Sunbeam Corporation, Chicago, Ill.
Filed Apr. 6, 1972, Ser. No. 241,862
Term of patent 14 years
Int. Cl. D28—*03*

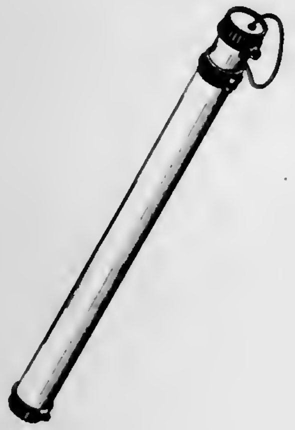
U.S. Cl. D86—8



226,407
EXTENSIBLE ROD CASE

Donald W. Doman, Janesville, Wis., assignor to Flambeau Plastics Corporation
Filed July 30, 1970, Ser. No. 24,231
Term of patent 14 years
Int. Cl. D3—*02*

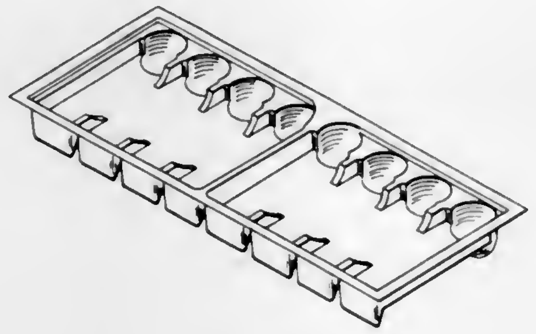
U.S. Cl. D87—1 R



226,408
STORAGE TRAY FOR MICROSCOPE SLIDES

William Earl Jones, Naperville, Ill., assignor to Miles Laboratories, Inc., Elkhart, Ind.
Filed June 3, 1971, Ser. No. 149,872
Term of patent 14 years
Int. Cl. D3—*02*

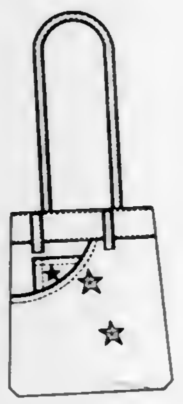
U.S. Cl. D87—1



226,409
HANDBAG

Margaret Elizabeth Noone, 1901 Belfield Road, Alexandria, Va. 22307
Filed Oct. 27, 1971, Ser. No. 193,242
Term of patent 14 years
Int. Cl. D3—*01*

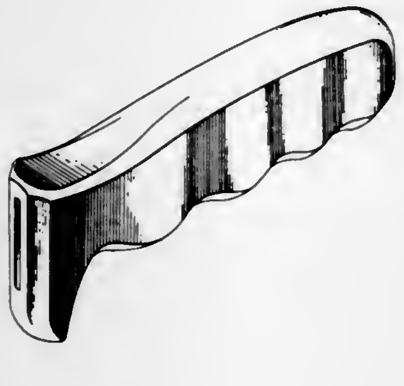
U.S. Cl. D87—3 F



226,410
KNIFE HANDLE

Walter A. Kunze, Chillicothe, Ohio, assignor to Lincoln Manufacturing Company, Inc.
Filed July 29, 1971, Ser. No. 167,551
Term of patent 14 years
Int. Cl. D7—*03*

U.S. Cl. D95—3 R



LIST OF PATENTEES
TO WHOM
PATENTS WERE ISSUED ON THE 27TH DAY OF FEBRUARY, 1973

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Abarotin, Eugene V.; Bollinger, Edward R., Jr.; and Nicely, Thomas E., to United States Steel Corporation. Apparatus for adjustment of side trimmer knife. 3,718,064, Cl. 83-502.000.

Abbott, Charles P., III; and Reilly, John M., to Texas Instruments, Incorporated. Liquid crystal display mounting structure. 3,718,842, Cl. 317-101.0cc.

Abbott, Frank R. High fidelity underwater music projector. 3,718,897, Cl. 340-8.00r.

Abbott Laboratories: *See—*
  Garmaise, David Lyon; Paris, Gerard Yvon; and Plotnikoff, Nicholas Peter, 3,718,657.

Abraham, William W.: *See—*
  Lanahan, John H.; and Abraham, William W., 3,718,255.

Abramson, Carl Newton; and Jones, Douglas George, to Adaptive Technology, Inc. Voice or analog communication system employing adaptive encoding techniques. 3,718,768, Cl. 179-15.0ba.

ACF Industries, Incorporated: *See—*
  Evans, William R., 3,718,803.
  Thornton, Duane V.; and Holt, Jan D., 3,718,099.

Acker, Morris: *See—*
  Ikrath, Kurt; and Acker, Morris, 3,718,932.

Acme Highway Products Corporation: *See—*
  Kerschner, James J., 3,718,403.

Acme-Cleveland Corporation: *See—*
  Schubert, Karl P.; and Rienerth, George R., 3,718,211.

Acra-Plant, Inc.: *See—*
  Williams, Donald E., 3,718,191.

Adamo, Michael D., to Monsanto Company. Apparatus for removing a hollow article having internal enlargements from an injection mold assembly. 3,718,419, Cl. 425-438.000.

Adams, James E.: *See—*
  Wysocki, Joseph J.; Adams, James E.; Becker, James H.; Madrid, Robert W.; and Haas, Werner E., 3,718,380.
  Wysocki, Joseph J.; Adams, James E.; Becker, James H.; Madrid, Robert W.; and Haas, Werner E. L., 3,718,382.

Adams, Patrick James, to Stauffer-Wacker Silicone Corporation, mesne. Acyloxybenzoyloxysilanes. 3,718,681, Cl. 260-448.20r.

Adaptive Technology, Inc.: *See—*
  Abramson, Carl Newton; and Jones, Douglas George, 3,718,768.

Addor, Roger Williams; and Drabb, Thomas Walter, Jr., to American Cyanamid Company. Aralkylthiovinyl phosphorothioates. 3,718,718, Cl. 260-948.000.

Adler, Franklin P.; Bailey, John D.; and Bridges, George F., to Pullman Incorporated. Railroad box car and door positioning and stop means therefor. 3,718,100, Cl. 105-378.000.

Adolphi, Heinrich: *See—*
  Dietsche, Wolfram; Adolphi, Heinrich; Beutel, Peter; and Koenig, Karl-Heinz, 3,718,661.

Afanasiev, Vadim Nikolaevich; Belyaev, Jury Pavlovich; Gaiduchik, Vladimir Olegovich; Gruzin, Pavel Lukich; Konkin, Nikolai Alexandrovich; Megarsky, Valery Vasilievich; Okunev, Boris Nikolaevich; and Trokin, Jury Alexandrovich. Device for determining the lvel and surface profile of materials utilizing hard radiation. 3,718,817, Cl. 250-43.5fl.

Agfa-Gevaert Aktiengesellschaft: *See—*
  Berthold, Werner; Von Konig, Anita; and Timmler, Helmut, 3,718,468.
  Haase, Gunter; and Schopper, Erwin, 3,718,606.
  Kolb, Gunter; Schmidt, Adolf; Schmitz-Josten, Robert; and Wolff, Erich, 3,718,474.
  Pfeifer, Josef; Ambraschka, Kasimir; Koopmann, Adolf; Hofmann, Wilfried; Dietrich, Karl-Heinz; and Rauffer, Walter, 3,718,391.

Agrest, Jacobo. Firing chamber for the combustion of gaseous, liquid or fine-granular fuel. 3,718,122, Cl. 122-149.000.

Ahlen, Karl Gustav, to S.R.M. Hydromekanik AB. Hydrodynamic torque converters. 3,717,996, Cl. 60-327.000.

Ahrens, Kurt-Henning: *See—*
  Bohme, Horst; and Ahrens, Kurt-Henning, 3,718,659.

Ahrweiler, Karl-Heinz, to Kuesters, Eduard, Maschinenfabrik. Method and apparatus for treating a moving web of material. 3,718,427, Cl. 8-151.000.

Aichenegg, Paul C.: *See—*
  Emerson, Carl D.; and Aichenegg, Paul C., 3,718,687.

Airco, Inc.: *See—*
  Mc Dermott, Richard L., 3,718,005.

Akashi, Naotomo: *See—*
  Ohsato, Nobuyoshi; and Akashi, Naotomo, 3,718,450.

Aktiebolaget Leo: *See—*
  Eriksoo, Edgar; Fex, Hans; Hogberg, Knut Bertil; Mollberg, Rene; and Rohte, Oskar, 3,718,694.

Aktien-Gesellschaft "Weser": *See—*
  Janssen, Hans Georg, 3,718,108.

Aktiengesellschaft Brown, Boveri & Cie: *See—*
  Fischer, Wilfried; and Rohr, Franz-Josef, 3,718,506.
  von Arx, Arnold; and Kuphal, Klaus, 3,718,818.

Akzona Incorporated: *See—*
  Fries, Karl, 3,717,910.

Alaimo, Benjamin, to Peripheral Equipment Corporation. Reel servo system. 3,718,289, Cl. 242-190.000.

Albanese, Thomas. Multipurpose support bar. 3,718,307, Cl. 248-205.00r.

Albrecht, Konrad, to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning. Stabilized pesticidal wettable powder formulations. 3,718,454, Cl. 71-106.000.

Alcan Research and Development Limited: *See—*
  Cooke, William Ernest; Cote, Jacques Francois; Innes, Robert Arthur; Spooner, Roy Cowieson; and Kellermann, Walter Maria Eduard, 3,718,547.

Alexandrov, Nikolai Nikolaevich; and Strukov, Arkady Dmitrievich, to Nauchno-Issledovatelsky Institut Onkologii i Meditsinskoi Radiologii MZ BSSR. Radioactive solutions injector for lymphatic systems. 3,718,138, Cl. 128-214.00r.

Alfter, Franz-Werner: *See—*
  Wienand, Michael; Jensen, Klaus; Primessing, Franz; and Alfter, Franz-Werner, 3,717,916.

Alicot, Marie-Josephe Jeanne: *See—*
  Sureau, Robert Frederick Michel; and Alicot, Marie-Josephe Jeanne, 3,718,652.

Allied Chemical Corporation: *See—*
  Gerson, Herman, 3,718,669.
  Stewart, Donald F., 3,718,164.
  Watson, William E.; and Troeger, Richard P., 3,718,736.

Alms, Erhard E. Combined burner, fan and igniter. 3,718,321, Cl. 263-19.00a.

Altenburger, Otto, to Stromberg-Carlson Corporation. Scanner circuit. 3,718,907, Cl. 340-147.00r.

Aluminium Suisse SA: *See—*
  Laroche, Rene V., 3,718,147.

Ambraschka, Kasimir: *See—*
  Pfeifer, Josef; Ambraschka, Kasimir; Koopmann, Adolf; Hofmann, Wilfried; Dietrich, Karl-Heinz; and Rauffer, Walter, 3,718,391.

American Chain & Cable Company, Inc.: *See—*
  Gilmore, William J.; and Mesler, Lilburn L., 3,717,987.

American Cyanamid Company: *See—*
  Addor, Roger Williams; and Drabb, Thomas Walter, Jr., 3,718,718.
  Amin, Ashok Babubhai; and Bristow, Robert Lee, 3,718,729.
  Cook, Charles Calvin; and Haynsworth, Erwin Mathew, 3,718,003.
  Rauhut, Michael McKay, 3,718,599.
  Smyth, Nelda Marjorie, 3,718,614.
  Stackel, Richard Frederick; and Depaolo, George Robert, 3,718,501.

American Express Investment Management Company: *See—*.
  Rice, Philip J., Jr., 3,718,936.

American Home Products Corporation: *See—*
  Strike, Donald P.; and Smith, Herchel, 3,718,667.

American Velcro, Inc.: *See—*
  Perina, Joseph, 3,717,908.
  Perina, Joseph, 3,718,009.

Amin, Ashok Babubhai; and Bristow, Robert Lee, to American Cyanamid Company. Defluorination of wet process phosphoric acid. 3,718,729, Cl. 423-321.000.

Amoco Production Company: *See—*
  Bearden, William G.; Fast, Clarence R.; and Mallinger, Morton A., 3,718,088.
  Clements, Frank H., 3,718,195.
  Lummus, James L.; Anderson, Duane B.; and Edwards, Carl D., 3,718,585.

Amos, Homer C.; and Strickland, Edward T. Tacky floor pad. 3,717,897, Cl. 15-215.000.

AMP Incorporated: *See—*
  Apa, Armand Samuel, 3,717,930.
  Reynolds, Charles Edward; and Gombar, Eugene Leonard, 3,718,895.

Ampex Corporation: *See—*
  Bogner, Richard D., 3,718,934.

Anaconda Wire and Cable Company: *See—*

Chrisman, Willis L.; and Ring, Walter R., Sr., 3,718,023.
Ancherlik, Arnost. Dosing apparatus. 3,718,438, Cl. 23-259.000.
Anderson, Duane B.: *See—*
Lummus, James L.; Anderson, Duane B.; and Edwards, Carl D., 3,718,585.
Anderson, Forrest Symington, to Anderson Mavor Limited. Cutting drums for mineral mining machines. 3,718,369, Cl. 299-59.000.
Anderson, Layton H. Bunk feeder for cattle. 3,718,121, Cl. 119-52.00b.
Anderson Mavor Limited: *See—*
Anderson, Forrest Symington, 3,718,369.
Anderson, Peter Harold, to Bell Telephone Laboratories, Incorporated. Pulse train checking circuit. 3,718,778, Cl. 179-175.20a.
Ando, Masao, to Chisso Corporation. Fixing heat-generating pipe utilizing skin effect current. 3,718,804, Cl. 219-301.000.
Ando, Noriyoshi: *See—*
Oishi, Kazuo; Kurebayashi, Tokuhiro; Ando, Noriyoshi; Yamamoto, Noboru; Toda, Tadahide; Nohira, Hidetaka; and Katoh, Takashi, 3,718,126.
Angner, Ronald Joseph; and Daniele, Phillip Paul, to Bell Telephone Laboratories, Incorporated. Integrity check equipment for automatic trunk substitution. 3,718,781, Cl. 179-175.300.
Anikin, Leonid Trifonovich; Kravetsky, Gennady Alexandrovich; Dergunova, Viktoria Sergeevna; and Dutov, Valery Vasilievich. Method of joining graphite articles. 3,717,926, Cl. 29-472.700.
Annis, James R., Jr., to Signode Corporation. Apparatus for friction fusing. 3,718,526, Cl. 156-580.000.
Antkowiak, Thomas A., to Firestone Tire & Rubber Company, The. Process for producing dilithio hydrocarbons. 3,718,702, Cl. 260-665.00r.
Apa, Armand Samuel, to AMP Incorporated. Method of connecting a center contact within a coax connector. 3,717,930, Cl. 29-629.000.
Arai, Kinjiro; and Nakatani, Yoshio, to Victor Company of Japan, Limited. Method and an apparatus for manufacturing a tap cassette. 3,717,923, Cl. 29-429.000.
Araki, Tadashi; Asano, Kiro; Takita, Hitoshi; and Awao, Takao. Method for heavying polycyclic substances. 3,718,574, Cl. 208-44.000.
Arber, Scott Gordin: *See—*
Morgan, Cyril Alfred; Arber, Scott Gordin; and Young, Oswald William John, 3,718,490.
Argus Engineering Company, Inc.: *See—*
Costello, Bernard J., 3,718,800.
Aritz, Yokohama: *See—*
Niikura, Isamu; and Aritz, Yokohama, 3,718,823.
Arlow, Michael S., to United States of America, Army, mesne. Electric circuit test element for use with a pair of electrical connectors. 3,718,859, Cl. 324-72.500.
Armstrong, Ramsey C.; and Hoover, Herbert, III, to Sierracin Corporation, The. Preformed self-supporting, flexible and coherent electrically heatable laminar structure and method of manufacture thereof. 3,718,535, Cl. 161-165.000.
Armstrong-Blum Manufacturing Company: *See—*
Wilkin, John P., 3,718,061.
Arnold, Wolfgang. Method and apparatus for producing a hollow body from a helically wound strand. 3,718,522, Cl. 156-448.000.
ARO Corporation, The: *See—*
Brandenberg, Karl; and Kautz, Wilbert C., 3,718,409.
Aronoff, Edward I. Apparatus for rolling tubular fabrics. 3,718,300, Cl. 242-66.000.
Asahi Glass Company Ltd.: *See—*
Tabata, Yoneho; and Kojima, Gen, 3,718,558.
Asahi Kasei Kogyo Kabushiki Kaisha: *See—*
Sugiyama, Michiyuki; Takatori, Yoshikuni; Touyama, Ryosuke; Nakamura, Akira; Yamauchi, Teiji; Kato, Masaaki; and Nakashiba, Yoshio, 3,718,560.
Asano, Kiro: *See—*
Araki, Tadashi; Asano, Kiro; Takita, Hitoshi; and Awao, Takao, 3,718,574.
Ashelford, Samuel J.: *See—*
Steibel, James P., 3,718,071.
Ashland Oil Inc.: *See—*
Chapman, Duane K.; Newman, John W.; and Green, William S., 3,718,704.
Assouline, Georges J.; Hareng, Michel; and Leiba, Eugene, to Thomson-CSF. Liquid crystal electro-optical modulators. 3,718,381, Cl. 350-160.0lc.
Atkinson, Cliff C.; Butler, Rolland O.; and Ross, Francis J., to Du Pont de Nemours, E. I., and Company. Method of making alkali metal-filled electrical conductors and terminations therefor. 3,717,929, Cl. 29-624.000.
Atlantic Richfield Company: *See—*
Uhl, George A.; and Baillie, Lloyd A., 3,718,579.
Atlas Copco Aktiebolag: *See—*
Berger, Karl Gustav; and Fernstrom, Gustaf Harry, 3,718,410.
Aubert, Jean. Movable dam and method of operation. 3,718,002, Cl. 61-22.000.
Auping N.V.: *See—*
Savenije, Franciscus Gerhardus, 3,717,902.
Awao, Takao: *See—*
Araki, Tadashi; Asano, Kiro; Takita, Hitoshi; and Awao, Takao, 3,718,574.
Awataguchi, Shigemi: *See—*
Okuda, Tomoharu; and Awataguchi, Shigemi, 3,718,742.
Ayers, Orval E.; and Huskins, Chester W., to United States of America, Army. Method for operating hybrid engines. 3,717,997, Cl. 60-220.000.
Ayers, Thaddeus. Sanitary collector. 3,718,358, Cl. 294-19.00r.
Babb, John J.; and Bays, Marvin G., to Delta Exploration Company, Inc. Amphibious seismic exploration vehicle and method. 3,718,206, Cl. 181-.5vm.
Babb, John J., to Delta Exploration Company, Inc. Method and apparatus for providing underwater seismic energy signals. 3,718,207, Cl. 181-.50h.
Bach, Niels Breinholt, to Mirroless Watson Company Limited. Process and apparatus for the clarification of liquids. 3,718,257, Cl. 210-73.000.
Bacon, James A.; and Lindenmuth, Charles J., to United States Steel Corporation. Pail bail ear tester. 3,718,039, Cl. 73-141.0ab.
Bacon, James R.; Barnes, George H.; and Schott, John C., to Burroughs Corporation. Line generator for CRT display systems. 3,718,834, Cl. 315-22.000.
Badische Anilin- & Soda-Fabrik Aktiengesellschaft: *See—*
Sabater, Eudaldo; and Schlemmer, Lothar, 3,718,727.
Baer, Maurice; and Severini, Joseph H., to United States of America, Army. Mine sterilization by means of a deliquescent additive. 3,718,513, Cl. 149-24.000.
Baersch, Herbert: *See—*
Prell, Gunter; and Baersch, Herbert, 3,718,385.
Bagguley, Richard B., to Continental Can Company, Inc. Rack for pressurized product dispensing container. 3,718,234, Cl. 222-135.000.
Bailey, Henry Philip, to International Research & Development Company Limited. Electrolytic cells. 3,718,540, Cl. 204-272.000.
Bailey, Homer M.: *See—*
Martone, Ronald J.; Mueller, Peter G.; and Bailey, Homer M., 3,718,833.
Bailey, John D.: *See—*
Adler, Franklin P.; Bailey, John D.; and Bridges, George F., 3,718,100.
Bailey, Ronald B., to General Electric Company. Phase angle regulator for high frequency inverter. 3,718,852, Cl. 321-19.000.
Baillie, Lloyd A.: *See—*
Uhl, George A.; and Baillie, Lloyd A., 3,718,579.
Bain, George W.; and Haak, Fred C., to International Telephone and Telegraph Corporation. Multipactor ion generator. 3,718,836, Cl. 315-111.000.
Baird, Robert J.; and Everett, Thomas G., Jr., to Union Carbide Corporation. Reusable mandrel for structures having zero draft or re-entrant geometries. 3,717,914, Cl. 29-195.000.
Bakassian, Georges; and Bazouin, Andre, to Rhone-Poulenc S.A. Process for obtaining hydrogenochlorosilanes. 3,718,682, Cl. 260-448.20p.
Baker, Broughton L.: *See—*
Wu, James S. H.; and Baker, Broughton L., 3,718,583.
Baker, Don R.; Tilles, Harry; and Dewald, Chester L., to Stauffer Chemical Company. Method of combatting weeds with α-naphthoxy acetamides. 3,718,455, Cl. 71-118.000.
Bakkerus, Hermanus, to Nederlandse Organisatie voor Toegepast-Natuurwetenschappelijk Onderzoek ten behoeve van Nijverheid, Handel en Verkeer. Pipe fitting. 3,718,351, Cl. 285-236.000.
Baldwin, D. H., Company: *See—*
Bunger, David A., 3,718,748.
Martin, Daniel W.; and Stein, John L., 3,718,747.
Baldwin, Mart G.; and Reed, Samuel F., Jr., to United States of America, Army. Hydroxy-terminated copolymers of butadiene and ferrocene derivatives. 3,718,633, Cl. 260-82.100.
Bancal, Bernard Robert Laurent Marie: *See—*
Violleau, Andre; Coffy, Rene Louis; and Bancal, Bernard Robert Laurent Marie, 3,718,521.
Bang, Erik Borje. Production of long chips and products made from same. 3,718,285, Cl. 241-28.000.
Bank, Gilbert, to National Midco Industries, Incorporated. Automatic telephone calling apparatus utilizing digital logic device. 3,718,771, Cl. 179-90.00r.
Barber-Colman Company: *See—*
Mahoney, Robert J.; Dean, Donald N.; and Uzuanis, Joseph, Jr., 3,718,296.
Barnard, Russell D.: *See—*
Berkovitz, Robert A., 3,718,773.
Barnes, George H.: *See—*
Bacon, James R.; Barnes, George H.; and Schott, John C., 3,718,834.
Barnett, Karl F., to Cadillac Products, Inc. Bag dispenser. 3,718,251, Cl. 206-47.00r.
Barnewald, Rudolf: *See—*
Barten, Hans; Barnewald, Rudolf; and Hanich, Werner, 3,718,197.
Barr, William A.; Hahlbeck, Edwin C.; and Heine, Ferdinand L., to Milwaukee Gear Company. Gear structure and method of making the same. 3,718,052, Cl. 74-462.000.
Bartels, Herbert D., to Continental Can Company, Inc. Method of making stress relieved containers. 3,718,107, Cl. 113-116.00w.
Barten, Hans; Barnewald, Rudolf; and Hanich, Werner, to Klockner-Humboldt-Deutz Aktiengesellschaft. Conveyor belt weighing device. 3,718,197, Cl. 177-16.000.
Bartlett, Kenneth D. Terminal block covering means. 3,718,889, Cl. 339-103.00r.

Bate, Geoffrey; Echelmeier, Robert H.; Everett, Larry H.; Kehr, William D.; Schaps, Joseph E.; Taylor, Gerald; and Thornley, Richard F. M., to International Business Machines Corporation. Multi-track overlapped-gap magnetic head assembly. 3,718,776, Cl. 17-100.20c.
Batlles, Jorge Ferrer: *See—*
Salat, Carlos Ferrer; Batlles, Jorge Ferrer; and Riers, Juan Colombe, 3,718,664.
Batta, Louis Bela, to Union Carbide Corporation. Selective adsorption process for air separation. 3,717,974, Cl. 55-58.000.
Battelle-Entwicklungs-Gesellschaft m.b.H.: *See—*
Fischer, Horst; and Neufelder, Manfred, 3,718,430.
Batzer, Hans: *See—*
Lohse, Friedrich; Schmid, Rolf; and Batzer, Hans, 3,718,623.
Baumann, Heinz. Method of making fertilizer from chicken manure. 3,718,451, Cl. 71-9.000.
Baxter Laboratories, Inc.: *See—*
Cayle, Theodore, 3,718,739.
Baychem Corporation, mesne: *See—*
Emerson, Carl D.; and Aichenegg, Paul C., 3,718,687.
Bayer Aktiengesellschaft: *See—*
Bock, Eugen; and Dollhausen, Manfred, 3,718,518.
Logemann, Heino, 3,718,717.
Bayless, Jack H.; and Penberthy, Walter L., Jr., to Esso Production Research Company. Insulation for a wellbore. 3,718,184, Cl. 166-57.000.
Bays, Marvin G.: *See—*
Babb, John J.; and Bays, Marvin G., 3,718,206.
Bazouin, Andre: *See—*
Bakassian, Georges; and Bazouin, Andre, 3,718,682.
Bear, Fred B. Fletching machine. 3,717,919, Cl. 29-208.00r.
Bearden, Edith Mae: *See—*
Bearden, William G.; Fast, Clarence R.; and Mallinger, Morton A., 3,718,088.
Bearden, William G.; deceased (by Bearden, Edith Mae; administratrix); Fast, Clarence R.; and Mallinger, Morton A.; deceased (by Mallinger, Zella K.; administratrix), to Amoco Production Company. Explosive fracturing method. 3,718,088, Cl. 102-21.000.
Beatenbough, Paul K.; Hutchins, Ward H.; and Richards, Gary E., to General Motors Corporation. Thermostatic vacuum positioner. 3,718,281, Cl. 237-2.00a.
Beaufort, Ronald E.: *See—*
Larralde, Edward; and Beaufort, Ronald E., 3,718,316.
Beaver, Thomas R., to CTS Corporation. Method of making an electric switch. 3,718,106, Cl. 113-119.000.
Beck, Erich: *See—*
Patels, Gottfried; and Beck, Erich, 3,718,760.
Becker, Brant W.: *See—*
Horwitz, Joshua; Gordon, Bernard M.; and Becker, Brant W., 3,718,923.
Becker, James H.: *See—*
Wysocki, Joseph J.; Adams, James E.; Becker, James H.; Madrid, Robert W.; and Haas, Werner E., 3,718,380.
Wysocki, Joseph J.; Adams, James E.; Becker, James H.; Madrid, Robert W.; and Haas, Werner E. L., 3,718,382.
Beckman Instruments, Inc.: *See—*
Krull, Irwin H.; and Martin, Donald N., 3,718,563.
Petersen, Arne J.; and Matsuyama, George, 3,718,569.
Becraft, Ardath M.; and Hammer, Clifford E., to United States of America, Air Force. Method of aligning laser beam by rotation. 3,718,398, Cl. 356-153.000.
Beesch, Otto: *See—*
Weyl, Helmut; Kauhl, Gunther; and Beesch, Otto, 3,718,425.
Behring Corporation: *See—*
Brown, Victor E.; Mora, Raul L.; and Morton, Evans T., 3,717,964.
Morton, Evans T.; and Vescio, Kimbel L., 3,717,965.
Bejach, Benton; and Bernhardt, Earl T., to Borg-Warner Corporation. Variable speed master-slave motor control system with continuous position adjustment. 3,718,845, Cl. 318-78.000.
Bejach, Benton, to Borg-Warner Corporation. Variable speed plural motor control system with incremental speed synchronization. 3,718,846, Cl. 318-85.000.
Bell & Howell Company: *See—*
Cooper, Dexter P., Jr., 3,718,389.
Morton, Robert B., 3,718,301.
Bell Telephone Laboratories, Incorporated: *See—*
Anderson, Peter Harold, 3,718,778.
Angner, Ronald Joseph; and Daniele, Phillip Paul, 3,718,781.
Bulfer, Andrew Frederick; and Tammaru, Enn, 3,718,904.
Dental, Andrew Gomperz; Van Uitert, Le Grand Gerard; and Williams, John Charles, 3,718,601.
Erdman, William Charles; and Miller, Paul, 3,718,514.
Fletcher, Roger Florin, 3,718,876.
Fraser, David Bruce; O'Bryan, Henry Miles, Jr.; and Thomson, John, Jr., 3,718,723.
Pasternak, John Paul, 3,718,888.
Pelletier, Frank Palmer, 3,718,565.
Reese, Randall Douglas, 3,718,770.
Tong, Shih Yung, 3,718,905.
Bellanca, Joseph V., to McCain Manufacturing Corporation. Trading stamp saver books. 3,718,348, Cl. 283-8.500.
Bellos, Thomas J.; and Mange, Franklin E., to Petrolite Corporation. Aqueous salts of phosphate esters. 3,718,588, Cl. 252-32.500.
Beltone Electronics Corporation: *See—*
Cannon, Vernon W.; and Stowe, Gordon N., 3,718,763.
Belyaev, Jury Pavlovich: *See—*
Afanasiev, Vadim Nikolaevich; Belyaev, Jury Pavlovich; Gaiduchik, Vladimir Olegovich; Gruzin, Pavel Lukich; Konkin, Nikolai Alexandrovich; Megarsky, Valery Vasilievich; Okunev, Boris Nikolaevich; and Trokin, Jury Alexandrovich, 3,718,817.
Bender, Heinz: *See—*
Muller, Rolf; Von Brachel, Hanswilli; Klein, Rudolf; Schmidt, Ewald; and Bender, Heinz, 3,718,641.
Benfield, John D. Pipe bending tool. 3,718,018, Cl. 72-31.000.
Bennett, Reginald Frank Charles: *See—*
Fothergill, Reginald Allan; Bennett, Reginald Frank Charles; Risley, Gerald Thomas; and Weeks, William Stanley, 3,718,918.
Berchtold, Robert F. High pressure bleed valve tool. 3,718,057, Cl. 81-15.400.
Berends, Emerson R., to Rockwell Manufacturing Company. Planer. 3,718,168, Cl. 144-117.00r.
Berg, Thomas L. Method and apparatus for decorating articles. 3,718,517, Cl. 156-234.000.
Berger, Karl Gustav; and Fernstrom, Gustaf Harry, to Atlas Copco Aktiebolag. Reversible pressure fluid actuated vane motor. 3,718,410, Cl. 418-15.000.
Bergstrom, Axel Emil. Heat reflecting laminate. 3,718,528, Cl. 161-1.000.
Bergwerksverband GmbH: *See—*
Gappa, Gunther; Knoblauch, Karl; Maier, Franz; Schwarte, Jurgen; and Steiner, Peter, 3,717,976.
Berkovitz, Robert A., 22.5 to Barnard, Russell D., 5% to Dolph, Norman, and, 5% to Felfe, Peter F. and 22.5% to Killion, John. Four Channel recording and reproducing system. 3,718,773, Cl. 179-100.1td.
Berlant, George, to New Hermes Engraving Corporation. Attachment kit for copying machine for engraving jewelry rings. 3,718,072, Cl. 90-62.00r.
Berman, Abraham; and Gerber, George V., to Vishay Intertechnology, Inc. Electrical components with flexible terminal means. 3,718,883, Cl. 338-322.000.
Bermender, Norman W., to North American Aviation, Inc. Gas generator charge with decreased temperature sensitivity. 3,718,094, Cl. 102-101.000.
Bermingham, Peter D.: *See—*
Dernovshek, Joseph Frank; and Bermingham, Peter D., 3,718,210.
Bernard, Marcel, to Societe Industrielle Honeywell Bull (Societe Anonyme). Testing device for differential amplifiers. 3,718,857, Cl. 324-57.00r.
Bernhardt, Earl T.: *See—*
Bejach, Benton; and Bernhardt, Earl T., 3,718,845.
Berry, Jean-Luc: *See—*
Dardaine, Edgar J.; and Berry, Jean-Luc, 3,718,246.
Berthold, Werner; Von Konig, Anita; and Timmler, Helmut, to Agfa-Gevaert Aktiengesellschaft. Stabilising developed photographic images. 3,718,468, Cl. 96-50.000.
Bessemer and Lake Erie Railroad Company: *See—*
Freeman, William H.; Peterson, Leavitt A.; and Wandrisco, Joseph M. (said Peterson assor. to said), 3,718,040.
Beste, Lawrence F.; Jones, Edward B.; and Yates, Paul C., to Du Pont de Nemours, E. I., and Company. Colloidal metal oxide sols in polar organic solvents. 3,718,584, Cl. 252-8.100.
Bethe, Eugene J., to Uniroyal Inc. Apparatus for molding foam articles. 3,718,417, Cl. 425-406.000.
Betts, Robert E., to United States of America, Army. Rocket motor with combined nozzle and suspension plate. 3,717,998, Cl. 60-255.000.
Beutel, Peter: *See—*
Dietsche, Wolfram; Adolphi, Heinrich; Beutel, Peter; and Koenig, Karl-Heinz, 3,718,661.
Bey, Paul P.; Giuliani, John F.; and Rabin, Herbert, to United States of America, Navy. Liquid medium for optical third harmonic generation. 3,718,602, Cl. 252-301.20r.
Beyerle, Rudi; and Stachel, Adolf; deceased (by Stachel, Inge; and Stachel, Sophie; heirs), to Cassella Farbwerke Mainkur Aktiengesellschaft. Basically substituted 2,4-(1H,3H)-quinazolindione derivatives. 3,718,648, Cl. 260-247.20a.
Bhakuni, Roop S.; and Cormany, Joseph L., Jr., to Goodyear Tire & Rubber Company, The. Cyanuric acid derivatives as finish additives. 3,718,587, Cl. 252-8.600.
Bibler, David R. Poultry handling system. 3,718,117, Cl. 119-16.000.
Bibler, David R. Poultry handling system. 3,718,118, Cl. 119-16.000.
Bidwell, Arthur W., to Magnode Products, Inc. Anode fitting. 3,718,571, Cl. 204-197.000.
Bidwell, Arthur W., to Magnode Products, Inc. Fluid fitting. 3,718,573, Cl. 204-297.00r.
Bio-Derivatives Corporation: *See—*
Lagomarsino, John A., 3,718,543.
Bird Island, Inc.: *See—*
Maker, Paul, 3,717,913.
Bishop, Walton B.: *See—*
Parker, Carlyle V.; and Bishop, Walton B., 3,718,926.
Bixler, Kenneth D.: *See—*
Reifers, Richard F.; and Bixler, Kenneth D., 3,718,274.
Black Clawson Company, The: *See—*
Plough, Irving L., 3,718,169.
Blackburn, Marvin J., to Vernon Tool Company. Automatic control system for tube expander tool. 3,718,017, Cl. 72-20.000.
Blackley, William D.: *See—*

Reinhard, Russell R.; and Blackley, William D., 3,718,695.
Blackmer, David E.: *See*—
Rosse, Thomas A.; Blackmer, David E.; Zindler, Jerrold; and Kelley, Thomas F., 3,718,439.
Blanchard, Clarence E., to Outboard Marine Corporation. Hydraulic arrangement for veritcally trimming a marine propulsion unit. 3,718,110, Cl. 115-41.oht.
Blatter, Herbert Morton: *See*—
Mizzoni, Renat Herbert; and Blatter, Herbert Morton, 3,718,654.
Bliss, E. W., Company: *See*—
Wilson, Walter W., 3,718,216.
Bloom, Donald W., Sr. Apparatus for correcting printing errors. 3,717,975, Cl. 355-78.000.
Bloomfield, Roger D.; and Wirth, Gary J., to Uniflo Systems Company. Vortex thruster for fluid propelled objects. 3,718,096, Cl. 104-155.000.
Bloomstein, Richard W. Signature and retrieval system. 3,718,908, Cl. 340-149.00a.
Blower, Warren A.; and Jerse, Emil P., to Sherwin-Williams Company, The. Vibrator for foundry molding and like machines. 3,718,318, Cl. 259-1.000.
Blum, Alvin S. Regional lung measuring device. 3,718,136, Cl. 128-2.080.
Bock, Eugen; and Dollhausen, Manfred, to Bayer Aktiengesellschaft. Process of preparing bonded materials using polyurethane adhesives which form bonds of immediate high strength. 3,718,518, Cl. 156-242.000.
Bogner, Richard D., to Ampex Corporation. Broadcast antenna assembly. 3,718,934, Cl. 343-770.000.
Bohdan Melnyk: *See*—
Konig, Karl, 3,717,931.
Bohme, Horst; and Ahrens, Kurt-Henning, to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning. 5-Aryl-3H-1,2,4-dithiazoles and process for their manufacture. 3,718,659, Cl. 260-302.00r.
Bollinger, Edward R., Jr.: *See*—
Abarotin, Eugene V.; Bollinger, Edward R., Jr.; and Nicely, Thomas E., 3,718,064.
Bonner, Willard H.; and Craven, Robert L., to Du Pont de Nemours, E. I., and Company. Process of forming a uniform batt from staple fibers. 3,717,904, Cl. 19-66.00r.
Boomsma, Pieter: *See*—
Wierts, Derk; and Boomsma, Pieter, 3,718,865.
Booth, Ralph E.: *See*—
Tillman, Herman L.; and Booth, Ralph E., 3,718,812.
Borg-Warner Corporation: *See*—
Bejach, Benton; and Bernhardt, Earl T., 3,718,845.
Bejach, Benton, 3,718,846.
Havranek, John E., 3,718,212.
Jones, William Felix, Jr., 3,718,058.
Onal, Hasan F., 3,718,406.
Pande, Kailash C.; and Trampe, George M., 3,718,684.
Bork, Karl-Heinz: *See*—
Irmscher, Klaus; Von Werder, Fritz; Bork, Karl-Heinz; and Kraft, Hans-Gunther, 3,718,542.
Borkowski, Allan S.: *See*—
Schwarz, Karl W.; Borkowski, Allan S.; and Hafesh, Joseph W., 3,718,120.
Bosch, Robert, G.m.b.H.: *See*—
Eckert, Konrad; Knapp, Heinrich; and Engel, Gerhard, 3,718,123.
Hofer, Friedrich Wilhelm, 3,718,373.
Reitz, Werner; and Schwerin, Gunther, 3,717,983.
Schleupen, Richard; and Ferdinand, Grob, 3,718,201.
Wanner, Karl, 3,718,193.
Weyl, Helmut; Kauhl, Gunther; and Beesch, Otto, 3,718,425.
Bosch, Robert, Photokino GmbH: *See*—
Stieringer, Albert, 3,718,387.
Bosworth, Delbert B.; and Fournier, Joseph R., to United Industrial Syndicate, Inc. Constant tensioning device for the chains of conveyors. 3,718,250, Cl. 198-208.000.
Botker, Kurt, to North American Philips Corporation. Ignition interlock system. 3,718,128, Cl. 123-179.00k.
Boudouris, Angelo; and Plumadore, Harold M., to Eprad Incorporated. Pick-off device. 3,718,388, Cl. 352-92.000.
Bowler, Lauren L.; and Harned, John L., to General Motors Corporation. Hydraulic anti-lock brake control system. 3,718,376, Cl. 303-21.0cg.
Bowler, Laurence L.; and Harned, John L., to General Motors Corporation. Hydraulic anti-lock brake control system. 3,718,375, Cl. 303-21.00b.
Bowman, Arthur J., Jr.: *See*—
Milanowski, Floyd J.; and Bowman, Arthur J., Jr., 3,718,093.
Box, William A.; and Wojnar, Joseph A., to United States Steel Corporation. Gauge device for alignment of rolls of a rolling mill. 3,718,019, Cl. 72-35.000.
Boy de la Tour, Roger: *See*—
Holt, William J.; and Boy de la Tour, Roger, 3,718,132.
Boyd, Loyis J.: *See*—
Hafs, Harold D.; and Boyd, Loyis J., 3,718,740.
Boyer, Jackson S.; and Cassar, Richard D., to Sun Oil Company. Vulcanization of ethylene-propylene-diene terpolymer. 3,718,628, Cl. 260-79.50b.
Bracken, Thomas W.; Laughon, Thomas C.; and Smith, Gerald C., to Eastman Kodak Company. Method and apparatus for facilitating the packaging and pricing of photographic prints. 3,718,807, Cl. 235-92.0pd.
Braden, John R. Self-adjusting stop valve actuating mechanism. 3,718,311, Cl. 251-77.000.
Brady, William A., Jr., to Certain-Teed Saint Gobain Insulation Corporation. Packaging compressible material. 3,717,973, Cl. 53-124.00e.
Brainin, Herbert, to Vitredent Corporation. Tooth replacement. 3,717,932, Cl. 32-10.00a.
Branche, William H., to Carrier Corporation. Ignition device for a gas fired appliance. 3,718,838, Cl. 317-93.000.
Brandenberg, Karl; and Kautz, Wilbert C., to ARO Corporation, The. Reciprocating pump control system. 3,718,409, Cl. 417-326.000.
Brandon, Clarence W., 12 1/2% to Brandon, Orpha B., 50% to Hardin, Nat A., Newton, Catherine H., Wright, Hazel H. and 5% to Jacob, Harvey B. Method and apparatus for forming and/or augmenting an energy wave. 3,718,186, Cl. 166-248.000.
Brandon, Orpha B.: *See*—
Brandon, Clarence W., 3,718,186.
Braniski, Alexandru I.; Ionescu, Teodor; and Deica, Neculai, to Institutul de Cercetari Metalurgice. Refractory aluminous cements. 3,718,492, Cl. 106-104.000.
Brazier, Robert Leo, to Sangamo Electric Company. Capacitor with terminal clips. 3,718,844, Cl. 317-258.000.
Brewster Corporation, The: *See*—
Murray, I. Gillis, 3,718,306.
Bridges, George F.: *See*—
Adler, Franklin P.; Bailey, John D.; and Bridges, George F., 3,718,100.
Bridges, Peter John: *See*—
Faulkner, Roy Gwyn; and Bridges, Peter John, 3,718,443.
Bright, Elvin M. Apparatus for forming attachable incompletely-cured plastic wafers. 3,718,524, Cl. 156-500.000.
Brija, Raymond L.: *See*—
Bukowski, Raymond J.; Brija, Raymond L.; and Yanikoski, Florian F., 3,718,244.
Brindley, Giles Skey, to National Research Development Corporation. Implantable electrode connector device. 3,718,134, Cl. 128-2.10e.
Bringman, Robert D. Stabilizing apparatus. 3,718,345, Cl. 280-289.000.
Brink, David L.; and Thomas, Jerome F., to University of California, The Regents of the. Pollutant-free process for producing a clean burning fuel gas from organic-containing waste materials. 3,713,446, Cl. 48-209.000.
Bristol-Myers Company: *See*—
Nakanishi, Koji; and Gylys, Jonas A. (said Gylys assor. to), 3,718,745.
Bristow, Robert Lee: *See*—
Amin, Ashok Babubhai; and Bristow, Robert Lee, 3,718,729.
British Aircraft Corporation Limited: *See*—
Godwin, Roy Charles, 3,718,171.
British Insulated Callender's Cable Limited: *See*—
Cleaver, John Stephen; Guilford, Peter; Kimpton, Frederick James; Page, Thomas John; and Steinberg, Norman Richard, 3,718,273.
British Nuclear Design & Construction Limited: *See*—
Charcharos, Anthreas Nicholas, 3,718,353.
Britton, Leon R.; Vojir, Frank S.; and Wright, William W., to Guardian Electric Manufacturing Company. Push button pulse signal generator. 3,718,828, Cl. 310-15.000.
Brock, Donald J., to Texas Instruments, Incorporated. Vehicle antitheft system. 3,718,202, Cl. 180-114.000.
Broemmelsiek, Marc W.: *See*—
Landre, John K.; Kline, Donald D.; and Broemmelsiek, Marc W., 3,718,751.
Brown, Graydon L.: *See*—
Fair, Delbert W.; and Brown, Graydon L., 3,718,205.
Brown, Victor E.; Mora, Raul L.; and Morton, Evans T., to Behring Corporation. Module frames. 3,717,964, Cl. 52-79.000.
Brunner, Fred William, to Mannings, Inc. Pancake-making machine. 3,718,487, Cl. 99-353.000.
Buckley, Francis T.; Riek, Raymond F.; and Christensen, Donald I., to Monsanto Company. Process for production of interlayer safety-glass. 3,718,516, Cl. 156-106.000.
Bufkin, Dale E.; and Murphy, Willard G., to McGraw-Edison Company. Coffee maker basket and filter. 3,718,084, Cl. 99-312.000.
Bukowski, Raymond J.; Brija, Raymond L.; and Yanikoski, Florian F., to Motiongraph, Inc. Apparatus for reading pre-programmed cards and printing thereon. 3,718,244, Cl. 197-127.000.
Bulfer, Andrew Frederick; and Tammaru, Enn, to Bell Telephone Laboratories, Incorporated. NAND gate realization of the N-input parity function. 3,718,904, Cl. 340-146.1ag.
Bunger, David A., to Baldwin, D. H., Company. Multi-tone arpeggio system for electronic organ. 3,718,748, Cl. 84-1.240.
Burgess, James P.; and Polkinghorn, Melvin W., to International Telephone and Telegraph Corporation. Lamp socket. 3,718,892, Cl. 339-126.00r.
Burley, Harvey A., to General Motors Corporation. Vacuum actuated ignition spark energy level control circuit. 3,718,124, Cl. 123-148.0dc.
Burlington Industries, Inc.: *See*—
Watson, Thomas F., Sr., 3,718,530.
Burnet, Robert Cortland: *See*—
Tysko, Leon Albert; and Burnet, Robert Cortland, 3,718,394.

Burns Machine Co.: *See*—
Hook, Melvin S., 3,718,789.
Burroughs Corporation: *See*—
Bacon, James R.; Barnes, George H.; and Schott, John C., 3,718,834.
Busch, Norbert: *See*—
Mauvernay, Roland Yves; Busch, Norbert; Moleyre, Jacques; and Simond, Jacques, 3,718,650.
Bushick, Ronald D.; Norman, Oscar L.; and Spinelli, Harry J. Formation of naphthalene-2,6-dicarboxylic acid. 3,718,690, Cl. 260-515.00p.
Buss, Waldeen C.; and Kluksdahl, Harris E., to Chevron Research Company. Reforming with a platinum-tin-iridium catalyst. 3,718,578, Cl. 208-139.000.
Busse, Ewald A.; and Raker, Glen W. Vacuum collar for roofing kettles and the like. 3,718,131, Cl. 126-343.50a.
Butler, Rolland O.: *See*—
Atkinson, Cliff C.; Butler, Rolland O.; and Ross, Francis J., 3,717,929.
Butter, Donald A.; Kern, Edmund R.; and Menelly, Richard A., to International Telephone and Telegraph Corporation. Cavity pellet emissive electrode. 3,718,831, Cl. 313-346.00r.
Butz, Erich Dagobert. Hoist apparatus. 3,718,362, Cl. 294-112.000.
Cadillac Products, Inc.: *See*—
Barnett, Karl F., 3,718,251.
Cairns, Hugh; and Minshull, Robert, to Fisons Limited. Benzodipyrones. 3,718,668, Cl. 260-345.200.
Camara, Elias Humberto: *See*—
Fleming, Donald Kingsley; Randhava, Sarabjit Singh; and Camara, Elias Humberto, 3,718,418.
Cameron Iron Works, Inc.: *See*—
Oliver, John P.; and Wedel, Alfred W., 3,717,920.
Camilleri, Louis T.; and Huehner, Manfred H., to Hooker Chemical Corporation. Gel prevention in polyurethanes. 3,718,622, Cl. 260-75.0np.
Canadian Patents and Development Limited: *See*—
Ritcey, Gordon Malcolm; and Lucas, Bernard Henry, 3,718,458.
Cannon, Vernon W.; and Stowe, Gordon N., to Beltone Electronics Corporation. Audiometer apparatus. 3,718,763, Cl. 179-1.00n.
Canon Kabushiki Kaisha: *See*—
Goshima, Takeshi; and Sato, Hideaki, 3,718,754.
Inoue, Eiichi; and Yamase, Toshihiro, 3,718,467.
Ogiso, Mitsutoshi; and Ito, Tadashi, 3,718,075.
Canter, Richard S. Seal. 3,718,355, Cl. 292-321.000.
Cardinal-Ordinal Corporation: *See*—
Myers, Paul K., 3,718,810.
Carlson, George R. Automatic tape-controlled work finishing machine. 3,717,893, Cl. 15-97.00r.
Carlson, Harrison Cornforth; and Hess, Wayne Thomas, to Du Pont de Nemours, E. I., and Company. Process for recovering ammonia from a gaseous mixture containing NH_3 and HCN. 3,718,731, Cl. 423-238.000.
Carlton, Fred W.; and Carlton, Jesse W. Log-cutting apparatus. 3,718,060, Cl. 83-84.000.
Carlton, Jesse W.: *See*—
Carlton, Fred W.; and Carlton, Jesse W., 3,718,060.
Carmichael, Keith Stewart: *See*—
Wyeth, Nathanial Convers; Roseveare, Ronald Newman; and Carmichael, Keith Stewart, 3,718,229.
Caron Compactor Co.: *See*—
Caron, Fred Joseph; Caron, James Oliver; and Gray, George Carrol, 3,718,170.
Caron, Fred Joseph; Caron, James Oliver; and Gray, George Carrol, to Caron Compactor Co. Axle cushioning assembly for wheels on construction equipment. 3,718,170, Cl. 152-49.000.
Caron, James Oliver: *See*—
Caron, Fred Joseph; Caron, James Oliver; and Gray, George Carrol, 3,718,170.
Carpano & Pons: *See*—
Lemery, Jean-Paul, 3,718,291.
Carpano, Ets. & Pons S.A.: *See*—
Mimeur, Robert, 3,718,215.
Carrier Corporation: *See*—
Branche, William H., 3,718,838.
Cartridge Television, Inc.: *See*—
Crosno, Philip M., 3,718,755.
Case, Cecil L., to Hesston Corporation. Hydraulic flotation for implement header. 3,717,995, Cl. 60-470.000.
Case Western Reserve University: *See*—
Pao, Yoh-Han; and Knox, Joseph Dale, 3,718,868.
Caserta, James: *See*—
Caserta, Richard John, 3,718,370.
Caserta, Richard John, 1/2 to Caserta, James. Interchangeable jack hammer tips. 3,718,370, Cl. 299-91.000.
Cassar, Richard D.: *See*—
Boyer, Jackson S.; and Cassar, Richard D., 3,718,628.
Cassella Farbwerke Mainkur AG: *See*—
Muller, Rolf; Von Brachel, Hanswilli; Klein, Rudolf; Schmidt, Ewald; and Bender, Heinz, 3,718,641.
Cassella Farbwerke Mainkur Aktiengesellschaft: *See*—
Beyerle, Rudi; and Stachel, Adolf, 3,718,648.
Caterpillar Tractor Company: *See*—
Gates, Marvin A.; and Parks, John H., 3,718,127.
C.A.V. Limited: *See*—
Fenne, Ivor, 3,718,283.
Cayle, Theodore, to Baxter Laboratories, Inc. Treating lactase deficiency with an active lactase. 3,718,739, Cl. 424-94.000.
Celanese Corporation: *See*—
Horlenko, Theodore, 3,718,545.
Lee, Leonard A., 3,718,722.
Centre National de Recherches Metallurgiques: *See*—
Ponghis, Nicolas Gerassimos; and Van Osmael, Claude Henri, 3,718,758.
Cerone, Robert J. Compact multi-cavity wiper bullet mold. 3,718,310, Cl. 249-165.000.
Certain-Teed Saint Gobain Insulation Corporation: *See*—
Brady, William A., Jr., 3,717,973.
Cervenak, Peter J., to Nicholson Manufacturing Company. Limb stub-cutting mechanism. 3,718,167, Cl. 144-2.00z.
Chapman, Duane K.; Newman, John W.; and Green, William S., to Ashland Oil Inc. Methylation process. 3,718,704, Cl. 260-671.00m.
Charcharos, Anthreas Nicholas, to British Nuclear Design & Construction Limited. Support arrangement. 3,718,353, Cl. 287-20.300.
Charles, Glen W.: *See*—
Crookston, James A.; and Charles, Glen W., 3,718,489.
Charron, Denny W. Dental apparatus. 3,717,933, Cl. 32-11.000.
Chase, David O.; Maloney, Martin V.; Wood, Frederick J., Jr.; and Wood, Barry B., to Shur-Line Manufacturing Co., Inc. Paint applicator. 3,717,896, Cl. 15-210.00r.
Chateau, Frederick D. Eyebrow stencilling method and apparatus. 3,718,145, Cl. 132-88.500.
Chatin, Remy, to Moulinage et Retorderie de Chavanoz. Process for producing fancy effect yarns. 3,717,959, Cl. 57-160.000.
Chavee, Rene M. J., to Fabrique Nationale d'Armes de Guerre, Societe Anonyme. Device for shooting a projectile. 3,717,946, Cl. 42-1.00f.
Chen, Nai Yuen; and Yan, Tsoung-Yuan, to Mobil Oil Corporation. Control of hydrocracking process for constant conversion. 3,718,577, Cl. 208-108.000.
Cheng, Tai Chun; and Halasa, Adel F., to Firestone Tire & Rubber Company, The. Process for the polymerization of conjugated dienes. 3,718,638, Cl. 260-94.20t.
Chevron Research Company: *See*—
Buss, Waldeen C.; and Kluksdahl, Harris E., 3,718,578.
Christensen, Robert I.; and Larimore, David B., 3,718,734.
Fenyes, Joseph G. E., 3,718,738.
Fenyes, Joseph G. E., 3,728,738.
Hughes, Thomas R.; and Sieg, Robert P., 3,718,576.
Kemp, Jacob D.; and Sieg, Robert P., 3,718,705.
Sieg, Robert P., 3,718,706.
Chew, Norman B.: *See*—
Self, Kenneth W.; Chew, Norman B.; and Twyman, Bill I., 3,718,346.
Chisso Corporation: *See*—
Ando, Masao, 3,718,804.
Chodnekar, Madhukar Subraya; Pfiffner, Albert; Rigassi, Norbert; Schwieter, Ulrich; and Suchy, Milos, to Hoffmann-La Roche Inc. Alkynyl esters of alkoxybenzoic acids. 3,718,686, Cl. 260-473.00r.
Chottiner, Jacob: *See*—
Philofsky, Harold M.; Ying, Sui-Chun; and Chottiner, Jacob, 3,718,830.
Chow, Sui-Wu: *See*—
Matzner, Markus; Reichle, Walter T.; Chow, Sui-Wu; and McGrath, James E., 3,718,672.
Chrisman, Willis L.; and Ring, Walter R., Sr., to Anaconda Wire and Cable Company. Wire corrugator. 3,718,023, Cl. 72-196.000.
Christensen, Donald I.: *See*—
Buckley, Francis T.; Riek, Raymond F.; and Christensen, Donald I., 3,718,516.
Christensen, Robert I.; and Larimore, David B., to Chevron Research Company. Hydrogen purification. 3,718,734, Cl. 423-228.000.
Christmann, John L., to Merrick Scale Mfg. Company. Mass measuring system applied to belt conveyors. 3,718,031, Cl. 73-67.200.
Chvatlinsky, Kurt, to Olympia Werke AG. Apparatus for storing typing commands given in too rapid succession by keys. 3,718,243, Cl. 197-16.000.
Ciba-Geigy AG: *See*—
Lohse, Friedrich; Schmid, Rolf; and Batzer, Hans, 3,718,623.
Roueche, Armand, 3,718,640.
Zondler, Helmut; and Pfleiderer, Wolfgang, 3,718,610.
Ciba-Geigy Corporation: *See*—
Kristiansen, Odd, 3,718,683.
Mizzoni, Renat Herbert; and Blatter, Herbert Morton, 3,718,654.
Cinadr, James J., to General Motors Corporation. Tilt steering wheel mechanism. 3,718,053, Cl. 74-493.000.
Clark Equipment Company: *See*—
La Tourneau, Howard C.; and Riedner, William E., 3,718,097.
Visser, Peter J., 3,718,221.
Clark, Frank S., to Monsanto Company. Polyphenyl thioether lubricating compositions. 3,718,590, Cl. 252-46.700.
Clay, John Armstrong, to Turnbull Marine Design Company Limited. Tail-shaft bearing assembly. 3,718,378, Cl. 308-36.100.
Clayton, William J., to Mobil Oil Corporation. Permeable thermoplastic film product and method. 3,718,059, Cl. 83-2.000.
Cleaver, John Stephen; Guilford, Peter; Kimpton, Frederick James; Page, Thomas John; and Steinberg, Norman Richard, to British Insulated Callender's Cable Limited. Kit of parts for use in joining electric cables. 3,718,273, Cl. 228-15.000.
Clegg, Samuel E. Apparatus for rooted plant excavating. 3,717,944, Cl. 37-2.00r.

- Clements, Frank H., to Amoco Production Company. Core drilling with air containing polymer in oil. 3,718,195, Cl. 175-58.000.
- Clements, Paul Bernard, to Words on Wheels Limited. Tape recorders providing replay without stopping or rewinding. 3,718,775, Cl. 179-100.20t.
- Cochran, Raymond J., to Fairfield Plastics Incorporated. Dispenser with turn cap. 3,718,239, Cl. 222-548.000.
- Coffy, Rene Louis: *See—*
  - Violleau, Andre; Coffy, Rene Louis; and Bancal, Bernard Robert Laurent Marie, 3,718,521.
- Cogar Corporation: *See—*
  - Kelly, William J.; and Reynolds, Warren A., 3,718,864.
- Coleman, Margot O.; and Johnson, Elizabeth W. Picture and method of making same. 3,718,529, Cl. 161-19.000.
- Collins Radio Company: *See—*
  - Stover, Harris A., 3,718,766.
  - Stover, Harris A., 3,718,928.
- Collins, Robin Ashley, to International Standard Electric Corporation. Aerial field monitoring. 3,718,931, Cl. 343-703.000.
- Colome-Riera, Juan: *See—*
  - Ferrer-Salat, Carlos; Ferrer-Batlles, Jorge; and Colome-Riera, Juan, 3,718,655.
- Combustion Engineering, Inc.: *See—*
  - West, John M.; and Fletcher, William D., III, 3,718,539.
- Commercial Electronics Incorporated: *See—*
  - Landre, John K.; Kline, Donald D.; and Broemmelsiek, Marc W., 3,718,751.
- Commonwealth Scientific and Industrial Research Organization: *See—*
  - Walls, Gordon William, 3,717,988.
- Compagnie Francaise de Raffinage: *See—*
  - Grosmangin, Jacques; and Peyrot, Jean, 3,718,631.
- Compagnie Industrielle des Telecommunications Cit-Alcatel: *See—*
  - Jacob, Jean-Baptiste, 3,718,769.
- Component Manufacturing Service, Inc.: *See—*
  - Solomon, William E.; and Healey, Arthur V., 3,718,887.
- Comstock, Alfred E., to Latta's Inc. Shingling device. 3,718,328, Cl. 271-20.000.
- Comstock, Lowell R.; and Smith, Percy L., to Union Carbide Corporation. Unsaturated polyester compositions. 3,718,714, Cl. 260-862.000.
- Conger, Marvin T.; and Evans, Theodore A., to Goodyear Tire & Rubber Company, The. Polyurethane form reticulated by fire-polishing method. 3,718,613, Cl. 260-2.5bd.
- Conklin, John R., to De Laval Separator Company, The. Basket centrifuge with self-triggering sludge discharge. 3,718,278, Cl. 233-19.00a.
- Conrad Industries, Inc.: *See—*
  - Doumany, Constantine R., 3,718,154.
- Consolidated Paper (Bahamas) Limited: *See—*
  - Stringer, Peter Jack Eldon Crawford; Knight, Richard Langhiam Castle; and Wayne, Donald Gordon, 3,718,037.
- Consolidation Coal Company: *See—*
  - Yavorsky, Paul M.; and Gorin, Everett, 3,718,691.
- Construction Specialties, Inc.: *See—*
  - Olsen, Robert W.; and Herrick, Richard E., 3,717,968.
- Conti, Donald J.; and Reilly, Thomas L. Under-voltage protection device. 3,718,839, Cl. 317-31.000.
- Continental Can Company, Inc.: *See—*
  - Bagguley, Richard B., 3,718,234.
  - Bartels, Herbert D., 3,718,107.
  - Naggert, Dietrich K., 3,717,971.
- Continental Oil Company: *See—*
  - Hill, William L., 3,718,366.
  - Kleinpeter, Joseph A., 3,718,581.
  - Rogers, Lynn C.; and Hunt, Mack W., 3,718,589.
  - Weimer, Dean R., 3,718,609.
- Cook, Calvin S.: *See—*
  - Lohr, Raymond J.; and Cook, Calvin S., 3,718,344.
- Cook, Charles Calvin; and Haynsworth, Erwin Mathew, to American Cyanamid Company. Process for producing land-fills. 3,718,003, Cl. 61-35.000.
- Cook, Rufus Lee; and Folds, Donald L., to United States of America, Navy. Transducer. 3,718,898, Cl. 340-10.000.
- Cooke, William Ernest; Cote, Jacques Francois; Innes, Robert Arthur; Spooner, Roy Cowieson; and Kellermann, Walter Maria Eduard, to Alcan Research and Development Limited. Continuous electrolytic treatment for cleaning and conditioning aluminum surfaces. 3718,547, Cl. 204-28.000.
- Cooper, Dexter P., Jr., to Bell & Howell Company. Image display from continuously moving image carrier. 3,718,389, Cl. 352-109.000.
- Cooper, Robert B., Jr., 1/2 to Sossen, Edwin J. Etched inductance bandpass filter. 3,718,874, Cl. 333-73.00s.
- Cordis Corporation: *See—*
  - Ushakoff, Alexis E., 3,718,436.
- Cormany, Joseph L., Jr.: *See—*
  - Bhakuni, Roop S.; and Cormany, Joseph L., Jr., 3,718,587.
- Corteg, Walter V.: *See—*
  - Fischer, Raymond G.; Henckel, Marvin H.; Corteg, Walter V.; and Frig, Gerald E., 3,718,364.
- Cossar, Bernard C.: *See—*
  - Janssen, Donald E.; Reynolds, Delbert D.; and Cossar, Bernard C., 3,718,464.
- Costello, Bernard J., to Argus Engineering Company, Inc. Infra-red heating apparatus. 3,718,800, Cl. 219-85.000.
- Cote, Jacques Francois: *See—*
  - Cooke, William Ernest; Cote, Jacques Francois; Innes, Robert Arthur; Spooner, Roy Cowieson; and Kellermann, Walter Maria Eduard, 3,718,547.
- Cozewith, Charles: *See—*
  - Gardner, Irwin J.; and Cozewith, Charles, 3,718,632.
- Crano, John C.; and Trenta, Gerald M., to PPG Industries, Inc. Polychloral homopolymers containing polyethers, polyolefins, or polyurethanes. 3,718,711, Cl. 260-823.000.
- Craven, Robert L.: *See—*
  - Bonner, Willard H.; and Craven, Robert L., 3,717,904.
- Crawford, Robert W.; and Witsiepe, William K., to Du Pont de Nemours, E. I., and Company. Blends of thermoplastic copolyester elastomers with vinyl chloride polymers. 3,718,715, Cl. 260-873.000.
- CRC-Crose International, Inc.: *See—*
  - Randolph, James B.; Nelson, Jerome W.; Paysinger, Joe R.; and Crump, E. Eugene, 3,718,798.
- Cronan, Philip J. Spring trigger assembly for mixing dual liquids. 3,718,235, Cl. 222-145.000.
- Crookston, James A.; and Charles, Glen W., to Green, A. P., Refractories Co. Insulating castable. 3,718,489, Cl. 106-64.000.
- Crosno, Philip M., to Cartridge Television, Inc. Interlacing system for skip-field magnetic recording and reproducing. 3,718,755, Cl. 178-6.6sf.
- Cross, David C.: *See—*
  - Howard, Dean D.; and Cross, David C., 3,718,927.
- Crump, E. Eugene: *See—*
  - Randolph, James B.; Nelson, Jerome W.; Paysinger, Joe R.; and Crump, E. Eugene, 3,718,798.
- CTS Corporation: *See—*
  - Beaver, Thomas R., 3,718,106.
- Culp, Fred E.: *See—*
  - Taylor, Richard P.; Van Brimmer, Russell H.; and Culp, Fred E., 3,717,945.
- Cunningham, Francis V., to Joslyn Mfg. and Supply Co. Device for coupling high voltage cables. 3,718,749, Cl. 174-73.00r.
- Dafler, Gene L.; and Magyar, Lorand W., to General Motors Corporation. Circuit breaker. 3,718,162, Cl. 337-94.000.
- Dahle, Norman A.; and Doyle, William C., Jr., to Gulf Research & Development Company. Combating unwanted vegetation with 2-aryl-5-substituted 1,3,4-oxadiazoles. 3,718,452, Cl. 71-92.000.
- Dal-Air Tool Company: *See—*
  - Northcutt, Oren Van, 3,718,352.
- Dally, James W., to IIT Research Institute. Tension indicating fastener. 3,718,066, Cl. 85-62.000.
- D'Alo, Bruno: *See—*
  - Parmeggiani, Paolo; Nicita, Domenico; and D'Alo, Bruno, 3,718,270.
- Damon Corporation: *See—*
  - Perry, Wesley G.; and Marten, James F., 3,718,133.
- Daniele, Phillip Paul: *See—*
  - Angner, Ronald Joseph; and Daniele, Phillip Paul, 3,718,781.
- Dardaine, Edgar J.; and Berry, Jean-Luc, to Remy, E. P., & Cie. Multipurpose grouping device for an encasing-uncasing machine. 3,718,246, Cl. 198-34.000.
- Dark, Patrick M., to Moog Inc. Screwdown control system for rolling mills. 3,718,016, Cl. 72-8.000.
- Darling, Jacob B.; and La Boda, Mitchell. Electrochemical machining electrolyte. 3,718,555, Cl. 204-129.750.
- Darrow, Kenneth A.: *See—*
  - Hibbs, Louis E., Jr.; Holub, Fred F.; and Darrow, Kenneth A., 3,718,447.
- Data Card Corporation, mesne: *See—*
  - Deschenes, Raymond J.; and Macdonald, Robert N., 3,718,764.
- Davis, Andrew M.: *See—*
  - Salzano, Francis J.; Davis, Andrew M.; and Isaacs, Hugh S., 3,718,546.
- Davis, Edward P.: *See—*
  - Gould, Eric G.; and Davis, Edward P., 3,718,721.
- Davis, James W.; Umina, Anthony P.; and Kelley, Nancy J., to United States of America, Army. Method for preparing storage-stable bakery products within hermetically sealed containers. 3,718,483, Cl. 99-182.000.
- Davis, Jefferson W. Alkylidine and arylidine amino acid esters, and alkyl and aryl amino acid esters. 3,718,688, Cl. 260-482.00r.
- Davis, Richard H. Color data acquisition camera. 3,718,074, Cl. 95-1.100.
- Davis, Warren B., to Superior Oil Company. Transducer amplifier system. 3,718,901, Cl. 340-17.000.
- Dayco Corporation: *See—*
  - Freedlander, Abraham L.; Garrett, Wayne C.; and Matthews, Robert E., 3,717,985.
- De Felice, Amedio P. Mechanical and pneumatic knockout pin. 3,718,415, Cl. 425-444.000.
- De Geleke, Gerrit: *See—*
  - Mount, Robert E.; De Geleke, Gerrit; and Pundyk, Joseph, 3,718,302.
- De Gelleke, Gerrit: *See—*
  - Mount, Robert E.; De Gelleke, Gerrit; and Pundyk, Joseph, 3,718,303.
- De Laval Separator Company, The: *See—*
  - Conklin, John R., 3,718,278.
- Dean, Donald N.: *See—*

  - Mahoney, Robert J.; Dean, Donald N.; and Uzuanis, Joseph, Jr., 3,718,296.
- Decicom Systems, Inc.: *See—*
  - Goldstein, Amnon, 3,718,515.
- Deering Milliken Research Corporation: *See—*
  - Wylie, Richard D.; and Morrison, Bobby, 3,717,940.
- Deica, Neculai: *See—*
  - Braniski, Alexandru I.; Ionescu, Teodor; and Deica, Neculai, 3,718,492.
- Del Mar Engineering Laboratories: *See—*
  - Sanctuary, Clifford, 3,718,772.
- Del Vecchio, Michael. Motorized aqua disc. 3,718,111, Cl. 115-70.000.
- Delgadillo, Fred M. Burglar-proof locking device. 3,718,014, Cl. 70-56.000.
- Delta Exploration Company, Inc.: *See—*
  - Babb, John J.; and Bays, Marvin G., 3,718,206.
  - Babb, John J., 3,718,207.
- Demag Aktiengesellschaft: *See—*
  - Trost, Werner, 3,718,265.
- Demare, Baltzar Leo. Clinical manipulator. 3,717,885, Cl. 5-61.000.
- Denki Onkyo Co., Ltd.: *See—*
  - Masuda, Noboru; and Kobayashi, Tunekazu, 3,718,882.
- Denniston, Donald W.: *See—*
  - Drummond, Warren W.; and Denniston, Donald W., 3,718,448.
- Denny, Patrick John; and Dowden, Dennis Albert, to Imperial Chemical Industries Limited. Catalytic composition. 3,718,498, Cl. 117-97.000.
- Dental, Andrew Gomperz; Van Uitert, Le Grand Gerard; and Williams, John Charles, to Bell Telephone Laboratories, Incorporated. Fluorescent high alumina substrates. 3,718,601, Cl. 252-301.40r.
- Depaolo, George Robert: *See—*
  - Stackel, Richard Frederick; and Depaolo, George Robert, 3,718,501.
- Dergunova, Viktoria Sergeevna: *See—*
  - Anikin, Leonid Trifonovich; Kravetsky, Gennady Alexandrovich; Dergunova, Viktoria Sergeevna; and Dutov, Valery Vasilievich, 3,717,926.
- Dernedde, Robert; and Freese, Heinz, to Klein Schanzlin & Becker Aktiengesellschaft. Hydrostatic ring seal construction. 3,718,335, Cl. 277-26.000.
- Dernovshek, Joseph Frank; and Bermingham, Peter D., to Goodyear Tire & Rubber Company, The. Rotating brake disc subassembly with segmented beryllium core. 3,718,210, Cl. 188-218.0xl.
- Deschenes, Raymond J.; and Macdonald, Robert N., to Data Card Corporation, mesne. Terminal unit for credit account maintenance system. 3,718,764, Cl. 179-2.0dp.
- Dewald, Chester L.: *See—*
  - Baker, Don R.; Tilles, Harry; and Dewald, Chester L., 3,718,455.
- Dewey, Michael Albert Pike, to Fulmer Research Institute Limited. Cobalt-base alloys. 3,718,461, Cl. 75-171.000.
- Diamond International Corporation: *See—*
  - Reifers, Richard F.; and Bixler, Kenneth D., 3,718,274.
- Diamond, Louis; and Lipscomb, William T., to University of Kentucky Research Foundation, The, mesne. Pneumotachograph. 3,718,135, Cl. 128-2.080.
- Diamond Shamrock Corporation: *See—*
  - Germano, Victor V., 3,718,509.
- Dietrich, Karl-Heinz: *See—*
  - Pfeifer, Josef; Ambraschka, Kasimir; Koopmann, Adolf; Hofmann, Wilfried; Dietrich, Karl-Heinz; and Rauffer, Walter, 3,718,391.
- Dietrick, Gerald P. Pump and valve unit for electrical discharge machining equipment. 3,718,408, Cl. 417-178.000.
- Dietsche, Wolfram; Adolphi, Heinrich; Beutel, Peter; and Koenig, Karl-Heinz. Phosphoric esters. 3,718,661, Cl. 260-308.00c.
- Diffenderfer, Walter L.: *See—*
  - McFarland, Frederick R.; and Diffenderfer, Walter L., 3,717,895.
- Dilling, Peter: *See—*
  - Falkehag, Sten I.; and Dilling, Peter, 3,718,639.
- Divita, Sam: *See—*
  - Frey, Dennis L.; Divita, Sam; and Smoke, Edward J., 3,718,730.
- Doan, Hazen V.: *See—*
  - Plomer, John J.; Doan, Hazen V.; and Slykhouse, Thomas E., 3,718,069.
- Doerr, Albert H., to Marmon Group, Inc., The. Shell core testing apparatus. 3,718,035, Cl. 73-95.000.
- Dollhausen, Manfred: *See—*
  - Bock, Eugen; and Dollhausen, Manfred, 3,718,518.
- Dolph, Norman, and: *See—*
  - Berkovitz, Robert A., 3,718,773.
- Donn, Edward S.; and Knauber, Ronald L. Digital surveillance system. 3,718,925, Cl. 340-413.000.
- Donnally, Robert B., to Moore, Lee C., Corporation. Oil well derrick substructure with carriages for blowout preventers. 3,718,266, Cl. 214-2.500.
- Donofrio, Nicholas M.; and Linton, Richard H., to International Business Machines Corporation. Fet address decoder. 3,718,826, Cl. 307-251.000.
- Dorjee, Hendrik; and Lesterhuis, Jan, to North American Philips Co., Inc. Multiple connector. 3,718,885, Cl. 339-17.0lc.
- Double Envelope Corporation: *See—*
  - Vandergrift, Don W.; and Secrist, David E., 3,718,276.
- Doumany, Constantine R., to Conrad Industries, Inc. Washing machine outlet box. 3,718,154, Cl. 137-360.000.
- Dow Chemical Company, The: *See—*
  - Foerster, George S., 3,718,460.
  - Martin, George Robert, 3,718,607.
  - Nyquist, Edwin B., 3,718,500.
  - Plomer, John J.; Doan, Hazen V.; and Slykhouse, Thomas E., 3,718,069.
  - West, Peter; and Woodville, Mary C., 3,718,703.
- Dowden, Dennis Albert: *See—*
  - Denny, Patrick John; and Dowden, Dennis Albert, 3,718,498.
- Downs, Martin L.; and Schmitt, Milton G., to Thilmany Pulp & Paper Company. Composite board and method of manufacture. 3,718,536, Cl. 161-168.000.
- Doyle, William C., Jr.: *See—*
  - Dahle, Norman A.; and Doyle, William C., Jr., 3,718,452.
- DP Way Corporation: *See—*
  - Johnstone, Duncan, 3,717,901.
- Drabb, Thomas Walter, Jr.: *See—*
  - Addor, Roger Williams; and Drabb, Thomas Walter, Jr., 3,718,718.
- Dreher, Hans C., to General Cigar Co., Inc. Machine for the helical movement of cylindrical objects. 3,718,247, Cl. 198-127.000.
- Droll, Hans. Inserting tool for inserting coils into stator grooves. 3,717,918, Cl. 29-205.00r.
- Droulin, Jean Louis: *See—*
  - Trubert, Georges; and Droulin, Jean Louis, 3,718,924.
- Drummond, Warren W.; and Denniston, Donald W., to PPG Industries, Inc. Glass fiber forming and coating process. 3,718,448, Cl. 65-3.000.
- Du Pont de Nemours, E. I., and Company: *See—*
  - Atkinson, Cliff C.; Butler, Rolland O.; and Ross, Francis J., 3,717,929.
  - Beste, Lawrence F.; Jones, Edward B.; and Yates, Paul C., 3,718,584.
  - Bonner, Willard H.; and Craven, Robert L., 3,717,904.
  - Carlson, Harrison Cornforth; and Hess, Wayne Thomas, 3,718,731.
  - Crawford, Robert W.; and Witsiepe, William K., 3,718,715.
  - Gervay, Joseph Edmond; and Walker, Peter, 3,718,473.
  - Grot, Walther Gustav, 3,718,627.
  - Jacobson, Howard W., 3,718,494.
  - Jennings, Uel Duane; and Sparling, Wayne Clifford, 3,718,288.
  - Jones, Thurman Ralston, Jr., 3,718,414.
  - Leverett, Glen Frederick, 3,718,630.
  - Reilly, Thomas A.; Reitz, Charles F.; and Smith, Robert D., 3,718,181.
  - Ripka, William Charles, 3,718,673.
  - Summers, John C., 3,718,658.
  - Trofimenko, Swiatoslaw; and Vaughan, Lawrence G., 3,718,488.
  - Williamson, James A., Jr., 3,718,429.
  - Wyeth, Nathanial Convers; Roseveare, Ronald Newman; and Carmichael, Keith Stewart, 3,718,229.
  - Yates, Paul C., 3,718,491.
- Du Rose, Arthur H.; and Stern, Robert L., to Kewanee Oil Company. Alkaline nickel plating solutions. 3,718,549, Cl. 204-49.000.
- Dunham, Russell H.; Moody, Harry A.; and Skahen, Don H., to Dunham Tool Company, Inc., The. Workpiece stop assembly for contracting collet chucks. 3,718,339, Cl. 279-51.000.
- Dunham Tool Company, Inc., The: *See—*
  - Dunham, Russell H.; Moody, Harry A.; and Skahen, Don H., 3,718,339.
- Dupre, Barry E., to North American Car Corporation. Modular home rack for vehicles. 3,718,363, Cl. 296-14.000.
- Duren, John B. Vehicle carrier assembly. 3,718,225, Cl. 214-450.000.
- Dutch, Emery. Thermometer spinner. 3,718,045, Cl. 73-373.000.
- Dutov, Valery Vasilievich: *See—*
  - Anikin, Leonid Trifonovich; Kravetsky, Gennady Alexandrovich; Dergunova, Viktoria Sergeevna; and Dutov, Valery Vasilievich, 3,717,926.
- Dyer, Gerald T., to Polaroid Corporation. Process for thiouracil production. 3,718,649, Cl. 260-251.00r.
- Dynalite Corporation: *See—*
  - Hull, Donald R.; and Simonton, Robert D., 3,718,174.
- Dynamit Nobel Aktiengesellschaft: *See—*
  - Wienand, Michael; Jensen, Klaus; Primessing, Franz; and Alfter, Franz-Werner, 3,717,916.
- Dzioba, Don L.: *See—*
  - Roth, Alton A.; Dzioba, Don L.; and Yonker, John F., 3,718,788.
- Eagle, George R., to Telex Corporation, The. Continuous loop magnetic tape cartridge. 3,718,297, Cl. 242-55.19a.
- Eastern Rotorcraft Corporation: *See—*
  - Huber, John Richard, 3,718,315.
- Eastman Kodak Company: *See—*
  - Bracken, Thomas W.; Laughon, Thomas C.; and Smith, Gerald C., 3,718,807.
  - Edwards, Evan A.; and Tone, Frederick F., 3,718,471.
  - Fumia, Arthur, Jr.; and Heseltine, Donald W., 3,718,476.
  - Harvey, Donald M., 3,718,392.
  - Janssen, Donald E.; Reynolds, Delbert D.; and Cossar, Bernard C., 3,718,464.
  - Jenkins, Philip W., 3,718,477.
  - Miller, Howard A., 3,718,594.
  - Moore, Robert S., 3,718,383.
  - Oliver, Gene L.; and Harbison, Judith M., 3,718,472.
  - Schrader, Robert W., 3,718,728.
  - Spencer, John; and Janssen, Donald E., 3,718,470.

Ebrey, John Alfred Charles; and Gough, George Terah, to Gough and Company (Hanley) Limited. Electrophoretic casting of pottery. 3,718,564, Cl. 204-181.000.

Echelmeier, Robert H.: *See—*
- Bate, Geoffrey; Echelmeier, Robert H.; Everett, Larry H.; Kehr, William D.; Schaps, Joseph E.; Taylor, Gerald; and Thornley, Richard F. M., 3,718,776.

Eck, Albert: *See—*
- Rau, Gottfried; and Eck, Albert, 3,718,027.

Eck, Francis B. Power transfer system. 3,718,051, Cl. 74-216.300.

Eckert, Konrad; Knapp, Heinrich; and Engel, Gerhard, to Bosch, Robert, G.m.b.H. Apparatus for regulating the air-fuel mixture in an externally ignited internal combustion engine operating on injected fuel. 3,718,123, Cl. 123-140.0cc.

Eckert, Rudolf J. A., to Shell Oil Company. Lubricant compositions containing terpolymers. 3,718,591, Cl. 252-49.800.

Edrich, Jochen, to United States of America, Navy. Non-degenerative parametric amplifier. 3,718,866, Cl. 330-4.900.

Edwards, Carl D.: *See—*
- Lummus, James L.; Anderson, Duane B.; and Edwards, Carl D., 3,718,585.

Edwards, Evan A.; and Tone, Frederick F., to Eastman Kodak Company. Film record card. 3,718,471, Cl. 96-75.000.

Efstathiou, John: *See—*
- Soule, Winsor, Jr.; and Efstathiou, John, 3,718,911.

Egnaczak, Raymond K.: *See—*
- Zurovskis, Egon; and Egnaczak, Raymond K., 3,718,393.

Eickstedt, Klaus-Wolf Von: *See—*
- Zeugner, Horst; Eickstedt, Klaus-Wolf Von; Stuhmer, Werner; and Funke, Siegfried, 3,718,666.

Eikevik, Arne. Gate valve and method of making the same. 3,718,314, Cl. 251-329.000.

Ekman, Carl F. W., to Itek Corporation. Diffusion transfer element and method. 3,718,465, Cl. 96-29.000.

Electronic Research Associates, Inc.: *See—*
- Schoengold, Herbert, 3,718,779.

Electrospace Corporation: *See—*
- Spyrou, Constantine A.; and Klein, George P., 3,718,854.

Ellis Corporation: *See—*
- Toth, Alex, 3,718,013.

Ellis, Lynn W., to International Telephone and Telegraph Corporation. Multiplex out-of-band signaling system. 3,718,767, Cl. 179-15.0bm.

Ellwanger, Charles G.; and Pedersen, Harry, to Gleason Works, The. Machine for lapping gears. 3,717,958, Cl. 51-26.000.

Eltzroth, Richard E.; and Fewell, Larry K., to General Motors Corporation. Bonding tip. 3,718,272, Cl. 228-3.000.

Emerson, Carl D.; and Aichenegg, Paul C., to Baychem Corporation, mesne. Sulfur containing carboxylic acids. 3,718,687, Cl. 260-479.00r.

Emmet, Robert T. Method of analyzing of ammonia, urea, and tyrosine. 3,718,433, Cl. 23-230.00r.

Endo, Yasuo: *See—*
- Oiso, Mitsuo; and Endo, Yasuo, 3,718,903.

Endtinger, Fritz: *See—*
- Paulet, Jean-Francois; and Endtinger, Fritz, 3,718,548.

Engel, Gerhard: *See—*
- Eckert, Konrad; Knapp, Heinrich; and Engel, Gerhard, 3,718,123.

Engel Industries, Inc.: *See—*
- McClain, Lamont R.; and Slavik, Emil L., 3,718,022.

Engert, Heinz: *See—*
- Tupaj, Manfred Paul; and Engert, Heinz, 3,718,777.

Entwisle, John Hubert; and Griffiths, Robert William, said Entwisle assor. to Imperial Chemical Industries Limited. Process for the recovery of mercury from waste brine from mercury cells. 3,718,457, Cl. 75-108.000.

Eprad Incorporated: *See—*
- Boudouris, Angelo; and Plumadore, Harold M., 3,718,388.

Erdman, William Charles; and Miller, Paul, to Bell Telephone Laboratories, Incorporated. Removal of projections on epitaxial layers. 3,718,514, Cl. 156-17.000.

Ericson, John F. E.: *See—*
- Lund, Harold E.; and Ericson, John F. E., 3,718,228.

Eriksoo, Edgar; Fex, Hans; Hogberg, Knut Bertil; Mollberg, Rene; and Rohte, Oskar, to Aktiebolaget Leo. N-Arylacylamino-alkyl-and-alkylidene-dibenzo [a,d] cycloheptenes and anthracenes and the salts thereof. 3,718,694, Cl. 260-570.50c.

ESB Incorporated: *See—*
- Werth, John J., 3,718,505.

Esclamadon, Christian; Labat, Yves; and Signouret, Jean-Baptiste, to Societe Anonyme dite: Societe Nationale des Petroles d'Aquitaine. Useful dithiols, their preparation and compositions made from them. 3,718,700, Cl. 260-609.00r.

Esso Production Research Company: *See—*
- Bayless, Jack H.; and Penberthy, Walter L., Jr., 3,718,184.
- Terry, William M., 3,718,189.

Esso Research and Engineering Company: *See—*
- Gardner, Irwin J.; and Cozewith, Charles, 3,718,632.

Ethyl Corporation: *See—*
- Hnizda, Vincent F., 3,718,444.
- Kehoe, Lawrence J.; and Schell, Raymond A., 3,718,676.

Eumuco Aktiengesellschaft fur Maschinenbau: *See—*
- Rau, Gottfried; and Eck, Albert, 3,718,027.
- Werner, Eberhard, 3,718,025.

Evans, Theodore A.: *See—*
- Conger, Marvin T.; and Evans, Theodore A., 3,718,613.

Evans, William R., to ACF Industries, Incorporated. Apparatus and method for fabricating a container. 3,718,803, Cl. 219-158.000.

Everett, Larry H.: *See—*
- Bate, Geoffrey; Echelmeier, Robert H.; Everett, Larry H.; Kehr, William D.; Schaps, Joseph E.; Taylor, Gerald; and Thornley, Richard F. M., 3,718,776.

Everett, Thomas G., Jr.: *See—*
- Baird, Robert J.; and Everett, Thomas G., Jr., 3,717,914.

Evers-Euterneck, Ernst T., to United States of America, Army. Angular sensing system using a pair of strapped-down rate gyros. 3,718,292, Cl. 244-3.110.

Eversberg, Gerhard: *See—*
- Seelbach, Heinz; and Eversberg, Gerhard, 3,718,816.

Eversheim, Paul: *See—*
- Teubler, Adolf; and Eversheim, Paul, 3,717,915.

Eyles, Leonard William, to Lucas, Joseph, (Industries) Limited. Control arrangement for hydraulic transmission system. 3,717,992, Cl. 60-19.000.

Fa. Reininghaus & Co.: *See—*
- Seelbach, Heinz; and Eversberg, Gerhard, 3,718,816.

Fabrique Nationale d'Armes de Guerre, Societe Anonyme: *See—*
- Chavee, Rene M. J., 3,717,946.
- Theate, Paul, 3,718,091.

Fagerholt, Gunnar Rindal, to Smidth, F. L., & Co. Method and apparatus for grinding mineral materials. 3,718,286, Cl. 241-30.000.

Fahey, Dennis M., to PPG Industries, Inc. Sizing, coating and combined sizing and coating composition for glass fibers. 3,718,449, Cl. 65-3.000.

Fair, Delbert W.; and Brown, Graydon L. Bore hole seismic transducer. 3,718,205, Cl. 181-.50h.

Fairfield Plastics Incorporated: *See—*
- Cochran, Raymond J., 3,718,239.

Falkehag, Sten I.; and Dilling, Peter, to Westvaco Corporation. Process for producing cationic lignin amines. 3,718,639, Cl. 260-124.00a.

Farbenfabriken Bayer Aktiengesellschaft: *See—*
- Lehment, Klaus-Friedrich; and Raue, Roderich, 3,718,642.
- Plumpe, Hans; and Puls, Walter, 3,718,660.

Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning: *See—*
- Albrecht, Konrad, 3,718,454.
- Bohme, Horst; and Ahrens, Kurt-Henning, 3,718,659.
- Kuch, Heinz; and Hoffmann, Irmgard, 3,718,645.

Farmer, Ray H.: *See—*
- Willem Gilbert C.; and Farmer, Ray H., 3,718,293.

Farrand, Roy; and Hull, Roy, to Imperial Chemical Industries Limited. 1-(α-Cyanomethylene-hydrazino)-phenoxy-3-aminopropan-2-ols. 3,718,678, Cl. 260-465.00d.

Fast, Clarence R.: *See—*
- Bearden, William G.; Fast, Clarence R.; and Mallinger, Morton A., 3,718,088.

Faulkner, Roy Gwyn; and Bridges, Peter John, to International Nickel Company, Inc., The. Composite metal products. 3,718,443, Cl. 29-196.600.

Feed Recycling Co.: *See—*
- Whittingham, Barron S., 3,718,504.

Felder, Winfried; and Kuhn, Walter, to Zahnradfabrik Friedrichshafen Aktiengesellschaft. Gear shift control for automotive transmissions and the like. 3,718,056, Cl. 74-865.000.

Felfe, Peter F.: *See—*
- Berkovitz, Robert A., 3,718,773.

Fenne, Ivor, to C.A.V. Limited. Fuel injection nozzle units. 3,718,283, Cl. 239-533.000.

Fenyes, Joseph G. E., to Chevron Research Company. N-Phenyl sulfenamides and their use as fungicides and onicides. 3,718,738, Cl. 424-32.00h.

Fenyes, Joseph G. E., to Chevron Research Company. N-Phenyl sulfenamides and their use as fungicides and onicides. 3,728,738, Cl. 424-32.00h.

Ferdinand, Groh: *See—*
- Schleupen, Richard; and Ferdinand, Groh, 3,718,201.

Fernstrom, Gustaf Harry: *See—*
- Berger, Karl Gustav; and Fernstrom, Gustaf Harry, 3,718,410.

Ferrer-Batlles, Jorge: *See—*
- Ferrer-Salat, Carlos; Ferrer-Batlles, Jorge; and Colome-Riera, Juan, 3,718,655.

Ferrer-Salat, Carlos; Ferrer-Batlles, Jorge; and Colome-Riera, Juan, to Laboratorios Ferrer S.L. Certain diisoniazid methane sulfonate complexes. 3,718,655, Cl. 260-294.80h.

Ferro-Corporation: *See—*
- Jespers, Gerard P., 3,718,320.

Fewell, Larry K.: *See—*
- Eltzroth, Richard E.; and Fewell, Larry K., 3,718,272.

Fex, Hans: *See—*
- Eriksoo, Edgar; Fex, Hans; Hogberg, Knut Bertil; Mollberg, Rene; and Rohte, Oskar, 3,718,694.

Fiedler, Dolores E.: *See—*
- Pagano, Anthony M.; and Fiedler, Dolores E., 3,718,143.

Fila, Dominick, to Tri-Line Electric Co., Inc. Rotary switch assembly. 3,718,786, Cl. 200-63.000.

Filper Corporation: *See—*
- Meissner, Konrad Emil, 3,718,223.

Firestone Tire & Rubber Company, The: *See—*
- Antkowiak, Thomas A., 3,718,702.
- Cheng, Tai Chun; and Halasa, Adel F., 3,718,638.

Fischer, Artur. Fastening system. 3,718,067, Cl. 85-68.000.

Fischer, Horst; and Neufelder, Manfred, to Battelle-Entwicklungs-Gesellschaft m.b.H. Flame ionisation detector. 3,718,430, Cl. 23-254.00e.

Fischer, Raymond G.; Henckel, Marvin H.; Corteg, Walter V.; and Frig, Gerald E., to General Motors Corporation. Vehicle body and frame construction. 3,718,364, Cl. 296-28.00r.

Fischer, Wilfried; and Rohr, Franz-Josef, to Aktiengesellschaft Brown, Boveri & Cie. Fuel cell system for reacting hydrocarbons. 3,718,506, Cl. 136-86.00c.

Fischer-Brodbeck G.m.b.H., Prazisionsteile-Fabrik: *See—*
- Maier, Heinz, 3,718,055.

Fishman, Jack B.; and Mutschler, William E., to Nucleonics Development Company. Ionization gas flow meter with pulse servo. 3,718,043, Cl. 73-194.00f.

Fisons Limited: *See—*
- Cairns, Hugh; and Minshull, Robert, 3,718,668.

Flatz, Wolfgang, to Sandoz Ltd. Process for the production of perborates. 3,718,735, Cl. 423-281.000.

Fleming, Donald Kingsley; Randhava, Sarabjit Singh; and Camara, Elias Humberto, to Institute of Gas Technology. CO shift process. 3,718,418, Cl. 423-415.000.

Fleming, Robert W.: *See—*
- Sill, Arthur D.; and Fleming, Robert W., 3,718,685.

Fleskes, Timothy E.: *See—*
- Hegar, Frank; and Fleskes, Timothy E., 3,718,213.

Fletcher, Roger Florin, to Bell Telephone Laboratories, Incorporated. Sealed contact matrix switch having a flexible membrane at a crosspoint opening. 3,718,876, Cl. 335-152.000.

Fletcher, William D., III: *See—*
- West, John M.; and Fletcher, William D., III, 3,718,539.

Fletcher-Terry Company, The: *See—*
- Insolio, Thomas A., 3,718,268.

Florjancic, Peter. Apparatus for producing annularly closed, interconnected elements. 3,718,420, Cl. 425-441.000.

Foerster, George S., to Dow Chemical Company, The. Mg-Al-Si alloy. 3,718,460, Cl. 75-168.00m.

Folds, Donald L.: *See—*
- Cook, Rufus Lee; and Folds, Donald L., 3,718,898.

Food Technology, Inc.: *See—*
- Glabe, Elmer F., 3,718,484.

Formica Corporation: *See—*
- Willard, Jack August, 3,718,496.

Forsythe, John D. Safety belt. 3,718,241, Cl. 224-5.00a.

Foster, Phillip W. Coupling for detachable implements. 3,718,222, Cl. 214-145.000.

Foster-Pegg, Richard W. Regenerative afterburner for air pollution elimination. 3,718,440, Cl. 23-277.00c.

Fothergill, Reginald Allan; Bennett, Reginald Frank Charles; Risley, Gerald Thomas; and Weeks, William Stanley, to United Kingdom Atomic Energy Authority. Nuclear explosion detection systems. 3,718,918, Cl. 340-213.00r.

Fournier, Joseph R.: *See—*
- Bosworth, Delbert B.; and Fournier, Joseph R., 3,718,250.

Frank, Dieter: *See—*
- Wallrabenstein, Michael; Schopf, Albert; and Frank, Dieter, 3,718,625.

Fraser, David Bruce; O'Bryan, Henry Miles, Jr.; and Thomson, John, Jr., to Bell Telephone Laboratories, Incorporated. Use of water soluble lanthanum compounds in lead zirconate-lead titanate ceramics. 3,718,723, Cl. 264-61.000.

Frederick, Albert R.; Paine, Joseph L.; and Rosser, Daniel B., to General Electric Company. Modular rectifier holding assembly with heat sink supporting circuit protecting means. 3,718,841, Cl. 317-100.000.

Freed, Roy F. Amusement vehicle. 3,718,342, Cl. 280-87.010.

Freedlander, Abraham L.; Garrett, Wayne C.; and Matthews, Robert E., to Dayco Corporation. Mower blade. 3,717,985, Cl. 56-295.000.

Freeman, William H.; Peterson, Leavitt A.; and Wandrisco, Joseph M., said Peterson assor. to said Bessemer and Lake Erie Railroad Company, said Freeman assor. to Quebec Cartier Mining Company and said Wandrisco assor. to United States Steel Corporation. Mehod and apparatus for evaluating railroad track structure and car performance. 3,718,040, Cl. 73-146.000.

Freeman, William J.: *See—*
- Stone, Charles W., 3,717,977.

Freese, Heinz: *See—*
- Dernedde, Robert; and Freese, Heinz, 3,718,335.

Freightliner Corporation: *See—*
- Self, Kenneth W.; Chew, Norman B.; and Twyman, Bill I., 3,718,346.

Frey, Dennis L.; Divita, Sam; and Smoke, Edward J., to United States of America, Army, mesne. Method of treating barium titanate. 3,718,730, Cl. 423-81.000.

Fried, Josef; Pribyl, Edward J.; and Krapcho, John, to Squibb, E. R., & Sons, Inc. Derivatives of bis(p-hydroxyaryl)alkanoic acids. 3,718,643, Cl. 260-243.00b.

Fries, Karl, to Akzona Incorporated. Heatable pin assembly for treating thread. 3,717,910, Cl. 28-62.000.

Frig, Gerald E.: *See—*
- Fischer, Raymond G.; Henckel, Marvin H.; Corteg, Walter V.; and Frig, Gerald E., 3,718,364.

Frobel, Arthur: *See—*
- Priebel, Wolfgang; and Frobel, Arthur, 3,718,245.

Frosst, Charles E., & Co.: *See—*
- Weinstock, Leonard M.; Tull, Roger J.; and Mulvey, Dennis M., 3,718,647.

Fuji Photo Film Co., Ltd.: *See—*
- Hatano, Tadao; Hara, Hikoharu; Sugiyama, Masatoshi; and Ohi, Reiichi, 3,718,469.
- Shiba, Keisuke; and Sato, Akira, 3,718,475.
- Tamai, Yasuo, 3,718,593.

Fujii, Akira. Automatic air flow smoothing apparatus. 3,718,156, Cl. 137-512.100.

Fujisawa, Tamotsu; and Yamamoto, Mizuo, to Sagami Chemical Research Center. Process of preparing 4,4'-dithiobis (2,6-di-t-butylphenol). 3,718,699, Cl. 260-608.000.

Fujita, Kinji, to Kabushiki Kaisha Suwa Seikosha. Time correction device for digital watches. 3,717,990, Cl. 58-50.00r.

Fujitsu Limited: *See—*
- Oiso, Mitsuo; and Endo, Yasuo, 3,718,903.

Fuller, David L., to Scripto, Inc. Shutter assembly for photographic equipment. 3,718,079, Cl. 95-62.000.

Fulmer Research Institute Limited: *See—*
- Dewey, Michael Albert Pike, 3,718,461.

Fumia, Arthur, Jr.; and Heseltine, Donald W., to Eastman Kodak Company. Silver halide element containing merocyanine dyes with a 3-pyrrolinylalkyl group. 3,718,476, Cl. 96-127.000.

Funke, Siegfried: *See—*
- Zeugner, Horst; Eickstedt, Klaus-Wolf Von; Stuhmer, Werner; and Funke, Siegfried, 3,718,666.

Furbeck, Warren R., to International Paper Company, mesne. Air laying apparatus. 3,717,905, Cl. 19-148.000.

Gabella, Aristides A. Bumper and brake actuator assembly. 3,718,356, Cl. 293-5.000.

GAF Corporation: *See—*
- Schultz, Herman S., 3,718,634.
- Streck, Clemens, 3,718,428.

Gagliardi, Louis J.: *See—*
- Waters, Ernest, 3,717,979.

Gaiduchik, Vladimir Olegovich: *See—*
- Afanasiev, Vadim Nikolaevich; Belyaev, Jury Pavlovich; Gaiduchik, Vladimir Olegovich; Gruzin, Pavel Lukich; Konkin, Nikolai Alexandrovich; Megarsky, Valery Vasilievich; Okunev, Boris Nikolaevich; and Trokin, Jury Alexandrovich, 3,718,817.

Gant, Lawrence A. Suspension device. 3,718,200, Cl. 180-74.000.

Gappa, Gunther; Knoblauch, Karl; Maier, Franz; Schwarte, Jurgen; and Steiner, Peter, to Bergwerksverband GmbH. Process for removing sulfur oxides from sulfur oxide containing exhaust gas. 3,717,976, Cl. 55-73.000.

Garczynski, Jozef: *See—*
- Gawlikowicz, Jan J.; Krywult, Jerzy; Wusatowski, Roman; Garczynski, Jozef; Makowski, Aleksander; and Sikora, Leopold, 3,718,026.

Gardner, Charles R.; and Johnson, Jay, to Republic Corporation. Resin radius roller. 3,717,899, Cl. 15-230.110.

Gardner, Irwin J.; and Cozewith, Charles, to Esso Research and Engineering Company. Continuous process for the production of ethylene copolymers. 3,718,632, Cl. 260-80.780.

Gariti, Victor T. Golf practice equipment. 3,718,330, Cl. 273-187.00r.

Garmaise, David Lyon; Paris, Gerard Yvon; and Plotnikoff, Nicholas Peter, to Abbott Laboratories. Certain-2-substituted-1,2,3,4-tetrahydro-beta or gamma carbolines. 3,718,657, Cl. 260-296.00a.

Garrett, Wayne C.: *See—*
- Freedlander, Abraham L.; Garrett, Wayne C.; and Matthews, Robert E., 3,717,985.

Garver, Robert V., to United States of America, Army. Phase shifter having at least one T-section LC circuit. 3,718,873, Cl. 333-31.00r.

Gates, Marvin A.; and Parks, John H., to Caterpillar Tractor Company. Hydraulic governor. 3,718,127, Cl. 123-140.000.

Gawlikowicz, Jan J.; Krywult, Jerzy; Wusatowski, Roman; Garczynski, Jozef; Makowski, Aleksander; and Sikora, Leopold, to Instytut Metalurgii Zelaza. Cluster mill with cantilevered rolls. 3,718,026, Cl. 72-242.000.

Gaylord, John F., Jr., to Medical Specialties, Inc. Clavicle brace. 3,718,137, Cl. 128-87.00r.

Gazda, Irvin William, to Great Lakes Carbon Corporation. Method of making a nipple-electrode joint. 3,717,911, Cl. 29-25.140.

Gee, Bernard Arthur: *See—*
- Marten, John Anthony; and Gee, Bernard Arthur, 3,718,036.

Gehri, Dennis C., to North American Rockwell Corporation. Catalytic treatment of exhaust gases. 3,718,733, Cl. 423-213.000.

Geld, Isidore, to United States of America, Navy. Cathodic protection anode with sections replaceable underwater. 3,718,570, Cl. 204-196.000.

Geneco Inc.: *See—*
- Perret, Georges, 3,718,085.

General Cigar Co., Inc.: *See—*
- Dreher, Hans C., 3,718,247.

General Dynamics Corporation: *See—*
- Van Horn, James H., 3,718,929.

General Electric Company: *See—*
- Bailey, Ronald B., 3,718,852.
- Frederick, Albert R.; Paine, Joseph L.; and Rosser, Daniel B., 3,718,841.
- Gittelson, Joel A.; and True, Howard D. F., Jr., 3,718,237.
- Graf, Carlton Eugene; Skogsholm, Einar Aasen; and Volkmann, Werner Karl, 3,718,847.
- Graf, Carlton Eugene; and Skogsholm, Einar Aasen, 3,718,851.

  - Graf, Carlton Eugene, 3,718,853.
  - Hibbs, Louis E., Jr.; Holub, Fred F.; and Darrow, Kenneth A., 3,718,447.
  - Kim, Sang-Chul, 3,718,422.
  - Schumacher, Walter C., 3,718,894.
  - Sheldon, Luther M., 3,718,884.
  - Sheldon, Luther M., 3,718,890.
- General Motors Corporation: *See—*
  - Beatenbough, Paul K.; Hutchins, Ward H.; and Richards, Gary E., 3,718,281.
  - Bowler, Lauren L.; and Harned, John L., 3,718,376.
  - Bowler, Laurence L.; and Harned, John L., 3,718,375.
  - Burley, Harvey A., 3,718,124.
  - Cinadr, James J., 3,718,053.
  - Dafler, Gene L.; and Magyar, Lorand W., 3,718,162.
  - Eltzroth, Richard E.; and Fewell, Larry K., 3,718,272.
  - Fischer, Raymond G.; Henckel, Marvin H.; Corteg, Walter V.; and Frig, Gerald E., 3,718,364.
  - Harned, John L.; and Johnston, Laird E., 3,718,377.
  - Hart, Jack P., 3,718,179.
  - Hart, Jack P., 3,718,180.
  - Jones, Trevor O., 3,718,332.
  - Klein, Lee F., 3,718,350.
  - Mazzarins, Janis, 3,718,199.
  - Perkins, Ralph W.; and Morden, Russell L., 3,718,054.
  - Potter, Russell F., 3,717,993.
  - Rice, Hal H.; and Holzwarth, James C., 3,718,172.
  - Rice, Hal H., 3,718,497.
  - Ristau, Theodore F., 3,718,326.
  - Roth, Alton A.; Dzioba, Don L.; and Yonker, John F., 3,718,788.
  - Sayers, Eugene H., 3,718,750.
  - Schade, Charles W.; and Staley, Jack F., 3,718,796.
  - Schulz, John C.; and Lyday, Richard W., 3,718,304.
  - Sharpe, Cecil H., 3,718,258.
  - Stoughton, George R., 3,718,835.
  - Szablowski, Teofil, 3,718,791.
  - Szanny, Roy G., 3,718,881.
  - Templin, Jackson R., 3,717,994.
  - Van Slyke, Allan S., 3,718,814.
  - Zelenka, Donald J., 3,718,790.
- General Tire & Rubber Company, The: *See—*
  - Maxey, Edwin M.; and Harrington, John T., 3,718,611.
- George Lithograph Company: *See—*
  - Hollwedel, Henry C., Jr., 3,718,395.
- George, Michel: *See—*
  - Stevens, Jacques; and George, Michel, 3,718,636.
- Gerber, George V.: *See—*
  - Berman, Abraham; and Gerber, George V., 3,718,883.
- Gerlach, Horst W. A., to United States of America, Army. Microwave oscillator with coaxial leakage output coupling. 3,718,869, Cl. 331-96.000.
- Germano, Victor V., to Diamond Shamrock Corporation. Coated metal and method. 3,718,509, Cl. 148-6.200.
- Gerson, Herman, to Allied Chemical Corporation. 4,4-Bis(2-Nitro-X-halo-anilino)-1,1 dianthraquinonyl. 3,718,669, Cl. 260-367.000.
- Gervay, Joseph Edmond; and Walker, Peter, to Du Pont de Nemours, E. I., and Company. Photopolymerizable elements containing hydro philiccolloids and polymerizable monmers for making gravure printing plate resists. 3,718,473, Cl. 96-83.000.
- Gewerkschaft Eisenhutte Westfalia: *See—*
  - Rassmann, Christoph; Heyer, Willy; and Stuckmann, Dieter, 3,718,368.
- Gibbons, James F. Enhancement of diffusion of atoms into a heated substrate by bombardment. 3,718,502, Cl. 117-212.000.
- Gibel, Stephen J. Expansion chambered, pressure relief muffler. 3,718,208, Cl. 181-50.000.
- Gibellina, Michael C. Pool cleaning device. 3,718,148, Cl. 134-167.00r.
- Gibson, Curtis E. Seat attachment for boats. 3,718,365, Cl. 297-349.000.
- Giebler, Fritz, to Siemens Aktiengesellschaft. Method and apparatus for detecting terminal signals in centrally controlled telecommunication installations. 3,718,782, Cl. 179-18.00j.
- Gilmore, William J.; and Mesler, Lilburn L., to American Chain & Cable Company, Inc. Flat wire structure and apparatus and method of making same. 3,717,987, Cl. 57-9.000.
- Gilvar, Martin, to Morgan Construction Company. Product handling system for cooling beds. 3,718,062, Cl. 83-268.000.
- Gits Bros. Mfg. Co., Inc.: *See—*
  - Jackson, Richard H.; and Warner, Dale J., 3,718,336.
- Gittelson, Joel A.; and True, Howard D. F., Jr., to General Electric Company. Closure means for through-the-door ice service for household refrigerators. 3,718,237, Cl. 222-505.000.
- Gitterman, Charles O.; Madas, John; Rickes, Edward L.; and Stoudt, Thomas H., to Merck & Co., Inc. 3,6-Bis(5-chloro-2-piperidinyl)-2,5-piperazine-dione. 3,718,651, Cl. 260-268.0dk.
- Giuliani, John F.: *See—*
  - Bey, Paul P.; Giuliani, John F.; and Rabin, Herbert, 3,718,602.
- Glabe, Elmer F., to Food Technology, Inc. Solidified product from high fructose corn syrup and process for the preparation thereof. 3,718,484, Cl. 99-199.000.
- Glaettli, Hans H. Driving device provided with control system. 3,718,269, Cl. 26-33.000.
- Glanzstoff AG: *See—*
  - Wallrabenstein, Michael; Schopf, Albert; and Frank, Dieter, 3,718,625.
- Glaxo Laboratories Limited: *See—*
  - Turnbull, John Peter, 3,718,670.
- Gleason Works, The: *See—*
  - Ellwanger, Charles G.; and Pedersen, Harry, 3,717,958.
- Glendinning, William B.; and Pharo, Wellington B., to United States of America, Army. Method of forming a diffusion mask barrier on a silicon substrate. 3,718,503, Cl. 117-212.000.
- Glindmeyer, Friedrich, to William Prym-Werke KG. Method of connecting slide fasteners to fly strips for trousers or the like. 3,718,105, Cl. 112-265.000.
- Glory Kogyo Kabushiki Kaisha: *See—*
  - Hatanaka, Yoshihiro; and Shigemori, Hideto, 3,718,824.
- Gneupel, Artur. Length measuring instrument. 3,718,114, Cl. 116-129.000.
- Godwin, Roy Charles, to British Aircraft Corporation Limited. Doors. 3,718,171, Cl. 160-210.000.
- Goetz, Edward A. Colostomy aid. 3,718,141, Cl. 128-283.000.
- Goldak Company, Inc., The: *See—*
  - McCullough, Lester E.; and Ladine, Duane A., 3,718,930.
- Goldstein, Amnon, to Decicom Systems, Inc. Process for manufacturing shaped energy transmission arrays. 3,718,515, Cl. 156-174.000.
- Gombar, Eugene Leonard: *See—*
  - Reynolds, Charles Edward; and Gombar, Eugene Leonard, 3,718,895.
- Good, Arthur L., to Robertshaw Controls Company. Electrical switch construction having barbed means for locking together the casing parts thereof. 3,718,795, Cl. 200-168.00r.
- Goodman, H., & Co.: *See—*
  - Jennis, Murray, 3,718,144.
- Goodman, James L., to Morrison Molded Fiber Glass Company, mesne. Apparatus for impregnating fiber reinforcements with hardeble resin. 3,718,527, Cl. 156-381.
- Goodrich, B. F., Company, The: *See—*
  - Orndorff, Roy L., 3,717,943.
- Goodyear Tire & Rubber Company, The: *See—*
  - Bhakuni, Roop S.; and Cormany, Joseph L., Jr., 3,718,587.
  - Conger, Marvin T.; and Evans, Theodore A., 3,718,613.
  - Dernovshek, Joseph Frank; and Bermingham, Peter D., 3,718,210.
  - Wilson, Warren K., 3,718,621.
- Gordon, Bernard M.: *See—*
  - Horwitz, Joshua; Gordon, Bernard M.; and Becker, Brant W., 3,718,923.
- Gordon Engineering Company: *See—*
  - Horwitz, Joshua; Gordon, Bernard M.; and Becker, Brant W., 3,718,923.
- Gorin, Everett: *See—*
  - Yavorsky, Paul M.; and Gorin, Everett, 3,718,691.
- Goron, John, to Midland-Ross Corporation. Manifold and adjustable nozzle assembly for molding machines. 3,718,166, Cl. 141-236.000.
- Goshima, Takeshi; and Sato, Hideaki, to Canon Kabushiki Kaisha. Video disk signal recording system with cyclical speed control. 3,718,754, Cl. 178-6.6dd.
- Goto, Hachiro: *See—*
  - Tanaka, Atsushi; and Goto, Hachiro, 3,718,713.
- Gough and Company (Hanley) Limited: *See—*
  - Ebrey, John Alfred Charles; and Gough, George Terah, 3,718,564.
- Gough, George Terah: *See—*
  - Ebrey, John Alfred Charles; and Gough, George Terah, 3,718,564.
- Gould, Eric G.; and Davis, Edward P. Method for controlling the state of cure of curable articles. 3,718,721, Cl. 264-40.000.
- Gourdine, Meredith C.; and Law, S. Edward, to Gourdine Systems, Incorporated. Electrostatic mass per unit volume dust monitor. 3,718,029, Cl. 73-28.000.
- Gourdine Systems, Incorporated: *See—*
  - Gourdine, Meredith C.; and Law, S. Edward, 3,718,029.
- Graf, Carlton Eugene; Skogsholm, Einar Aasen; and Volkmann, Werner Karl, to General Electric Company. Adjustable speed polyphase A-C motor drive utilizing an in-phase current signal for motor control. 3,718,847, Cl. 318-227.000.
- Graf, Carlton Eugene; and Skogsholm, Einar Aasen, to General Electric Company. Means responsive to an overvoltage condition for generating a frequency increasing control signal. 3,718,851, Cl. 321-12.000.
- Graf, Carlton Eugene, to General Electric Company. Pulse width limiting means for inverter circuits. 3,718,853, Cl. 321-12.000.
- Graubremse GmbH: *See—*
  - Gruner, Hans; and Nicolay, Heinz, 3,718,372.
- Gray, George Carrol: *See—*
  - Caron, Fred Joseph; Caron, James Oliver; and Gray, George Carrol, 3,718,170.
- Gray, George William, to Hoffmann-La Roche Inc. Ultrasonic visualization. 3,718,032, Cl. 73-67.700.
- Great Lakes Carbon Corporation: *See—*
  - Gazda, Irvin William, 3,717,911.
  - Joo, Louis A.; McKee, John A.; and Shea, Frederick L., 3,718,493.
- Greatbatch, Wilson, to Medtronic, Inc., mesne. Rate controller and checker for pulse generator means. 3,718,909, Cl. 340-167.00a.
- Green, A. P., Refractories Co.: *See—*

  - Crookston, James A.; and Charles, Glen W., 3,718,489.
- Green Giant Company: *See—*
  - Lawson, Lewis E., 3,717,986.
- Green, William S.: *See—*
  - Chapman, Duane K.; Newman, John W.; and Green, William S., 3,718,704.
- Greer Hydraulics, Inc.: *See—*
  - Schon, Otmar, 3,718,158.
- Gregory, Douglas W., to United States of America, Army. Integral twist top for mechanically actuated munition containers. 3,718,090, Cl. 102-64.000.
- Grenier, Aime J., to Texas Instruments, Incorporated. Power control system having fault sensing means. 3,718,920, Cl. 340-248.00e.
- Griffiths, Robert William: *See—*
  - Entwisle, John Hubert; and Griffiths, Robert William, 3,718,457.
- Grinnell, Garith K.: *See—*
  - Grinnell, George G.; Grinnell, Sherman K.; and Grinnell, Garith K., 3,718,404.
- Grinnell, George G.; Grinnell, Sherman K.; and Grinnell, Garith K. Apparatus for drilling holes through a stack of sheet paper. 3,718,404, Cl. 408-46.000.
- Grinnell, Sherman K.: *See—*
  - Grinnell, George G.; Grinnell, Sherman K.; and Grinnell, Garith K., 3,718,404.
- Groenendyke, Goethe M., to Mobil Oil Corporation. Display of borehole wall configuration. 3,718,204, Cl. 181-5.0be.
- Grosmangin, Jacques; and Peyrot, Jean, to Compagnie Francaise de Raffinage. 4-Vinyl pyridine polymer of improved properties for purification of polymers containing Ziegler-Nata catalyst residues. 3,718,631, Cl. 260-80.720.
- Grot, Walther Gustav, to Du Pont de Nemours, E. I., and Company. CF_2-$CFCF_2$ CF_2 SO_2 F and derivatives and polymers thereof. 3,718,627, Cl. 260-79.3mu.
- Grothoff, Gisela. Refillable aerosol dispenser. 3,718,165, Cl. 141-20.000.
- Grund, John L. Needle. 3,718,104, Cl. 112-224.000.
- Gruner, Hans; and Nicolay, Heinz, to Graubremse GmbH. Double circuit brake arrangement for trucks for drawing trailers braked by pressurized air. 3,718,372, Cl. 303-7.000.
- Gruzin, Pavel Lukich: *See—*
  - Afanasiev, Vadim Nikolaevich; Belyaev, Jury Pavlovich; Gaiduchik, Vladimir Olegovich; Gruzin, Pavel Lukich; Konkin, Nikolai Alexandrovich; Megarsky, Valery Vasilievich; Okunev, Boris Nikolaevich; and Trokin, Jury Alexandrovich, 3,718,817.
- GTE Sylvania Incorporated: *See—*
  - Mc Donough, Thomas B.; and Shaffer, John W., 3,718,815.
- Guardian Electric Manufacturing Company: *See—*
  - Britton, Leon R.; Vojir, Frank S.; and Wright, William W., 3,718,828.
  - Obszarny, Theodore J., 3,718,793.
- Guilden, Paul: *See—*
  - Kemenczky, Miklos, 3,718,783.
- Guilford, Peter: *See—*
  - Cleaver, John Stephen; Guilford, Peter; Kimpton, Frederick James; Page, Thomas John; and Steinberg, Norman Richard, 3,718,273.
- Gulf Research & Development Company: *See—*
  - Dahle, Norman A.; and Doyle, William C., Jr., 3,718,452.
- Gulitz, Louis; Kwap, Theodore W.; and O'Kane, Daniel F., to International Business Machines Corporation. Temperature monitoring. 3,718,757, Cl. 178-6.800.
- Gylys, Jonas A.: *See—*
  - Nakanishi, Koji; and Gylys, Jonas A., 3,718,745.
- Haak, Fred C.: *See—*
  - Bain, George W.; and Haak, Fred C., 3,718,836.
- Haas, Werner E.: *See—*
  - Wysocki, Joseph J.; Adams, James E.; Becker, James H.; Madrid, Robert W.; and Haas, Werner E., 3,718,380.
- Haas, Werner E. L.: *See—*
  - Wysocki, Joseph J.; Adams, James E.; Becker, James H.; Madrid, Robert W.; and Haas, Werner E. L., 3,718,382.
- Haase, Gunter; and Schopper, Erwin, to Agfa-Gevaert Aktiengesellschaft. Silver halide monocrystal particle-tract detectors doped with manganese. 3,718,606, Cl. 252-408.000.
- Hach Chemical Company: *See—*
  - Hach, Clifford C., 3,718,198.
- Hach, Clifford C., to Hach Chemical Company. Weight loss spring balance. 3,718,198, Cl. 177-232.000.
- Haddad, Ihsan A., to Instrumentation Laboratory, Inc. Electrode assembly. 3,718,562, Cl. 204-195.00p.
- Haddad, Ihsan A.; and Rosse, Thomas A., to Instrumentation Laboratory, Inc. Electrode assembly. 3,718,567, Cl. 204-195.00p.
- Hafesh, Joseph W.: *See—*
  - Schwarz, Karl W.; Borkowski, Allan S.; and Hafesh, Joseph W., 3,718,120.
- Hafs, Harold D.; and Boyd, Loyis J., to Research Corporation. Animal semen preparations of increased fertility. 3,718,740, Cl. 424-105.000.
- Hagiwara, Hiroshi: *See—*
  - Kobari, Masao; Hagiwara, Hiroshi; and Uchiyama, Kensuke, 3,718,153.
- Hahlbeck, Edwin C.: *See—*
  - Barr, William A.; Hahlbeck, Edwin C.; and Heine, Ferdinand L., 3,718,052.
- Hainault, Paul E., to University of Michigan Technological, Board of Control. Book holder. 3,718,308, Cl. 248-460.000.
- Halaby, Josef. Communication system with provision for concealing intelligence signals with noise signals. 3,718,765, Cl. 179-1.50m.
- Halasa, Adel F.: *See—*
  - Cheng, Tai Chun; and Halasa, Adel F., 3,718,638.
- Halasa, Adel F. Process for the polymerization of conjugated dienes. 3,718,637, Cl. 260-94.20t.
- Haldex Aktiebolag: *See—*
  - Larsen, Carl Ib Peder, 3,718,811.
- Hall, John B., to International Flavors & Fragrances, Inc. Isolongifolene processes and product. 3,718,698, Cl. 260-587.000.
- Hamano, Hisashi, to Internationak Knitlok Corporation. Method for making hook fabric material for fasteners. 3,718,725, Cl. 264-163.000.
- Hamby Company, The: *See—*
  - Mills, Franky D., 3,718,343.
- Hamer, Martin, to International Minerals & Chemical Corporation. Quinoyl alkanesulfonates and toluenesulfonates. 3,718,653, Cl. 260-283.00s.
- Hammer, Clifford E.: *See—*
  - Becraft, Ardath M.; and Hammer, Clifford E., 3,718,398.
- Hanford, George W. Syringe. 3,718,139, Cl. 128-235.000.
- Hanft, Charles, to Schaefer, F. & M., Brewing Co., The. Automatic program generator and signaller system. 3,718,049, Cl. 74-89.000.
- Hanich, Werner: *See—*
  - Barten, Hans; Barnewald, Rudolf; and Hanich, Werner, 3,718,197.
- Hara, Hikoharu: *See—*
  - Hatano, Tadao; Hara, Hikoharu; Sugiyama, Masatoshi; and Ohi, Reiichi, 3,718,469.
- Harbison, Judith M.: *See—*
  - Oliver, Gene L.; and Harbison, Judith M., 3,718,472.
- Hardin, Nat A.: *See—*
  - Brandon, Clarence W., 3,718,186.
- Hardware & Industrial Tool Co., Inc.: *See—*
  - Vosbikian, Mike; and Vosbikian, James T., 3,718,337.
- Hardwick, Roy, to Yorkshire Imperial Metals Limited. Method of making explosively welded joints. 3,717,925, Cl. 29-470.100.
- Hareng, Michel: *See—*
  - Assouline, Georges J.; Hareng, Michel; and Leiba, Eugene, 3,718,381.
- Harned, John L.: *See—*
  - Bowler, Lauren L.; and Harned, John L., 3,718,376.
  - Bowler, Laurence L.; and Harned, John L., 3,718,375.
- Harned, John L.; and Johnston, Laird E., to General Motors Corporation. Hydraulic vehicle ground speed computer. 3,718,377, Cl. 303-21.0cg.
- Harper, John D. Wave riding water barrier. 3,718,001, Cl. 61-1.00f.
- Harrington, John T.: *See—*
  - Maxey, Edwin M.; and Harrington, John T., 3,718,611.
- Harris, James Michael. Burner. 3,718,426, Cl. 431-328.000.
- Harris, Robert J., to Price, H. C., Co. Pipe coating mold. 3,718,309, Cl. 249-90.000.
- Harris-Intertype Corporation: *See—*
  - Osgood, John H., 3,718,299.
- Harrison, Henry, 1/2 to Kalski, Bernd. Mechanical separation for viscous fluids. 3,718,259, Cl. 210-109.000.
- Hart, Charles Richard; Nield, Eric; and Rose, John Brewster, to Imperial Chemical Industries Limited. Aromatic polysulphone-diphenyl sulphone blends. 3,718,620, Cl. 260-30.80r.
- Hart, Jack P., to General Motors Corporation. Regenerator seal. 3,718,179, Cl. 165-9.000.
- Hart, Jack P., to General Motors Corporation. Regenerator seal. 3,718,180, Cl. 165-9.000.
- Harvey, Donald M., to Eastman Kodak Company. Interlocking dual purpose slide tray structure for forming a single tray or a pair of trays. 3,718,392, Cl. 353-111.000.
- Hasbrouck, Leo J.; Madden, Bill C.; Rew, Robert P.; Sussenguth, Edward H.; and Wierzbicki, John R., to International Business Machines Corporation. Instruction execution unit. 3,718,912, Cl. 340-172.500.
- Hastings Manufacturing Company: *See—*
  - Quinlan, William J.; and Huver, Lawrence L., 3,717,900.
- Hatanaka, Yoshihiro; and Shigemori, Hideto, to Glory Kogyo Kabushiki Kaisha. System of data discrimination in money dispensing machine. 3,718,824, Cl. 307-149.000.
- Hatano, Tadao; Hara, Hikoharu; Sugiyama, Masatoshi; and Ohi, Reiichi, to Fuji Photo Film Co., Ltd. Making of a photographic image. 3,718,469, Cl. 96-50.00r.
- Haugwitz, Rudiger D.: *See—*
  - Narayanan, Venkatachala L.; and Haugwitz, Rudiger D., 3,718,662.
- Hauser, Raimund: *See—*
  - Patels, Gottfried; and Beck, Erich, 3,718,760.
- Haverson, Robert H.: *See—*
  - Pitman, Robert L.; Haverson, Robert H.; Lyon, Jerry; Weldon, Peter; and Rand, Henry T., 3,718,092.
- Havranek, John E., to Borg-Warner Corporation. Phased roller clutch. 3,718,212, Cl. 192-45.000.
- Hayasaka, Akio: *See—*
  - Oya, Yuichiro; and Hayasaka, Akio, 3,718,780.
- Hayashi, Katsumi, to Lubrizol Corporation, The. Polyesters derived from 5-pentanolides. 3,718,626, Cl. 260-78.300.

- Hayes, C. I., Inc.: *See—*
  - Westeren, Herbert W.; Kimball, William H.; Scotto, Vincent; and Vanderford, Wallace S., Jr., 3,718,324.
- Hayes, Stanley I., Jr., to USM Corporation. Microporous sheets. 3,718,532, Cl. 161-159.000.
- Haynsworth, Erwin Mathew: *See—*
  - Cook, Charles Calvin; and Haynsworth, Erwin Mathew, 3,718,003.
- Hazard, Robert E.; and Wilson, Woodrow S., to Polytop Corporation. Safety dispensing closure. 3,718,238, Cl. 222-536.000.
- Heald Machine Company, The: *See—*
  - Klar, John, 3,717,991.
  - Kuniholm, Martin L., 3,717,960.
- Healey, Arthur V.: *See—*
  - Solomon, William E.; and Healey, Arthur V., 3,718,887.
- Heberlein, Gustave E., Jr.: *See—*
  - Kussy, Frank W.; and Heberlein, Gustave E., Jr., 3,718,875.
- Heck, Lyle D.: *See—*
  - Williams, Allan L.; and Heck, Lyle D., 3,718,922.
- Heck, Richard F., to Hercules Incorporated. Oxidation of aromatic hydrocarbons to phenols with oxygen. 3,718,629, Cl. 260-621.00g.
- Hegar, Frank; and Fleskes, Timothy E., to Warn-Belleview, Inc. Wheel hub clutching mechanism. 3,718,213, Cl. 192-67.00r.
- Heimann, Werner; and Lossa, Ulrich, to Palitex Project Company GmbH. Carrier for packages of textile yarn. 3,717,989, Cl. 57-58.520.
- Heine, Ferdinand L.: *See—*
  - Barr, William A.; Hahlbeck, Edwin C.; and Heine, Ferdinand L., 3,718,052.
- Helka S.A.: *See—*
  - Sequaris, Etienne-Thomas, 3,717,969.
- Hemsath, Klaus H.; and Wright, Dale E., to Midland-Ross Corporation. Combustion apparatus. 3,718,102, Cl. 110-7.00r.
- Henckel, Marvin H.: *See—*
  - Fischer, Raymond G.; Henckel, Marvin H.; Corteg, Walter V.; and Frig, Gerald E., 3,718,364.
- Hendriks, Jozef H., to Teradyne, Inc. Inductance and capacitance reactance measuring instrument having minimal inclusion of stray reactances. 3,718,856, Cl. 324-57.00r.
- Henkel & Cie G.m.b.H.: *See—*
  - Werdehausen, Achim; Jahnke, Ullrich; Jakobi, Gunter; and Walther, Guntram, 3,718,597.
- Hennings, Klaus, to Licentia Patent-Verwaltungs G.m.b.H. System for photographic production of semiconductor micro structures. 3,718,396, Cl. 355-43.000.
- Hercules Incorporated: *See—*
  - Heck, Richard F., 3,718,629.
- Hering, Donald R.; and Lindsey, James M., to Sperry-Sun Well Surveying Company. Method and apparatus for orienting a borehole device. 3,718,194, Cl. 175-45.000.
- Herrera, Crisogono. Automatic geographical position indicator. 3,718,042, Cl. 73-178.00r.
- Herrick, Richard E.: *See—*
  - Olsen, Robert W.; and Herrick, Richard E., 3,717,968.
- Hertzell, Adelbert F. Retractable side bumper guard. 3,718,357, Cl. 293-9.000.
- Heseltine, Donald W.: *See—*
  - Fumia, Arthur, Jr.; and Heseltine, Donald W., 3,718,476.
- Hess, Gildard H., to Stanray Corporation. Carousel for baggage and other articles. 3,718,249, Cl. 198-181.000.
- Hess, Wayne Thomas: *See—*
  - Carlson, Harrison Cornforth; and Hess, Wayne Thomas, 3,718,731.
- Hesston Corporation: *See—*
  - Case, Cecil L., 3,717,995.
- Hewlett-Packard Company: *See—*
  - Robison, Billie J.; and Lucic, Richard A. D., 3,718,572.
- Heyer, Willy: *See—*
  - Rassmann, Christoph; Heyer, Willy; and Stuckmann, Dieter, 3,718,368.
- Hibbs, Louis E., Jr.; Holub, Fred F.; and Darrow, Kenneth A., to General Electric Company. Grinding wheels formed from prepolymer compositions containing aliphatically unsaturated imido radicals. 3,718,447, Cl. 51-295.000.
- Hiebert, Adoniram C.; and Lowry, Richard E. Article stacking machine. 3,718,267, Cl. 214-6.0fa.
- Hihara, Takeshi: *See—*
  - Sawamura, Mitsuyoshi; and Hihara, Takeshi, 3,718,799.
- Hill, William L., to Sun Oil Company. Method and system for wellbore protection when explosively stimulating earth formations. 3,718,188, Cl. 166-299.000.
- Hill, William L., to Continental Oil Company. Method for creating permeability in sulfur deposits. 3,718,366, Cl. 299-4.000.
- Hillman, James George Edward, to Molins Machine Company Limited. Machine for unloading trays of articles. 3,718,224, Cl. 214-302.000.
- Hilmer, Elwyn P. Portable hand winch and anchoring and stabilizing means. 3,718,317, Cl. 254-186.0hc.
- Hines, Charles E., to Outboard Marine Corporation. Series-parallel battery system and switch therefor. 3,718,848, Cl. 320-7.000.
- Hinkley, David F., to Merck & Co., Inc. Food composition with isoascorbic acid-phosphate as an antioxidant. 3,718,482, Cl. 99-150.000.
- Hirobe, Masaaki: *See—*
  - Okamoto, Toshihiko; Hirobe, Masaaki; Suzue, Seigo; Nagatsu, Yoshio; Ushiyama, Keiichi; Satoh, Susumu; and Irikura, Tsutomu, 3,718,656.
- Hitachi, Ltd.: *See—*
  - Oya, Yuichiro; and Hayasaka, Akio, 3,718,780.
- Hnizda, Vincent F., to Ethyl Corporation. Jet fuel additive. 3,718,444, Cl. 44-66.000.
- Hochli, Beat: *See—*
  - Moser, Kurt; and Hochli, Beat, 3,718,028.
- Hofer, Friedrich Wilhelm, to Bosch, Robert, G.m.b.H. Arrangement for controlling the brake systems of trailers or the like. 3,718,373, Cl. 303-7.000.
- Hoffmann, Irmgard: *See—*
  - Kuch, Heinz; and Hoffmann, Irmgard, 3,718,645.
- Hoffmann-La Roche Inc.: *See—*
  - Chodnekar, Madhukar Subraya; Pfiffner, Albert; Rigassi, Norbert; Schwieter, Ulrich; and Suchy, Milos, 3,718,686.
  - Gray, George William, 3,718,032.
- Hoffmeister, Hansmartin, to Oy Nokia Ab Finnish Cable Works. Connection plug for a current supply rail. 3,718,886, Cl. 339-21.00r.
- Hofmann, Wilfried: *See—*
  - Pfeifer, Josef; Ambraschka, Kasimir; Koopmann, Adolf; Hofmann, Wilfried; Dietrich, Karl-Heinz; and Rauffer, Walter, 3,718,391.
- Hogberg, Knut Bertil: *See—*
  - Eriksoo, Edgar; Fex, Hans; Hogberg, Knut Bertil; Mollberg, Rene; and Rohte, Oskar, 3,718,694.
- Holler, Albert, to Western Electric Company, Incorporated. Multiple connector assembly system for interconnecting strands of cables without creating a substantially enlarged section therein. 3,718,893, Cl. 339-176.00m.
- Holliday, Robert G., to Xerox Corporation. Microfiche indexer. 3,718,390, Cl. 353-27.000.
- Hollwedel, Henry C., Jr., to George Lithograph Company. Machine for producing plates and prints from microfilm. 3,718,395, Cl. 355-27.000.
- Holmes, Robert C., Jr., to Mark Products, Inc. Seismometer with spring spider suspension. 3,718,900, Cl. 340-17.000.
- Holovka, John M.; and Hurley, Edward, Jr., to Marathon Oil Company. Preparation of mixed unsymmetrical ethers. 3,718,701, Cl. 260-611.00r.
- Holt, Jan D.: *See—*
  - Thornton, Duane V.; and Holt, Jan D., 3,718,099.
- Holt, William J.; and Boy de la Tour, Roger, to Neuro Systems Inc., mesne. Electrotherapy machine. 3,718,132, Cl. 128-1.00c.
- Holub, Fred F.: *See—*
  - Hibbs, Louis E., Jr.; Holub, Fred F.; and Darrow, Kenneth A., 3,718,447.
- Holzmann, Rainer; Kader, Reiner; and Thomas, Alfred, to Kautex-Werk Reinold Hagen. Method of blow molding hollow thermoplastic bodies. 3,718,724, Cl. 264-98.000.
- Holzwarth, James C.: *See—*
  - Rice, Hal H.; and Holzwarth, James C., 3,718,172.
- Honma, Shiro: *See—*
  - Tomoshige, Toru; and Honma, Shiro, 3,718,635.
- Hood, John W.: *See—*
  - Smith, Edmund G.; and Hood, John W., 3,718,582.
- Hook, Melvin S., to Burns Machine Co. Pressure switch with overtravel means on switch actuating arm for maintaining load on switch during small pressure fluctuations. 3,718,789, Cl. 200-83.00r.
- Hooker Chemical Corporation: *See—*
  - Camilleri, Louis T.; and Huebner, Manfred H., 3,718,622.
- Hoover, Herbert, III: *See—*
  - Armstrong, Ramsey C.; and Hoover, Herbert, III, 3,718,535.
- Horlacher, Joseph D.: *See—*
  - Moore, George E.; and Horlacher, Joseph D., 3,718,232.
- Horlenko, Theodore, to Celanese Corporation. Distillation process for recovering substantially anhydrous formic acid from aqueous solutions. 3,718,545, Cl. 203-15.000.
- Horwitz, Joshua; Gordon, Bernard M.; and Becker, Brant W., to Gordon Engineering Company. Bipolar floating input, particularly for digital panel meters. 3,718,923, Cl. 340-347.0nt.
- Hough, William T., mesne: *See—*
  - Siebentritt, Frank H.; and Silvera, Esteban, 3,718,157.
- Howard, Dean D.; and Cross, David C., to United States of America, Navy. Automatic digital error detector for radar range tracking. 3,718,927, Cl. 343-7.400.
- Howell, Cleves H., Jr.: *See—*
  - Jones, Kenneth P.; and Howell, Cleves H., Jr., 3,718,041.
- Howell, Edith S.: *See—*
  - Jones, Kenneth P.; and Howell, Cleves H., Jr., 3,718,041.
- Huber, John Richard, to Eastern Rotorcraft Corporation. Strap adjuster devices. 3,718,315, Cl. 254-164.000.
- Huebner, Manfred H.: *See—*
  - Camilleri, Louis T.; and Huebner, Manfred H., 3,718,622.
- Huele, Hendrik Teunis, to N.V. Hollandse Signaalapparaten. Microwave antenna. 3,718,933, Cl. 343-768.000.
- Hughes Aircraft Company: *See—*
  - Myer, Jon H., 3,718,761.
- Hughes, Thomas R.; and Sieg, Robert P., to Chevron Research Company. Gasoline production. 3,718,576, Cl. 208-93.000.
- Hull, Donald R.; and Simonton, Robert D., to Dynalite Corporation. Battery element casting machine. 3,718,174, Cl. 164-154.000.
- Hull, Richard N.: *See—*
  - Jacobs, Lloyd K.; and Hull, Richard N., 3,718,554.

- Hull, Roy: *See—*
  - Farrand, Roy; and Hull, Roy, 3,718,678.
- Hunt, Mack W.: *See—*
  - Rogers, Lynn C.; and Hunt, Mack W., 3,718,589.
- Hurley, Edward, Jr.: *See—*
  - Holovka, John M.; and Hurley, Edward, Jr., 3,718,701.
- Hurst, Gerald L., to Kinetics International Corporation. Porous particles containing dispersed organic liquid and gaseous components. 3,718,512, Cl. 149-2.000.
- Huskins, Chester W.: *See—*
  - Ayers, Orval E.; and Huskins, Chester W., 3,717,997.
- Hutchins, Ward H.: *See—*
  - Beatenbough, Paul K.; Hutchins, Ward H.; and Richards, Gary E., 3,718,281.
- Huver, Lawrence L.: *See—*
  - Quinlan, William J.; and Huver, Lawrence L., 3,717,900.
- Hvoslef, Peer. Life-boats. 3,717,889, Cl. 9-4.00r.
- Hydraulic Industries, Inc.: *See—*
  - Tennis, Francis H., 3,718,159.
- I-T-E Imperial Corporation: *See—*
  - Kussy, Frank W.; and Heberlein, Gustave E., Jr., 3,718,875.
- Ideal Industries, Inc.: *See—*
  - Wells, Peter M., 3,717,906.
- IIT Research Institute: *See—*
  - Dally, James W., 3,718,066.
  - Liber, Theodore, 3,718,065.
- Ikrath, Kurt; and Acker, Morris, to United States of America, Army. Combined multi-polarization loopstick and whip antenna. 3,718,932, Cl. 343-728.000.
- Imabayashi, Ziro: *See—*
  - Nezu, Kazuo; Imabayashi, Ziro; Watanabe; Kazutaka; Iritani, Tadamitsu; Kataoka, Kouju; and Yoshioka, Michio, 3,718,762.
- Imajyo, Yasutaka: *See—*
  - Tanaka, Hideo; Imajyo, Yasutaka; Takano, Ikuo; Takahashi, Jiro; and Oka, Kazumichi, 3,718,840.
- Imperial Chemical Industries Limited: *See—*
  - Denny, Patrick John; and Dowden, Dennis Albert, 3,718,498.
  - Entwisle, John Hubert; and Griffiths, Robert William (said Entwisle assor. to), 3,718,457.
  - Farrand, Roy; and Hull, Roy, 3,718,678.
  - Hart, Charles Richard; Nield, Eric; and Rose, John Brewster, 3,718,620.
- Impex-Essen GmbH: *See—*
  - Schneider, Fritz, 3,718,271.
- Index-Werke KG: *See—*
  - Lahm, Heinrich, 3,717,912.
- Industrial Modular Systems Corporation: *See—*
  - Lasch, Cecil A., Jr., 3,718,371.
- Industrie A. Zanussi S.p.A.: *See—*
  - Mazza, Lamberto, 3,718,149.
- Information Displays, Inc.: *See—*
  - Premru, Brian Allan; and Nash, James H., Jr., 3,718,832.
- Ingersoll-Rand Company: *See—*
  - Miller, Stanley M., 3,718,313.
- Innes, Robert Arthur: *See—*
  - Cooke, William Ernest; Cote, Jacques Francois; Innes, Robert Arthur; Spooner, Roy Cowieson; and Kellermann, Walter Maria Eduard, 3,718,547.
- Inoue, Eiichi; and Yamase, Toshihiro, to Canon Kabushiki Kaisha. Positive working photographic process for producing colored images of metal chelates of sulfur compounds. 3,718,467, Cl. 96-48.00r.
- Insolio, Thomas A., to Fletcher-Terry Company, The. Machine for feeding, scoring, and breaking smal diameter glass tubing. 3,718,268, Cl. 225-2.000.
- Inspiration Consolidated Copper Company: *See—*
  - Jacob, Harry M.; and Lorenzen, John C., 3,718,176.
- Institute of Gas Technology: *See—*
  - Fleming, Donald Kingsley; Randhava, Sarabjit Singh; and Camara, Elias Humberto, 3,718,418.
- Institute of Paper Chemistry, The: *See—*
  - Kesler, Richard B., 3,718,030.
- Institutul de Cercetari Metalurgice: *See—*
  - Braniski, Alexandru I.; Ionescu, Teodor; and Deica, Neculai, 3,718,492.
- Instrumentation Laboratory, Inc.: *See—*
  - Haddad, Ihsan A., 3,718,562.
  - Haddad, Ihsan A.; and Rosse, Thomas A., 3,718,567.
  - Krebs, William Michael, 3,718,566.
  - Newelt, Robert T., 3,718,568.
  - Rosse, Thomas A.; Blackmer, David E.; Zindler, Jerrold; and Kelley, Thomas F., 3,718,439.
- Instytut Metalurgii Zelaza: *See—*
  - Gawlikowicz, Jan J.; Krywult, Jerzy; Wusatowski, Roman; Garczynski, Jozef; Makowski, Aleksander; and Sikora, Leopold, 3,718,026.
- Intercontinental Plastics Manufacturing: *See—*
  - Sauriol, John T., 3,717,963.
- Internationak Knitlok Corporation: *See—*
  - Hamano, Hisashi, 3,718,725.
- International Business Machines Corporation: *See—*
  - Bate, Geoffrey; Echelmeier, Robert H.; Everett, Larry H.; Kehr, William D.; Schaps, Joseph E.; Taylor, Gerald; and Thornley, Richard F. M., 3,718,776.
  - Donofrio, Nicholas M.; and Linton, Richard H., 3,718,826.
  - Gulitz, Louis; Kwap, Theodore W.; and O'Kane, Daniel F., 3,718,757.
  - Hasbrouck, Leo J.; Madden, Bill C.; Rew, Robert P.; Sussenguth, Edward H.; and Wierzbicki, John R., 3,718,912.
  - Scray, Eugene J., Jr.; and Wilder, Donald L., 3,718,910.
- International Flavors & Fragrances, Inc.: *See—*
  - Hall, John B., 3,718,698.
  - Mookherjee, Braja D.; and Theimer, Ernst T., 3,718,696.
- International Minerals & Chemical Corporation: *See—*
  - Hamer, Martin, 3,718,653.
- International Nickel Company, Inc., The: *See—*
  - Faulkner, Roy Gwyn; and Bridges, Peter John, 3,718,443.
- International Paper Company, mesne: *See—*
  - Furbeck, Warren R., 3,717,905.
  - Lee, Charles A., 3,718,115.
- International Research & Development Company Limited: *See—*
  - Bailey, Henry Philip, 3,718,540.
- International Standard Electric Corporation: *See—*
  - Collins, Robin Ashley, 3,718,931.
  - Kudritzki, Hans, 3,718,785.
- International Telephone and Telegraph Corporation: *See—*
  - Bain, George W.; and Haak, Fred C., 3,718,836.
  - Burgess, James P.; and Polkinghorn, Melvin W., 3,718,892.
  - Butter, Donald A.; Kern, Edmund R.; and Menelly, Richard A., 3,718,831.
  - Ellis, Lynn W., 3,718,767.
  - Marks, John L., 3,717,917.
  - Ranghelli, Joseph C.; and Perrott, Emmanuel J., 3,718,935.
- Ionescu, Teodor: *See—*
  - Braniski, Alexandru I.; Ionescu, Teodor; and Deica, Neculai, 3,718,492.
- Irikura, Tsutomu: *See—*
  - Okamoto, Toshihiko; Hirobe, Masaaki; Suzue, Seigo; Nagatsu, Yoshio; Ushiyama, Keiichi; Satoh, Susumu; and Irikura, Tsutomu, 3,718,656.
- Iritani, Tadamitsu: *See—*
  - Nezu, Kazuo; Imabayashi, Ziro; Watanabe, Kazutaka; Iritani, Tadamitsu; Kataoka, Kouju; and Yoshioka, Michio, 3,718,762.
- Irmscher, Klaus; Von Werder, Fritz; Bork, Karl-Heinz; and Kraft, Hans-Gunther, to Merck Patent Gesellschaft mit beschrankter Haftung. Inverted steps for the preparation of 9α-fluoro-16-methyleneprednisolone or prednisone and 21-esters thereof. 3,718,542, Cl. 195-51.00e.
- Irvin Industries, Inc.: *See—*
  - Pearsall, Gerald Robert, 3,718,902.
- Isaacs, Hugh S.: *See—*
  - Salzano, Francis J.; Davis, Andrew M.; and Isaacs, Hugh S., 3,718,546.
- Ishikawa, Mineo, to Toyoda Koki Kabushiki Kaisha. Sizing device for measuring the diameter of a workpiece of non-circular cross-section. 3,717,934, Cl. 33-147.00n.
- Ishikawa, Mutsuo: *See—*
  - Nakagawa, Shiro; and Ishikawa, Mutsuo, 3,718,917.
- Itek Corporation: *See—*
  - Ekman, Carl F. W., 3,718,465.
- Ito, Tadashi: *See—*
  - Ogiso, Mitsutoshi; and Ito, Tadashi, 3,718,075.
- ITT Industries, Inc.: *See—*
  - Keller, Hans, 3,718,870.
- Iwatsu Electric Co., Ltd.: *See—*
  - Matsuoka, Hideo, 3,718,825.
- Jackson, Byron, Inc.: *See—*
  - Scott, Lyle B., 3,718,183.
- Jackson, Richard H.; and Warner, Dale J., to Gits Bros. Mfg. Co., Inc. Shaft seal and method of manufacture. 3,718,336, Cl. 277-40.000.
- Jacob, Ezekiel J. Process for production of poromeric products. 3,718,561, Cl. 204-180.
- Jacob, Harry M.; and Lorenzen, John C., to Inspiration Consolidated Copper Company. Spreader wheel. 3,718,176, Cl. 164-278.000.
- Jacob, Harvey B.: *See—*
  - Brandon, Clarence W., 3,718,186.
- Jacob, Jean-Baptiste, to Compagnie Industrielle des Telecommunications Cit-Alcatel and Societe Lannionnaise d'Electronique Raute de Perros-Guirec. Path finding system for time-division multiplexed telephone communication network. 3,718,769, Cl. 179-18.00j.
- Jacobs, Harold, to United States of America, Army. Photon radiation detector. 3,718,820, Cl. 250-83.30h.
- Jacobs, Lloyd K.; and Hull, Richard N. Cathodic protection for water tanks. 3,718,554, Cl. 204-147.000.
- Jacobsen Manufacturing Company: *See—*
  - Rogers, Chester D., 3,718,192.
- Jacobson, Howard W., to Du Pont de Nemours, E. I., and Company. Sheet-like alpha aluminum oxide. 3,718,494, Cl. 106-291.000.
- Jahnke, Ullrich: *See—*
  - Werdehausen, Achim; Jahnke, Ullrich; Jakobi, Gunter; and Walther, Guntram, 3,718,597.
- Jakobi, Gunter: *See—*
  - Werdehausen, Achim; Jahnke, Ullrich; Jakobi, Gunter; and Walther, Guntram, 3,718,597.
- James, Peter Henry, to Quartz Investments Limited. Child proof containers. 3,718,230, Cl. 220-60.00a.
- Janssen, Donald E.: *See—*
  - Spencer, John; and Janssen, Donald E., 3,718,470.

Janssen, Donald E.; Reynolds, Delbert D.; and Cossar, Bernard C., to Eastman Kodak Company. Development accelerators for image transfer systems. 3,718,464, Cl. 96-29.00d.

Janssen, Hans Georg, to Aktien-Gesellschaft "Weser". Guide arrangement. 3,718,108, Cl. 114-181.000.

Japan Monoply Corporation, The: *See—*
    Kobari, Masao; Hagiwara, Hiroshi; and Uchiyama, Kensuke, 3,718,153.

Jardinier, Pierre Charles Jules; and Simonnot, Jack Paul Robert, to Societe d'Etudes et de Recherches de Ventilation et d'Aeraulique. Device for controlling air flow in ventilation pipes. 3,718,160, Cl. 138-46.000.

Jenkins, Philip W., to Eastman Kodak Company. Silver halide emulsions containing holopolar cyanine dyes with urazole nucleus. 3,718,477, Cl. 96-140.000.

Jennings, Uel Duane; and Sparling, Wayne Clifford, to Du Pont de Nemours, E. I., and Company. Yarn package. 3,718,288, Cl. 242-178.000.

Jennis, Murray, to Goodman, H., & Co. Hair curlers. 3,718,144, Cl. 132-39.000.

Jensen, Jens-Lauge Bolund. Method of packaging foodstuffs and a packaging for employing the method. 3,718,486, Cl. 99-214.000.

Jensen, Klaus: *See—*
    Wienand, Michael; Jensen, Klaus; Primessing, Franz; and Alfter, Franz-Werner, 3,717,916.

Jerse, Emil P.: *See—*
    Blower, Warren A.; and Jerse, Emil P., 3,718,318.

Jespers, Gerard P., to Ferro-Corporation. Automatic slot sealing system for continuous furnaces. 3,718,320, Cl. 263-8.00r.

Joaquin, Jean. Fish fillet product and method for making. 3,718,481, Cl. 99-111.000.

Joh, Yasushi; and Mimura, Koji, to Mitsubishi Rayon Company Limited. Acrylic fiber and a method for manufacturing the same. 3,718,716, Cl. 260-898.000.

Johnson, Allan S., to Tapmatic Corporation. Tapping attachment adapted for numerical control. 3,717,892, Cl. 10-89.00f.

Johnson, Anna D. Driver alertness alarm system. 3,718,921, Cl. 340-279.000.

Johnson, Clarence. Force measuring instrument. 3,718,038, Cl. 73-141.00a.

Johnson, Elizabeth W.: *See—*
    Coleman, Margot O.; and Johnson, Elizabeth W., 3,718,529.

Johnson, Jay: *See—*
    Gardner, Charles R.; and Johnson, Jay, 3,717,899.

Johnston, Laird E.: *See—*
    Harned, John L.; and Johnston, Laird E., 3,718,377.

Johnstone, Duncan, to DP Way Corporation. Refuse hoppers. 3,717,901, Cl. 15-314000.

Jones, Douglas George: *See—*
    Abramson, Carl Newton; and Jones, Douglas George, 3,718,768.

Jones, Edward B.: *See—*
    Beste, Lawrence F.; Jones, Edward B.; and Yates, Paul C., 3,718,584.

Jones, Kenneth P.; and Howell, Cleves H., Jr.; deceased (by Howell, Edith S.; executrix). Projectile deceleration device. 3,718,041, Cl. 73-167.000.

Jones, Kermith W. Foam brush. 3,717,898, Cl. 15-244.00r.

Jones, Thurman Ralston, Jr., to Du Pont de Nemours, E. I., and Company. Pump wear plate viscometer. 3,718,414, Cl. 425-146.000.

Jones, Trevor O., to General Motors Corporation. Occupant restraint system. 3,718,332, Cl. 280-150.0ab.

Jones, William Felix, Jr., to Borg-Warner Corporation. Camlock threaded stud actuator. 3,718,058, Cl. 81-532.000.

Joo, Louis A.; McKee, John A.; and Shea, Frederick L., to Great Lakes Carbon Corporation. Process for the production of carbon filaments from coal tar pitch. 3,718,493, Cl. 106-273.00r.

Joslyn Mfg. and Supply Co.: *See—*
    Cunningham, Francis V., 3,718,749.

Joyce, James W., Jr.; and Villarroel, Fernando, to United States of America, Army. Flow meter for indirectly measuring the flow of blood from a blood pump. 3,718,044, Cl. 73-223.000.

Jungfer, Hans: *See—*
    Ranke, Gerhard; and Jungfer, Hans, 3,718,006.

Juri, Isao; Koguchi, Kazuo; Kuroiwa, Toshimi; and Koken, Tomoyuki, to Tokyo Shibaura Electric Company, Ltd. Semiconductor rectifier device. 3,718,850, Cl. 321-8.00c.

K-D Manufacturing Company: *See—*
    McFarland, Frederick R.; and Diffenderfer, Walter L., 3,717,895.

Kabushiki Kaisha Hattori Tokeiten: *See—*
    Matsushima, Akira, 3,718,877.

Kabushiki Kaisha Ricoh: *See—*
    Suzuki, Shigeru; Kanno, Tadaaki; and Sakamaki, Tadatoshi, 3,718,155.

Kabushiki Kaisha Sankyo Seiki Seisakusho: *See—*
    Kitamura, Yoshio; and Suzuki, Ikuo, 3,718,746.

Kabushiki Kaisha Suwa Seikosha: *See—*
    Fujita, Kinji, 3,717,990.

Kabushiki Kaisha Yamamoto Kogyosho: *See—*
    Yamamoto, Yoshiro; and Tajihi, Michio, 3,718,080.

Kabushikikaisha Yokogawa Denki Seisakusho: *See—*
    Nakagawa, Mutsuaki; Tauchi, Takao; and Nishihara, Tadashi, 3,718,047.

Kader, Reiner: *See—*
    Holzmann, Rainer; Kader, Reiner; and Thomas, Alfred, 3,718,724.

Kaiser, Carl; and Ross, Stephen T., to Smith Kline & French Laboratories. Pharmaceutical compositions comprising an a-aminoalkyl-4-hydroxy-3-carboalkoxyaminobenzyl alcohol. 3,718,744, Cl. 924-300.000.

Kali-Chemie Aktiengesellschaft: *See—*
    Zeugner, Horst; Eickstedt, Klaus-Wolf Von; Stuhmer, Werner; and Funke, Siegfried, 3,718,666.

Kalina, Vladimir, to Societe d'Assistance Technique pour Produits Nestle S.A. Isolation of proteins. 3,718,541, Cl. 195-28.00r.

Kalman, Gabor U. Distance compensated reflectance sensor. 3,718,399, Cl. 356-210.000.

Kalski, Bernd: *See—*
    Harrison, Henry, 3,718,259.

Kanno, Tadaaki: *See—*
    Suzuki, Shigeru; Kanno, Tadaaki; and Sakamaki, Tadatoshi, 3,718,155.

Kanno, Tomoei; and Kobayashi, Harunobu, to Showa Sangyo Kabushiki Kaisha. Method for manufacture of processed foods from soybeans. 3,718,479, Cl. 99-17.000.

Kano, Kenichi: *See—*
    Katsuta, Takashi; Kano, Kenichi; Kawasaki, Mitsuru; and Ushiyama, Yasuichi, 3,718,752.

Kanter Jerome J. Process for protecting ferrous base metals against corrosion, and articles produced thereby. 3,718,499, Cl. 117-127.000.

Karady, Sandor; Pines, Seemon H.; Ly, Manuel G.; and Sletzinger, Meyer, to Merck & Co., Inc. Diastereomers of α-hydroazino-b-(phenyl) propionitriles. 3,718,674, Cl. 260-397.100.

Karll, Robert E.: *See—*
    Piasek, Edmund J.; Karll, Robert E.; and Lee, Richard J., 3,718,663.

Kataoka, Kouju: *See—*
    Nezu, Kazuo; Imabayashi, Ziro; Watanabe, Kazutaka; Iritani, Tadamitsu; Kataoka, Kouju; and Yoshioka, Michio, 3,718,762.

Kato, Masaaki: *See—*
    Sugiyama, Michiyuki; Takatori, Yoshikuni; Touyama, Ryosuke; Nakamura, Akira; Yamauchi, Teiji; Kato, Masaaki; and Nakashiba, Yoshio, 3,718,560.

Katoh, Takashi: *See—*
    Oishi, Kazuo; Kurebayashi, Tokuhiro; Ando, Noriyoshi; Yamamoto, Noboru; Toda, Tadahide; Nohira, Hidetaka; and Katoh, Takashi, 3,718,126.

Katsuta, Takashi; Kano, Kenichi; Kawasaki, Mitsuru; and Ushiyama, Yasuichi. Color television camera. 3,718,752, Cl. 178-5.4tc.

Katsuyama, Takehiro: *See—*
    Kawai, Atsushi; Katsuyama, Takehiro; Suzuki, Migaku; and Ohta, Hidenori, 3,718,537.

Kauhl, Gunther: *See—*
    Weyl, Helmut; Kauhl, Gunther; and Beesch, Otto, 3,718,425.

Kautex-Werk Reinold Hagen: *See—*
    Holzmann, Rainer; Kader, Reiner; and Thomas, Alfred, 3,718,724.

Kautz, Wilbert C.: *See—*
    Brandenberg, Karl; and Kautz, Wilbert C., 3,718,409.

Kawai, Atsushi; Katsuyama, Takehiro; Suzuki, Migaku; and Ohta, Hidenori, to Mitsubishi Rayon Company, Ltd. Non woven fibrous product and method for producing same. 3,718,537, Cl. 162-157.00c.

Kawamoto, Kinji, to Matsushita Electric Industrial Co., Ltd. Phase modulating device. 3,718,871, Cl. 332-16.00t.

Kawasaki, Mitsuru: *See—*
    Katsuta, Takashi; Kano, Kenichi; Kawasaki, Mitsuru; and Ushiyama, Yasuichi, 3,718,752.

Kayaku Antibiotic Research Company, Ltd.: *See—*
    Koyama, Yasuo, 3,718,741.

Keatts, Albert B. Expanding lap arbor. 3,717,956, Cl. 51-1.000.

Kehoe, Lawrence J.; and Schell, Raymond A., to Ethyl Corporation. Preparation of carboxylic acids. 3,718,676, Cl. 260-413.000.

Kehr, William D.: *See—*
    Bate, Geoffrey; Echelmeier, Robert H.; Everett, Larry H.; Kehr, William D.; Schaps, Joseph E.; Taylor, Gerald; and Thornley, Richard F. M., 3,718,776.

Keiter, Edward F.; Pfleiderer, Glenn F.; and Pettigrew, David D., to Rockwell Manufacturing Company. Drill press or the like variable speed drive. 3,718,405, Cl. 408-128.000.

Kelch, Heinz; and Spauszus, Siegfried, to Kienzle Apparate G.m.b.H. Apparatus for time-depending evaluation of a diagram carrier. 3,718,808, Cl. 235-92.00t.

Keller, Hans, to ITT Industries, Inc. Driving circuit for electromechanical oscillators. 3,718,870, Cl. 331-116.00m.

Kellermann, Walter Maria Eduard: *See—*
    Cooke, William Ernest; Cote, Jacques Francois; Innes, Robert Arthur; Spooner, Roy Cowieson; and Kellermann, Walter Maria Eduard, 3,718,547.

Kelley, Nancy J.: *See—*
    Davis, James W.; Umina, Anthony P.; and Kelley, Nancy J., 3,718,483.

Kelley, Thomas F.: *See—*
    Rosse, Thomas A.; Blackmer, David E.; Zindler, Jerrold; and Kelley, Thomas F., 3,718,439.

Kelly, William J.; and Reynolds, Warren A., to Cogar Corporation. Crossover detector. 3,718,864, Cl. 328-115.000.

Kemenczky, Miklos, to Guilden, Paul. Sharing apparatus and system. 3,718,783, Cl. 200-1.00r.

Kemp, Jacob D.; and Sieg, Robert P., to Chevron Research Company. Hexane conversion. 3,718,705, Cl. 260-676.00r.

Kendall Company, The: *See—*
    Samour, Carlos M.; and Richards, Mildred C., 3,718,693.

Kennedy, George W. Multiple stapling system. 3,717,924, Cl. 29-432.000.

Kern, Edmund R.: *See—*
    Butter, Donald A.; Kern, Edmund R.; and Menelly, Richard A., 3,718,831.

Kerschner, James J., to Acme Highway Products Corporation. Sealing member. 3,718,403, Cl. 404-49.000.

Kesler, Richard B., to Institute of Paper Chemistry, The. Method and apparatus for analysis of fluid suspensions. 3,718,030, Cl. 73-61.00r.

Kewanee Oil Company: *See—*
    Du Rose, Arthur H.; and Stern, Robert L., 3,718,549.

Kienzle Apparate G.m.b.H.: *See—*
    Kelch, Heinz; and Spauszus, Siegfried, 3,718,808.

Kikuchi, Makoto: *See—*
    Kusakabe, Takeshi; Kikuchi, Makoto; and Suzuki, Isao, 3,717,962.

Killion, John: *See—*
    Berkovitz, Robert A., 3,718,773.

Kim, Sang-Chul, to General Electric Company. Photoflash firing circuits employing series resistor-diode combinations. 3,718,422, Cl. 431-95.000.

Kimball, William H.: *See—*
    Westeren, Herbert W.; Kimball, William H.; Scotto, Vincent; and Vanderford, Wallace S., Jr., 3,718,324.

Kimpton, Frederick James: *See—*
    Cleaver, John Stephen; Guilford, Peter; Kimpton, Frederick James; Page, Thomas John; and Steinberg, Norman Richard, 3,718,273.

Kinetics International Corporation: *See—*
    Hurst, Gerald L., 3,718,512.

King, Arthur S. Particle separator and method. 3,718,256, Cl. 210-71.000.

Kingmann-White, Inc.: *See—*
    Nolte, Calude B., 3,718,048.

Kiriu, Yoshihito. Nib and writing instrument construction with capillary action. 3,718,401, Cl. 401-199.000.

Kise, Mearl A.: *See—*
    Winslow, Charles E., Jr.; Plentovish, Jack; and Kise, Mearl A., 3,718,732.

Kitamura, Yoshio; and Suzuki, Ikuo, to Kabushiki Kaisha Sankyo Seiki Seisakusho. Automatic sound-reproducing apparatus. 3,718,746, Cl. 84-101.000.

Kiwalle, Jozef, to Production Technology Inc., mesne. Hydrostatic bearing seal assembly. 3,718,334, Cl. 277-27.000.

Klamer, Reuben B.: *See—*
    Venditti, Arthur P., 3,717,950.

Klar, John, to Heald Machine Company, The. Impact time indicator. 3,717,991, Cl. 58-152.00r.

Klein, George P.: *See—*
    Spyrou, Constantine A.; and Klein, George P., 3,718,854.

Klein, Gerald B. Leader connector. 3,717,907, Cl. 24-128.000.

Klein, Hans-Jurgen, to Swiss Aluminium Ltd. Process for the electrolytic production of aluminum. 3,718,550, Cl. 204-67.000.

Klein, Lee F., to General Motors Corporation. Snap ring coupling. 3,718,350, Cl. 285-39.000.

Klein, Rudolf: *See—*
    Muller, Rolf; Von Brachel, Hanswilli; Klein, Rudolf; Schmidt, Ewald; and Bender, Heinz, 3,718,641.

Klein Schanzlin & Becker Aktiengesellschaft: *See—*
    Dernedde, Robert; and Freese, Heinz, 3,718,335.

Kleinpeter, Joseph A., to Continental Oil Company. Adsorption process for recovering condensible components from a gas stream. 3,718,581, Cl. 208-340.000.

Kline, Donald D.: *See—*
    Landre, John K.; Kline, Donald D.; and Broemmelsiek, Marc W., 3,718,751.

Klockner-Humboldt-Deutz Aktiengesellschaft: *See—*
    Barten, Hans; Barnewald, Rudolf; and Hanich, Werner, 3,718,197.

Kluksdahl, Harris E.: *See—*
    Buss, Waldeen C.; and Kluksdahl, Harris E., 3,718,578.

Knapp, Heinrich: *See—*
    Eckert, Konrad; Knapp, Heinrich; and Engel, Gerhard, 3,718,123.

Knauber, Ronald L.: *See—*
    Donn, Edward S.; and Knauber, Ronald L., 3,718,925.

Knight, Richard Langhiam Castle: *See—*
    Stringer, Peter Jack Eldon Crawford; Knight, Richard Langhiam Castle; and Wayne, Donald Gordon, 3,718,037.

Knippa, James A., Jr.; and Schwartz, Andrew K., Jr., to Petro-Tex Chemical Corporation. Oxidative dehydrogenation. 3,718,707, Cl. 260-678.000.

Knoblauch, Karl: *See—*
    Gappa, Gunther; Knoblauch, Karl; Maier, Franz; Schwarte, Jurgen; and Steiner, Peter, 3,717,976.

Knox, Joseph Dale: *See—*
    Pao, Yoh-Han; and Knox, Joseph Dale, 3,718,868.

Knutzen, Frances M. Baby bottle holder. 3,718,360, Cl. 294-27.00h.

Kobari, Masao; Hagiwara, Hiroshi; and Uchiyama, Kensuke, to Japan Monoply Corporation, The. Process for preparing sheet-like material for smoking. 3,718,153, Cl. 131-140.00c.

Kobayashi, Akihiro: *See—*
    Sasaki, Koju; Kobayashi, Akihiro; and Takahashi, Naoki, 3,718,919.

Kobayashi, Harunobu: *See—*
    Kanno, Tomoei; and Kobayashi, Harunobu, 3,718,479.

Kobayashi, Tunekazu: *See—*
    Masuda, Noboru; and Kobayashi, Tunekazu, 3,718,882.

Kobylanski, Anthony, to Signode Corporation. Nail shank broaching apparatus and method. 3,717,891, Cl. 10-54.000.

Koenig, Karl-Heinz: *See—*
    Dietsche, Wolfram; Adolphi, Heinrich; Beutel, Peter; and Koenig, Karl-Heinz, 3,718,661.

Koguchi, Kazuo: *See—*
    Juri, Isao; Koguchi, Kazuo; Kuroiwa, Toshimi; and Koken, Tomoyuki, 3,718,850.

Kohl, Karl. Method and device for laying-in yarn in a warp knitting machine. 3,718,010, Cl. 66-84.000.

Kojima, Gen: *See—*
    Tabata, Yoneho; and Kojima, Gen, 3,718,558.

Koken, Tomoyuki: *See—*
    Juri, Isao; Koguchi, Kazuo; Kuroiwa, Toshimi; and Koken, Tomoyuki, 3,718,850.

Kolb, Gunter; Schmidt, Adolf; Schmitz-Josten, Robert; and Wolff, Erich, to Agfa-Gevaert Aktiengesellschaft. Layers crosslinkable by light. 3,718,474, Cl. 96-115.00p.

Kolb, Karl-Heinz: *See—*
    Laurent, Henry; Kolb, Karl-Heinz; and Wiechert, Rudolf, 3,718,671.

Konagai, Kotaro. Burner mechanism of used oil. 3,718,424, Cl. 431-207.000.

Konig, Karl, to Bohdan Melnyk. Anchor for dental prostheses. 3,717,931, Cl. 32-5.000.

Konkin, Nikolai Alexandrovich: *See—*
    Afanasiev, Vadim Nikolaevich; Belyaev, Jury Pavlovich; Gaiduchik, Vladimir Olegovich; Gruzin, Pavel Lukich; Konkin, Nikolai Alexandrovich; Megarsky, Valery Vasilievich; Okunev, Boris Nikolaevich; and Trokin, Jury Alexandrovich, 3,718,817.

Kooi, Else, to U.S. Philips Corporation. Semiconductor device for monolithic integrated circuits compact. 3,718,843, Cl. 317-235.00r.

Koopmann, Adolf: *See—*
    Pfeifer, Josef; Ambraschka, Kasimir; Koopmann, Adolf; Hofmann, Wilfried; Dietrich, Karl-Heinz; and Rauffer, Walter, 3,718,391.

Kosaka, Masahiro, to Matsushita Electric Industrial Co., Ltd. Instructional tape recorder for preventing erroneous erasure on a double track magnetic tape using two sensing means. 3,718,774, Cl. 179-100.20d.

Kovacic, Zoran: *See—*
    Tolmie, Robert J.; and Kovacic, Zoran, 3,717,936.

Koyama, Yasuo, to Kayaku Antibiotic Research Company, Ltd. N-1 and N-2 fractions of neocarzinostatin. 3,718,741, Cl. 424-118.000.

Kraakman, Hillebrand J. J., to U.S. Philips Corporation. Fluid logic element. 3,718,152, Cl. 137-114.000.

Kraft, Hans-Gunther: *See—*
    Irmscher, Klaus; Von Werder, Fritz; B[illegible], Karl-Heinz; and Kraft, Hans-Gunther, 3,718,542.

Krapcho, John: *See—*
    Fried, Josef; Pribyl, Edward J.; and Krapcho, John, 3,718,643.

Kravetsky, Gennady Alexandrovich: *See—*
    Anikin, Leonid Trifonovich; Kravetsky, Gennady Alexandrovich; Dergunova, Viktoria Sergeevna; and Dutov, Valery Vasilievich, 3,717,926.

Krebs, William Michael, to Instrumentation Laboratory, Inc. Polarographic electrode assembly. 3,718,566, Cl. 204-195.00p.

Krenz, Gunter, to Vereinigte Flugtechnische Werke-Fokker GmbH. Wing arrangement for a V/STOL aircraft. 3,718,294, Cl. 244-46.000.

Kristiansen, Odd, to Ciba-Geigy Corporation. Propanal derivatives. 3,718,683, Cl. 260-456.00a.

Krohn, Ivar T.; and Page, Geoffrey A., to Xerox Corporation. Manifold electrification process. 3,718,462, Cl. 96-1.300.

Krull, Irwin H.; and Martin, Donald N., to Beckman Instruments, Inc. Polarographic sensor and membrane therefor. 3,718,563, Cl. 204-195.00p.

Krywult, Jerzy: *See—*
    Gawlikowicz, Jan J.; Krywult, Jerzy; Wusatowski, Roman; Garczynski, Jozef; Makowski, Aleksander; and Sikora, Leopold, 3,718,026.

Kuch, Heinz; and Hoffmann, Irmgard, to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning. 1,5-Benzodiazepines and process for preparing them. 3,718,645, Cl. 260-239.30b.

Kudritzki, Hans, to International Standard Electric Corporation. Microswitch with improved flexible loop sensing means for detecting transient objects. 3,718,785, Cl. 200-61.410.

Kuesters, Eduard, Maschinenfabrik: *See—*
    Ahrweiler, Karl-Heinz, 3,718,427.

Kuhn, Jorg; and Sohm, Elmar. Apparatus for cultivating plants. 3,717,953, Cl. 47-1.100.

Kuhn, Walter: *See—*
    Felder, Winfried; and Kuhn, Walter, 3,718,056.

Kuniholm, Martin L., to Heald Machine Company, The. Grinding machine. 3,717,960, Cl. 51-165.900.

- Kuphal, Klaus: *See—*
  - von Arx, Arnold; and Kuphal, Klaus, 3,718,818.
- Kuramoto, Yoshio: *See—*
  - Ueda, Hiroshi; and Kuramoto, Yoshio, 3,718,076.
- Kurebayashi, Tokuhiro: *See—*
  - Oishi, Kazuo; Kurebayashi, Tokuhiro; Ando, Noriyoshi; Yamamoto, Noboru; Toda, Tadahide; Nohira, Hidetaka; and Katoh, Takashi, 3,718,126.
- Kuroiwa, Toshimi: *See—*
  - Juri, Isao; Koguchi, Kazuo; Kuroiwa, Toshimi; and Koken, Tomoyuki, 3,718,850.
- Kusakabe, Takeshi; Kikuchi, Makoto; and Suzuki, Isao, to Toyoda Koki Kabushiki Kaisha. Machine tool with time control device. 3,717,962, Cl. 51-165.091.
- Kussy, Frank W.; and Heberlein, Gustave E., Jr., to I-T-E Imperial Corporation. Current limiting circuit breaker with magnetic latch. 3,718,875, Cl. 335-18.000.
- Kwap, Theodore W.: *See—*
  - Gulitz, Louis; Kwap, Theodore W.; and O'Kane, Daniel F., 3,718,757.
- Kwast, Victor B.; Morlock, Douglas A.; and Satz, Richard G., to United States of America, Army. Real time digital energy meter. 3,718,860, Cl. 324-142.000.
- Kyorin Seiyaku Kabushiki Kaisha: *See—*
  - Okamoto, Toshihiko; Hirobe, Masaaki; Suzue, Seigo; Nagatsu, Yoshio; Ushiyama, Keiichi; Satoh, Susumu; and Irikura, Tsutomu, 3,718,656.
- La Boda, Mitchell: *See—*
  - Darling, Jacob B.; and La Boda, Mitchell, 3,718,555.
- La Telemecanique Electrique: *See—*
  - Trubert, Georges; and Droulin, Jean Louis, 3,718,924.
- La Tourneau, Howard C.; and Riedner, William E., to Clark Equipment Company. Automatic vehicle stop mechanism. 3,718,097, Cl. 104-249.000.
- Labat, Yves: *See—*
  - Esclamadon, Christian; Labat, Yves; and Signouret, Jean-Baptiste, 3,718,700.
- Laboratorios Ferrer S.L.: *See—*
  - Ferrer-Salat, Carlos; Ferrer-Batlles, Jorge; and Colome-Riera, Juan, 3,718,655.
  - Salat, Carlos Ferrer; Batlles, Jorge Ferrer; and Riers, Juan Colombe, 3,718,664.
- Ladine, Duane A.: *See—*
  - McCullough, Lester E.; and Ladine, Duane A., 3,718,930.
- Lagomarsino, John A., to Bio-Derivatives Corporation. Bacteriuria test material. 3,718,543, Cl. 195-99.000.
- Lahm, Heinrich, to Index-Werke KG. Indexing apparatus for tool holders of machine tools. 3,717,912, Cl. 29-39.000.
- Lambdin, Foraker, Jr; and Randles, William W., to United States of America, Atomic Energy Commission. Method for manufacturing fibrous, carbonaceous composites having near isotropic properties. 3,718,720, Cl. 264-29.000.
- Lanahan, John H.; and Abraham, William W., to Mohawk Industrial Laboratories, Inc. Brush for assisting in separation of sheets. 3,718,255, Cl. 209-80.500.
- Landingham, Richard L., to United States of America, Army. Method for forming metal-filled ceramics of near theoretical density. 3,718,441, Cl. 29-182.100.
- Landre, John K.; Kline, Donald D.; and Broemmelsiek, Marc W., to Commercial Electronics Incorporated. Optics for high sensitivity color television camera. 3,718,751, Cl. 178-5.40e.
- Lankford, Marion P., to Vacu-dry. Food dehydration method. 3,718,485, Cl. 99-204.000.
- Lapkin, Milton: *See—*
  - Wojtowicz, John A.; Lapkin, Milton; and Puar, Mohindar S., 3,718,598.
- Larimore, David B.: *See—*
  - Christensen, Robert I.; and Larimore, David B., 3,718,734.
- Laroche, Rene V., to Aluminium Suisse SA. Installation for degreasing metal articles. 3,718,147, Cl. 134-60.000.
- Larralde, Edward; and Beaufort, Ronald E., to Vetco Offshore Industries, Inc. Hydraulic-pneumatic weight control and compensating apparatus. 3,718,316, Cl. 254-172.000.
- Larsen, Carl Ib Peder, to Haldex Aktiebolag. Electronic taximeters device. 3,718,811, Cl. 235-30.00r.
- Larson, Ronald H. Ski carrier. 3,718,242, Cl. 224-45.00s.
- Lasch, Cecil A., Jr., to Industrial Modular Systems Corporation. Fluid bearing track structure and components thereof. 3,718,371, Cl. 302-31.000.
- Latta's Inc.: *See—*
  - Comstock, Alfred E., 3,718,328.
- Lattin, William W., to Motorola, Inc. Opposite conductivity gating circuit for refreshing information in semiconductor memory cells. 3,718,915, Cl. 340-173.00r.
- Laughon, Thomas C.: *See—*
  - Bracken, Thomas W.; Laughon, Thomas C.; and Smith, Gerald C., 3,718,807.
- Laurent, Henry; Kolb, Karl-Heinz; and Wiechert, Rudolf, to Schering Aktiengesellschaft. 21-Halogen steroids. 3,718,671, Cl. 260-397.300.
- Law, S. Edward: *See—*
  - Gourdine, Meredith C.; and Law, S. Edward, 3,718,029.
- Lawson, Lewis E., to Green Giant Company. Asparagus harvester. 3,717,986, Cl. 56-327.00a.
- Leblond, Jean, to Uniroyal Englebert France S.A. Tire building drum. 3,718,520, Cl. 156-400.000.
- Leckenby, Robert Edwin: *See—*
  - Williams, Raymond; and Leckenby, Robert Edwin, 3,718,379.
- Lee, Charles A., to International Paper Company, mesne. Adhesive application system. 3,718,115, Cl. 118-203.000.
- Lee, Leonard A., to Celanese Corporation. Method of forming a porous cellulose acetate membrane. 3,718,722, Cl. 264-41.000.
- Lee, Raymond, Organization, Inc., The: *See—*
  - Pizzerrato, Adrian, 3,718,282.
  - Wilson, Arthur L., 3,718,829.
- Lee, Richard J.: *See—*
  - Piasek, Edmund J.; Karll, Robert E.; and Lee, Richard J., 3,718,663.
- Lehman, Walter R. Ground effect vehicle with integrated forward thrust means. 3,718,203, Cl. 180-120.000.
- Lehment, Klaus-Friedrich; and Raue, Roderich, to Farbenfabriken Bayer Aktiengesellschaft. Process for the quaternization of basic dyestuffs. 3,718,642, Cl. 260-165.000.
- Leiba, Eugene: *See—*
  - Assouline, Georges J.; Hareng, Michel; and Leiba, Eugene, 3,718,381.
- Leitner, Hermann, to Siemag Siegener Maschinenbau G.m.b.H. Rolling mill. 3,718,020, Cl. 72-78.000.
- Lemberg, Seymour. Novel fragrance materials and processes therefor. 3,718,697, Cl. 260-586.00a.
- Lemery, Jean-Paul, to Carpano & Pons. Fishing reel. 3,718,291, Cl. 242-219.000.
- Lemmen, Conrardus Johannes Gerardus, to Oce-Van der Grinten N.V. Apparatus for sectionally delivering a web from a storage roll. 3,718,354, Cl. 242-75.000.
- Lesterhuis, Jan: *See—*
  - Dorjee, Hendrik; and Lesterhuis, Jan, 3,718,885.
- Leverett, Glen Frederick, to Du Pont de Nemours, E. I., and Company. Stabilization of polyoxymethylene. 3,718,630, Cl. 260-67.0fp.
- Levine, Seymour. Deferred-action battery comprising a perforated ampoule sealed with removable plugs. 3,718,508, Cl. 136-90.000.
- Levine, Seymour, to United States of America, Army. Magnetic setback-centrifugal switch. 3,718,787, Cl. 200-80.000.
- Lewis, Thomas W., to Rexham Corporation, mesne. Mounting base material for rubber printing plates and method of manufacturing the same. 3,718,531, Cl. 161-116.000.
- Liber, Theodore, to IIT Research Institute. Tension indicating fastener. 3,718,065, Cl. 85-62.000.
- Licentia Patent-Verwaltungs G.m.b.H.: *See—*
  - Hennings, Klaus, 3,718,396.
  - Prell, Gunter; and Baersch, Herbert, 3,718,385.
- Liedholm, Folke: *See—*
  - Liljeqvist, Alf Harald; and Liedholm, Folke, 3,718,073.
- Lightner, Robert W. Vending system for remotely accessible stored information. 3,718,906, Cl. 340-147.00r.
- Liljeqvist, Alf Harald; and Liedholm, Folke. Means for synchronizing a speed-following machine in relation to a speed-setting machine. 3,718,073, Cl. 91-412.000.
- Linde Aktiengesellschaft: *See—*
  - Ranke, Gerhard; and Jungfer, Hans, 3,718,006.
- Linden, David, to United States of America, Army. Bi-cell unit for fuel cell. 3,718,507, Cl. 136-86.00r.
- Lindenmuth, Charles J.: *See—*
  - Bacon, James A.; and Lindenmuth, Charles J., 3,718,039.
- Lindsey, James M.: *See—*
  - Hering, Donald R.; and Lindsey, James M., 3,718,194.
- Linton, Richard H.: *See—*
  - Donofrio, Nicholas M.; and Linton, Richard H., 3,718,826.
- Lipoma, Samuel P. Apparatus for continuous electromagnetic sterilization. 3,718,082, Cl. 99-470.000.
- Lipscomb, William T.: *See—*
  - Diamond, Louis; and Lipscomb, William T., 3,718,135.
- Lipton, Thomas J., Limited: *See—*
  - Tremblay, Maurice Robert; and Maurer, Richard Launt, 3,718,480.
- Ljungdahl, Erland Samuel. Toy comprising a model of a perpetuum mobile. 3,717,951, Cl. 46-243.000.
- Logemann, Heino, to Bayer Aktiengesellschaft. Containing a polymer of vinyl methyl formamide. 3,718,717, Cl. 260-898.000.
- Lohr, Raymond J.; and Cook, Calvin S., to Marx, Louis, & Co. Occupant-propelled vehicle. 3,718,344, Cl. 280-261.000.
- Lohse, Friedrich; Schmid, Rolf; and Batzer, Hans, to Ciba-Geigy AG. Heat-curable polyurethane foams and elastomers based on aromatic polyesters. 3,718,623, Cl. 260-75.0np.
- Lonza Ltd.: *See—*
  - Moser, Kurt; and Hochli, Beat, 3,718,028.
- Lorenz, Howard I.; and Rosser, Eugene P., to Nobel Drilling Corporation. Guide and protector arrangement incorporating fill-up float valve means. 3,718,196, Cl. 175-307.000.
- Lorenzen, John C.: *See—*
  - Jacob, Harry M.; and Lorenzen, John C., 3,718,176.
- Lossa, Ulrich: *See—*
  - Heimann, Werner; and Lossa, Ulrich, 3,717,989.
- Lowry, Richard E.: *See—*
  - Hiebert, Adoniram C.; and Lowry, Richard E., 3,718,267.
- Lubrizol Corporation, The: *See—*
  - Hayashi, Katsumi, 3,718,626.
- Lucas, Bernard Henry: *See—*

  - Ritcey, Gordon Malcolm; and Lucas, Bernard Henry, 3,718,458.
- Lucas, Joseph, (Industries) Limited: *See—*
  - Eyles, Leonard William, 3,717,992.
  - Nolan, Roger William; and Wright, Maurice James, 3,718,849.
  - Tregurtha, Steven John, 3,718,794.
  - Wilkinson, Norman, 3,718,784.
- Lucas, Raymond Louis Roger. Paper strip processing equipment. 3,718,298, Cl. 242-58.600.
- Lucht, Wilbert A., to United States Steel Corporation. Stranded steel wire structures. 3,718,442, Cl. 29-191.600.
- Lucic, Richard A. D.: *See—*
  - Robison, Billie J.; and Lucic, Richard A. D., 3,718,572.
- Lummus, James L.; Anderson, Duane B.; and Edwards, Carl D., to Amoco Production Company. Stabilizing asphalt in water-base drilling fluids. 3,718,585, Cl. 252-8.50c.
- Lund, Harold E.; and Ericson, John F. E., to Marvel Industries, Inc. Multiple drum clamping unit. 3,718,228, Cl. 214-620.000.
- Luraschi, Marisa. Manufacturing process and machine for producing an extruded thermoplastic laminate with multishaped variegation. 3,718,413, Cl. 425-130.000.
- Ly, Manuel G.: *See—*
  - Karady, Sandor; Pines, Seemon H.; Ly, Manuel G.; and Sletzinger, Meyer, 3,718,674.
- Lyday, Richard W.: *See—*
  - Schulz, John C.; and Lyday, Richard W., 3,718,304.
- Lynn, John R.; and Tate, George W., Jr. Automatic visual examination including fixation monitoring and compensation. 3,718,386, Cl. 351-39.000.
- Lyon, Jerry: *See—*
  - Pitman, Robert L.; Haverson, Robert H.; Lyon, Jerry; Weldon, Peter; and Rand, Henry T., 3,718,092.
- Lysons, Hilton H.; and Mann, Charles N., to United States of America, Agriculture. Two cable tension-controlled carriage. 3,718,262, Cl. 212-110.000.
- M&W Gear Company, Inc.: *See—*
  - Meiners, Elmo R., 3,717,982.
- Macdonald, Robert N.: *See—*
  - Deschenes, Raymond J.; and Macdonald, Robert N., 3,718,764.
- Madas, John: *See—*
  - Gitterman, Charles O.; Madas, John; Rickes, Edward L.; and Stoudt, Thomas H., 3,718,651.
- Madden, Bill C.: *See—*
  - Hasbrouck, Leo J.; Madden, Bill C.; Rew, Robert P.; Sussenguth, Edward H.; and Wierzbicki, John R., 3,718,912.
- Madrid, Robert W.: *See—*
  - Wysocki, Joseph J.; Adams, James E.; Becker, James H.; Madrid, Robert W.; and Haas, Werner E., 3,718,380.
  - Wysocki, Joseph J.; Adams, James E.; Becker, James H.; Madrid, Robert W.; and Haas, Werner E. L., 3,718,382.
- Magna Corporation: *See—*
  - Rohrback, Gilson H., 3,718,556.
- Magnetico International, Inc.: *See—*
  - Nordhoff, John J., 3,718,233.
- Magnode Products, Inc.: *See—*
  - Bidwell, Arthur W., 3,718,571.
  - Bidwell, Arthur W., 3,718,573.
- Magyar, Lorand W.: *See—*
  - Dafler, Gene L.; and Magyar, Lorand W., 3,718,162.
- Mahoney, Robert J.; Dean, Donald N.; and Uzuanis, Joseph, Jr., to Barber-Colman Company. Balloon breaker for thread winders. 3,718,296, Cl. 242-35.50r.
- Maier, Franz: *See—*
  - Gappa, Gunther; Knoblauch, Karl; Maier, Franz; Schwarte, Jurgen; and Steiner, Peter, 3,717,976.
- Maier, Heinz, to Fischer-Brodbeck G.m.b.H., Prazisionsteile-Fabrik. Rotary indexing machine. 3,718,055, Cl. 74-826.000.
- Makela, Taisto Ensio, to Osakeyhtio, A. Ahlstrom. Paper machine head box having improved balance. 3,718,538, Cl. 162-340.000.
- Maker, Paul, to Bird Island, Inc. Gear making. 3,717,913, Cl. 29-103.00c.
- Makowski, Aleksander: *See—*
  - Gawlikowicz, Jan J.; Krywult, Jerzy; Wusatowski, Roman; Garczynski, Jozef; Makowski, Aleksander; and Sikora, Leopold, 3,718,026.
- Mallinger, Morton A.: *See—*
  - Bearden, William G.; Fast, Clarence R.; and Mallinger, Morton A., 3,718,088.
- Mallinger, Zella K.: *See—*
  - Bearden, William G.; Fast, Clarence R.; and Mallinger, Morton A., 3,718,088.
- Mallory, Edwin E.; and Mapel, William S., to National-Standard Company. Tire bead wrapping machine. 3,718,523, Cl. 156-460.000.
- Malmedie & Co. Maschinfabrik GmbH: *See—*
  - Weller, Alois, 3,717,890.
- Maloney, Martin V.: *See—*
  - Chase, David O.; Maloney, Martin V.; Wood, Frederick J., Jr.; and Wood, Barry B., 3,717,896.
- Maloney, William T.; and Thaxter, James B., to Sperry Rand Corporation. Erasable optical recording system. 3,718,913, Cl. 340-173.0ch.
- Mange, Franklin E.: *See—*
  - Bellos, Thomas J.; and Mange, Franklin E., 3,718,588.
- Mann, Charles N.: *See—*
  - Lysons, Hilton H.; and Mann, Charles N., 3,718,262.
- Mann, Frederick W. Adjustable swing hitch for vehicles. 3,718,347, Cl. 280-467.000.
- Mannings, Inc.: *See—*
  - Brunner, Fred William, 3,718,487.
- Mantooth, Charles P. Seat lifter. 3,717,884, Cl. 4-237.000.
- Manz, August Frederick, to Union Carbide Corporation. Ripple control for electric arc welding power supply apparatus. 3,718,802, Cl. 219-131.0wr.
- Mapel, William S.: *See—*
  - Mallory, Edwin E.; and Mapel, William S., 3,718,523.
- Marathon Oil Company: *See—*
  - Holovka, John M.; and Hurley, Edward, Jr., 3,718,701.
  - Milton, Harry W., Jr., 3,718,187.
- Marcotte, Eugene M., to West Coast Rope and Rigging of Portland, Inc. Beam end cap. 3,718,361, Cl. 294-67.00e.
- Mark Products, Inc.: *See—*
  - Holmes, Robert C., Jr., 3,718,900.
- Marks, John L., to International Telephone and Telegraph Corporation. Apparatus for cutting a wire and crimping a winding to the wire. 3,717,917, Cl. 29-203.00d.
- Marmon Group, Inc., The: *See—*
  - Doerr, Albert H., 3,718,035.
- Marotto, Robert Anthony: *See—*
  - Tornoe, John Axel; and Marotto, Robert Anthony, 3,718,015.
- Marten, James F.: *See—*
  - Perry, Wesley G.; and Marten, James F., 3,718,133.
- Marten, John Anthony; and Gee, Bernard Arthur, to Suntester Limited. Vehicle testing apparatus. 3,718,036, Cl. 73-117.000.
- Martin, Daniel W.; and Stein, John L., to Baldwin, D. H., Company. Electrocoustic pipes for electronic organs. 3,718,747, Cl. 84-1.010.
- Martin, Donald N.: *See—*
  - Krull, Irwin H.; and Martin, Donald N., 3,718,563.
- Martin, George Robert, to Dow Chemical Company, The. Catalyst for dehydrogenation of alkanes. 3,718,607, Cl. 252-439.000.
- Martinsons, Aleksandrs, to PPG Industries, Inc. Ruthenium coated titanium electrode. 3,718,551, Cl. 204-98.000.
- Martone, Ronald J.; Mueller, Peter G.; and Bailey, Homer M., to Picker Corporation. Scintillation camera system. 3,718,833, Cl. 315-18.000.
- Marvel Industries, Inc.: *See—*
  - Lund, Harold E.; and Ericson, John F. E., 3,718,228.
- Marx, Louis, & Co.: *See—*
  - Lohr, Raymond J.; and Cook, Calvin S., 3,718,344.
- Mason, Daniel W.; and Nester, Henry H.; deceased (by Nester, Dianne L.; as special administratrix), said Mason, Daniel W., assors. to Owens-Illinois, Inc. Resistor compositions for microcircuitry. 3,718,608, Cl. 252-514.000.
- Masuda, Noboru; and Kobayashi, Tunekazu, to Denki Onkyo Co., Ltd. Magnetic switching apparatus. 3,718,882, Cl. 338-32.00h.
- Matsubara, Masaki, to Olympus Optical Company Limited. Accurate lens system for producing an extremely small image in a reduced scale. 3,718,384, Cl. 350-215.000.
- Matsui, Kazuma; and Tsubouchi, Hideo, to Nippondenso Kabushiki Kaisha. Gas controlled liquid proportioning fluidic device. 3,718,151, Cl. 137-823.000.
- Matsuoka, Hideo, to Iwatsu Electric Co., Ltd. Sweep circuit exhibiting eliminated jitter. 3,718,825, Cl. 307-228.000.
- Matsushima, Akira, to Kabushiki Kaisha Hattori Tokeiten. Switch for push key. 3,718,877, Cl. 335-205.000.
- Matsushita Electric Industrial Co., Ltd.: *See—*
  - Kawamoto, Kinji, 3,718,871.
  - Kosaka, Masahiro, 3,718,774.
  - Nagaoka, Yoshitomi; and Saishima, Takayuki, 3,718,753.
  - Yoshida, Hideyuki, 3,718,801.
- Matsushita Electronics Corporation: *See—*
  - Wilson, James C., 3,718,878.
- Matsuyama, George: *See—*
  - Petersen, Arne J.; and Matsuyama, George, 3,718,569.
- Matthews, Robert E.: *See—*
  - Freedlander, Abraham L.; Garrett, Wayne C.; and Matthews, Robert E., 3,717,985.
- Matthews, Russell B. Automatic fuel ignition system. 3,718,423, Cl. 431-266.000.
- Matzner, Markus; Reichle, Walter T.; Chow, Sui-Wu; and McGrath, James E., to Union Carbide Corporation. Disulfonamides of diamino diphenyl sulfones. 3,718,672, Cl. 260-397.600.
- Maurer, Richard Launt: *See—*
  - Tremblay, Maurice Robert; and Maurer, Richard Launt, 3,718,480.
- Mauvernay, Roland Yves; Busch, Norbert; Moleyre, Jacques; and Simond, Jacques, to Societe Anonyme Centre Europeen de Recherches Mauvernay. Derivatives of substituted piperazines. 3,718,650, Cl. 260-268.00r.
- Maxey, Edwin M.; and Harrington, John T., to General Tire & Rubber Company, The. Urethane foams containing halogen containing polymers and methods for preparing the same using certain catalysts. 3,718,611, Cl. 260-2.5ae.
- Mazza, Lamberto, to Industrie A. Zanussi S.p.A. Dish-washer. 3,718,149, Cl. 134-57.00d.
- Mazzarins, Janis, to General Motors Corporation. Suspension system for crawler tractor. 3,718,199, Cl. 180-9.20r.
- Mc Dermott, Richard L., to Airco, Inc. Reactivated low temperature adsorber system with a non-adsorbing cold accumulator. 3,718,005, Cl. 62-13.000.
- Mc Donough, Thomas B.; and Shaffer, John W., to GTE Sylvania Incorporated. Photographic flashlamp unit with flashed lamp indicator and method of making same. 3,718,815, Cl. 240-1.300.

McCain, James H.; and Theiling, Louis F., to Union Carbide Corporation. Preparation of trisubstituted-hydroxyalkyl alkanoates. 3,718,689, Cl. 260-494.000.

McCain Manufacturing Corporation: *See—*
Bellanca, Joseph V., 3,718,348.

McClain, Lamont R.; and Slavik, Emil L., to Engel Industries, Inc. Combined slitting and overlaying feed apparatus for roll former machines and the like. 3,718,022, Cl. 72-132.000.

McCormick, Harold E., to Ramsey Corporation. Pumping seal for rotary piston engines. 3,718,412, Cl. 418-142.000.

McCullough, Lester E.; and Ladine, Duane A., to Goldak Company, Inc., The. Boring bit locator. 3,718,930, Cl. 343-112.00r.

McFarland, Frederick R.; and Diffenderfer, Walter L., to K-D Manufacturing Company. Battery terminal post and post clamp cleaner tool. 3,717,895, Cl. 15-105.000.

McGrath, James E.: *See—*
Matzner, Markus; Reichle, Walter T.; Chow, Sui-Wu; and McGrath, James E., 3,718,672.

McGraw-Edison Company: *See—*
Bufkin, Dale E.; and Murphy, Willard G., 3,718,084.

McGuire, John V.; and Watson, Donald W., to Xerox Corporation. Label transfer wheel. 3,718,525, Cl. 156-539.000.

McGusty, Elizabeth R.; and Sutton, Blaine M., to Smith Kline & French Laboratories. Phosphine or phosphite gold complexes of thiomalic acid. 3,718,679, Cl. 260-430.000.

McGusty, Elizabeth R.; and Sutton, Blaine M., to Smith Kline & French Laboratories. Phosphine or phosphite gold complexes of thioethanol and derivatives thereof. 3,718,680, Cl. 260-430.000.

McJones, Robert W. Pressure gauge isolator. 3,718,046, Cl. 73-395.000.

McKee, John A.: *See—*
Joo, Louis A.; McKee, John A.; and Shea, Frederick L., 3,718,493.

McKee, Kenneth R. Apparatus for starting rope-pull engines. 3,718,129, Cl. 123-179.00p.

McMechan, Maurice H. Orchard heating system. 3,718,421, Cl. 431-23.000.

Mead Corporation, The: *See—*
Taylor, Richard P.; Van Brimmer, Russell H.; and Culp, Fred E., 3,717,945.

Medical Specialties, Inc.: *See—*
Gaylord, John F., Jr., 3,718,137.

Medtronic, Inc.: *See—*
Mulier, Pieter M.J., 3,718,142.

Medtronic, Inc., mesne: *See—*
Greatbatch, Wilson, 3,718,909.

Megarsky, Valery Vasilievich: *See—*
Afanasiev, Vadim Nikolaevich; Belyaev, Jury Pavlovich; Gaiduchik, Vladimir Olegovich; Gruzin, Pavel Lukich; Konkin, Nikolai Alexandrovich; Megarsky, Valery Vasilievich; Okunev, Boris Nikolaevich; and Trokin, Jury Alexandrovich, 3,718,817.

Meier, Johann. Inclinometer or oscillation measuring device. 3,717,935, Cl. 33-391.000.

Meiners, Elmo R., to M&W Gear Company, Inc. Corn detasseler head. 3,717,982, Cl. 56-63.000.

Meis, Thomas F. Cant-producing saw mills. 3,718,063, Cl. 84-471.200.

Meissner, Konrad Emil, to Filper Corporation. Method of palletizing cans. 3,718,223, Cl. 214-152.000.

Melancon, John D.: *See—*
Rollo, William C.; and Melancon, John D., 3,718,586.

Menelly, Richard A.: *See—*
Butter, Donald A.; Kern, Edmund R.; and Menelly, Richard A., 3,718,831.

Merck & Co., Inc.: *See—*
Gitterman, Charles O.; Madas, John; Rickes, Edward L.; and Stoudt, Thomas H., 3,718,651.
Hinkley, David F., 3,718,482.
Karady, Sandor; Pines, Seemon H.; Ly, Manuel G.; and Sletzinger, Meyer, 3,718,674.
Shen, Tsung-Ying; and Witzel, Bruce E., 3,718,743.
Weston, Roy G.; and Putter, Irving, 3,718,644.

Merck Patent Gesellschaft mit beschrankter Haftung: *See—*
Irmscher, Klaus; Von Werder, Fritz; Bork, Karl-Heinz; and Kraft, Hans-Gunther, 3,718,542.

Merrick Scale Mfg. Company: *See—*
Christmann, John L., 3,718,031.

Mesler, Lilburn L.: *See—*
Gilmore, William J.; and Mesler, Lilburn L., 3,717,987.

Met-L-Wood Corporation: *See—*
Urbanick, Burton Alfred, 3,717,955.

Metaframe Corporation: *See—*
Willinger, Allan H., 3,718,275.

Microwave Associates, Inc.: *See—*
Tenenholtz, Robert, 3,718,867.

Midland-Ross Corporation: *See—*
Goron, John, 3,718,166.
Hemsath, Klaus H.; and Wright, Dale E., 3,718,102.
Mount, Robert E.; De Geleke, Gerrit; and Pundyk, Joseph, 3,718,302.
Mount, Robert E.; De Gelleke, Gerrit; and Pundyk, Joseph, 3,718,303.

Mihailovski, Alexander, to Stauffer Chemical Company. Herbicidal method employing 4-chloro-1-naphthyl 2'-propynyl ether. 3,718,456, Cl. 71-124.000.

Miksitz, Frank J. Feeding and particle size measurement of comminuted solids. 3,718,819, Cl. 250-43.50d.

Milanowski, Floyd J.; and Bowman, Arthur J., Jr., to United States of America, Army. Firing pin assembly. 3,718,093, Cl. 102-73.00a.

Miller, Howard A., to Eastman Kodak Company. Method of preparing magnetically responsive carrier particles. 3,718,594, Cl. 252-62.100.

Miller, Paul: *See—*
Erdman, William Charles; and Miller, Paul, 3,718,514.

Miller, Robert E.: *See—*
Wildi, Bernard S.; and Miller, Robert E., 3,718,478.

Miller, Stanley M., to Ingersoll-Rand Company. Trigger mechanism. 3,718,313, Cl. 251-290.000.

Miller, William Don. Elastic post bracing assembly. 3,718,098, Cl. 105-369.

Mills, Franky D., to Hamby Company, The. Ammonia trailer improvements. 3,718,343, Cl. 280-116.000.

Milton, Harry W., Jr., to Marathon Oil Company. Method of injection well stimulation. 3,718,187, Cl. 166-274.000.

Milwaukee Gear Company: *See—*
Barr, William A.; Hahlbeck, Edwin C.; and Heine, Ferdinand L., 3,718,052.

Mimeur, Robert, to Carpano, Ets. & Pons S.A. Device for limiting the number of revolution of a rotating shaft. 3,718,215, Cl. 192-141.000.

Mimura, Koji: *See—*
Joh, Yasushi; and Mimura, Koji, 3,718,716.

Minnesota Mining and Manufacturing Company: *See—*
Schertler, Paul H.; and Strobel, Rupert F., 3,718,113.
Tomita, Jun, 3,718,495.
Tushaus, Leonard A., 3,718,712.

Minolta Camera Kabushiki Kaisha: *See—*
Ueda, Hiroshi; and Kuramoto, Yoshio, 3,718,076.

Minshull, Robert: *See—*
Cairns, Hugh; and Minshull, Robert, 3,718,668.

Mirroless Watson Company Limited: *See—*
Bach, Niels Breinholt, 3,718,257.

Mishima Kosan Co., Ltd.: *See—*
Takeuchi, Shinjiro, 3,718,872.

Mitchell, John Z., to Oven Systems, Inc. Shrink film oven. 3,717,939, Cl. 34-230.000.

Mitchell, Robert S., to Monsanto Company. Methods of inhibiting corrosion with substituted tertiary amine phosphonates. 3,718,603, Cl. 252-389.00h.

Mitsubishi Rayon Company Limited: *See—*
Joh, Yasushi; and Mimura, Koji, 3,718,716.

Mitsubishi Rayon Company, Ltd.: *See—*
Kawai, Atsushi; Katsuyama, Takehiro; Suzuki, Migaku; and Ohta, Hidenori, 3,718,537.

Mitsui Petrochemical Industries, Ltd.: *See—*
Tomoshige, Toru; and Honma, Shiro, 3,718,635.

Mitsui Shipbuilding and Engineering Co., Ltd.: *See—*
Ozawa, Tokuji; Uyeda, Mikio; and Suzuki, Shigenori, 3,718,708

Mix-Mill, Inc.: *See—*
Skelton, Robert F., 3,718,322.

Miyata Industry Co., Ltd.: *See—*
Nomura, Hideo, 3,717,947.

Mizzoni, Renat Herbert; and Blatter, Herbert Morton, to Ciba-Geigy Corporation. Anilino-3-pyridinesulfonic acids. 3,718,654, Cl. 260-294.80r.

Mobil Oil Corporation: *See—*
Chen, Nai Yuen; and Yan, Tsoung-Yuan, 3,718,577.
Clayton, William J., 3,718,059.
Groenendyke, Goethe M., 3,718,204.
Stover, William A., 3,718,553.

Modern Animal Care, Inc.: *See—*
Schwarz, Karl W.; Borkowski, Allan S.; and Hafesh, Joseph W., 3,718,120.

Moffett, Robert B., to Upjohn Company, The. N-lower alkenyl-2,3-dihydro-2-oxo-5-phenyl-1H-1, 4-benzodiazepine-1-carboxamides. 3,718,646, Cl. 260-239.30d.

Mohawk Industrial Laboratories, Inc.: *See—*
Lanahan, John H.; and Abrahām, William W., 3,718,255.

Moleyre, Jacques: *See—*
Mauvernay, Roland Yves; Busch, Norbert; Moleyre, Jacques; and Simond, Jacques, 3,718,650.

Molins Machine Company Limited: *See—*
Hillman, James George Edward, 3,718,224.

Mollberg, Rene: *See—*
Eriksoo, Edgar; Fex, Hans; Hogberg, Knut Bertil; Mollberg, Rene; and Rohte, Oskar, 3,718,694.

Monsanto Company: *See—*
Adamo, Michael D., 3,718,419.
Buckley, Francis T.; Riek, Raymond F.; and Christensen, Donald I., 3,718,516.
Clark, Frank S., 3,718,590.
Mitchell, Robert S., 3,718,603.
Richard, William R., Jr., 3,718,596.
Shelby, Richard K., 3,718,416.
Stenzel, Hans-Jurgen A., 3,718,459.
Wildi, Bernard S.; and Miller, Robert E., 3,718,478.
Young, Raymond H., Jr., 3,718,463.

Montgomery, Donald Lee. Method of making flat rotatable disc assemblies. 3,718,519, Cl. 156-250.000.

Moody, Harry A.: *See—*
Dunham, Russell H.; Moody, Harry A.; and Skahen, Don H., 3,718,339.

Moog Inc.: *See—*
Dark, Patrick M., 3,718,016.

Mookherjee, Braja D.; and Theimer, Ernst T., to International Flavors & Fragrances, Inc. Process for the preparation of macrocyclic compounds and novel compounds produced thereby. 3,718,696, Cl. 260-586.00a.

Moore, Alvin Edward. Barrel-curved, wreck-resistant cabin. 3,718,295, Cl. 244-119.000.

Moore, George E.; and Horlacher, Joseph D., to Watson Manufacturing Company, Inc. File tray control plate system. 3,718,232, Cl. 220-22.300.

Moore, Lee C., Corporation: *See—*
Donnally, Robert B., 3,718,266.

Moore, Robert S., to Eastman Kodak Company. Plastic optical element having refractive index gradient. 3,718,383, Cl. 350-175.0gn

Mora, Raul L.: *See—*
Brown, Victor E.; Mora, Raul L.; and Morton, Evans T., 3,717,964.

Morden, Russell L.: *See—*
Perkins, Ralph W.; and Morden, Russell L., 3,718,054.

Morgan Construction Company: *See—*
Gilvar, Martin, 3,718,062.
Vitelli, Vito J., 3,718,024.

Morgan, Cyril Alfred; Arber, Scott Gordin; and Young, Oswald William John, to United States Borax & Chemical Corporation. Process for purification of refractory metal nitrides. 3,718,490, Cl. 106-65.000.

Morlock, Douglas A.: *See—*
Kwast, Victor B.; Morlock, Douglas A.; and Satz, Richard G., 3,718,860.

Morrison, Bobby: *See—*
Wylie, Richard D.; and Morrison, Bobby, 3,717,940.

Morrison Molded Fiber Glass Company, mesne: *See—*
Goodman, James L., 3,718,527.

Mortell, Charles H. Method and apparatus for electrolytically recovering metals. 3,718,552, Cl. 204-105.00r.

Morton, Evans T.: *See—*
Brown, Victor E.; Mora, Raul L.; and Morton, Evans T., 3,717,964.

Morton, Evans T.; and Vescio, Kimbel L., to Behring Corporation. Roof sealing of modules. 3,717,965, Cl. 52-79.000.

Morton, Robert B., to Bell & Howell Company. Filmstrip cartridge. 3,718,301, Cl. 242-71.100.

Moser, Kurt; and Hochli, Beat, to Lonza Ltd. Torsional vibrator for testing plastics materials. 3,718,028, Cl. 73-15.400.

Mosher, Fred D., to Techno Corporation. Cardiac valve replacement. 3,717,883, Cl. 3-1.000.

Moslo, Ernest P. Lubricating mechanism. 3,718,209, Cl. 184-5.000.

Motiongraph, Inc.: *See—*
Bukowski, Raymond J.; Brija, Raymond L.; and Yanikoski, Florian F., 3,718,244.

Motorola, Inc.: *See—*
Lattin, William W., 3,718,915.
Rollins, Thomas J., 3,718,899.

Moulin, Michel, to Thomson-CSF. Process for epitaxially growing semiconductor crystals. 3,718,511, Cl. 148-171.000.

Moulinage et Retorderie de Chavanoz: *See—*
Chatin, Remy, 3,717,959.

Mount Hope Machine Company, Incorporated: *See—*
Robertson, J. Douglas, 3,717,909.

Mount, Robert E.; De Geleke, Gerrit; and Pundyk, Joseph, to Midland-Ross Corporation. Coil and mandrel separating machinery. 3,718,302, Cl. 242-81.000.

Mount, Robert E.; De Gelleke, Gerrit; and Pundyk, Joseph, to Midland-Ross Corporation. Turnstile-type coil-gathering machine. 3,718,303, Cl. 242-81.000.

Mowat, Geoffrey C. Guiding devices. 3,718,896, Cl. 340-1.00r.

MTS Systems Corporation: *See—*
Petersen, Niel R., 3,718,033.

Mueller, Peter G.: *See—*
Martone, Ronald J.; Mueller, Peter G.; and Bailey, Homer M., 3,718,833.

Muirhead, Leslie A., to Shell Oil Company. High impact polyvinyl-aromatic compositions. 3,718,616, Cl. 260-28.50b.

Mulier, Pieter M.J., to Medtronic, Inc. Electrically shielded, gas-permeable implantable electro-medical apparatus. 3,718,142, Cl. 128-419.00p.

Muller, Donald C., to Webb, Jervis B., Company. Accumulation roller conveyor. 3,718,248, Cl. 198-127.000.

Muller, Karl-Heinz, to Siemens Aktiengesellschaft. Data storage system utilizing particle beam for reading information. 3,718,914, Cl. 340-173.0cr.

Muller, Rolf; Von Brachel, Hanswilli; Klein, Rudolf; Schmidt, Ewald; and Bender, Heinz, to Cassella Farbwerke Mainkur AG. Reactive arylazo-pyrazalone dyestuffs. 3,718,641, Cl. 260-162.000.

Mulvey, Dennis M.: *See—*
Weinstock, Leonard M.; Tull, Roger J.; and Mulvey, Dennis M., 3,718,647.

Munger, John R.; and Tate, Sherman E., to United States of America, Army. Burn out perforation for rocket propellants. 3,718,095, Cl. 102-102.000.

Murphy, Willard G.: *See—*
Bufkin, Dale E.; and Murphy, Willard G., 3,718,084.

Murray, I. Gillis, to Brewster Corporation, The. Supporting feet for panels and the like. 3,718,306, Cl. 248-188.800.

Mutschler, William E.: *See—*
Fishman, Jack B.; and Mutschler, William E., 3,718,043.

Myer, Jon H., to Hughes Aircraft Company. Omnidirectional planar optical code reader. 3,718,761, Cl. 178-7.600.

Myers, Paul K., to Cardinal-Ordinal Corporation. Cardinal-ordinal digital calculators and computers. 3,718,810, Cl. 235-156.000.

Myers, Robert E. Dental floss holder. 3,718,146, Cl. 132-92.000.

Nagaoka, Yoshitomi; and Saishima, Takayuki, to Matsushita Electric Industrial Co., Ltd. Tint-control indicating apparatus for color TV receivers. 3,718,753, Cl. 178-5.4he.

Nagatsu, Yoshio: *See—*
Okamoto, Toshihiko; Hirobe, Masaaki; Suzue, Seigo; Nagatsu, Yoshio; Ushiyama, Keiichi; Satoh, Susumu; and Irikura, Tsutomu, 3,718,656.

Naggert, Dietrich K., to Continental Can Company, Inc. Machine for positioning a flexible container for seaming. 3,717,971, Cl. 53-89.000.

Nakagawa, Mutsuaki; Tauchi, Takao; and Nishihara, Tadashi, to Kabushikikaisha Yokogawa Denki Seisakusho. Force-to-signal converter. 3,718,047, Cl. 73-398.00r.

Nakagawa, Shiro; and Ishikawa, Mutsuo, to T.D.K. Electronics Corporation. Driving system of magnetic thin film memory. 3,718,917, Cl. 340-174.0tf.

Nakamura, Akira: *See—*
Sugiyama, Michiyuki; Takatori, Yoshikuni; Touyama, Ryosuke; Nakamura, Akira; Yamauchi, Teiji; Kato, Masaaki; and Nakashiba, Yoshio, 3,718,560.

Nakanishi, Koji; and Gylys, Jonas A., said Gylys assor. to Bristol-Myers Company. Method of sedation. 3,718,745, Cl. 424-311.000.

Nakashiba, Yoshio: *See—*
Sugiyama, Michiyuki; Takatori, Yoshikuni; Touyama, Ryosuke; Nakamura, Akira; Yamauchi, Teiji; Kato, Masaaki; and Nakashiba, Yoshio, 3,718,560.

Nakatani, Yoshio: *See—*
Arai, Kinjiro; and Nakatani, Yoshio, 3,717,923.

Narayanan, Venkatachala L.; and Haugwitz, Rudiger D., to Squibb, E. R., & Sons, Inc. Mercaptobenzimidazolyl ureas and thioureas. 3,718,662, Cl. 260-309.200.

Nash, James H., Jr.: *See—*
Premru, Brian Allan; and Nash, James H., Jr., 3,718,832.

National Blank Book Company, Inc.: *See—*
Schade, Frank Stanley, 3,718,402.

National Midco Industries, Incorporated: *See—*
Bank, Gilbert, 3,718,771.

National Research Development Corporation: *See—*
Brindley, Giles Skey, 3,718,134.

National-Standard Company: *See—*
Mallory, Edwin E.; and Mapel, William S., 3,718,523.

Nauchno-Issledovatelsky Institut Onkologii i Meditsinskoi Radiologii MZ BSSR: *See—*
Alexandrov, Nikolai Nikolaevich; and Strukov, Arkady Dmitrievich, 3,718,138.

Nederlandse Organisatie voor Toegepast-Natuurwetenschappelijk Onderzoek ten behoeve van Nijverheid, Handel en Verkeer: *See—*
Bakkerus, Hermanus, 3,718,351.

Negre, Robert Numa Paul, to Societe des Fonderies de Pont-A-Mousson. Sealing means for a machine for centrifugally casting pipes. 3,718,178, Cl. 164-297.000.

Nelson, Jerome W.: *See—*
Randolph, James B.; Nelson, Jerome W.; Paysinger, Joe R.; and Crump, E. Eugene, 3,718,798.

Nester, Dianne L.: *See—*
Mason, Daniel W.; and Nester, Henry H., 3,718,608.

Nester, Henry H.: *See—*
Mason, Daniel W.; and Nester, Henry H., 3,718,608.

Neufelder, Manfred: *See—*
Fischer, Horst; and Neufelder, Manfred, 3,718,430.

Neuro Systems Inc., mesne: *See—*
Holt, William J.; and Boy de la Tour, Roger, 3,718,132.

New Hermes Engraving Corporation: *See—*
Berlant, George, 3,718,072.

Newbrough, Joseph S. Multi-stage gas lift fluid pump system. 3,718,407, Cl. 417-108.000.

Newelt, Robert T., to Instrumentation Laboratory, Inc. Electrochemical sensor instrumentation. 3,718,568, Cl. 204-195.00p.

Newman, Albert K., to Textron, Inc. Centrifugal clutch. 3,718,214, Cl. 192-105.0cd.

Newman, John W.: *See—*
Chapman, Duane K.; Newman, John W.; and Green, William S., 3,718,704.

Newton, Catherine H.: *See—*
Brandon, Clarence W., 3,718,186.

Nezu, Kazuo; Imabayashi, Ziro; Watanabe, Kazutaka; Iritani, Tadamitsu; Kataoka, Kouju; and Yoshioka, Michio, to Yokogawa Electric Works, Ltd. Pulse transmitting apparatus. 3,718,762, Cl. 178-68.000.

Nicely, Thomas E.: *See—*
Abarotin, Eugene V.; Bollinger, Edward R., Jr.; and Nicely, Thomas E., 3,718,064.

Nicholson Manufacturing Company: *See—*
Cervenak, Peter J., 3,718,167.

Nicita, Domenico: *See—*
Parmeggiani, Paolo; Nicita, Domenico; and D'Alo, Bruno, 3,718,270.

Nicolay, Heinz: *See—*
Gruner, Hans; and Nicolay, Heinz, 3,718,372.

Niedecker, Herbert. Apparatus for closing open-topped flexible containers. 3,717,972, Cl. 53-13.80a.
Nield, Eric: *See—*
Hart, Charles Richard; Nield, Eric; and Rose, John Brewster, 3,718,620.
Nies, Nelson P.: *See—*
Woods, William G.; Whiten, Joseph G.; and Nies, Nelson P., 3,718,615.
Niikura, Isamu; and Aritz, Yokohama, to Tokyo Shibaura Electric Co., Ltd. Optical detectors for inspecting the condition of samples. 3,718,823, Cl. 250-223.00r.
Nippon Electric Company, Limited: *See—*
Takahashi, Sadayuki; and Tsubouchi, Norio, 3,718,595.
Wada, Toshio; and Tsujide, Tohru, 3,718,916.
Nippon Kogaku K.K.: *See—*
Ono, Shigeo, 3,718,077.
Nippon Sheet Glass Co.: *See—*
Ohsato, Nobuyoshi; and Akashi, Naotomo, 3,718,450.
Nippondenso Kabushiki Kaisha: *See—*
Matsui, Kazuma; and Tsubouchi, Hideo, 3,718,151.
Oishi, Kazuo; Kurebayashi, Tokuhiro; Ando, Noriyoshi; Yamamoto, Noboru; Toda, Tadahide; Nohira, Hidetaka; and Katoh, Takashi, 3,718,126.
Yamaguchi, Terumote, 3,717,928.
Nishihara, Tadashi: *See—*
Nakagawa, Mutsuaki; Tauchi, Takao; and Nishihara, Tadashi, 3,718,047.
Nittan Company, Limited: *See—*
Sasaki, Koju; Kobayashi, Akihiro; and Takahashi, Naoki, 3,718,919.
Nobel Drilling Corporation: *See—*
Lorenz, Howard I.; and Rosser, Eugene P., 3,718,196.
Nohira, Hidetaka: *See—*
Oishi, Kazuo; Kurebayashi, Tokuhiro; Ando, Noriyoshi; Yamamoto, Noboru; Toda, Tadahide; Nohira, Hidetaka; and Katoh, Takashi, 3,718,126.
Nolan, Roger William; and Wright, Maurice James, to Lucas, Joseph, (Industries) Limited. Voltage regulators for use in battery charging systems. 3,718,849, Cl. 320-61.000.
Nolte, Calude B., to Kingmann-White, Inc. Relief valves for differential pressure flow meters. 3,718,048, Cl. 73-407.00r.
Nomura, Hideo, to Miyata Industry Co., Ltd. Fishing device. 3,717,947, Cl. 43-19.000.
Nordhoff, John J., to Magnetico International, Inc. Beer dispensing system. 3,718,233, Cl. 222-70.000.
Norman, Oscar L.: *See—*
Bushick, Ronald D.; Norman, Oscar L.; and Spinelli, Harry J., 3,718,690.
Norman, William A., Jr. Retainer for draft key of railway car like coupling. 3,718,264, Cl. 213-50.500.
Norris, Elwood G., to Sound Systems International, Inc. Wireless microphone and adapter kit. 3,718,862, Cl. 325-111.000.
North American Aviation, Inc.: *See—*
Bermender, Norman W., 3,718,094.
North American Car Corporation: *See—*
Dupre, Barry E., 3,718,363.
North American Philips Co., Inc.: *See—*
Dorjee, Hendrik; and Lesterhuis, Jan, 3,718,885.
North American Philips Corporation: *See—*
Botker, Kurt, 3,718,128.
North American Rockwell Corporation: *See—*
Gehri, Dennis C., 3,718,733.
Rogers, Howard H.; and Pilipovich, Donald, 3,718,557.
North Branch Industries, Inc.: *See—*
Siebentritt, Frank H.; and Silvera, Esteban, 3,718,157.
Northcutt, Oren Van, to Dal-Air Tool Company. Ball joint air supply connection. 3,718,352, Cl. 285-261.000.
Nucleonics Development Company: *See—*
Fishman, Jack B.; and Mutschler, William E., 3,718,043.
Nunez, Hector R. Portable vice. 3,718,327, Cl. 269-37.000.
N.V. Hollandse Signaalapparaten: *See—*
Huele, Hendrik Teunis, 3,718,933.
Nyquist, Edwin B., to Dow Chemical Company, The. Coated articles. 3,718,500, Cl. 117-132.00r.
Nystrom, Donald L. Repair clamp for spring. 3,718,325, Cl. 267-74.000.
O'Bryan, Henry Miles, Jr.: *See—*
Fraser, David Bruce; O'Bryan, Henry Miles, Jr.; and Thomson, John, Jr., 3,718,723.
Obszarny, Theodore J., to Guardian Electric Manufacturing Company. High speed push button switch. 3,718,793, Cl. 200-160.000.
Oce-Van der Grinten N.V.: *See—*
Lemmen, Conrardus Johannes Gerardus, 3,718,354.
Ochiai, Takeshi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Skid control system for automotive vehicles. 3,718,374, Cl. 303-21.00a.
O'Connor, Liam, to O'Connor, Liam, and Company Limited. Closure assembly for a bulk container. 3,718,231, Cl. 220-41.000.
O'Connor, Liam, and Company Limited: *See—*
O'Connor, Liam, 3,718,231.
Ogiso, Mitsutoshi; and Ito, Tadashi, to Canon Kabushiki Kaisha. Exposure controlling device for a camera. 3,718,075, Cl. 95-10.0ct.
Ohi, Reiichi: *See—*
Hatano, Tadao; Hara, Hikoharu; Sugiyama, Masatoshi; and Ohi, Reiichi, 3,718,469.
Ohsato, Nobuyoshi; and Akashi, Naotomo, to Nippon Sheet Glass Co. Float process for manufacture of glass ribbon. 3,718,450, Cl. 65-99.00a.
Ohta, Hidenori: *See—*
Kawai, Atsushi; Katsuyama, Takehiro; Suzuki, Migaku; and Ohta, Hidenori, 3,718,537.
Oishi, Kazuo; Kurebayashi, Tokuhiro; Ando, Noriyoshi; Yamamoto, Noboru; Toda, Tadahide; Nohira, Hidetaka; and Katoh, Takashi, to Toyota Jidosha Kogyo Kabushiki Kaisha and Nippondenso Kabushiki Kaisha. Ignition timing regulating device for internal combustin engines. 3,718,126, Cl. 123-117.00r.
Oiso, Mitsuo; and Endo, Yasuo, to Fujitsu Limited. Circuit arrangement for checking stored information. 3,718,903, Cl. 340-146.1al.
Oka, Kazumichi: *See—*
Tanaka, Hideo; Imajyo, Yasutaka; Takano, Ikuo; Takahashi, Jiro; and Oka, Kazumichi, 3,718,840.
Okamoto, Miyoshi; and Watanabe, Koji, to Toray Industries, Inc. Spontaneously crimping synthetic composite filament and process of manufacturing the same. 3,718,534, Cl. 161-173.000.
Okamoto, Toshihiko; Hirobe, Masaaki; Suzue, Seigo; Nagatsu, Yoshio; Ushiyama, Keiichi; Satoh, Susumu; and Irikura, Tsutomu, to Kyorin Seiyaku Kabushiki Kaisha. Pyrazolo (1,5-a) pyridine derivatives 3,718,656, Cl. 260-295.00f.
O'Kane, Daniel F.: *See—*
Gulitz, Louis; Kwap, Theodore W., and O'Kane, Daniel F., 3,718,757.
Okuda, Tomoharu; and Awataguchi, Shigemi, to Tanabe Seiyaku Co., Ltd. Antibiotics yl 704 and preparation thereof. 3,718,742, Cl. 424-121.000.
Okunev, Boris Nikolaevich: *See—*
Afanasiev, Vadim Nikolaevich; Belyaev, Jury Pavlovich; Gaiduchik, Vladimir Olegovich; Gruzin, Pavel Lukich; Konkin, Nikolai Alexandrovich; Megarsky, Valery Vasilievich, Okunev, Boris Nikolaevich; and Trokin, Jury Alexandrovich, 3,718,817.
Olin Mathieson Chemical Corporation: *See—*
Wojtowicz, John A.; Lapkin, Milton; and Puar, Mohindar S., 3,718,598.
Oliver, Gene L.; and Harbison, Judith M., to Eastman Kodak Company. Filter dyes for photographic elements. 3,718,472, Cl. 96-84.00r.
Oliver, John P.; and Wedel, Alfred W., to Cameron Iron Works, Inc. Apparatus for making an underwater pipeline connection. 3,717,920, Cl. 29-237.000.
Oliver, John P.; Wedel, Alfred W.; and Priesmeyer, Paul T. Method for making an underwater pipeline connection. 3,718,004, Cl. 61-72.300.
Olsen, Leslie R., to United States of America, Navy. Method of making a cool burning gun propellant. 3,718,719, Cl. 264-3.00h.
Olsen, Robert W.; and Herrick, Richard E., to Construction Specialties, Inc. Surface-mounted wall guards. 3,717,968, Cl. 52-288.000
Olympia Werke AG: *See—*
Chvatlinsky, Kurt, 3,718,243.
Priebel, Wolfgang; and Frobel, Arthur, 3,718,245.
Olympus Optical Company Limited: *See—*
Matsubara, Masaki, 3,718,384.
Yonekubo, Ken, 3,718,400.
Omdoll, James W., Jr. Gaff hook. 3,718,359, Cl. 294-26.000.
Onal, Hasan F., to Borg-Warner Corporation. Centrifugal pump with integral seal pressure balance. 3,718,406, Cl. 415-111.000.
Ono, Shigeo, to Nippon Kogaku K.K. Transistorized control device for camera shutters including exposure setting and shutter delay timing means. 3,718,077, Cl. 95-10.0ct.
Orndorff, Roy L., to Goodrich, B. F., Company, The. Mud resistant elastomers. 3,717,943, Cl. 36-32.00r.
Orthman, Henry K., to Orthman Manufacturing Inc. Seedbed splitter and shaper. 3,718,103, Cl. 172-159.000.
Orthman Manufacturing Inc.: *See—*
Orthman, Henry K., 3,718,103.
Osakeyhtio, A. Ahlstrom: *See—*
Makela, Taisto Ensio, 3,718,538.
Osborne, Edwin F., Jr. Air filter system. 3,717,978, Cl. 55-242.000.
Osgood, John H., to Harris-Intertype Corporation. Roll out stand. 3,718,299, Cl. 242-58.600.
Outboard Marine Corporation: *See—*
Blanchard, Clarence E., 3,718,110.
Hines, Charles E., 3,718,848.
Oven Systems, Inc.: *See—*
Mitchell, John Z., 3,717,939.
Owens-Illinois, Inc.: *See—*
Mason, Daniel W.; and Nester, Henry H. (said Mason, Daniel W., assors. to), 3,718,608.
Oy Nokia Ab Finnish Cable Works: *See—*
Hoffmeister, Hansmartin, 3,718,886.
Oya, Yuichiro; and Hayasaka, Akio, to Hitachi, Ltd. Active pulse transmission circuit for an integrated circuit. 3,718,780, Cl. 179-170.00g.
Ozawa, Tokuji; Uyeda, Mikio; and Suzuki, Shigenori, to Mitsui Shipbuilding and Engineering Co., Ltd. Method and apparatus for thermal cracking and quenching. 3,718,708, Cl. 260-683.00r.
Packaging Products & Design Corporation: *See—*
Smith, Jesse J., 3,718,253.
Pagano, Anthony M.; and Fiedler, Dolores E. Breast support. 3,718,143, Cl. 128-499.000.
Page, Geoffrey A.: *See—*

Krohn, Ivar T.; and Page, Geoffrey A., 3,718,462.
Page, Thomas John: *See—*
Cleaver, John Stephen; Guilford, Peter; Kimpton, Frederick James; Page, Thomas John; and Steinberg, Norman Richard, 3,718,273.
Paine, Joseph L.: *See—*
Frederick, Albert R.; Paine, Joseph L.; and Rosser, Daniel B., 3,718,841.
Palitex Project Company GmbH: *See—*
Heimann, Werner; and Lossa, Ulrich, 3,717,989.
Paloniemi, Paavo. Isothermal calorimeter. 3,718,437, Cl. 23-253.00r.
Pande, Kailash C.; and Trampe, George M., to Borg-Warner Corporation. Method for synthesizing alpha-haloacrylonitrile acid. 3,718,684, Cl. 260-465.700.
Pao, Yoh-Han; and Knox, Joseph Dale, to Case Western Reserve University. I_2^{129} Inverted lamb dip stabilized He-Ne laser. 3,718,868, Cl. 331-94.500.
Papastavrou, Antonios. Pollution control apparatus. 3,717,980, Cl. 55-461.000.
Paris, Gerard Yvon. *See—*
Garmaise, David Lyon; Paris, Gerard Yvon; and Plotnikoff, Nicholas Peter, 3,718,657.
Parker, Carlyle V.; and Bishop, Walton B., to United States of America, Navy. Instantaneous sidelobe interrogation decode suppressor. 3,718,926, Cl. 343-6.8lc.
Parks, John H.: *See—*
Gates, Marvin A.; and Parks, John H., 3,718,127.
Parmeggiani, Paolo; Nicita, Domenico; and D'Alo, Bruno, to Snia Viscosa Societa Nazionale Industria Applicazioni Viscosa. Devices for picking-up, sucking and dragging textile filaments and yarns. 3,718,270, Cl. 226-97.000.
Pascoe, Larry B., to Rohr Industries, Inc. Rivet center detecting mechanism. 3,718,822, Cl. 250-210.000.
Passer, La Roy B., to USM Corporation. Hole plug fasteners. 3,718,068, Cl. 85-71.000.
Pasternak, John Paul, to Bell Telephone Laboratories, Incorporated. Universal connector for cable conductors. 3,718,888, Cl. 339-98.000.
Patels, Gottfried; and Beck, Erich, to Vockenhuber, Karl and Hauser, Raimund. System for reproducing motion pictures. 3,718,760, Cl. 178-7.200.
Patula, Edward J.; Somers, Robert R.; and Roberts, William L., to United States Steel Corporation. Method for increasing the heating rate in continuous annealing processes. 3,718,510, Cl. 148-14.000.
Paulet, Jean-Francois; and Endtinger, Fritz, to Swiss Aluminium Ltd. Process for the coloring of anodized layers on aluminum. 3,718,548, Cl. 204-35.00n.
Payne, Leroy C., to Standard Pneumatic Motor Company. Quick connect and disconnect valved coupling. 3,718,312, Cl. 251-149.400.
Paysinger, Joe R.: *See—*
Randolph, James B.; Nelson, Jerome W.; Paysinger, Joe R.; and Crump, E. Eugene, 3,718,798.
Pearsall, Gerald Robert, to Irvin Industries, Inc. Vehicle seat belt alarm and starter interlock control system. 3,718,902, Cl. 340-52.00e.
Peatman, John B.: *See—*
Williams, Olin A., Jr.; and Peatman, John B., 3,718,813.
Pecker, Guillermo Eugene: *See—*
Pringle, John; and Pecker, Guillermo Eugene, 3,718,880.
Pedersen, Harry: *See—*
Ellwanger, Charles G.; and Pedersen, Harry, 3,717,958.
Pelletier, Frank Palmer, to Bell Telephone Laboratories, Incorporated. Technique for the fabrication of discrete RC structure. 3,718,565, Cl. 204-192.000.
Penberthy, Walter L., Jr.: *See—*
Bayless, Jack H.; and Penberthy, Walter L., Jr., 3,718,184.
Penley, Walter E. Spare tire mount for pickups. 3,718,226, Cl. 214-451.000.
Penn, Harry S. Process of treating bile and novel iodine-131 complex. 3,718,737, Cl. 424-1.000.
Perina, Joseph, to American Velcro, Inc. Deformable fastening device. 3,717,908, Cl. 24-204.000.
Perina, Joseph, to American Velcro, Inc. Breakaway clutch. 3,718,009, Cl. 64-28.00r.
Peripheral Equipment Corporation: *See—*
Alaimo, Benjamin, 3,718,289.
Perkins, Ralph W.; and Morden, Russell L., to General Motors Corporation. Load responsive torque transmission mechanism. 3,718,054, Cl. 74-751.000.
Perlick, Allan A. Landscaping implement. 3,718,190, Cl. 172-173.000.
Perlman, Marvin: *See—*
United States of America, National Aeronautics and Space Administration, 3,718,863.
Perret, Georges, to Geneco Inc. Apparatus for printing on cylindrical articles. 3,718,085, Cl. 101-40.000.
Perrott, Emmanuel J.: *See—*
Ranghelli, Joseph C.; and Perrott, Emmanuel J., 3,718,935.
Perry, David Lester Edgar. Measuring machine. 3,718,112, Cl. 116-114.000.
Perry, Frederick G., to Texas Instruments, Incorporated. Apparatus for starting and protecting of electrical motors. 3,718,879, Cl. 337-95.000.
Perry, Wesley G.; and Marten, James F., to Damon Corporation. Container unit for liquid samples. 3,718,133, Cl. 128-2.00f.
Peschl, Ervin; and Skrepek, Jan, 1/2 to Schlafhorst, W., & Co. and 1/2 to Vyzkumny Ustav Pletarsky. Method of producing a warp knitted or sewn fabric. 3,718,011, Cl. 66-192.000.
Petersen, Arne J.; and Matsuyama, George, to Beckman Instruments, Inc. Method of making solid state glass electrode. 3,718,569, Cl. 204-195.00g.
Petersen, Niel R., to MTS Systems Corporation. Testing apparatus utilizing position-force cross coupling control. 3,718,033, Cl. 73-71.700.
Peterson, Leavitt A.: *See—*
Freeman, William H.; Peterson, Leavitt A.; and Wandrisco, Joseph M., 3,718,040.
Petro-Tex Chemical Corporation: *See—*
Knippa, James A., Jr.; and Schwartz, Andrew K., Jr., 3,718,707.
Petrolite Corporation: *See—*
Bellos, Thomas J.; and Mange, Franklin E., 3,718,588.
Pettigrew, David D.: *See—*
Keiter, Edward F.; Pfleiderer, Glenn F.; and Pettigrew, David D., 3,718,405.
Peyrot, Jean: *See—*
Grosmangin, Jacques; and Peyrot, Jean, 3,718,631.
Pfaff, Gary C.: *See—*
Scherf, Gerhard W.; and Pfaff, Gary C., 3,718,604.
Pfeifer, Josef; Ambraschka, Kasimir; Koopmann, Adolf; Hofmann, Wilfried; Dietrich, Karl-Heinz; and Rauffer, Walter, to Agfa-Gevaert Aktiengesellschaft. Microfilm reading apparatus. 3,718,391, Cl. 353-101.000.
Pfender, Georg, to Wehrle-Werk AG., Firma. Lapping machine for the production of reinforcement baskets with bell sleeve. 3,718,797, Cl. 210-56.000.
Pfiffner, Albert: *See—*
Chodnekar, Madhukar Subraya; Pfiffner, Albert; Rigassi, Norbert; Schwieter, Ulrich; and Suchy, Milos, 3,718,686.
Pfleiderer, Glenn F.: *See—*
Keiter, Edward F.; Pfleiderer, Glenn F.; and Pettigrew, David D., 3,718,405.
Pfleiderer, Wolfgang: *See—*
Zondler, Helmut; and Pfleiderer, Wolfgang, 3,718,610.
Pharo, Wellington B.: *See—*
Glendinning, William B.; and Pharo, Wellington B., 3,718,503.
Phelan, David P. Sleeping bag. 3,717,888, Cl. 5-343.000.
Philofsky, Harold M.; Ying, Sui-Chun; and Chottiner, Jacob, to Westinghouse Electric Corporation. Liquid cooled rotor for dynamoelectric machines. 3,718,830, Cl. 310-64.000.
Piasek, Edmund J.; Karll, Robert E.; and Lee, Richard J., to Standard Oil Company. Preparation of oil-soluble boron derivatives of an alkylene polyamine-urea or thiourea-succinic anhydride addition product. 3,718,663, Cl. 260-326.300.
Picker Corporation: *See—*
Martone, Ronald J.; Mueller, Peter G.; and Bailey, Homer M., 3,718,833.
Pierce, Russell W. Apparatus and method for detecting gaseous contaminants. 3,718,434, Cl. 23-232.00r.
Pilipovich, Donald: *See—*
Rogers, Howard H.; and Pilipovich, Donald, 3,718,557.
Pines, Seemon H.: *See—*
Karady, Sandor; Pines, Seemon H.; Ly, Manuel G.; and Sletzinger, Meyer, 3,718,674.
Pit-Bar Manufacturing Company: *See—*
Wakefield, Orval W., 3,717,894.
Pitman, Robert L.; Haverson, Robert H.; Lyon, Jerry; Weldon, Peter; and Rand, Henry T., to United States of America, Army. Batteryless electronic time fuze. 3,718,092, Cl. 102-70.20r.
Pitts, Sam H., Jr., to United States of America, Atomic Energy Commission. Plutonium dissolution and plutonium alkoxide product. 3,718,677, Cl. 260-429.100.
Pizzerrato, Adrian, to Lee, Raymond, Organization, Inc., The. Drinking straws. 3,718,282, Cl. 239-33.000.
Plentovish, Jack: *See—*
Winslow, Charles E., Jr.; Plentovish, Jack; and Kise, Mearl A., 3,718,732.
Plomer, John J.; Doan, Hazen V.; and Slykhouse, Thomas E., to Dow Chemical Company, The. Mixer-molder. 3,718,069, Cl. 86-20.00d.
Plotnikoff, Nicholas Peter: *See—*
Garmaise, David Lyon; Paris, Gerard Yvon; and Plotnikoff, Nicholas Peter, 3,718,657.
Plough, Irving L., to Black Clawson Company, The. Chipping apparatus. 3,718,169, Cl. 144-242.00r.
Plumadore, Harold M.: *See—*
Boudouris, Angelo; and Plumadore, Harold M., 3,718,388.
Plummer, William T., to Polaroid Corporation. Smoothly granulated optical surface and method for making same. 3,718,078, Cl. 95-49.000.
Plumpe, Hans; and Puls, Walter, to Farbenfabriken Bayer Aktiengesellschaft. Arylsulphonyl ureas containing heterocyclic acylamino groups. 3,718,660, Cl. 260-307.00d.
Polaroid Corporation: *See—*
Dyer, Gerald T., 3,718,649.
Plummer, William T., 3,718,078.
Polkinghorn, Melvin W.: *See—*
Burgess, James P.; and Polkinghorn, Melvin W., 3,718,892.
Pollman, Frederic W., to Sundstrand Corporation. Hydraulic motor. 3,718,411, Cl. 418-82.000.
Pollution Research & Control Corporation: *See—*

Sims, Anker V., 3,718,544.
Polytop Corporation: *See—*
Hazard, Robert E.; and Wilson, Woodrow S., 3,718,238.
Ponghis, Nicolas Gerassimos; and Van Osmael, Claude Henri, to Centre National de Recherches Metallurgiques. Method and device for monitoring the working of a furnace. 3,718,758, Cl. 178-6.800.
Posey, Eldridge D. Heated fluid gun. 3,718,805, Cl. 219-305.000.
Posey, Thad W. Capacitor discharge ignition system. 3,718,125, Cl. 123-148.00e.
Potter, Paul H. Electric resistance heater with spaced insulators and an inter-connectable flexible metallic base strip. 3,718,806, Cl. 219-550.000.
Potter, Russell F., to General Motors Corporation. Preheater assembly for stirling engine. 3,717,993, Cl. 60-24.000.
PPG Industries, Inc.: *See—*
Crano, John C.; and Trenta, Gerald M., 3,718,711.
Drummond, Warren W.; and Denniston, Donald W., 3,718,448.
Fahey, Dennis M., 3,718,449.
Martinsons, Aleksandrs, 3,718,551.
Prell, Gunter; and Baersch, Herbert, to Licentia Patent-Verwaltungs G.m.b.H. Apparatus for mounting an optical correction member in a housing. 3,718,385, Cl. 350-252.000.
Premru, Brian Allan; and Nash, James H., Jr., to Information Displays, Inc. Apparatus for producing ramp signals and an intensity control signal inresponse to digital data, particularly for a CRT vector generator. 3,718,832, Cl. 315-18.000.
Presby, Benedict F. Rotatable amusement and education device. 3,717,942, Cl. 35-77.000.
Pribyl, Edward J.: *See—*
Fried, Josef; Pribyl, Edward J.; and Krapcho, John, 3,718,643.
Price, H. C., Co.: *See—*
Harris, Robert J., 3,718,309.
Priebel, Wolfgang; and Frobel, Arthur, to Olympia Werke AG. Sheet inserting apparatus for a typewriter. 3,718,245, Cl. 197-127.000.
Priesmeyer, Paul T.: *See—*
Oliver, John P.; Wedel, Alfred W.; and Priesmeyer, Paul T., 3,718,004.
Primessing, Franz: *See—*
Wienand, Michael; Jensen, Klaus; Primessing, Franz; and Alfter, Franz-Werner, 3,717,916.
Pringle, John; and Pecker, Guillermo Eugene, to Texas Instruments, Incorporated. Thermostatic device and means for mounting same. 3,718,880, Cl. 337-380.000.
Production Technology Inc., mesne: *See—*
Kiwalle, Jozef, 3,718,334.
Prosser, Robert A. Protection against radiant heat energy. 3,718,592, Cl. 252-62.000.
Puar, Mohindar S.: *See—*
Wojtowicz, John A.; Lapkin, Milton; and Puar, Mohindar S., 3,718,598.
Pullman Incorporated: *See—*
Adler, Franklin P.; Bailey, John D.; and Bridges, George F., 3,718,100.
Puls, Walter: *See—*
Plumpe, Hans; and Puls, Walter, 3,718,660.
Pundyk, Joseph: *See—*
Mount, Robert E.; De Geleke, Gerrit; and Pundyk, Joseph, 3,718,302.
Mount, Robert E.; De Gelleke, Gerrit; and Pundyk, Joseph, 3,718,303.
Putter, Irving: *See—*
Weston, Roy G.; and Putter, Irving, 3,718,644.
Quaker Oats Company, The: *See—*
Rustad, Norman E., 3,718,619.
Rustad, Norman E., 3,718,624.
Quartz Investments Limited: *See—*
James, Peter Henry, 3,718,230.
Quebec Cartier Mining Company: *See—*
Freeman, William H.; Peterson, Leavitt A.; and Wandrisco, Joseph M. (said Freeman assor. to), 3,718,040.
Quinlan, William J.; and Huver, Lawrence L., to Hastings Manufacturing Company. Windshield, wiper assembly. 3,717,900, Cl. 15-250.360.
Quisenberry, Robert E., to Texaco, Inc. Hydrotreating and hydroisomerizing C_5 and C_6 hydrocarbon streams. 3,718,710, Cl. 260-683.670.
Rabin, Herbert: *See—*
Bey, Paul P.; Giuliani, John F.; and Rabin, Herbert, 3,718,602.
Radovan, Joseph T. Tethered aerial top. 3,717,949, Cl. 46-61.000.
Ragsdale, Charles W., to United States of America, Army. Voltage-controlled one-shot. 3,718,827, Cl. 307-273.000.
Raker, Glen W.: *See—*
Busse, Ewald A.; and Raker, Glen W., 3,718,131.
Ralston Purina Company: *See—*
Walters, Roger E., 3,718,083.
Ramsey Corporation: *See—*
McCormick, Harold E., 3,718,412.
Ramsey, James E., Jr., to Westinghouse Electric Corporation. Electrolytic coulometer for integrating voltage and current components of power. 3,718,861, Cl. 324-142.000.
Rand, Henry T.: *See—*
Pitman, Robert L.; Haverson, Robert H.; Lyon, Jerry; Weldon, Peter; and Rand, Henry T., 3,718,092.
Randhava, Sarabjit Singh: *See—*
Fleming, Donald Kingsley; Randhava, Sarabjit Singh; and Camara, Elias Humberto, 3,718,418.
Randles, William W.: *See—*
Lambdin, Foraker, Jr; and Randles, William W., 3,718,720.
Randolph, James B.; Nelson, Jerome W.; Paysinger, Joe R.; and Crump, E. Eugene, to CRC-Crose International, Inc. Traveling selding apparatus. 3,718,798, Cl. 219-60.00a.
Randrup, Benjamin F. Method and apparatus for handling and cooling bottles. 3,718,007, Cl. 62-63.000.
Ranghelli, Joseph C.; and Perrott, Emmanuel J., to International Telephone and Telegraph Corporation. Dual circularly polarized phased array antenna. 3,718,935, Cl. 343-797.000.
Ranke, Gerhard; and Jungfer, Hans, to Linde Aktiengesellschaft. Process for selective absorption. 3,718,006, Cl. 62-17.000.
Rao, Durvasula V.; Ulrich, Henri; Stuber, Fred A.; and Sayigh, Adnan A. R., to Upjohn Company, The. N-stilbenylacrylamides. 3,718,692, Cl. 260-562.00a.
Rassmann, Christoph; Heyer, Willy; and Stuckmann, Dieter, to Gewerkschaft Eisenhutte Westfalia. Plough drive unit for longwall mining. 3,718,368, Cl. 299-34.000.
Rau, Gottfried; and Eck, Albert, to Eumuco Aktiengesellschaft fur Maschinenbau. Forming machine for heated materials, particularly metals. 3,718,027, Cl. 72-407.000.
Raue, Roderich: *See—*
Lehment, Klaus-Friedrich; and Raue, Roderich, 3,718,642.
Rauffer, Walter: *See—*
Pfeifer, Josef; Ambraschka, Kasimir; Koopmann, Adolf; Hofmann, Wilfried; Dietrich, Karl-Heinz; and Rauffer, Walter, 3,718,391.
Rauhut, Michael McKay, to American Cyanamid Company. Stabilization of oxalate ester solutions during storage. 3,718,599, Cl. 252-188.300.
Reed, Samuel F., Jr.: *See—*
Baldwin, Mart G.; and Reed, Samuel F., Jr., 3,718,633.
Reese, Randall Douglas, to Bell Telephone Laboratories, Incorporated. Key telephone system wideband conferencing arrangement. 3,718,770, Cl. 179-18.0bc.
Regal Manufacturing Company: *See—*
Verhellen, Norbert J. B., 3,718,050.
Reichert, Ernst, to Stump Bohr AG. Anchor tie construction and method of setting an anchor tie in the ground. 3,717,966, Cl. 52-127.000.
Reichle, Walter T.: *See—*
Matzner, Markus; Reichle, Walter T.; Chow, Sui-Wu; and McGrath, James E., 3,718,672.
Reifers, Richard F.; and Bixler, Kenneth D., to Diamond International Corporation. High strength open bottom packaging trays. 3,718,274, Cl. 229-2.500.
Reiffel, Leonard, to Telestrator Industries, Inc. Audio-visual teaching system and student response apparatus. 3,718,759, Cl. 178-6.800.
Reilly, John M.: *See—*
Abbott, Charles P., III; and Reilly, John M., 3,718,842.
Reilly, Thomas A.; Reitz, Charles F.; and Smith, Robert D., to Du Pont de Nemours, E. I., and Company. Plastic heat exchange apparatus. 3,718,181, Cl. 165-180.000.
Reilly, Thomas L.: *See—*
Conti, Donald J.; and Reilly, Thomas L., 3,718,839.
Reinhard, Russell R.; and Blackley, William D., to Texaco Inc. Purifying bis (perfluoroalkyl) nitroxide. 3,718,695, Cl. 260-583.00d.
Reitz, Charles F.: *See—*
Reilly, Thomas A.; Reitz, Charles F.; and Smith, Robert D., 3,718,181.
Reitz, Werner; and Schwerin, Gunther, to Bosch, Robert, G.m.b.H. Control apparatus for a harvesting machine. 3,717,983, Cl. 56-208.000.
Remy, E. P., & Cie: *See—*
Dardaine, Edgar J.; and Berry, Jean-Luc, 3,718,246.
Republic Corporation: *See—*
Gardner, Charles R.; and Johnson, Jay, 3,717,899.
Research Corporation: *See—*
Hafs, Harold D.; and Boyd, Loyis J., 3,718,740.
Watanabe, Kantaro, 3,718,756.
Rew, Robert P.: *See—*
Hasbrouck, Leo J.; Madden, Bill C.; Rew, Robert P.; Sussenguth, Edward H.; and Wierzbicki, John R., 3,718,912.
Rexham Corporation, mesne: *See—*
Lewis, Thomas W., 3,718,531.
Reyner, Ellis M.; and Reyner, Margaret E., said Reyner, Ellis M., assor. to said Reyner, Margaret E. Pressurized container with non-rigid follower. 3,718,236, Cl. 222-386.500.
Reyner, Margaret E.: *See—*
Reyner, Ellis M.; and Reyner, Margaret E., 3,718,236.
Reynolds, Charles Edward; and Gombar, Eugene Leonard, to AMP Incorporated. Connecting device for printed circuit board. 3,718,895, Cl. 339-258.00r.
Reynolds, Delbert D.: *See—*
Janssen, Donald E.; Reynolds, Delbert D.; and Cossar, Bernard C., 3,718,464.
Reynolds, Warren A.: *See—*
Kelly, William J.; and Reynolds, Warren A., 3,718,864.
Rhone-Poulenc S.A.: *See—*
Bakassian, Georges; and Bazouin, Andre, 3,718,682.
Rice, Hal H.; and Holzwarth, James C., to General Motors Corporation. Method of forming a thermally insulated composite article. 3,718,172, Cl. 164-75.000.

Rice, Hal H., to General Motors Corporation. Heater coil support. 3,718,497, Cl. 117-35.00r.
Rice, Philip J., Jr., to American Express Investment Management Company. Electrostatic matrix head construction. 3,718,936, Cl. 346-74.0es.
Richard, William R., Jr., to Monsanto Company. Functional fluid compositions. 3,718,596, Cl. 252-78.000.
Richards, Gary E.: *See—*
Beatenbough, Paul K.; Hutchins, Ward H.; and Richards, Gary E., 3,718,281.
Richards, Mildred C.: *See—*
Samour, Carlos M.; and Richards, Mildred C., 3,718,693.
Richardson, Vernon C. H. Method of and apparatus for communiting rubber tires. 3,718,284, Cl. 241-23.000.
Richardson-Merrell Inc.: *See—*
Sill, Arthur D.; and Fleming, Robert W., 3,718,685.
Rickes, Edward L.: *See—*
Gitterman, Charles O.; Madas, John; Rickes, Edward L.; and Stoudt, Thomas H., 3,718,651.
Riedner, William E.: *See—*
La Tourneau, Howard C.; and Riedner, William E., 3,718,097.
Riek, Raymond F.: *See—*
Buckley, Francis T.; Riek, Raymond F.; and Christensen, Donald I., 3,718,516.
Rienerth, George R.: *See—*
Schubert, Karl P.; and Rienerth, George R., 3,718,211.
Riers, Juan Colombe: *See—*
Salat, Carlos Ferrer; Batlles, Jorge Ferrer; and Riers, Juan Colombe, 3,718,664.
Rigassi, Norbert: *See—*
Chodnekar, Madhukar Subraya; Pfiffner, Albert; Rigassi, Norbert; Schwieter, Ulrich; and Suchy, Milos, 3,718,686.
Rinesch, Rudolf, to Vereinigte Osterreichische Eisen- und Stahlwerke Aktiengesellschaft. Plant for continuous casting without deep casting stream penetration. 3,718,175, Cl. 164-254.000.
Ring, Walter R., Sr.: *See—*
Chrisman, Willis L.; and Ring, Walter R., Sr., 3,718,023.
Ripka, William Charles, to Du Pont de Nemours, E. I., and Company. Process for the preparation of 21-chloro-6,6,9 alpha-trifluoro-11 beta, alpha, 17 alpha-trihydroxy-1,4-pregnadien-3,20-dione 16,17-ketals and selected intermediates. 3,718,673, Cl. 260-397300.
Risley, Gerald Thomas: *See—*
Fothergill, Reginald Allan; Bennett, Reginald Frank Charles; Risley, Gerald Thomas; and Weeks, William Stanley, 3,718,918.
Ristau, Theodore F., to General Motors Corporation. Torsions impact energy absorbing device. 3,718,326, Cl. 267-140.000.
Ritcey, Gordon Malcolm; and Lucas, Bernard Henry, to Canadian Patents and Development Limited. Liquid-liquid separation of cobalt from ammoniacal solutions. 3,718,458, Cl. 75-119.000.
Roberts, William L.: *See—*
Patula, Edward J.; Somers, Robert R.; and Roberts, William L., 3,718,510.
Robertshaw Controls Company: *See—*
Good, Arthur L., 3,718,795.
Russell, William J., 3,718,280.
Robertson, J. Douglas, to Mount Hope Machine Company, Incorporated. Cloth straightening apparatus. 3,717,909, Cl. 26-51.400.
Robison, Billie J.; and Lucic, Richard A. D., to Hewlett-Packard Company. Sputtering system with spirally coiled coolant coil. 3,718,572, Cl. 204-298.000.
Rockwell Manufacturing Company: *See—*
Berends, Emerson R., 3,718,168.
Keiter, Edward F.; Pfleiderer, Glenn F.; and Pettigrew, David D., 3,718,405.
Roeder, Gerald M., to United States Steel Corporation. Package of screws. 3,718,252, Cl. 206-56.0dg.
Rogel, Albert P.; and Scalese, Joseph J. Eddy current flaw detection system. 3,718,855, Cl. 324-37.000.
Rogers, Chester D., to Jacobsen Manufacturing Company. Implement tool arm control. 3,718,192, Cl. 172-624.000.
Rogers, Howard H.; and Pilipovich, Donald, to North American Rockwell Corporation. Process of making ClF_3O. 3,718,557, Cl. 204-157.100.
Rogers, Lynn C.; and Hunt, Mack W., to Continental Oil Company. Preparation of neutral and highly basic alkylphenates and sulfurized alkylphenates. 3,718,589, Cl. 252-33.400.
Rohr, Franz-Josef: *See—*
Fischer, Wilfried; and Rohr, Franz-Josef, 3,718,506.
Rohr Industries, Inc.: *See—*
Pascoe, Larry B., 3,718,822.
Rohrback, Gilson H., to Magna Corporation. Ionic pH control. 3,718,556, Cl. 204-149.000.
Rohte, Oskar: *See—*
Eriksoo, Edgar; Fex, Hans; Hogberg, Knut Bertil; Mollberg, Rene; and Rohte, Oskar, 3,718,694.
Rollins, Thomas J., to Motorola, Inc. Vehicle monitoring system including automatic preselection of desired satellite receiver. 3,718,899, Cl. 340-23.000.
Rollo, William C.; and Melancon, John D. Solvent for cleaning well bores, flowlines, etc. 3,718,586, Cl. 252-8.55b.
Root, James R., to Ruskin Manufacturing Company. Control damper construction. 3,718,081, Cl. 98-110..000.
Rosback, Donald H., to Universal Oil Products Company. Adsorbing olefins with a copper-exchanged type X zeolite. 3,718,580, Cl. 208-310.000.
Rose, John Brewster: *See—*
Hart, Charles Richard; Nield, Eric; and Rose, John Brewster, 3,718,620.
Rose, Phillip C. Holster with pistol retaining mechanism. 3,718,240, Cl. 224-2.00b.
Rosenblum, William J. Wallboard repair device. 3,717,970, Cl. 52-514.000.
Roseveare, Ronald Newman: *See—*
Wyeth, Nathanial Convers; Roseveare, Ronald Newman; and Carmichael, Keith Stewart, 3,718,229.
Ross, Francis J.: *See—*
Atkinson, Cliff C.; Butler, Rolland O.; and Ross, Francis J., 3,717,929.
Ross, Stephen T.: *See—*
Kaiser, Carl; and Ross, Stephen T., 3,718,744.
Rosse, Thomas A.: *See—*
Haddad, Ihsan A.; and Rosse, Thomas A., 3,718,567.
Rosse, Thomas A.; Blackmer, David E.; Zindler, Jerrold; and Kelley, Thomas F., to Instrumentation Laboratory, Inc. Analytical apparatus. 3,718,439, Cl. 23-259.000.
Rosser, Daniel B.: *See—*
Frederick, Albert R.; Paine, Joseph L.; and Rosser, Daniel B., 3,718,841.
Rosser, Eugene P.: *See—*
Lorenz, Howard I.; and Rosser, Eugene P., 3,718,196.
Rossetti, Carlo. Apparatus for the production of cast polymer sheets. 3,718,182, Cl. 165-166.000.
Roth, Alton A.; Dzioba, Don L.; and Yonker, John F., to General Motors Corporation. Flow switch assembly. 3,718,788, Cl. 200-81.90r.
Roth, Marc. Determination ammonia and organic amino compounds. 3,718,432, Cl. 23-230.00r.
Roueche, Armand, to Ciba-Geigy AG. Triazole azo pigments. 3,718,640, Cl. 260-157.000.
Royal, Lewis M., to Texas Instruments, Incorporated. Minimum irritation potential potting compound. 3,718,617, Cl. 260-30.4ep.
Ruskin Manufacturing Company: *See—*
Root, James R., 3,718,081.
Russell, William J., to Robertshaw Controls Company. Fluid pressure transmitter and system therefor. 3,718,280, Cl. 236-44.00r.
Rustad, Norman E., to Quaker Oats Company, The. Curing polyurethane prepolymers with liquid comprising 4,4'-methylenebis (2-chloroaniline) and ethylene oxide capped bisphenol. 3,718,619, Cl. 260-47.0cb.
Rustad, Norman E., to Quaker Oats Company, The. Method of curing polyurethane prepolymers with liquid extender comprising 4,4'-methylenebis (2-chloroaniline) and low molecular weight. 3,718,624, Cl. 260-77.5am.
Sabater, Eudaldo; and Schlemmer, Lothar, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Stretching film of partially crystalline polymers. 3,718,727, Cl. 264-289.000.
Sabo, William T. Elastic amusement or exercise device. 3,718,329, Cl. 273-1.00r.
Sacks, Francis G. Shelf. 3,718,101, Cl. 108-152.000.
Sagami Chemical Research Center: *See—*
Fujisawa, Tamotsu; and Yamamoto, Mizuo, 3,718,699.
Saishima, Takayuki: *See—*
Nagaoka, Yoshitomi; and Saishima, Takayuki, 3,718,753.
Sakamaki, Tadatoshi: *See—*
Suzuki, Shigeru; Kanno, Tadaaki; and Sakamaki, Tadatoshi, 3,718,155.
Salat, Carlos Ferrer; Batlles, Jorge Ferrer; and Riers, Juan Colombe, to Laboratorios Ferrer S.L. Tris(hydroxymethyl)aminomethane salt of thioctic acid. 3,718,664, Cl. 260-327.00a.
Salzano, Francis J.; Davis, Andrew M.; and Isaacs, Hugh S., to United States of America, Atomic Energy Commission. Sulfur oxide activity measurement. 3,718,546, Cl. 204-1.00t.
Samour, Carlos M.; and Richards, Mildred C., to Kendall Company, The. Monomeric emulsion stabilizers containing an N-diallylacetamido or N-dimethallylacetamido radical. 3,718,693, Cl. 260-561.00a.
Sanctuary, Clifford, to Del Mar Engineering Laboratories. Dynamic ECG presentation. 3,718,772, Cl. 179-100.20b.
Sandoz Ltd.: *See—*
Flatz, Wolfgang, 3,718,735.
Sangamo Electric Company: *See—*
Brazier, Robert Leo, 3,718,844.
Santoro, Gerald C.; and Sibert, Glenn R. Golf putter guide. 3,718,333, Cl. 273-192.000.
Sasaki, Koju; Kobayashi, Akihiro; and Takahashi, Naoki, to Nittan Company, Limited. Ionization smoke detector. 3,718,919, Cl. 340-237.00s.
Sato, Akira: *See—*
Shiba, Keisuke; and Sato, Akira, 3,718,475.
Sato, Hideaki: *See—*
Goshima, Takeshi; and Sato, Hideaki, 3,718,754.
Sato, Hiroya: *See—*
Yokota, Mitsuhisa; and Sato, Hiroya, 3,718,837.
Satoh, Susumu: *See—*
Okamoto, Toshihiko; Hirobe, Masaaki; Suzue, Seigo; Nagatsu, Yoshio; Ushiyama, Keiichi; Satoh, Susumu; and Irikura, Tsutomu, 3,718,656.
Satz, Richard G.: *See—*
Kwast, Victor B.; Morlock, Douglas A.; and Satz, Richard G., 3,718,860.

- Sauriol, John T., to Intercontinental Plastics Manufacturing. Meter housing. 3,717,963, Cl. 52-19.000.
- Savenije, Franciscus Gerhardus, to Auping N.V. Hinge construction. 3,717,902, Cl. 16-171.000.
- Sawamura, Mitsuyoshi; and Hihara, Takeshi. Apparatus for electrically bonding cemented carbide elements to the teeth of a saw blade. 3,718,799, Cl. 219-77.000.
- Sayers, Eugene H., to General Motors Corporation. Electrical connector. 3,718,750, Cl. 174-94.00r.
- Sayigh, Adnan A. R.: *See—*
  - Rao, Durvasula V.; Ulrich, Henri; Stuber, Fred A.; and Sayigh, Adnan A. R., 3,718,692.
- Scalese, Joseph J.: *See—*
  - Rogel, Albert P.; and Scalese, Joseph J., 3,718,855.
- Schace, Charles W.; and Staley, Jack F., to General Motors Corporation. Method of manufacturing waved and coned friction material faced friction plates. 3,718,796, Cl. 219-10.410.
- Schade, Frank Stanley, to National Blank Book Company, Inc. Arched ring-wire post binder. 3,718,402, Cl. 402-31.000.
- Schaefer, F. & M., Brewing Co., The: *See—*
  - Hanft, Charles, 3,718,049.
- Schaps, Joseph E.: *See—*
  - Bate, Geoffrey; Echelmeier, Robert H.; Everett, Larry H.; Kehr, William D.; Schaps, Joseph E.; Taylor, Gerald; and Thornley, Richard F. M., 3,718,776.
- Schell, Raymond A.: *See—*
  - Kehoe, Lawrence J.; and Schell, Raymond A., 3,718,676.
- Scherf, Gerhard W.; and Pfaff, Gary C. Corrosion inhibitor containing a water soluble emulsion of a fatty amine with a cationic emulsifier. 3,718,604, Cl. 252-391.000.
- Schering Aktiengesellschaft: *See—*
  - Laurent, Henry; Kolb, Karl-Heinz; and Wiechert, Rudolf, 3,718,671.
- Schertler, Paul H.; and Strobel, Rupert F., to Minnesota Mining and Manufacturing Company. Buried pipeline signal. 3,718,113, Cl. 116-114.00r.
- Schlafhorst, W., & Co.: *See—*
  - Peschl, Ervin; and Skrepek, Jan, 3,718,011.
- Schlage Lock Company: *See—*
  - Tornoe, John Axel; and Marotto, Robert Anthony, 3,718,015.
- Schlemmer, Lothar: *See—*
  - Sabater, Eudaldo; and Schlemmer, Lothar, 3,718,727.
- Schleupen, Richard; and Ferdinand, Grob, to Bosch, Robert, G.m.b.H. Arrangement for automatically controlling the movement of motor vehicles. 3,718,201, Cl. 180-98.000.
- Schmid, Rolf: *See—*
  - Lohse, Friedrich; Schmid, Rolf; and Batzer, Hans, 3,718,623.
- Schmidt, Adolf: *See—*
  - Kolb, Gunter; Schmidt, Adolf; Schmitz-Josten, Robert; and Wolff, Erich, 3,718,474.
- Schmidt, Ewald: *See—*
  - Muller, Rolf; Von Brackel, Hanswilli; Klein, Rudolf; Schmidt, Ewald; and Bender, Heinz, 3,718,641.
- Schmitt, Milton G.: *See—*
  - Downs, Martin L.; and Schmitt, Milton G., 3,718,536.
- Schmitz-Josten, Robert: *See—*
  - Kolb, Gunter; Schmidt, Adolf; Schmitz-Josten, Robert; and Wolff, Erich, 3,718,474.
- Schnabel, Walter. Universal unit for toy blocks. 3,717,948, Cl. 46-25.000.
- Schneider, Clayton J., Jr., to United States of America, Army, mesne. Expendable launcher munition. 3,718,070, Cl. 89-1.800.
- Schneider, Fritz, to Impex-Essen GmbH. Driving device for driving bolts or other drivepins into fixed structural or building elements or the like. 3,718,271, Cl. 227-10.000.
- Schoengold, Herbert, to Electronic Research Associates, Inc. Loudspeaker diaphragm having marginal air release passages and center high frequency propagator. 3,718,779, Cl. 179-115.50r.
- Schon, Otmar, to Greer Hydraulics, Inc. Accumulator control system. 3,718,158, Cl. 137-593.000.
- Schopf, Albert: *See—*
  - Wallrabenstein, Michael; Schopf, Albert; and Frank, Dieter, 3,718,625.
- Schopper, Erwin: *See—*
  - Haase, Gunter; and Schopper, Erwin, 3,718,606.
- Schott, John C.: *See—*
  - Bacon, James R.; Barnes, George H.; and Schott, John C., 3,718,834.
- Schrader, Robert W., to Eastman Kodak Company. Process for heat stabilizing cellulose triacetate films or sheets. 3,718,728, Cl. 264-346.000.
- Schreckendgust, Jay George, to Staley, A. E., Manufacturing Company. Magnetic development. 3,718,466, Cl. 96-48.00r.
- Schubert, Karl P.; and Rienerth, George R., to Acme-Cleveland Corporation. Electric coupling control. 3,718,211, Cl. 192-12.00d.
- Schuessler, Walter E. Cap with adjustable face mask. 3,717,882, Cl. 2-173.000.
- Schultz, Herman S., to GAF Corporation. Polymerization of alkyl vinyl ethers with catalyst based on dialkyl aluminum halide and water. 3,718,634, Cl. 260-91.10m.
- Schulz, John C.; and Lyday, Richard W., to General Motors Corporation. Engine mount assembly. 3,718,304, Cl. 248-9.000.
- Schumacher, Berthold W., to Westinghouse Electric Corporation. Corpuscular beam in mining and excavation. 3,718,367, Cl. 299-14.000.
- Schumacher, Walter C., to General Electric Company. Resiliently reinforced NEMA contact. 3,718,894, Cl. 339-217.0ps.
- Schwarte, Jurgen: *See—*
  - Gappa, Gunther; Knoblauch, Karl; Maier, Franz; Schwarte, Jurgen; and Steiner, Peter, 3,717,976.
- Schwartz, Andrew K., Jr.: *See—*
  - Knippa, James A., Jr.; and Schwartz, Andrew K., Jr., 3,718,707.
- Schwarz, Karl W.; Borkowski, Allan S.; and Hafesh, Joseph W., to Modern Animal Care, Inc. Automated kennel. 3,718,120, Cl. 119-16.000.
- Schwerin, Gunther: *See—*
  - Reitz, Werner; and Schwerin, Gunther, 3,717,983.
- Schwieter, Ulrich: *See—*
  - Chodnekar, Madhukar Subraya; Pfiffner, Albert; Rigassi, Norbert; Schwieter, Ulrich; and Suchy, Milos, 3,718,686.
- SCM Corporation: *See—*
  - Soule, Winsor, Jr.; and Efstathiou, John, 3,718,911.
- Scott, Donald W., to Scott-Fisher Development Co. Game apparatus with an articulated frame. 3,718,331, Cl. 273-119.00r.
- Scott, Lyle B., to Jackson, Byron, Inc. Subsea bumper sub hydraulic bypass system. 3,718,183, Cl. 166-5.000.
- Scott-Fisher Development Co.: *See—*
  - Scott, Donald W., 3,718,331.
- Scotto, Vincent: *See—*
  - Westeren, Herbert W.; Kimball, William H.; Scotto, Vincent; and Vanderford, Wallace S., Jr., 3,718,324.
- Scray, Eugene J., Jr.; and Wilder, Donald L., to International Business Machines Corporation. Time coherent sampling system for eliminating the effects of test system jitter and providing a simplified single transient threshold test. 3,718,910, Cl. 340-172500.
- Scripto, Inc.: *See—*
  - Fuller, David L., 3,718,079.
- Sealy, Inc.: *See—*
  - Watts, Edwin B., 3,717,886.
- Secrist, David E.: *See—*
  - Vandergrift, Don W.; and Secrist, David E., 3,718,276.
- Seelbach, Heinz; and Eversberg, Gerhard, to Fa. Reininghaus & Co. Illumination device. 3,718,816, Cl. 240-52.00r.
- Self, Kenneth W.; Chew, Norman B.; and Twyman, Bill I., to Freightliner Corporation. Truck comprising tractor and semi-trailer. 3,718,346, Cl. 280-415.00b.
- Sequaris, Etienne-Thomas, to Helka S.A. Packing piece for civil engineering works. 3,717,969, Cl. 52-396.000.
- Severini, Joseph H.: *See—*
  - Baer, Maurice; and Severini, Joseph H., 3,718,513.
- Shaffer, John W.: *See—*
  - Mc Donough, Thomas B.; and Shaffer, John W., 3,718,815.
- Shaler Company, The: *See—*
  - Smith, Clarence J., 3,717,927.
- Shamban, W. S., & Co.: *See—*
  - Traub, Henry A., 3,718,338.
- Sharp, Sandra. Display device. 3,718,260, Cl. 211-13.000.
- Sharpe, Cecil H., to General Motors Corporation. Contaminant separation. 3,718,258, Cl. 210-98.000.
- Shea, Frederick L.: *See—*
  - Joo, Louis A.; McKee, John A.; and Shea, Frederick L., 3,718,493.
- Sheckells, Amuel E. Motor driven operating mechanism for revolving doors. 3,717,954, Cl. 49-43.000.
- Shein, Jury Ivanovich, to Vsesojuzny nauchno-issledovatelsky i proektny institur. Method of shaping sheet blanks to spherical form and a device to realize same. 3,718,021, Cl. 72-126.000.
- Shelby, Richard K., to Monsanto Company. Apparatus for blow molding containers having raised bottom wall portions. 3,718,416, Cl. 425-326.000.
- Sheldon, Luther M., to General Electric Company. Grounded flanged wiring device. 3,718,884, Cl. 339-14.00r.
- Sheldon, Luther M., to General Electric Company. Direction lock for angle plug. 3,718,890, Cl. 339-107.000.
- Shell Oil Company: *See—*
  - Eckert, Rudolf J. A., 3,718,591.
  - Muirhead, Leslie A., 3,718,616.
- Shen, Tsung-Ying; and Witzel, Bruce E., to Merck & Co., Inc. 5-Phenyl-2-piperidones and 5-phenyl-2-thiopiperidones in compositions and methods for treating pain, fever and inflammation. 3,718,743, Cl. 424-267.000.
- Sherwin-Williams Company, The: *See—*
  - Blower, Warren A.; and Jerse, Emil P., 3,718,318.
- Shiba, Keisuke; and Sato, Akira, to Fuji Photo Film Co., Ltd. Silver halide supersensitized photographic emulsion. 3,718,475, Cl. 96-124.000.
- Shibata, Shigeru. Composite sheets for agricultural use. 3,718,533, Cl. 161-165.000.
- Shields, Charles J., to States Steamship Company. Shipping and storage container interlock. 3,718,218, Cl. 214-10.50r.
- Shigemori, Hideto: *See—*
  - Hatanaka, Yoshihiro; and Shigemori, Hideto, 3,718,824.
- Showa Sangyo Kabushiki Kaisha: *See—*
  - Kanno, Tomoei; and Kobayashi, Harunobu, 3,718,479.
- Shur-Line Manufacturing Co., Inc.: *See—*
  - Chase, David O.; Maloney, Martin V.; Wood, Frederick J., Jr.; and Wood, Barry B., 3,717,896.
- Sibert, Glenn R.: *See—*
  - Santoro, Gerald C.; and Sibert, Glenn R., 3,718,333.

- Siebentritt, Frank H.; and Silvera, Esteban, to North Branch Industries, Inc. and 5% to Hough, William T., mesne. Ram-valve level indicator. 3,718,157, Cl. 137-551.000.
- Sieg, Robert P.: *See—*
  - Hughes, Thomas R.; and Sieg, Robert P., 3,718,576.
  - Kemp, Jacob D.; and Sieg, Robert P., 3,718,705.
- Sieg, Robert P., to Chevron Research Company. Hexane conversion. 3,718,706, Cl. 260-676.00r.
- Siemag Siegener Maschinenbau G.m.b.H.: *See—*
  - Leitner, Hermann, 3,718,020.
- Siemens Aktiengesellschaft: *See—*
  - Giebler, Fritz, 3,718,782.
  - Muller, Karl-Heinz, 3,718,914.
- Sierracin Corporation, The: *See—*
  - Armstrong, Ramsey C.; and Hoover, Herbert, III, 3,718,535.
- Signode Corporation: *See—*
  - Annis, James R., Jr., 3,718,526.
  - Kobylanski, Anthony, 3,717,891.
- Signouret, Jean-Baptiste: *See—*
  - Esclamadon, Christian; Labat, Yves; and Signouret, Jean-Baptiste, 3,718,700.
- Sikora, Leopold: *See—*
  - Gawlikowicz, Jan J.; Krywult, Jerzy; Wusatowski, Roman; Garczynski, Jozef; Makowski, Aleksander; and Sikora, Leopold, 3,718,026.
- Sill, Arthur D.; and Fleming, Robert W., to Richardson-Merrell Inc. Fluorenol bis-basic esters. 3,718,685, Cl. 260-473.00f.
- Silvera, Esteban: *See—*
  - Siebentritt, Frank H.; and Silvera, Esteban, 3,718,157.
- Simond, Jacques: *See—*
  - Mauvernay, Roland Yves; Busch, Norbert; Moleyre, Jacques; and Simond, Jacques, 3,718,650.
- Simonetta, Massimo, to Societa Italiana Resine S.I.R. S.p.A. Process for producing ethylene. 3,718,709, Cl. 260-683.00r.
- Simonnot, Jack Paul Robert: *See—*
  - Jardinier, Pierre Charles Jules; and Simonnot, Jack Paul Robert, 3,718,160.
- Simonton, Robert D.: *See—*
  - Hull, Donald R.; and Simonton, Robert D., 3,718,174.
- Sims, Anker V., to Pollution Research & Control Corporation. Water heating and purification system. 3,718,544, Cl. 202-190.000.
- Skahen, Don H.: *See—*
  - Dunham, Russell H.; Moody, Harry A.; and Skahen, Don H., 3,718,339.
- Skelton, Robert F., to Mix-Mill, Inc. Heat treating system for grains and legumes. 3,718,322, Cl. 263-33.00r.
- Skitsko, Michael D. Aquatic vehicle. 3,718,109, Cl. 115-28.00r.
- Skogsholm, Einar Aasen: *See—*
  - Graf, Carlton Eugene; Skogsholm, Einar Aasen; and Volkmann, Werner Karl, 3,718,847.
  - Graf, Carlton Eugene; and Skogsholm, Einar Aasen, 3,718,851.
- Skrepek, Jan: *See—*
  - Peschl, Ervin; and Skrepek, Jan, 3,718,011.
- Slavik, Emil L.: *See—*
  - McClain, Lamont R.; and Slavik, Emil L., 3,718,022.
- Sletzinger, Meyer: *See—*
  - Karady, Sandor; Pines, Seemon H.; Ly, Manuel G.; and Sletzinger, Meyer, 3,718,674.
- Slykhouse, Thomas E.: *See—*
  - Plomer, John J.; Doan, Hazen V.; and Slykhouse, Thomas E., 3,718,069.
- Smajo, Joseph J., to Unilux Graphics, Inc., mesne. Device for determining proper color balance in color printing. 3,718,397, Cl. 355-88.000.
- Small, Albert W. Cipher device and method. 3,718,349, Cl. 283-17.000.
- Smidth, F. L., & Co.: *See—*
  - Fagerholt, Gunnar Rindal, 3,718,286.
  - Sylvest, Karl Jens, 3,717,938.
- Smith, Clarence J., to Shaler Company, The. Method of making tire studs. 3,717,927, Cl. 29-517.000.
- Smith, Edmund G.; and Hood, John W. Microbial biolysis process. 3,718,582, Cl. 210-6.000.
- Smith, Gerald C.: *See—*
  - Bracken, Thomas W.; Laughon, Thomas C.; and Smith, Gerald C., 3,718,807.
- Smith, Herchel: *See—*
  - Strike, Donald P.; and Smith, Herchel, 3,718,667.
- Smith, Jesse J., to Packaging Products & Design Corporation. Bag package and method. 3,718,253, Cl. 206-57.00a.
- Smith Kline & French Laboratories: *See—*
  - McGusty, Elizabeth R.; and Sutton, Blaine M., 3,718,680.
  - Kaiser, Carl; and Ross, Stephen T., 3,718,744.
  - McGusty, Elizabeth R.; and Sutton, Blaine M., 3,718,679.
- Smith, Percy L.: *See—*
  - Comstock, Lowell R.; and Smith, Percy L., 3,718,714.
- Smith, Robert D.: *See—*
  - Reilly, Thomas A.; Reitz, Charles F.; and Smith, Robert D., 3,718,181.
- Smoke, Edward J.: *See—*
  - Frey, Dennis L.; Divita, Sam; and Smoke, Edward J., 3,718,730.
- Smyth, Nelda Marjorie, to American Cyanamid Company. Polymeric viscosity control additives for silica thixotropic compositions. 3,718,614, Cl. 260-31.80r.
- Snia Viscosa Societa Nazionale Industria Applicazioni Viscosa: *See—*
  - Parmeggiani, Paolo; Nicita, Domenico; and D'Alo, Bruno, 3,718,270.
- Snow, Roland B., to United States Steel Corporation. Method of removing alumina scum from a continuous-casting mold. 3,718,173, Cl. 164-82.000.
- Societa Italiana Resine S.I.R. S.p.A.: *See—*
  - Simonetta, Massimo, 3,718,709.
- Societe Anonyme Centre Europeen de Recherches Mauvernay: *See—*
  - Mauvernay, Roland Yves; Busch, Norbert; Moleyre, Jacques; and Simond, Jacques, 3,718,650.
- Societe Anonyme dite: Societe Nationale des Petroles d'Aquitaine: *See—*
  - Esclamadon, Christian; Labat, Yves; and Signouret, Jean-Baptiste, 3,718,700.
- Societe d'Assistance Technique pour Produits Nestle S.A.: *See—*
  - Kalina, Vladimir, 3,718,541.
- Societe des Fonderies de Pont-A-Mousson: *See—*
  - Negre, Robert Numa Paul, 3,718,178.
- Societe d'Etudes et de Recherches de Ventilation et d'Aeraulique: *See—*
  - Jardinier, Pierre Charles Jules; and Simonnot, Jack Paul Robert, 3,718,160.
- Societe Industrielle Honeywell Bull (Societe Anonyme): *See—*
  - Bernard, Marcel, 3,718,857.
- Societe Lannionnaise d'Electronique Raute de Perros-Guirec: *See—*
  - Jacob, Jean-Baptiste, 3,718,769.
- Societe Nationale Industrielle Aerospatiale: *See—*
  - Violleau, Andre; Coffy, Rene Louis; and Bancal, Bernard Robert Laurent Marie, 3,718,521.
- Sohm, Elmar: *See—*
  - Kuhn, Jorg; and Sohm, Elmar, 3,717,953.
- Sokolov, David A., to Xerox Corporation. Apparatus for applying ink and immiscible fluid to a printing surface. 3,718,087, Cl. 101-147.000.
- Solomon, William E.; and Healey, Arthur V., to Component Manufacturing Service, Inc. Connector. 3,718,887, Cl. 339-92.00m.
- Solvay & Cie: *See—*
  - Stevens, Jacques; and George, Michel, 3,718,636.
- Somers, Robert R.: *See—*
  - Patula, Edward J.; Somers, Robert R.; and Roberts, William L., 3,718,510.
- Sossen, Edwin J.: *See—*
  - Cooper, Robert B., Jr., 3,718,874.
- Sottosanti, Michael P. Collapsible spool. 3,718,287, Cl. 242-118.110.
- Soule, Winsor, Jr.; and Efstathiou, John, to SCM Corporation. Carriage-position modification of external program. 3,718,911, Cl. 340-172.500.
- Sound Systems International, Inc.: *See—*
  - Norris, Elwood G., 3,718,862.
- Sparling, Wayne Clifford: *See—*
  - Jennings, Uel Duane; and Sparling, Wayne Clifford, 3,718,288.
- Spauszus, Siegfried: *See—*
  - Kelch, Heinz; and Spauszus, Siegfried, 3,718,808.
- Spencer, John; and Janssen, Donald E., to Eastman Kodak Company. Surface development process utilizing an internal image silver halide emulsion containing a composite nucleating agent-spectral sensitizing polymethine dye. 3,718,470, Cl. 96-64.000.
- Sperry Rand Corporation: *See—*
  - Maloney, William T.; and Thaxter, James B., 3,718,913.
  - Tolmie, Robert J.; and Kovacic, Zoran, 3,717,936.
- Sperry-Sun Well Surveying Company: *See—*
  - Hering, Donald R.; and Lindsey, James M., 3,718,194.
- Spinelli, Harry J.: *See—*
  - Bushick, Ronald D.; Norman, Oscar L.; and Spinelli, Harry J., 3,718,690.
- Spooner, Roy Cowieson: *See—*
  - Cooke, William Ernest; Cote, Jacques Francois; Innes, Robert Arthur; Spooner, Roy Cowieson; and Kellermann, Walter Maria Eduard, 3,718,547.
- Springs Mills, Inc.: *See—*
  - Walker, Odie Edward, Jr., 3,718,163.
- Spyrou, Constantine A.; and Klein, George P., to Electrospace Corporation. Frequency converter circuit with multivibrator control. 3,718,854, Cl. 321-69.00r.
- Squibb, E. R., & Sons, Inc.: *See—*
  - Fried, Josef; Pribyl, Edward J.; and Krapcho, John, 3,718,643.
  - Narayanan, Venkatachala L.; and Haugwitz, Rudiger D., 3,718,662.
  - Yale, Harry L., 3,718,665.
- S.R.M. Hydromekanik AB: *See—*
  - Ahlen, Karl Gustav, 3,717,996.
- Stachel, Adolf: *See—*
  - Beyerle, Rudi; and Stachel, Adolf, 3,718,648.
- Stachel, Inge: *See—*
  - Beyerle, Rudi; and Stachel, Adolf, 3,718,648.
- Stachel, Sophie: *See—*
  - Beyerle, Rudi; and Stachel, Adolf, 3,718,648.
- Stackel, Richard Frederick; and Depaolo, George Robert, to American Cyanamid Company. Oil repellent textile finish. 3,718,501, Cl. 117-139.50a.
- Stagner, Jack R. Overload indicator. 3,718,792, Cl. 200-85.00r.
- Staley, A. E., Manufacturing Company: *See—*
  - Schreckendgust, Jay George, 3,718,466.
- Staley, Jack F.: *See—*

Schade, Charles W.; and Staley, Jack F., 3,718,796.
Standard Oil Company: *See—*
Piasek, Edmund J.; Karll, Robert E.; and Lee, Richard J., 3,718,663.
Standard Pneumatic Motor Company: *See—*
Payne, Leroy C., 3,718,312.
Stanray Corporation: *See—*
Hess, Gildard H., 3,718,249.
States Steamship Company: *See—*
Shields, Charles J., 3,718,218.
Stauffer Chemical Company: *See—*
Baker, Don R.; Tilles, Harry; and Dewald, Chester L., 3,718,455.
Mihailovski, Alexander, 3,718,456.
Stauffer-Wacker Silicone Corporation, mesne: *See—*
Adams, Patrick James, 3,718,681.
Steibel, James P., 1/2 to Ashelford, Samuel J. Power feed for the table of a machine tool or the like. 3,718,071, Cl. 90-21.500.
Stein, John L.: *See—*
Martin, Daniel W.; and Stein, John L., 3,718,747.
Steinberg, Norman Richard: *See—*
Cleaver, John Stephen; Guilford, Peter; Kimpton, Frederick James; Page, Thomas John; and Steinberg, Norman Richard, 3,718,273.
Steiner, Peter: *See—*
Gappa, Gunther; Knoblauch, Karl; Maier, Franz; Schwarte, Jurgen; and Steiner, Peter, 3,717,976.
Stenzel, Hans-Jurgen A., to Monsanto Company. Composite compositions. 3,718,459, Cl. 75-132.000.
Stephenson, Herman P., to Thiem Corporation. Package for transporting and storing liners for foundry risers. 3,718,254, Cl. 206-65.00s.
Sterilizer Control Royalties: *See—*
Strom, Lester F. M., 3,718,605.
Stern, Robert L.: *See—*
Du Rose, Arthur H.; and Stern, Robert L., 3,718,549.
Stevens, J. P., & Co., Inc.: *See—*
Tesoro, Giuliana C., 3,718,675.
Stevens, Jacques; and George, Michel, to Solvay & Cie. Catalysts and process for the polymerization of olefins. 3,718,636, Cl. 260-94.90d.
Stevenson, Howard Jackson. Self-cleaning animal enclosure structure. 3,718,119, Cl. 119-28.000.
Stewart, Donald F., to Allied Chemical Corporation. Powder feeding device. 3,718,164, Cl. 141-1.000.
Stewart, James M., to Stewart Research, Inc. Drill chuck. 3,718,340, Cl. 279-57.000.
Stewart Research, Inc.: *See—*
Stewart, James M., 3,718,340.
Stieringer, Albert, to Bosch, Robert, Photokino GmbH. Motion picture camera with dissolving shutter. 3,718,387, Cl. 352-91.000.
Stobb, Anton R.; Stobb, Rudolph C.; and Stobb, Walter J. Apparatus for feeding signatures. 3,718,217, Cl. 214-8.50a.
Stobb, Rudolph C.: *See—*
Stobb, Anton R.; Stobb, Rudolph C.; and Stobb, Walter J., 3,718,217.
Stobb, Walter J.: *See—*
Stobb, Anton R.; Stobb, Rudolph C.; and Stobb, Walter J., 3,718,217.
Stone, Charles W., 50% to Freeman, William J. and Taylor, Reese. Smoke pollutent concentrator. 3,717,977, Cl. 55-110.000.
Stork Amsterdam N.V.: *See—*
Vertegaal, Jacobus G., 3,718,086.
Stoudt, Thomas H.: *See—*
Gitterman, Charles O.; Madas, John; Rickes, Edward L.; and Stoudt, Thomas H., 3,718,651.
Stoughton, George R., to General Motors Corporation. Dual dimmer switch circuit. 3,718,835, Cl. 315-83.000.
Stover, Harris A., to Collins Radio Company. Wide band multiplexing system. 3,718,766, Cl. 179-15.0bm.
Stover, Harris A., to Collins Radio Company. False VOR bearing indication monitor. 3,718,928, Cl. 343-106.00r.
Stover, William A., to Mobil Oil Corporation. Cracking over contaminated catalyst. 3,718,553, Cl. 208-120.000.
Stowe, Gordon N.: *See—*
Cannon, Vernon W.; and Stowe, Gordon N., 3,718,763.
Streck, Clemens, to GAF Corporation. Alcoholic composition of a cationic dye-alkyl aryl sulfonic acid complex and process of dyeing therewith. 3,718,428, Cl. 8-173.000.
Strecke, Heinz. Traversing hoist arrangement. 3,718,263, Cl. 212-128.000.
Strickland, Edward T.: *See—*
Amos, Homer C.; and Strickland, Edward T., 3,717,897.
Strickman, Robert L., to Strickman, Robert L., Foundation, Inc., The; care of Valicenti, Leighton, Reid and Pine. Process for producing a cigarette filter material. 3,718,612, Cl. 260-2.5bd.
Strickman, Robert L., Foundation, Inc., The; care of Valicenti, Leighton, Reid and Pine: *See—*
Strickman, Robert L., 3,718,612.
Strike, Donald P.; and Smith, Herchel, to American Home Products Corporation. 2,3-Disubstituted levulinaldehyde compounds. 3,718,667, Cl. 260-345.800.
Stringer, Peter Jack Eldon Crawford; Knight, Richard Langhiam Castle; and Wayne, Donald Gordon, to Consolidated Paper (Bahamas) Limited. Paper machine tension tester. 3,718,037, Cl. 73-144.000.
Strobel, Rupert F.: *See—*
Schertler, Paul H.; and Strobel, Rupert F., 3,718,113.
Strom, Lester F. M., to Sterilizer Control Royalties. Wide range colorimetric reagent composition for chlorine. 3,718,605, Cl. 252-408.000.
Stromberg-Carlson Corporation: *See—*
Altenburger, Otto, 3,718,907.
Strongin, Ned. Toy vehicle. 3,717,952, Cl. 46-244.00d.
Strukov, Arkady Dmitrievich: *See—*
Alexandrov, Nikolai Nikolaevich; and Strukov, Arkady Dmitrievich, 3,718,138.
Stuber, Fred A.: *See—*
Rao, Durvasula V.; Ulrich, Henri; Stuber, Fred A.; and Sayigh, Adnan A. R., 3,718,692.
Stuckmann, Dieter: *See—*
Rassmann, Christoph; Heyer, Willy; and Stuckmann, Dieter, 3,718,368.
Stuhmer, Werner: *See—*
Zeugner, Horst; Eickstedt, Klaus-Wolf Von; Stuhmer, Werner; and Funke, Siegfried, 3,718,666.
Stump Bohr AG: *See—*
Reichert, Ernst, 3,717,966.
Suchy, Milos: *See—*
Chodnekar, Madhukar Subraya; Pfiffner, Albert; Rigassi, Norbert; Schwieter, Ulrich; and Suchy, Milos, 3,718,686.
Sud-Atlas-Werke G.m.b.H.: *See—*
Tupaj, Manfred Paul; and Engert, Heinz, 3,718,777.
Sugiyama, Masatoshi: *See—*
Hatano, Tadao; Hara, Hikoharu; Sugiyama, Masatoshi; and Ohi, Reiichi, 3,718,469.
Sugiyama, Michiyuki; Takatori, Yoshikuni; Touyama, Ryosuke; Nakamura, Akira; Yamauchi, Teiji; Kato, Masaaki; and Nakashiba, Yoshio, to Taito Co., Ltd. and Asahi Kasei Kogyo Kabushiki Kaisha. Process for electrodialysis of sugar solutions. 3,718,560, Cl. 20-180.00p.
Summers, John C., to Du Pont de Nemours, E. I., and Company. Compound for retarding combustion of polycarbonamides. 3,718,658, Cl. 260-501.120.
Sun Oil Company: *See—*
Boyer, Jackson S.; and Cassar, Richard D., 3,718,628.
Hill, William L., 3,718,188.
Sundstrand Corporation: *See—*
Pollman, Frederic W., 3,718,411.
Suntester Limited: *See—*
Marten, John Anthony; and Gee, Bernard Arthur, 3,718,036.
Suozzo, Leonard S. Constant support device. 3,718,305, Cl. 248-54.0cs.
Superior Oil Company. *See—*
Davis, Warren B., 3,718,901.
Sureau, Robert Frederick Michel; and Alicot, Marie-Josephe Jeanne, to Ugine Kulhmann. Naphthoylene-benzimidazolium dyestuffs. 3,718,652, Cl. 260-282.000.
Sussenguth, Edward H.: *See—*
Hasbrouck, Leo J.; Madden, Bill C.; Rew, Robert P.; Sussenguth, Edward H.; and Wierzbicki, John R., 3,718,912.
Sutton, Blaine M.: *See—*
McGusty, Elizabeth R.; and Sutton, Blaine M., 3,718,680.
McGusty, Elizabeth R.; and Sutton, Blaine M., 3,718,679.
Suzue, Seigo: *See—*
Okamoto, Toshihiko; Hirobe, Masaaki; Suzue, Seigo; Nagatsu, Yoshio; Ushiyama, Keiichi; Satoh, Susumu; and Irikura, Tsutomu, 3,718,656.
Suzuki, Ikuo: *See—*
Kitamura, Yoshio; and Suzuki, Ikuo, 3,718,746.
Suzuki, Isao: *See—*
Kusakabe, Takeshi; Kikuchi, Makoto; and Suzuki, Isao, 3,717,962.
Suzuki, Isao, to Toyoda Koki Kabushiki Kaisha. Multi-wheel grinding machine. 3,717,961, Cl. 51-165.880.
Suzuki, Migaku: *See—*
Kawai, Atsushi; Katsuyama, Takehiro; Suzuki, Migaku; and Ohta, Hidenori, 3,718,537.
Suzuki, Shigenori: *See—*
Ozawa, Tokuji; Uyeda, Mikio; and Suzuki, Shigenori, 3,718,708.
Suzuki, Shigeru; Kanno, Tadaaki; and Sakamaki, Tadatoshi, to Kabushiki Kaisha Ricoh. Developer liquid supplying method and device for liquid development electrophotography. 3,718,155, Cl. 137-433.000.
Swearingen, Dean E. Hydraulic corrosion monitoring coupon injector. 3,718,034, Cl. 73-86.000.
Swift, Merle E. Combination boat-automobile trailer. 3,718,227, Cl. 214-512.000.
Swiss Aluminium Ltd.: *See—*
Klein, Hans-Jurgen, 3,718,550.
Paulet, Jean-Francois; and Endtinger, Fritz, 3,718,548.
Sybron Corporation: *See—*
Westfall, Norman Roy, 3,718,279.
Sylvest, Karl Jens, to Smidth, F. L., & Co. Apparatus and method for drying or pre-heating pulverulent material. 3,717,938, Cl. 34-168.000.
Szablowski, Teofil, to General Motors Corporation. Pressure responsive switch. 3,718,791, Cl. 200-85.00a.
Szanny, Roy G., to General Motors Corporation. Detachable fastening clip. 3,718,881, Cl. 338-22.000.
Tabata, Yoneho; and Kojima, Gen, to Asahi Glass Company Ltd. Process for producing a cross-linked copolymer of

tetrafluoroethylene and propylene using high energy ionizing radiation. 3,718,558, Cl. 205-159.200.
Tait, David Adams Gilmor. Electrical testing methods and apparatus. 3,718,858, Cl. 324-60.00c.
Taito Co., Ltd.: *See—*
Sugiyama, Michiyuki; Takatori, Yoshikuni; Touyama, Ryosuke; Nakamura, Akira; Yamauchi, Teiji; Kato, Masaaki; and Nakashiba, Yoshio, 3,718,560.
Tajihi, Michio: *See—*
Yamamoto, Yoshiro; and Tajihi, Michio, 3,718,080.
Tak, Marinus Gerardus Antoine; and Van Klinken, Otto Jan, to U.S. Philips Corporation. Method of manufacturing a luminescent silicate activated by bivalent europium. 3,718,600, Cl. 252-301.40f.
Takahashi, Jiro: *See—*
Tanaka, Hideo; Imajyo, Yasutaka; Takano, Ikuo; Takahashi, Jiro; and Oka, Kazumichi, 3,718,840.
Takahashi, Naoki: *See—*
Sasaki, Koju; Kobayashi, Akihiro; and Takahashi, Naoki, 3,718,919.
Takahashi, Sadayuki; and Tsubouchi, Norio, to Nippon Electric Company, Limited. Method of improving the piezoelectric properties of ceramics. 3,718,595, Cl. 252-62.900.
Takano, Ikuo: *See—*
Tanaka, Hideo; Imajyo, Yasutaka; Takano, Ikuo; Takahashi, Jiro; and Oka, Kazumichi, 3,718,840.
Takatori, Yoshikuni: *See—*
Sugiyama, Michiyuki; Takatori, Yoshikuni; Touyama, Ryosuke; Nakamura, Akira; Yamauchi, Teiji; Kato, Masaaki; and Nakashiba, Yoshio, 3,718,560.
Takeuchi, Shinjiro, to Mishima Kosan Co., Ltd. Magnetic modulating system. 3,718,872, Cl. 332-51.00r.
Takita, Hitoshi: *See—*
Araki, Tadashi; Asano, Kiro; Takita, Hitoshi; and Awao, Takao, 3,718,574.
Tamai, Yasuo, to Fuji Photo Film Co., Ltd. Process for the production of an electrophotographic liquid developer containing gelatin. 3,718,593, Cl. 252-62.100.
Tammaru, Enn: *See—*
Bulfer, Andrew Frederick; and Tammaru, Enn, 3,718,904.
Tanabe Seiyaku Co., Ltd.: *See—*
Okuda, Tomoharu; and Awataguchi, Shigemi, 3,718,742.
Tanaka, Atsushi; and Goto, Hachiro, to Teijin Limited. Thermoplastic polyamide polyester urethane urea resin. 3,718,713, Cl. 260-858.000.
Tanaka, Hideo; Imajyo, Yasutaka; Takano, Ikuo; Takahashi, Jiro; and Oka, Kazumichi, to Tokyo Shibaura Electric Company, Ltd. Current limiting element. 3,718,840, Cl. 317-99.000.
Tapmatic Corporation: *See—*
Johnson, Allan S., 3,717,892.
Tate, George W., Jr.: *See—*
Lynn, John R.; and Tate, George W., Jr., 3,718,386.
Tate, Sherman E.: *See—*
Munger, John R.; and Tate, Sherman E., 3,718,095.
Tauchi, Takao: *See—*
Nakagawa, Mutsuaki; Tauchi, Takao; and Nishihara, Tadashi, 3,718,047.
Taylor, Gerald: *See—*
Bate, Geoffrey; Echelmeier, Robert H.; Everett, Larry H.; Kehr, William D.; Schaps, Joseph E.; Taylor, Gerald; and Thornley, Richard F. M., 3,718,776.
Taylor, John J., to USM Corporation. Method of making shoe bottom mold seals. 3,718,726, Cl. 264-219.000.
Taylor, Reese: *See—*
Stone, Charles W., 3,717,977.
Taylor, Richard P.; Van Brimmer, Russell H.; and Culp, Fred E., to Mead Corporation, The. Image construction system using multiple arrays of drop generators. 3,717,945, Cl. 40-106.250.
T.D.K. Electronics Corporation: *See—*
Nakagawa, Shiro; and Ishikawa, Mutsuo, 3,718,917.
Techno Corporation: *See—*
Mosher, Fred D., 3,717,883.
Teijin Limited: *See—*
Tanaka, Atsushi; and Goto, Hachiro, 3,718,713.
Telestrator Industries, Inc.: *See—*
Reiffel, Leonard, 3,718,759.
Telex Corporation, The: *See—*
Eagle, George R., 3,718,297.
Templin, Jackson R., to General Motors Corporation. Gas turbine system with regenerator bypass only during starting. 3,717,994, Cl. 60-39.50r.
Tenenholtz, Robert, to Microwave Associates, Inc. Noise limiters for electronic high-frequency oscillators. 3,718,867, Cl. 331-91.000.
Tennis, Francis H., to Hydraulic Industries, Inc. Control valve. 3,718,159, Cl. 137-596.120.
Teradyne, Inc.: *See—*
Hendriks, Jozef H., 3,718,856.
Terry, William M., to Esso Production Research Company. Consolidation of incompetent formations. 3,718,189, Cl. 166-305.000.
Tesoro, Giuliana C., to Stevens, J. P., & Co., Inc. Carbonic carboxylic anhydrides. 3,718,675, Cl. 260-408.000.
Teubler, Adolf; and Eversheim, Paul, to Vereinigte Leichtmetall-Werke GmbH. Aluminum offset printing plate. 3,717,915, Cl. 29-197.500.
Texaco, Inc.: *See—*
Quisenberry, Robert E., 3,718,710.
Reinhard, Russell R.; and Blackley, William D., 3,718,695.
Woodle, Robert A., 3,718,809.
Texas Instruments, Incorporated: *See—*
Abbott, Charles P., III; and Reilly, John M., 3,718,842.
Brock, Donald J., 3,718,202.
Grenier, Aime J., 3,718,920.
Perry, Frederick G., 3,718,879.
Pringle, John; and Pecker, Guillermo Eugene, 3,718,880.
Royal, Lewis M., 3,718,617.
Textron, Inc.: *See—*
Newman, Albert K., 3,718,214.
Thaxter, James B.: *See—*
Maloney, William T.; and Thaxter, James B., 3,718,913.
Theate, Paul, to Fabrique Nationale d'Armes de Guerre, Societe Anonyme. Ammunition and a process for manufacturing the same. 3,718,091, Cl. 102-67.000.
Theiling, Louis F.: *See—*
McCain, James H.; and Theiling, Louis F., 3,718,689.
Theimer, Ernst T.: *See—*
Mookherjee, Braja D.; and Theimer, Ernst T., 3,718,696.
Thettu, Raghulinga R., to Xerox Corporation. Oil dispensing apparatus. 3,718,116, Cl. 118-266.000.
Thiem Corporation: *See—*
Stephenson, Herman P., 3,718,254.
Thilmany Pulp & Paper Company: *See—*
Downs, Martin L.; and Schmitt, Milton G., 3,718,536.
Thomas, Alfred: *See—*
Holzmann, Rainer; Kader, Reiner; and Thomas, Alfred, 3,718,724.
Thomas, Charles H. Unitary plastic bed frame. 3,717,887, Cl. 5-280.000.
Thomas, Jerome F.: *See—*
Brink, David L.; and Thomas, Jerome F., 3,718,446.
Thompson, Stanley P. Flighting for dehydrator drum. 3,717,937, Cl. 34-108.000.
Thompson, William H., to W. & H. M. Goulding Limited. Production of potassium dihydrogen phosphate fertilizers. 3,718,453, Cl. 71-34.000.
Thomson, John, Jr.: *See—*
Fraser, David Bruce; O'Bryan, Henry Miles, Jr.; and Thomson, John, Jr., 3,718,723.
Thomson-CSF: *See—*
Assouline, Georges J.; Hareng, Michel; and Leiba, Eugene, 3,718,381.
Moulin, Michel, 3,718,511.
Thornley, Richard F. M.: *See—*
Bate, Geoffrey; Echelmeier, Robert H.; Everett, Larry H.; Kehr, William D.; Schaps, Joseph E.; Taylor, Gerald; and Thornley, Richard F. M., 3,718,776.
Thornton, Duane V.; and Holt, Jan D., to ACF Industries, Incorporated. Pressure bulkhead for a railway car. 3,718,099, Cl. 105-369.0ba.
Tile Council of America, Inc.: *See—*
Wagner, Herman B.; and Weiant, David S., 3,718,618.
Tilles, Harry: *See—*
Baker, Don R.; Tilles, Harry; and Dewald, Chester L., 3,718,455.
Tillman, Herman L.; and Booth, Ralph E. Bowling score computer. 3,718,812, Cl. 235-168.000.
Timmler, Helmut: *See—*
Berthold, Werner; Von Konig, Anita; and Timmler, Helmut, 3,718,468.
Titus, Hans-Joachim. Device for the peeling and extracting of solid material from a centrifuge. 3,718,220, Cl. 214-17.0db.
Toda, Tadahide: *See—*
Oishi, Kazuo; Kurebayashi, Tokuhiro; Ando, Noriyoshi; Yamamoto, Noboru; Toda, Tadahide; Nohira, Hidetaka; and Katoh, Takashi, 3,718,126.
Tokyo Shibaura Electric Co., Ltd.: *See—*
Niikura, Isamu; and Aritz, Yokohama, 3,718,823.
Yokota, Mitsuhisa; and Sato, Hiroya, 3,718,837.
Tokyo Shibaura Electric Company, Ltd.: *See—*
Juri, Isao; Koguchi, Kazuo; Kuroiwa, Toshimi; and Koken, Tomoyuki, 3,718,850.
Tanaka, Hideo; Imajyo, Yasutaka; Takano, Ikuo; Takahashi, Jiro; and Oka, Kazumichi, 3,718,840.
Tolmie, Robert J.; and Kovacic, Zoran, to Sperry Rand Corporation. Rigid hair dryer hood. 3,717,936, Cl. 34-99.000.
Tomerlin, Benjamin E. Probability teaching aid. 3,717,941, Cl. 35-30.000.
Tomita, Jun, to Minnesota Mining and Manufacturing Company. Heat-shrinkable pressure-sensitive adhesive tape. 3,718,495, Cl. 117-7.000.
Tomoshige, Toru; and Honma, Shiro, to Mitsui Petrochemical Industries, Ltd. Process for polymerization of olefins and catalyst composition therefor. 3,718,635, Cl. 260-93.700.
Tone, Frederick F.: *See—*
Edwards, Evan A.; and Tone, Frederick F., 3,718,471.
Tong, Shih Yung, to Bell Telephone Laboratories, Incorporated. Error correcting systems utilizing one-half optimum diffuse codes. 3,718,905, Cl. 340-146.0aq.
Toray Industries, Inc.: *See—*
Okamoto, Miyoshi; and Watanabe, Koji, 3,718,534.
Tornoe, John Axel; and Marotto, Robert Anthony, to Schlage Lock Company. Lock set handle. 3,718,015, Cl. 70-224.000.

- Toth, Alex, to Ellis Corporation. Commercial laundry machine and base assembly and cart positioner therefor. 3,718,013, Cl. 68-208.000.
- Touyama, Ryosuke: *See—*
  - Sugiyama, Michiyuki; Takatori, Yoshikuni; Touyama, Ryosuke; Nakamura, Akira; Yamauchi, Teiji; Kato, Masaaki; and Nakashiba, Yoshio, 3,718,560.
- Tower, Ronald H. Instantaneous on-line water tester. 3,718,435, Cl. 23-253.00r.
- Townsend Engineering Company: *See—*
  - Townsend, Ray T., 3,717,903.
- Townsend, Ray T., to Townsend Engineering Company. Hand operated fish skinning tool. 3,717,903, Cl. 17-67.000.
- Toyoda Koki Kabushiki Kaisha: *See—*
  - Ishikawa, Mineo, 3,717,934.
  - Kusakabe, Takeshi; Kikuchi, Makoto; and Suzuki, Isao, 3,717,962.
  - Suzuki, Isao, 3,717,961.
- Toyota Jidosha Kogyo Kabushiki Kaisha: *See—*
  - Ochiai, Takeshi, 3,718,374.
  - Oishi, Kazuo; Kurebayashi, Tokuhiro; Ando, Noriyoshi; Yamamoto, Noboru; Toda, Tadahide; Nohira, Hidetaka; and Katoh, Takashi, 3,718,126.
- Trampe, George M.: *See—*
  - Pande, Kailash C.; and Trampe, George M., 3,718,684.
- Traub, Henry A., to Shamban, W. S., & Co. Sealing assembly. 3,718,338, Cl. 277-165.000.
- Tregurtha, Steven John, to Lucas, Joseph, (Industries) Limited. Electrical switch having angularly oriented rectangular contacts. 3,718,794, Cl. 200-166.0bb.
- Tremblay, Maurice Robert; and Maurer, Richard Launt, to Lipton, Thomas J., Limited. Pasta. 3,718,480, Cl. 99-85.000.
- Trenta, Gerald M.: *See—*
  - Crano, John C.; and Trenta, Gerald M., 3,718,711.
- Tri-Line Electric Co., Inc.: *See—*
  - Fila, Dominick, 3,718,786.
- Troeger, Richard P.: *See—*
  - Watson, William E.; and Troeger, Richard P., 3,718,736.
- Troffkin, Howard Julian; and Wystrach, Vernon Paul, to United States of America, Army, mesne. Product and process. 3,718,445, Cl. 44-7.00c.
- Trofimenko, Swiatoslaw; and Vaughan, Lawrence G., to Du Pont de Nemours, E. I., and Company. Presious metal decorating compositions containing bis-chelate derivatives of palladium. 3,718,488, Cl. 106-1.000.
- Trokin, Jury Alexandrovich: *See—*
  - Afanasiev, Vadim Nikolaevich; Belyaev, Jury Pavlovich; Gaiduchik, Vladimir Olegovich; Gruzin, Pavel Lukich; Konkin, Nikolai Alexandrovich; Megarsky, Valery Vasilievich; Okunev, Boris Nikolaevich; and Trokin, Jury Alexandrovich, 3,718,817.
- Trost, Werner, to Demag Aktiengesellschaft. Lift truck for hot vessels, particularly for steel-mill converters. 3,718,265, Cl. 214-1.00d.
- Trubert, Georges; and Droulin, Jean Louis, to La Telemecanique Electrique. Electrical device for measuring and controlling the temperature at a large number of points. 3,718,924, Cl. 340-417.000.
- True, Howard D. F., Jr.: *See—*
  - Gittelson, Joel A.; and True, Howard D. F., Jr., 3,718,237.
- Tsentrglny Nauchno-Issledovatelsky i Proektno-Experimentalny Institut Inzhenernogo Oborudovania Gorodov: *See—*
  - Zusmanovich, Lev Markovich, 3,718,008.
- Tsubouchi, Hideo: *See—*
  - Matsui, Kazuma; and Tsubouchi, Hideo, 3,718,151.
- Tsubouchi, Norio: *See—*
  - Takahashi, Sadayuki; and Tsubouchi, Norio, 3,718,595.
- Tsujide, Tohru: *See—*
  - Wada, Toshio; and Tsujide, Tohru, 3,718,916.
- Tull, Roger J.: *See—*
  - Weinstock, Leonard M.; Tull, Roger J.; and Mulvey, Dennis M., 3,718,647.
- Tupaj, Manfred Paul; and Engert, Heinz, to Sud-Atlas-Werke G.m.b.H. Magnetic tape recorder having a friction wheel drive for the tape reel carrier shafts. 3,718,777, Cl. 179-100.20r.
- Turnbull, John Peter, to Glaxo Laboratories Limited. Process for the preparation of 17-oxo-steroids from 17α-hydroxy-20-oxo-steroids. 3,718,670, Cl. 260-397.300.
- Turnbull Marine Design Company Limited: *See—*
  - Clay, John Armstrong, 3,718,378.
- Tushaus, Leonard A., to Minnesota Mining and Manufacturing Company. Pressure-sensitive adhesives based on cyclic terpene urethane resin. 3,718,712, Cl. 260-858.000.
- Twyman, Bill I.: *See—*
  - Self, Kenneth W.; Chew, Norman B.; and Twyman, Bill I., 3,718,346.
- Tysko, Leon Albert; and Burnet, Robert Cortland, to Van Dyk Research Corporation. Variable sheet length paper feed and cutting system. 3,718,394, Cl. 355-13.000.
- Uchiyama, Kensuke: *See—*
  - Kobari, Masao; Hagiwara, Hiroshi; and Uchiyama, Kensuke, 3,718,153.
- Ueda, Hiroshi; and Kuramoto, Yoshio, to Minolta Camera Kabushiki Kaisha. Shutter speed control apparatus for a camera. 3,718,076, Cl. 95-10.00c.
- Ugine Kulhmann: *See—*
  - Sureau, Robert Frederick Michel; and Alicot, Marie-Josephe Jeanne, 3,718,652.
- Uhl, George A.; and Baillie, Lloyd A., to Atlantic Richfield Company. Process for charging catalyst. 3,718,579, Cl. 208-143.000.
- Ulbrich, Richard W. Radiant lining. 3,718,323, Cl. 263-40.00r.
- Ulrich, Henri: *See—*
  - Rao, Durvasula V.; Ulrich, Henri; Stuber, Fred A.; and Sayigh, Adnan A. R., 3,718,692.
- Umina, Anthony P.: *See—*
  - Davis, James W.; Umina, Anthony P.; and Kelley, Nancy J., 3,718,483.
- Uniflo Systems Company: *See—*
  - Bloomfield, Roger D.; and Wirth, Gary J., 3,718,096.
- Unilux Graphics, Inc., mesne: *See—*
  - Smajo, Joseph J., 3,718,397.
- Union Carbide Corporation: *See—*
  - Baird, Robert J.; and Everett, Thomas G., Jr., 3,717,914.
  - Batta, Louis Bela, 3,717,974.
  - Comstock, Lowell R.; and Smith, Percy L., 3,718,714.
  - Manz, August Frederick, 3,718,802.
  - Matzner, Markus; Reichle, Walter T.; Chow, Sui-Wu; and McGrath, James E., 3,718,672.
  - McCain, James H.; and Theiling, Louis F., 3,718,689.
- Uniroyal Englebert France S.A.: *See—*
  - Leblond, Jean, 3,718,520.
- Uniroyal Inc.: *See—*
  - Bethe, Eugene J., 3,718,417.
- United Industrial Syndicate, Inc.: *See—*
  - Bosworth, Delbert B.; and Fournier, Joseph R., 3,718,250.
- United Kingdom Atomic Energy Authority: *See—*
  - Fothergill, Reginald Allan; Bennett, Reginald Frank Charles; Risley, Gerald Thomas; and Weeks, William Stanley, 3,718,918.
  - Williams, Raymond; and Leckenby, Robert Edwin, 3,718,379.
- United States Borax & Chemical Corporation: *See—*
  - Morgan, Cyril Alfred; Arber, Scott Gordin; and Young, Oswald William John, 3,718,490.
- United States Borox & Chemical Corporation: *See—*
  - Woods, William G.; Whiten, Joseph G.; and Nies, Nelson P., 3,718,615.
- United States of America
  - Agriculture: *See—*
    - Lysons, Hilton H.; and Mann, Charles N., 3,718,262.
  - Air Force: *See—*
    - Becraft, Ardath M.; and Hammer, Clifford E., 3,718,398.
  - Army: *See—*
    - Ayers, Orval E.; and Huskins, Chester W., 3,717,997.
    - Baer, Maurice; and Severini, Joseph H., 3,718,513.
    - Baldwin, Mart G.; and Reed, Samuel F., Jr., 3,718,633.
    - Betts, Robert E., 3,717,998.
    - Davis, James W.; Umina, Anthony P.; and Kelley, Nancy J., 3,718,483.
    - Evers-Euterneck, Ernst T., 3,718,292.
    - Garver, Robert V., 3,718,873.
    - Gerlach, Horst W. A., 3,718,869.
    - Glendinning, William B.; and Pharo, Wellington B., 3,718,503.
    - Gregory, Douglas W., 3,718,090.
    - Ikrath, Kurt; and Acker, Morris, 3,718,932.
    - Jacobs, Harold, 3,718,820.
    - Joyce, James W., Jr.; and Villarroel, Fernando, 3,718,044.
    - Kwast, Victor B.; Morlock, Douglas A.; and Satz, Richard G., 3,718,860.
    - Landingham, Richard L., 3,718,441.
    - Levine, Seymour, 3,718,787.
    - Linden, David, 3,718,507.
    - Milanowski, Floyd J.; and Bowman, Arthur J., Jr., 3,718,093.
    - Munger, John R.; and Tate, Sherman E., 3,718,095.
    - Pitman, Robert L.; Haverson, Robert H.; Lyon, Jerry; Weldon, Peter; and Rand, Henry T., 3,718,092.
    - Ragsdale, Charles W., 3,718,827.
    - Warren, Raymond W., 3,718,150.
    - Weisman, Irving H., 3,718,319.
    - Wiese, Harold H., 3,718,089.
    - Willem Gilbert C.; and Farmer, Ray H., 3,718,293.
    - Wilson, Ben F., 3,717,999.
  - Army, mesne: *See—*
    - Arlow, Michael S., 3,718,859.
    - Frey, Dennis L.; Divita, Sam; and Smoke, Edward J., 3,718,730.
    - Schneider, Clayton J., Jr., 3,718,070.
    - Troffkin, Howard Julian; and Wystrach, Vernon Paul, 3,718,445.
  - Atomic Energy Commission: *See—*
    - Lambdin, Foraker, Jr; and Randles, William W., 3,718,720.
    - Pitts, Sam H., Jr., 3,718,677.
    - Salzano, Francis J.; Davis, Andrew M.; and Isaacs, Hugh S., 3,718,546.
    - Wu, James S. H.; and Baker, Broughton L., 3,718,583.
  - National Aeronautics and Space Administration; Administrator; with respect to an invention of:
    - Perlman, Marvin. N-Ary linear feedback shift register with binary logic. 3,718,863, Cl. 328-37.000.
  - Navy: *See—*
    - Bey, Paul P.; Giuliani, John F.; and Rabin, Herbert, 3,718,602.
    - Cook, Rufus Lee; and Folds, Donald L., 3,718,898.
    - Edrich, Jochen, 3,718,866.

    - Geld, Isidore, 3,718,570.
    - Howard, Dean D.; and Cross, David C., 3,718,927.
    - Olsen, Leslie R., 3,718,719.
    - Parker, Carlyle V.; and Bishop, Walton B., 3,718,926.
- United States Steel Corporation: *See—*
  - Abarotin, Eugene V.; Bollinger, Edward R., Jr.; and Nicely, Thomas E., 3,718,064.
  - Bacon, James A.; and Lindenmuth, Charles J., 3,718,039.
  - Box, William A.; and Wojnar, Joseph A., 3,718,019.
  - Freeman, William H.; Peterson, Leavitt A.; and Wandrisco, Joseph M. (said Wandrisco assor. to), 3,718,040.
  - Lucht, Wilbert A., 3,718,442.
  - Patula, Edward J.; Somers, Robert R.; and Roberts, William L., 3,718,510.
  - Roeder, Gerald M., 3,718,252.
  - Snow, Roland B., 3,718,173.
  - Wagner, George J., Jr., 3,718,177.
- Universal Oil Products Company: *See—*
  - Rosback, Donald H., 3,718,580.
  - Watkins, Charles H., 3,718,575.
- University of California, The Regents of the: *See—*
  - Brink, David L.; and Thomas, Jerome F., 3,718,446.
- University of Kentucky Research Foundation, The, mesne: *See—*
  - Diamond, Louis; and Lipscomb, William T., 3,718,135.
- University of Michigan Technological, Board of Control: *See—*
  - Hainault, Paul E., 3,718,308.
- Upjohn Company, The: *See—*
  - Moffett, Robert B., 3,718,646.
  - Rao, Durvasula V.; Ulrich, Henri; Stuber, Fred A.; and Sayigh, Adnan A. R., 3,718,692.
- Urbanick, Burton Alfred, to Met-L-Wood Corporation. Panel seal. 3,717,955, Cl. 49-488.000.
- U.S. Philips Corporation: *See—*
  - Kooi, Else, 3,718,843.
  - Kraakman, Hillebrand J. J., 3,718,152.
  - Tak, Marinus Gerardus Antoine; and Van Klinken, Otto Jan, 3,718,600.
  - Wierts, Derk; and Boomsma, Pieter, 3,718,865.
- Ushakoff, Alexis E., to Cordis Corporation. Immuno diffusion cell. 3,718,436, Cl. 23-253.00r.
- Ushiyama, Keiichi: *See—*
  - Okamoto, Toshihiko; Hirobe, Masaaki; Suzue, Seigo; Nagatsu, Yoshio; Ushiyama, Keiichi; Satoh, Susumu; and Irikura, Tsutomu, 3,718,656.
- Ushiyama, Yasuichi: *See—*
  - Katsuta, Takashi; Kano, Kenichi; Kawasaki, Mitsuru; and Ushiyama, Yasuichi, 3,718,752.
- USM Corporation: *See—*
  - Hayes, Stanley I., Jr., 3,718,532.
  - Passer, La Roy B., 3,718,068.
  - Taylor, John J., 3,718,726.
- Uyeda, Mikio: *See—*
  - Ozawa, Tokuji; Uyeda, Mikio; and Suzuki, Shigenori, 3,718,708.
- Uzuanis, Joseph, Jr.: *See—*
  - Mahoney, Robert J.; Dean, Donald N.; and Uzuanis, Joseph, Jr., 3,718,296.
- Vacu-dry: *See—*
  - Lankford, Marion P., 3,718,485.
- Van Brimmer, Russell H.: *See—*
  - Taylor, Richard P.; Van Brimmer, Russell H.; and Culp, Fred E., 3,717,945.
- Van Der Lely, Cornelis. Mowing machines. 3,717,981, Cl. 56-6.000.
- Van Dyk Research Corporation: *See—*
  - Tysko, Leon Albert; and Burnet, Robert Cortland, 3,718,394.
- Van Horn, James H., to General Dynamics Corporation. Pulse classification system. 3,718,929, Cl. 343-17.20r.
- Van Klinken, Otto Jan: *See—*
  - Tak, Marinus Gerardus Antoine; and Van Klinken, Otto Jan, 3,718,600.
- Van Osmael, Claude Henri: *See—*
  - Ponghis, Nicolas Gerassimos; and Van Osmael, Claude Henri, 3,718,758.
- Van Slyke, Allan S., to General Motors Corporation. Fiber optic illuminator and method of making same. 3,718,814, Cl. 240-8.160.
- Van Uitert, Le Grand Gerard: *See—*
  - Dental, Andrew Gomperz; Van Uitert, Le Grand Gerard; and Williams, John Charles, 3,718,601.
- Vanderford, Wallace S., Jr.: *See—*
  - Westeren, Herbert W.; Kimball, William H.; Scotto, Vincent; and Vanderford, Wallace S., Jr., 3,718,324.
- Vandergrift, Don W.; and Secrist, David E., to Double Envelope Corporation. Envelope. 3,718,276, Cl. 229-72.000.
- Vaughan, Lawrence G.: *See—*
  - Trofimenko, Swiatoslaw; and Vaughan, Lawrence G., 3,718,488.
- Venditti, Arthur P., to Klamer, Reuben B. Adjustable divining rod device. 3,717,950, Cl. 46-241.000.
- Vereinigte Flugtechnische Werke-Fokker GmbH: *See—*
  - Krenz, Gunter, 3,718,294.
- Vereinigte Leichtmetall-Werke GmbH: *See—*
  - Teubler, Adolf; and Eversheim, Paul, 3,717,915.
- Vereinigte Osterreichische Eisen- und Stahlwerke Aktiengesellschaft: *See—*
  - Rinesch, Rudolf, 3,718,175.
- Verhellen, Norbert J. B., to Regal Manufacturing Company. Apparatus for rotating spindle at high speed. 3,718,050, Cl. 74-206.000.
- Vernon Company, The: *See—*
  - Woofter, Cecil B., 3,718,261.
- Vernon Tool Company: *See—*
  - Blackburn, Marvin J., 3,718,017.
- Vertegaal, Jacobus G., to Stork Amsterdam N.V. Screen printing machine with adjustable bridge. 3,718,086, Cl. 101-115.000.
- Vescio, Kimbel L.: *See—*
  - Morton, Evans T.; and Vescio, Kimbel L., 3,717,965.
- Vetco Offshore Industries, Inc.: *See—*
  - Larralde, Edward; and Beaufort, Ronald E., 3,718,316.
- Victor Company of Japan, Limited: *See—*
  - Arai, Kinjiro; and Nakatani, Yoshio, 3,717,923.
- Villarroel, Fernando: *See—*
  - Joyce, James W., Jr.; and Villarroel, Fernando, 3,718,044.
- Vinas, Maria Teresa Clermont. Device for the wet treatment of textile materials. 3,718,012, Cl. 68-9.000.
- Violleau, Andre; Coffy, Rene Louis; and Bancal, Bernard Robert Laurent Marie, to Societe Nationale Industrielle Aerospatiale. Apparatus for impregnating yarns, and more particularly glass yarns, with synthetic resins. 3,718,521, Cl. 156-433.000.
- Virginia Chemicals Inc.: *See—*
  - Winslow, Charles E., Jr.; Plentovish, Jack; and Kise, Mearl A., 3,718,732.
- Vischulis, George. Automatically adjusting photoelectric position detector. 3,718,821, Cl. 250-202.000.
- Vishay Intertechnology, Inc.: *See—*
  - Berman, Abraham; and Gerber, George V., 3,718,883.
- Visser, Peter J., to Clark Equipment Company. Load transfer mechanism. 3,718,221, Cl. 214-77.00r.
- Vitelli, Vito J., to Morgan Construction Company. Apparatus including a fluidized bed for cooling steel rod through transformation. 3,718,024, Cl. 72-201.000.
- Vitredent Corporation: *See—*
  - Brainin, Herbert, 3,717,932.
- Vockenhuber, Karl: *See—*
  - Patels, Gottfried; and Beck, Erich, 3,718,760.
- Vojir, Frank S.: *See—*
  - Britton, Leon R.; Vojir, Frank S.; and Wright, William W., 3,718,828.
- Volkert, John K. Printed folder including mailable article. 3,718,277, Cl. 229-73.000.
- Volkmann, Werner Karl: *See—*
  - Graf, Carlton Eugene; Skogsholm, Einar Aasen; and Volkmann, Werner Karl, 3,718,847.
- von Arx, Arnold; and Kuphal, Klaus, to Aktiengesellschaft Brown, Boveri & Cie. Measuring Cerenkov radiation produced by charge particles passing through a gas as indicative of the energy of the charged particles. 3,718,818, Cl. 250-71.50r.
- Von Brachel, Hanswilli: *See—*
  - Muller, Rolf; Von Brachel, Hanswilli; Klein, Rudolf; Schmidt, Ewald; and Bender, Heinz, 3,718,641.
- Von Konig, Anita: *See—*
  - Berthold, Werner; Von Konig, Anita; and Timmler, Helmut, 3,718,468.
- Von Werder, Fritz: *See—*
  - Irmscher, Klaus; Von Werder, Fritz; Bork, Karl-Heinz; and Kraft, Hans-Gunther, 3,718,542.
- Vosbikian, James T.: *See—*
  - Vosbikian, Mike; and Vosbikian, James T., 3,718,337.
- Vosbikian, Mike; and Vosbikian, James T., to Hardware & Industrial Tool Co., Inc. Universal wheeled cart. 3,718,337, Cl. 280-47.260.
- Vsesojuzny nauchno-issledovatelsky i proektny institur: *See—*
  - Shein, Jury Ivanovich, 3,718,021.
- Vyzkumny Ustav Pletarsky: *See—*
  - Peschl, Ervin; and Skrepek, Jan, 3,718,011.
- W. & H. M. Goulding Limited: *See—*
  - Thompson, William H., 3,718,453.
- Wada, Toshio; and Tsujide, Tohru, to Nippon Electric Company Limited. Semiconductor memory element. 3,718,916, Cl. 340-173.00r.
- Wagner, George J., Jr., to United States Steel Corporation. Removable mold assembly with quick change mechanism. 3,718,177, Cl. 164-282.000.
- Wagner, Herman B.; and Weiant, David S., to Tile Council of America, Inc. Epoxy resin compositions containing a partial acid-addition salt of aromatic polyamine and water soluable amine. 3,718,618, Cl. 260-47.0en.
- Wakefield, Orval W., to Pit-Bar Manufacturing Company. Edge guard for buffing machine. 3,717,894, Cl. 15-97.00r.
- Walker, Brooks. Dual fueled engine with temperature switchover. 3,718,000, Cl. 60-285.000.
- Walker, Helen H. Tumbling of workpieces. 3,717,957, Cl. 51-9.000.
- Walker, Odie Edward, Jr., to Springs Mills, Inc. Two-piece textile loom sword. 3,718,163, Cl. 139-188.000.
- Walker, Peter: *See—*
  - Gervay, Joseph Edmond; and Walker, Peter, 3,718,473.
- Wallace, Richard A. Electrogel process for removing electrolytes an concentrating the same from an aqueous solution. 3,718,559, Cl. 204-180.00g.
- Wallrabenstein, Michael; Schopf, Albert; and Frank, Dieter, to Glanzstoff AG. Production of a polyacyloxalamidrazone. 3,718,625, Cl. 260-78.0tf.
- Walls, Gordon William, to Commonwealth Scientific and Industrial Research Organization. Formation of twisted thread assemblies. 3,717,988, Cl. 57-34.0at.

Walters, Roger E., to Ralston Purina Company. Poultry processing apparatus. 3,718,083, Cl. 99-532.000.

Walther, Guntram: *See—*

Werdehausen, Achim; Jahnke, Ullrich; Jakobi, Gunter; and Walther, Guntram, 3,718,597.

Wandrisco, Joseph M.: *See—*

Freeman, William H.; Peterson, Leavitt A.; and Wandrisco, Joseph M., 3,718,040.

Wanner, Karl, to Bosch, Robert, G.m.b.H. Cooling system for portable impulse transmitting machines. 3,718,193, Cl. 173-117.000.

Warn-Belleview, Inc.: *See—*

Hegar, Frank; and Fleskes, Timothy E., 3,718,213.

Warner, Dale J.: *See—*

Jackson, Richard H.; and Warner, Dale J., 3,718,336.

Warren, Raymond W., to United States of America, Army. Fluid stepping motor. 3,718,150, Cl. 137-829.000.

Watanabe, Kantaro, to Research Corporation. Mapping rectifier of earth S surface radiation signals scanned by artificial satellite. 3,718,756, Cl. 178-6.70r.

Watanabe, Kazutaka: *See—*

Nezu, Kazuo; Imabayashi, Ziro; Watanabe, Kazutaka; Iritani, Tadamitsu; Kataoka, Kouju; and Yoshioka, Michio, 3,718,762.

Watanabe, Koji: *See—*

Okamoto, Miyoshi; and Watanabe, Koji, 3,718,534.

Waters, Ernest, 50% to Gagliardi, Louis J. Anti-polution device. 3,717,979, Cl. 55-233.000.

Watkins, Charles H., to Universal Oil Products Company. Hydrocracking LPG production. 3,718,575, Cl. 208-59.000.

Watson, Donald W.: *See—*

McGuire, John V.; and Watson, Donald W., 3,718,525.

Watson Manufacturing Company, Inc.: *See—*

Moore, George E.; and Horlacher, Joseph D., 3,718,232.

Watson, Thomas F., Sr., to Burlington Industries, Inc. Treatment of polypropylene surface to promote adhesive bonding. 3,718,530, Cl. 161-67.000.

Watson, William E.; and Troeger, Richard P., to Allied Chemical Corporation. Process for the manufacture of hydrogen fluoride. 3,718,736, Cl. 423-485.000.

Watts, Edwin B., to Sealy, Inc. Box spring frame. 3,717,886, Cl. 5-239.000.

Wayne, Donald Gordon: *See—*

Stringer, Peter Jack Eldon Crawford; Knight, Richard Langhiam Castle; and Wayne, Donald Gordon, 3,718,037.

Webb, Jervis B., Company: *See—*

Muller, Donald C., 3,718,248.

Wedel, Alfred W.: *See—*

Oliver, John P.; and Wedel, Alfred W., 3,717,920.

Oliver, John P.; Wedel, Alfred W.; and Priesmeyer, Paul T., 3,718,004.

Weeks, William Stanley: *See—*

Fothergill, Reginald Allan; Bennett, Reginald Frank Charles; Risley, Gerald Thomas; and Weeks, William Stanley, 3,718,918.

Wehrle-Werk AG., Firma: *See—*

Pfender, Georg, 3,718,797.

Weiant, David S.: *See—*

Wagner, Herman B.; and Weiant, David S., 3,718,618.

Weimer, Dean R., to Continental Oil Company. Liquid detergent compositions. 3,718,609, Cl. 252-545.000.

Weinstock, Leonard M.; Tull, Roger J.; and Mulvey, Dennis M., to Frosst, Charles E., & Co. Process for making 1,2,5-thiadiazoles in the sinister configuration and novel intermediates. 3,718,647, Cl. 260-247.100.

Weisman, Irving H., to United States of America, Army. Apparatus and process for contacting immiscible liquids. 3,718,319, Cl. 259-4.000.

Weldon, Peter: *See—*

Pitman, Robert L.; Haverson, Robert H.; Lyon, Jerry; Weldon, Peter; and Rand, Henry T., 3,718,092.

Weller, Alois, to Malmedie & Co. Maschinfabrik GmbH. Transfer mechanism for multistage machine tools. 3,717,890, Cl. 10-12.00t.

Wells, Peter M., to Ideal Industries, Inc. Cable tie. 3,717,906, Cl. 24-16.0pb.

Wellstein, William. Well casing side connector. 3,718,185, Cl. 166-85.000.

Wening, Richard R. Battery terminal connector and housing means. 3,718,891, Cl. 339-116.00r.

Werdehausen, Achim; Jahnke, Ullrich; Jakobi, Gunter; and Walther, Guntram, to Henkel & Cie G.m.b.H. Washing, bleaching and cleansing agents containing copolymeric N-alkylcarboxylic acid alkyleneimines. 3,718,597, Cl. 252-102.000.

Werner, Eberhard, to Eumuco Aktiengesellschaft fur Maschinenbau. Machine for stretching material prior to rolling or forging. 3,718,025, Cl. 72-222.000.

Werth, John J., to ESB Incorporated. Sodium-sulfur battery having aluminum sulfide or aluminum polysulfide in the electroyte. 3,718,505, Cl. 136-6.000.

West Coast Rope and Rigging of Portland, Inc.: *See—*

Marcotte, Eugene M., 3,718,361.

West, John M.; and Fletcher, William D., III, to Combustion Engineering, Inc. Passive nuclear reactor safeguard system. 3,718,539, Cl. 176-37.000.

West, Peter; and Woodville, Mary C., to Dow Chemical Company, The. Bisorganoalkaline earth metal compounds and a method of preparing same from bisorganomercurials. 3,718,703, Cl. 260-665.00r.

Westberg, Russell C. Snowmobile anti-skid device. 3,718,341, Cl. 280-28.000.

Westeren, Herbert W.; Kimball, William H.; Scotto, Vincent; and Vanderford, Wallace S., Jr., to Hayes, C. I., Inc. Vacuum furnace and work cart for use therein. 3,718,324, Cl. 266-5.00r.

Western Electric Company, Incorporated: *See—*

Holler, Albert, 3,718,893.

Westfall, Norman Roy, to Sybron Corporation. Force balance instrument for computing. 3,718,279, Cl. 235-200.0wb.

Westinghouse Electric Corporation: *See—*

Philofsky, Harold M.; Ying, Sui-Chun; and Chottiner, Jacob, 3,718,830.

Ramsey, James E., Jr., 3,718,861.

Schumacher, Berthold W., 3,718,367.

Weston, Roy G.; and Putter, Irving, to Merck & Co., Inc. Antibiotic separation and purification. 3,718,644, Cl. 260-243.00c.

Westvaco Corporation: *See—*

Falkehag, Sten I.; and Dilling, Peter, 3,718,639.

Weyl, Helmut; Kauhl, Gunther; and Beesch, Otto, to Bosch, Robert, G.m.b.H. Glow plug construction. 3,718,425, Cl. 431-208.000.

Whiten, Joseph G.: *See—*

Woods, William G.; Whiten, Joseph G.; and Nies, Nelson P., 3,718,615.

Whittingham, Barron S., to Feed Recycling Co. Process for extracting sugars from cattle manure. 3,718,504, Cl. 127-37.000.

Wiechert, Rudolf: *See—*

Laurent, Henry; Kolb, Karl-Heinz; and Wiechert, Rudolf, 3,718,671.

Wienand, Michael; Jensen, Klaus; Primessing, Franz; and Alfter, Franz-Werner, to Dynamit Nobel Aktiengesellschaft. Apparatus for forming spiral wound pipes. 3,717,916, Cl. 29-200.00b.

Wierts, Derk; and Boomsma, Pieter, to U.S. Philips Corporation. Device for accelerating charged atomic particle including a pair of high frequency resonators. 3,718,865, Cl. 328-234.000.

Wierzbicki, John R.: *See—*

Hasbrouck, Leo J.; Madden, Bill C.; Rew, Robert P.; Sussenguth, Edward H.; and Wierzbicki, John R., 3,718,912.

Wiese, Harold H., to United States of America, Army. Caseless, linkless, telescoped ammunition. 3,718,089, Cl. 102-38.000.

Wild, John J. Method of stool sample collection and testing apparatus therefor. 3,718,431, Cl. 23-230.00b.

Wilder, Donald L.: *See—*

Scray, Eugene J., Jr.; and Wilder, Donald L., 3,718,910.

Wildi, Bernard S.; and Miller, Robert E., to Monsanto Company. Protein-acetylinic ester complex to retard digestion in the rumen. 3,718,478, Cl. 99-2.00r.

Wilkin, John P., to Armstrong-Blum Manufacturing Company. Stop gage for band saw conveyor or the like. 3,718,061, Cl. 83-201.000.

Wilkinson, Norman, to Lucas, Joseph, (Industries) Limited. Vehicle direction switch with automatic return and headlight dimmer control. 3,718,784, Cl. 200-61.270.

Willard, Jack August, to Formica Corporation. Textured coal plate surfaced with furnace cemen. 3,718,496, Cl. 117-10.000.

Willem Gilbert C.; and Farmer, Ray H., to United States of America, Army. Dynamic lead guidance system for homing navigation. 3,718,293, Cl. 244-3.160.

William Prym-Werke KG: *See—*

Glindmeyer, Friedrich, 3,718,105.

Williams, Allan L.: *See—*

Williams, Allan L.; and Heck, Lyle D. (said Heck assor. to said), 3,718,922.

Williams, Allan L.; and Heck, Lyle D., said Heck assor. to said Williams, Allan L. Product monitoring apparatus, system and method. 3,718,922, Cl. 340-280.000.

Williams, Donald E., to Acra-Plant, Inc. Clearing attachment for planter shoes. 3,718,191, Cl. 172-196.000.

Williams, John Charles: *See—*

Dental, Andrew Gomperz; Van Uitert, Le Grand Gerard; and Williams, John Charles, 3,718,601.

Williams, Olin A., Jr.; and Peatman, John B. Technique for correlation method of determining system impulse response. 3,718,813, Cl. 235-181.000.

Williams, Raymond; and Leckenby, Robert Edwin, to United Kingdom Atomic Energy Authority. Air bearings. 3,718,379, Cl. 308-9.000.

Williamson, James A., Jr., to Du Pont de Nemours, E. I., and Company. NO - NO_2 analyzer. 3,718,429, Cl. 23-232.00r.

Willinger, Allan H., to Metaframe Corporation. Protective shipping and display wrapper for an aquarium. 3,718,275, Cl. 229-14.00c.

Wilson, Arthur L., to Lee, Raymond, Organization, Inc., The. Reciprocating motor with conductive disc armature. 3,718,829, Cl. 310-27.000.

Wilson, Ben F., to United States of America, Army. Low L/D rocket engine with tangential-tangential injection. 3,717,999, Cl. 60-258.000.

Wilson, James C., to Matsushita Electronics Corporation. Fused circuit breaker. 3,718,878, Cl. 337-7.000.

Wilson, Walter W., to Bliss, E. W., Company. Forming press system and workpiece handling and transfer apparatus therefor. 3,718,216, Cl. 214-1.0bc.

Wilson, Warren K., to Goodyear Tire & Rubber Company, The. Solid state polymerization process. 3,718,621, Cl. 260-75.00m.

Wilson, Woodrow S.: *See—*

Hazard, Robert E.; and Wilson, Woodrow S., 3,718,238.

Wing, Frederick Donald. Free core grinding drill. 3,718,130, Cl. 125-20.000.

Winslow, Charles E., Jr.; Plentovish, Jack; and Kise, Mearl A., to Virginia Chemicals Inc. Method of recovering chemical values from a formate-sodium aydrosulfite reaction mixture. 3,718,732, Cl. 423-199.000.

Wirth, Gary J.: *See—*

Bloomfield, Roger D.; and Wirth, Gary J., 3,718,096.

Witkowski, Henry J. Method of making skin reinforced pallet. 3,717,922, Cl. 29-421.000.

Witsiepe, William K.: *See—*

Crawford, Robert W.; and Witsiepe, William K., 3,718,715.

Witzel, Bruce E.: *See—*

Shen, Tsung-Ying; and Witzel, Bruce E., 3,718,743.

Wojnar, Joseph A.: *See—*

Box, William A.; and Wojnar, Joseph A., 3,718,019.

Wojtowicz, John A.; Lapkin, Milton; and Puar, Mohindar S., to Olin Mathieson Chemical Corporation. Preparation of chloride-free hypochlorous acid solutions. 3,718,598, Cl. 252-187.00r.

Wolff, Erich: *See—*

Kolb, Gunter; Schmidt, Adolf; Schmitz-Josten, Robert; and Wolff, Erich, 3,718,474.

Wood, Barry B.: *See—*

Chase, David O.; Maloney, Martin V.; Wood, Frederick J., Jr.; and Wood, Barry B., 3,717,896.

Wood, Frederick J., Jr.: *See—*

Chase, David O.; Maloney, Martin V.; Wood, Frederick J., Jr.; and Wood, Barry B., 3,717,896.

Wood, Paul A. Block and building construction using same. 3,717,967, Cl. 52-259.000.

Woodle, Robert A., to Texaco Inc. Means and method for controlling a solvent refining unit to provide optimum yields of refined oil and extract oil. 3,718,809, Cl. 235-151.120.

Woods, William G.; Whiten, Joseph G.; and Nies, Nelson P., to United States Borox & Chemical Corporation. Halogenated polymeric compositions containing zinc borate. 3,718,615, Cl. 260-28.000.

Woodson, Charles S., to Youngstown Sheet and Tube Company, The. Crack-resistant pipe. 3,718,161, Cl. 138-153.000.

Woodville, Mary C.: *See—*

West, Peter; and Woodville, Mary C., 3,718,703.

Woofter, Cecil B., to Vernon Company, The. Self-locking writing implement holder. 3,718,261, Cl. 211-69.100.

Words on Wheels Limited: *See—*

Clements, Paul Bernard, 3,718,775.

Wright, Dale E.: *See—*

Hemsath, Klaus H.; and Wright, Dale E., 3,718,102.

Wright, Hazel H.: *See—*

Brandon, Clarence W., 3,718,186.

Wright, Maurice James: *See—*

Nolan, Roger William; and Wright, Maurice James, 3,718,849.

Wright, Ronald G. Recording tape segment indicator. 3,718,290, Cl. 242-199.000.

Wright, Roy. Bean vine cutter. 3,717,984, Cl. 56-229.000.

Wright, William W.: *See—*

Britton, Leon R.; Vojir, Frank S.; and Wright, William W., 3,718,828.

Wu, James S. H.; and Baker, Broughton L., to United States of America, Atomic Energy Commission. Method for the concentration of heavy metal cations using ion selective membranes. 3,718,583, Cl. 210-22.000.

Wusatowski, Roman: *See—*

Gawlikowicz, Jan J.; Krywult, Jerzy; Wusatowski, Roman; Garczynski, Jozef; Makowski, Aleksander; and Sikora, Leopold, 3,718,026.

Wyeth, Nathanial Convers; Roseveare, Ronald Newman; and Carmichael, Keith Stewart, to Du Pont de Nemours, E. I., and Company. Noneverting bottom for thermoplastic bottles. 3,718,229, Cl. 215-1.00c.

Wylie, Richard D.; and Morrison, Bobby, to Deering Milliken Research Corporation. Coin machine. 3,717,940, Cl. 34-236.000.

Wysocki, Joseph J.; Adams, James E.; Becker, James H.; Madrid, Robert W.; and Haas, Werner E., to Xerox Corporation. Imaging system in which either a liquid crystalline material or an electrode is shaped in an image configuration. 3,718,380, Cl. 350-160.0l.

Wysocki, Joseph J.; Adams, James E.; Becker, James H.; Madrid, Robert W.; and Haas, Werner E. L., to Xerox Corporation. Liquid crystal imaging system in which an electrical field is created by an x-y address system. 3,718,382, Cl. 350-160.0lc.

Wystrach, Vernon Paul: *See—*

Troffkin, Howard Julian; and Wystrach, Vernon Paul, 3,718,445.

Xerox Corporation: *See—*

Holliday, Robert G., 3,718,390.

Krohn, Ivar T.; and Page, Geoffrey A., 3,718,462.

McGuire, John V.; and Watson, Donald W., 3,718,525.

Sokolov, David A., 3,718,087.

Thettu, Raghulinga R., 3,718,116.

Wysocki, Joseph J.; Adams, James E.; Becker, James H.; Madrid, Robert W.; and Haas, Werner E., 3,718,380.

Wysocki, Joseph J.; Adams, James E.; Becker, James H.; Madrid, Robert W.; and Haas, Werner E. L., 3,718,382.

Zurovskis, Egon; and Egnaczak, Raymond K., 3,718,393.

Yale, Harry L., to Squibb, E. R., & Sons, Inc. Azabicyclo-(N)-alkylene-5,11-dihydrodibenzoxa (or thia) zepines. 3,718,665, Cl. 260-327.00b.

Yamaguchi, Terumote, to Nippondenso Kabushiki Kaisha. Method of manufacturing commutators for small-size electric machines. 3,717,928, Cl. 29-597.000.

Yamamoto, Mizuo: *See—*

Fujisawa, Tamotsu; and Yamamoto, Mizuo, 3,718,699.

Yamamoto, Noboru: *See—*

Oishi, Kazuo; Kurebayashi, Tokuhiro; Ando, Noriyoshi; Yamamoto, Noboru; Toda, Tadahide; Nohira, Hidetaka; and Katoh, Takashi, 3,718,126.

Yamamoto, Yoshiro; and Tajihi, Michio, to Kabushiki Kaisha Yamamoto Kogyosho. Device for developing two-component diazo photosensitive material. 3,718,080, Cl. 95-94.00g.

Yamase, Toshihiro: *See—*

Inoue, Eiichi; and Yamase, Toshihiro, 3,718,467.

Yamauchi, Akira. Nursing bottle device. 3,718,140, Cl. 128-252.000.

Yamauchi, Teiji: *See—*

Sugiyama, Michiyuki; Takatori, Yoshikuni; Touyama, Ryosuke; Nakamura, Akira; Yamauchi, Teiji; Kato, Masaaki; and Nakashiba, Yoshio, 3,718,560.

Yan, Tsoung-Yuan: *See—*

Chen, Nai Yuen; and Yan, Tsoung-Yuan, 3,718,577.

Yanikoski, Florian F.: *See—*

Bukowski, Raymond J.; Brija, Raymond L.; and Yanikoski, Florian F., 3,718,244.

Yates, Paul C.: *See—*

Beste, Lawrence F.; Jones, Edward B.; and Yates, Paul C., 3,718,584.

Yates, Paul C., to Du Pont de Nemours, E. I., and Company. Process for silicate-perlite structures. 3,718,491, Cl. 106-84.000.

Yavorsky, Paul M.; and Gorin, Everett, to Consolidation Coal Company. Reduction of aqueous thiosulfate solutions containing formate with carbon monoxide. 3,718,691, Cl. 260-542.000.

Ygfors, Goran, to Ygfors Trading AB. Manufacture of scissors, tongs, pliers or the like cutting or gripping tools. 3,717,921, Cl. 29-407.000.

Ygfors Trading AB: *See—*

Ygfors, Goran, 3,717,921.

Ying, Sui-Chun: *See—*

Philofsky, Harold M.; Ying, Sui-Chun; and Chottiner, Jacob, 3,718,830.

Yokogawa Electric Works, Ltd.: *See—*

Nezu, Kazuo; Imabayashi, Ziro; Watanabe, Kazutaka; Iritani, Tadamitsu; Kataoka, Kouju; and Yoshioka, Michio, 3,718,762.

Yokota, Mitsuhisa; and Sato, Hiroya, to Tokyo Shibaura Electric Co., Ltd. Control system for an extraction turbine system. 3,718,837, Cl. 317-13.00r.

Yonekubo, Ken, to Olympus Optical Company Limited. Mirror drum optical system for use in microscopic spectrophotometer. 3,718,400, Cl. 356-96.000.

Yonker, John F.: *See—*

Roth, Alton A.; Dzioba, Don L.; and Yonker, John F., 3,718,788.

Yorkshire Imperial Metals Limited: *See—*

Hardwick, Roy, 3,717,925.

Yoshida, Hideyuki, to Matsushita Electric Industrial Co., Ltd. Arc starting stud welding method. 3,718,801, Cl. 219-99.000.

Yoshioka, Michio: *See—*

Nezu, Kazuo; Imabayashi, Ziro; Watanabe, Kazutaka; Iritani, Tadamitsu; Kataoka, Kouju; and Yoshioka, Michio, 3,718,762.

Young, Oswald William John: *See—*

Morgan, Cyril Alfred; Arber, Scott Gordin; and Young, Oswald William John, 3,718,490.

Young, Raymond H., Jr., to Monsanto Company. Photoconductive coating compositions using a poly(vinyl-halbenzal) binder. 3,718,463, Cl. 96-1.800.

Youngstown Sheet and Tube Company, The: *See—*

Woodson, Charles S., 3,718,161.

Zahnradfabrik Friedrichshafen Aktiengesellschaft: *See—*

Felder, Winfried; and Kuhn, Walter, 3,718,056.

Zelenka, Donald J., to General Motors Corporation. Pressure responsive switch. 3,718,790, Cl. 200-83.00v.

Zeugner, Horst; Eickstedt, Klaus-Wolf Von; Stuhmer, Werner; and Funke, Siegfried, to Kali-Chemie Aktiengesellschaft. Substituted phenylacetonitriles. 3,718,666, Cl. 260-340.300.

Zindler, Jerrold: *See—*

Rosse, Thomas A.; Blackmer, David E.; Zindler, Jerrold; and Kelley, Thomas F., 3,718,439.

Zondler, Helmut; and Pfleiderer, Wolfgang, to Ciba-Geigy AG. Curable mixtures of epoxide resins and piperidine derivatives. 3,718,610, Cl. 260-2.00n.

Zurovskis, Egon; and Egnaczak, Raymond K., to Xerox Corporation. Imaging apparatus. 3,718,393, Cl. 355-8.000.

Zusmanovich, Lev Markovich, to Tsentrglny Nauchno-Issledovatelsky i Proektno-Experimentalny Institut Inzhenernogo Oborudovania Gorodov. Air conditioning installation. 3,718,008, Cl. 62-309.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 27TH DAY OF FEBRUARY, 1973

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Balliet, Karl E.: *See*—
  Dean, Duff L., and Balliet. Re. 27,589.
Benthimer, Floyd D.: *See*—
  Watts, Claude H., and Benthimer. Re. 27,586.
Celanese Corp.: *See*—
  Pallyenko, Paul, and Coates. Re. 27,587.
Coates, Herbert W.: *See*—
  Pallyenko, Paul, and Coates. Re. 27,587.
Dean, Duff L., and K. E. Balliet, by Triple D Industries, Inc., to Triple D Industries, Inc. Boat fender structures. Re. 27,589, 2-27-73, Cl. 114—219.
Hausermann, Elmer P. Apparatus for shaping electrodes. Re. 27,588, 2-27-73, Cl. 51—157.
Pallyenko, Paul, and H. W. Coates, to Celanese Corp. Treating vehicle for polyester filamentary material and method of improving the properties of such material. Re. 27,587, 2-27-73, Cl. 260—29.20.
Postolowski, John. Devices for dispensing tinsel and the like adaptable for decorating Christmas trees. Re. 27,585, 2-27-73, Cl. 83—225.
Precision Metalsmiths, Inc.: *See*—
  Watts, Claude H., and Benthimer. Re. 27,586.
Triple D Industries, Inc.: *See*—
  Dean, Duff L., and Balliet. Re. 27,589.
Watts, Claude H., and F. D. Benthimer, to Precision Metalsmiths, Inc. Apparatus for forming ceramic shell molds. Re. 27,586, 2-27-73, Cl. 164—165.

LIST OF PLANT PATENTEES

Cobia, Barnell L. Milkwood plant. 3,310, 2-27-73, Cl. 88.
Duffett, William E.: *See*—
  Jessel, Walter H., Jr., and Duffett. 3,311.
  Jessel, Walter H., Jr., and Duffett. 3,313.
Jessel, Walter H., Jr., and W. E. Duffett, to Yoder Brothers, Inc. Chrysanthemum plant. 3,311, 2-27-73, Cl. 80.
Jessel, Walter H., Jr., and W. E. Duffett, to Yoder Brothers, Inc. Chrysanthemum plant. 3,313, 2-27-73, Cl. 80.
Klehm, Carl G. Iris plant. 3,312, 2-27-73, Cl. 68.
Yoder Brothers, Inc.: *See*—
  Jessel, Walter H., Jr., and Duffett. 3,311.
  Jessel, Walter H., Jr., and Duffett. 3,313.

LIST OF DESIGN PATENTEES

A/S W. Jordon Borste & Penselfabrik: *See*—
  Lindbo, Per. 226,392.
Artaud, Maurice H.: *See*—
  Stanley, Donald, and Artaud. 226,401.
Bauer Bros. Co., The: *See*—
  Ginaven, Marvin E. 226,398.
Blumcraft of Pittsburgh: *See*—
  Horgan, William J., Jr. 226,365.
Burcliff Industries: *See*—
  Johnson, Dean W. 226,384.
Colgate-Palmolive Co.: *See*—
  Lauridsen, Jorgen. 226,372.
Cooper, Howard. Bottle. 226,371, 2-27-73, Cl. D9—28.
Corning Glass Works: *See*—
  Dorman, William H. 226,395.
Creative Creations, Inc.: *See*—
  Feuer, Perry. 226,388.
Cromb, Michael D., to Midland Glass Co., Inc. Bottle or similar article. 226,370, 2-27-73, Cl. D9—1.
Daher Co., Inc.: *See*—
  Greenstein, Benjamin. 226,393.
Dallaire, Dominique and R. M. Extruded plastic header track for a window unit. 226,374, 2-27-73, Cl. D13—6.
Dallaire, R. M.: *See*—
  Dallaire, Dominique and R. M. 226,374.
Doman, Donald W., to Kohler Co. Combined sink and disposal well. 226,378, 2-27-73, Cl. D23—62.
Doman, Donald W., to Gould Inc. Portable fluorescent light. 226,396, 2-27-73, Cl. D48—24.
Doman, Donald W., to Flambeau Plastics Corp. Extensible rod case. 226,407, 2-27-72, Cl. D87—1.
Dorman, William H., to Corning Glass Works. Fresnel lens. 226,395, 2-27-73, Cl. D48—16.
Draper, Walter R., and T. A. Poulton, to Parson Chain Co. Ltd. Swivel connector for joining ends of chains or the like. 226,369, 2-27-73, Cl. D8—252.
Electric Fishing Reel Systems, Inc.: *See*—
  Huffman, Peck T. 226,377.
Emmerling, Ronald, and R. Fisher, to Kenney Mfg. Co. Traverse rod. 226,367, 2-27-73, Cl. D8—210.
Emmerling, Ronald, and R. Fisher, to Kenney Mfg. Co. Traverse rod. 226,368, 2-27-73, Cl. D8—210.
Feuer, Perry, to Creative Creations, Inc. Toy spinner with openable petals. 226,388, 2-27-73, Cl. D34—15.
Fisher, Robert: *See*—
  Emmerling, Ronald, and Fisher. 226,367.
  Emmerling, Ronald, and Fisher. 226,368.
Fisher, Robert, and W. Goldschmidt, to Kenney Mfg. Co. Traverse rod. 226,366, 2-27-73, Cl. D8—210.
Flambeau Plastics Corp.: *See*—
  Doman, Donald W. 226,407.
Fort Howard Paper Co.: *See*—
  Joski, Nancy L. 226,400.
Franklin, Leon H. Sand urn or similar article. 226,397, 2-27-73, Cl. D49—35.
General Electric Co.: *See*—
  Maliskas, John S. 226,385.
  Hauenstein, Max C. 226,404.
Ginaven, Marvin E., to The Bauer Bros. Co. Hopper type screen unit for classifying and separating liquids and solids. 226,398, 2-27-73, Cl. D55—1.
Goldschmidt, Willfred: *See*—
  Fisher, Robert, and Goldschmidt. 226,366.
Gould Inc.: *See*—
  Doman, Donald W. 226,396.
Grace, W. R., & Co.: *See*—
  Joonase, Paul, and Perdue. 226,373.
Greenstein, Benjamin, to Daher Co., Inc. Serving tray. 226,393, 2-27-73, Cl. D44—10.
Harty, Millard F., Jr.: *See*—
  Main, John A., and Harty. 226,376.
Harty, Millard F., Jr., to Motor Wheel Corp. Air distribution unit for roof-mounted vehicle air conditioner. 226,381, 2-27-73, Cl. D23—142.
Hauenstein, Max C., to General Electric Co. Electric oven toaster or similar article. 226,404, 2-27-73, Cl. D81—10.
Horgan, William J., Jr., to Blumcraft of Pittsburgh. Panic door handle. 226,365, 2-27-73, Cl. D8—149.
Huffman, Peck T., to Electric Fishing Reel Systems, Inc. Electric fishing reel. 226,377, 2-27-73, Cl. D22—25.
Jacuzzi Research, Inc.: *See*—
  Jacuzzi, Roy A., and Kosta. 226,405.
Jacuzzi, Roy A., and P. L. Kosta, to Jacuzzi Research, Inc. Hydromassage bathtub. 226,405, 2-27-73, Cl. D83—1.
Johns, Mary B. Figurine. 226,387, 2-27-73, Cl. D29—23.
Johnson, Dean W., to Burcliff Industries. Coil and switch combination. 226,384, 2-27-73, Cl. D26—13.
Jones, William E., to Miles Laboratories, Inc. Storage tray for microscope slides. 226,408, 2-27-73, Cl. D87—1.
Joonase, Paul, and R. R. Perdue, to W. R. Grace & Co. Combined display and packaging tray for meat or the like. 226,373, 2-27-73, Cl. D9—242.
Joski, Nancy L., to Fort Howard Paper Co. Paper toweling. 226,400, 2-27-73, Cl. D59—2.
Kenney Mfg. Co.: *See*—
  Fisher, Robert, and Goldschmidt. 226,366.
  Emmerling, Ronald, and Fisher. 226,367.
  Emmerling, Ronald, and Fisher. 226,368.
Kohler Co.: *See*—
  Doman, Donald W. 226,378.
Kosta, Peter L.: *See*—
  Jacuzzi, Roy A., and Kosta. 226,405.
Krusinski, Raymond A.: *See*—
  Wells, Charles A., and Krusinski. 226,375.
Krutz, Kenneth W. Boat. 226,402, 2-27-73, Cl. D71—1.
Kunze, Walter A., to Lincoln Mfg. Co. Knife handle. 226,410, 2-27-73, Cl. D95—3.
Lauridsen, Jorgen, to Colgate-Palmolive Co. Bottle. 226,372, 2-27-73, Cl. D9—89.
Lincoln Mfg. Co.: *See*—
  Kunze, Walter A. 226,410.
Lindbo, Per, to A/S W. Jordon Borste & Penselfabrik. Brush scraper. 226,392, 2-27-73, Cl. D44—1.
Litton Systems, Inc.: *See*—
  Watts, James E. 226,380.
Long, Douglas G., to Sunbeam Corporation. Electric comb. 226,406, 2-27-73, Cl. D86—8.
Loughran, Anne E., to Thann Products Co. Dental x-ray collator/index. 226,383, 2-27-73, Cl. D24—1.
Madonia, Calogero. Inflatable missile kite. 226,389, 2-27-73, Cl. D34—15.

Magistretti, Lodovico. Armchair. 226,363, 2-27-73, Cl. D6—65.
Main, John A., and M. F. Harty, Jr., to Motor Wheel Corp. Wheel. 226,376, 2-27-73, Cl. D14—30.
Maliskas, John S., to General Electric Co. Cassette tape recorder. 226,385, 2-27-73, Cl. D26—14.
Margolin, Mildred: *See*—
  Margolin, William and M. 226,390.
Margolin, William and M. Exerciser. 226,390, 2-27-73, Cl. D34—15.
Mark, Jack G., to Whitney Optical Co., Inc. Spectacle frame or similar article. 226,399, 2-27-73, Cl. D57—1.
Midland Glass Co., Inc.: *See*—
  Cromb, Michael D. 226,370.
Miles Laboratories, Inc.: *See*—
  Jones, William E. 226,408.
Motor Wheel Corp.: *See*—
  Harty, Millard F., Jr. 226,381.
  Main, John A., and Harty. 226,376.
Mox, Dana W., to Research Products Corp. Casing for a humidifier. 226,382, 2-27-73, Cl. D23—147.
Murray Ohio Mfg. Co., The: *See*—
  Schreckengost, Viktor. 226,391.
Noone, Margaret E. Handbag. 226,409, 2-27-73, Cl. D87—3.
Parson Chain Co. Ltd.: *See*—
  Draper, Walter R., and Poulton. 226,369.
Perdue, Richard R.: *See*—
  Joonase, Paul, and Perdue. 226,373.
Poulton, Thomas A.: *See*—
  Draper, Walter R., and Poulton. 226,369.
Pretty Products, Inc.: *See*—
  Wells, Charles A., and Krusinski. 226,375.
Research Products Corp.: *See*—
  Mox, Dana W. 226,382.
Rosson, Ronald B. Pencil sharpener. 226,403, 2-27-73, Cl. D74—21.
Sandler, William B. Loudspeaker. 226,386, 2-27-73, Cl. D26—14.
Schreckengost, Viktor, to The Murray Ohio Mfg. Co. Riding mower. 226,391, 2-27-73, Cl. D40—1.
Seidler, David. Cosmetic container. 226,362, 2-27-73, Cl. D4—20.
Stanley, Donald, and M. H. Artaud, to Stromberg DatagraphiX, Inc. Microfiche viewer. 226,401, 2-27-73, Cl. D61—1.
Stromberg DatagraphiX, Inc.: *See*—
  Stanley, Donald, and Artaud. 226,401.
Stut, Petrus J., to United States Philips Corp. Fan heater. 226,379, 2-27-73, Cl. D23—73.
Sunbeam Corp.: *See*—
  Long, Douglas C. 226,406.
  Thomas, Richard K. 226,394.
Thann Products Co.: *See*—
  Loughran, Anne E. 226,383.
Thomas, Morton I. Bedside rail. 226,364, 2-27-73, Cl. D6—198.
Thomas, Richard K., to Sunbeam Corp. Clock casing. 226,394, 2-27-73, Cl. D42—7.
United States Philips Corp.: *See*—
  Stut, Petrus J. 226,379.
Watts, James E., to Litton Systems, Inc. Portable water heater. 226,380, 2-27-73, Cl. D23—88.
Wells, Charles A., and R. A. Krusinski, to Pretty Products, Inc. Automobile floor mat. 226,375, 2-27-73, Cl. D14—5.
Whitney Optical Co., Inc.: *See*—
  Mark, Jack G. 226,399.

CLASSIFICATION OF PATENTS

ISSUED FEBRUARY 27, 1973

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2	
173	3,717,882
CLASS 3	
1	3,717,883
CLASS 4	
237	3,717,884
CLASS 5	
61	3,717,885
239	3,717,886
280	3,717,887
343	3,717,888
CLASS 8	
151	3,718,427
173	3,718,428
CLASS 9	
4R	3,717,889
CLASS 10	
12T	3,717,890
54	3,717,891
89F	3,717,892
CLASS 15	
97R	3,717,893
	3,717,894
105	3,717,895
210R	3,717,896
215	3,717,897
230.11	3,717,899
244R	3,717,898
250.36	3,717,900
314	3,717,901
CLASS 16	
171	3,717,902
CLASS 17	
67	3,717,903
CLASS 19	
66R	3,717,904
148	3,717,905
CLASS 23	
230B	3,718,431
230R	3,718,432
	3,718,433
232R	3,718,429
	3,718,434
253R	3,718,435
	3,718,436
	3,718,437
254E	3,718,430
259	3,718,438
	3,718,439
277C	3,718,440
CLASS 24	
16PB	3,717,906
128	3,717,907
204	3,717,908
CLASS 26	
51.4	3,717,909
CLASS 28	
62	3,717,910
CLASS 29	
25.14	3,717,911
39	3,717,912
103C	3,717,913
182.1	3,718,441
191.6	3,718,442
195	3,717,914
196.6	3,718,443
197.5	3,717,915
200B	3,717,916
203D	3,717,917
205R	3,717,918
208R	3,717,919
237	3,717,920
407	3,717,921
421	3,717,922
429	3,717,923
432	3,717,924
470.1	3,717,925
472.7	3,717,926
517	3,717,927
597	3,717,928
624	3,717,929
629	3,717,930
CLASS 32	
5	3,717,931
10A	3,717,932
11	3,717,933
CLASS 33	
147N	3,717,934
391	3,717,935
CLASS 34	
99	3,717,936
108	3,717,937
168	3,717,938
230	3,717,939
236	3,717,940
CLASS 35	
30	3,717,941
77	3,717,942
CLASS 36	
32R	3,717,943
CLASS 37	
2R	3,717,944
CLASS 40	
106.25	3,717,945
CLASS 42	
1F	3,717,946
CLASS 43	
19	3,717,947
CLASS 44	
7C	3,718,445
66	3,718,444
CLASS 46	
25	3,717,948
61	3,717,949
241	3,717,950
243	3,717,951
244D	3,717,952
CLASS 47	
1.1	3,717,953
CLASS 48	
209	3,718,446
CLASS 49	
43	3,717,954
488	3,717,955
CLASS 51	
1	3,717,956
9	3,717,957
26	3,717,958
157	Re.27,588
165.091	3,717,962
165.88	3,717,961
165.9	3,717,960
295	3,718,447
CLASS 52	
19	3,717,963
79	3,717,964
	3,717,965
127	3,717,966
259	3,717,967
288	3,717,968
396	3,717,969
514	3,717,970
CLASS 53	
89	3,717,971
124E	3,717,973
138A	3,717,972
CLASS 55	
58	3,717,974
73	3,717,976
110	3,717,977
233	3,717,979
242	3,717,978
461	3,717,980
CLASS 56	
6	3,717,981
63	3,717,982
208	3,717,983
229	3,717,984
295	3,717,985
327A	3,717,986
CLASS 57	
9	3,717,987
34AT	3,717,988
58.52	3,717,989
160	3,717,959
CLASS 58	
50R	3,717,990
152R	3,717,991
CLASS 60	
19	3,717,992
24	3,717,993
39.51R	3,717,994
220	3,717,997
255	3,717,998
258	3,717,999
285	3,718,000
327	3,717,996
470	3,717,995
CLASS 61	
1F	3,718,001
22	3,718,002
35	3,718,003
72.3	3,718,004
CLASS 62	
13	3,718,005
17	3,718,006
63	3,718,007
309	3,718,008
CLASS 64	
28R	3,718,009
CLASS 65	
3	3,718,448
	3,718,449
99A	3,718,450
CLASS 66	
84	3,718,010
192	3,718,011
CLASS 68	
9	3,718,012
208	3,718,013
CLASS 70	
56	3,718,014
224	3,718,015
CLASS 71	
9	3,718,451
34	3,718,453
92	3,718,452
106	3,718,454
118	3,718,455
124	3,718,456
CLASS 72	
8	3,718,016
20	3,718,017
31	3,718,018
35	3,718,019
78	3,718,020
126	3,718,021
132	3,718,022
196	3,718,023
201	3,718,024
222	3,718,025
242	3,718,026
407	3,718,027
CLASS 73	
15.4	3,718,028
28	3,718,029
61R	3,718,030
67.2	3,718,031
67.7	3,718,032
71.7	3,718,033
86	3,718,034
95	3,718,035
117	3,718,036
141AB	3,718,039
141A	3,718,038
144	3,718,037
146	3,718,040
167	3,718,041
178R	3,718,042
194F	3,718,043
223	3,718,044
373	3,718,045
395	3,718,046
398R	3,718,047
407R	3,718,048
CLASS 74	
89	3,718,049
206	3,718,050
216.3	3,718,051
462	3,718,052
493	3,718,053
751	3,718,054
826	3,718,055
865	3,718,056
CLASS 75	
108	3,718,457
119	3,718,458
132	3,718,459
168M	3,718,460
171	3,718,461
CLASS 81	
15.4	3,718,057
53.2	3,718,058
CLASS 83	
2	3,718,059
84	3,718,060
201	3,718,061
225	Re.27,585
268	3,718,062
502	3,718,064
CLASS 84	
1.01	3,718,747
1.24	3,718,748
101	3,718,746
471.2	3,718,063
CLASS 85	
62	3,718,065
	3,718,066
68	3,718,067
71	3,718,068
CLASS 86	
20D	3,718,069
CLASS 89	
1.8	3,718,070
CLASS 90	
21.5	3,718,071
62R	3,718,072
CLASS 91	
412	3,718,073
CLASS 95	
1.1	3,718,074
10CT	3,718,075
	3,718,077
10C	3,718,076
49	3,718,078
62	3,718,079
94G	3,718,080
CLASS 96	
1.3	3,718,462
1.8	3,718,463
29D	3,718,464
29	3,718,465
48R	3,718,466
	3,718,467
50R	3,718,469
50	3,718,468
64	3,718,470
75	3,718,471
83	3,718,473
84R	3,718,472
115P	3,718,474
124	3,718,475
127	3,718,476
140	3,718,477
CLASS 98	
110	3,718,081
CLASS 99	
2R	3,718,478
17	3,718,479
85	3,718,480
111	3,718,481
150	3,718,482
182	3,718,483
199	3,718,484
204	3,718,485
214	3,718,486
312	3,718,084
353	3,718,487
470	3,718,082
532	3,718,083
CLASS 101	
40	3,718,085
115	3,718,086
147	3,718,087
CLASS 102	
21	3,718,088
38	3,718,089
64	3,718,090
67	3,718,091
70.2R	3,718,092
73A	3,718,093
101	3,718,094
102	3,718,095
CLASS 104	
155	3,718,096
249	3,718,097
CLASS 105	
369BA	3,718,099
369B	3,718,098
378	3,718,100
CLASS 106	
1	3,718,488
64	3,718,489
65	3,718,490
84	3,718,491
104	3,718,492
273R	3,718,493
291	3,718,494
CLASS 108	
152	3,718,101
CLASS 110	
7R	3,718,102
CLASS 112	
224	3,718,104
265	3,718,105
CLASS 113	
116W	3,718,107
119	3,718,106
CLASS 114	
181	3,718,108
219	Re.27,589
CLASS 115	
28R	3,718,109
41HT	3,718,110
70	3,718,111
CLASS 116	
114R	3,718,113
114	3,718,112
129	3,718,114
CLASS 117	
7	3,718,495
10	3,718,496
35R	3,718,497
97	3,718,498
127	3,718,499
132R	3,718,500
139.5A	3,718,501
212	3,718,502
	3,718,503
CLASS 118	
203	3,718,115
266	3,718,116
414	3,718,117
CLASS 119	
16	3,718,118
	3,718,120
28	3,718,119
52B	3,718,121
CLASS 122	
149	3,718,122
CLASS 123	
117R	3,718,126
140CC	3,718,123
140IG	3,718,127
148DC	3,718,124
148E	3,718,125
179K	3,718,128
179P	3,718,129
CLASS 125	
20	3,718,130
CLASS 126	
343.5A	3,718,131
CLASS 127	
37	3,718,504
CLASS 128	
1C	3,718,132
2F	3,718,133
2.08	3,718,135
	3,718,136
2.1E	3,718,134
87R	3,718,137
214R	3,718,138
235	3,718,139
252	3,718,140
283	3,718,141
419P	3,718,142
499	3,718,143
CLASS 131	
140C	3,718,153
CLASS 132	
39	3,718,144
88.5	3,718,145
92	3,718,146
CLASS 134	
57D	3,718,149
60	3,718,147
167R	3,718,148
CLASS 136	
6	3,718,505
86C	3,718,506
86R	3,718,507
90	3,718,508
CLASS 137	
114	3,718,152
360	3,718,154
433	3,718,155
512.1	3,718,156
551	3,718,157
593	3,718,158
596.12	3,718,159
823	3,718,151
829	3,718,150
CLASS 138	
46	3,718,160
153	3,718,161
CLASS 139	
188	3,718,163
CLASS 141	
1	3,718,164
20	3,718,165
236	3,718,166
CLASS 144	
2Z	3,718,167
117R	3,718,168
242R	3,718,169
CLASS 148	
6.2	3,718,509
14	3,718,510
171	3,718,511
CLASS 149	
2	3,718,512
24	3,718,513
CLASS 152	
49	3,718,170
CLASS 156	
17	3,718,514
106	3,718,516
174	3,718,515
234	3,718,517
242	3,718,518
250	3,718,519
381	3,718,527
400	3,718,520
433	3,718,521
448	3,718,522
460	3,718,523
500	3,718,524
539	3,718,525
580	3,718,526
CLASS 160	
210	3,718,171
CLASS 161	
1	3,718,528
19	3,718,529
67	3,718,530
116	3,718,531
159	3,718,532
165	3,718,533
	3,718,535
168	3,718,536
173	3,718,534
CLASS 162	
157C	3,718,537
340	3,718,538

CLASS 164	
75	3,718,172
82	3,718,173
154	3,718,174
165	Re.27,586
254	3,718,175
278	3,718,176
282	3,718,177
297	3,718,178
CLASS 165	
9	3,718,179
	3,718,180
166	3,718,182
180	3,718,181
CLASS 166	
5	3,718,183
57	3,718,184
85	3,718,185
248	3,718,186
274	3,718,187
299	3,718,188
305	3,718,189
CLASS 172	
159	3,718,103
173	3,718,190
196	3,718,191
624	3,718,192
CLASS 173	
117	3,718,193
CLASS 174	
73R	3,718,749
94R	3,718,750
CLASS 175	
45	3,718,194
58	3,718,195
307	3,718,196
CLASS 176	
37	3,718,539
CLASS 177	
16	3,718,197
232	3,718,198
CLASS 178	
5.4HE	3,718,753
5.4TC	3,718,752
5.4E	3,718,751
6.6DD	3,718,754
6.6SF	3,718,755
6.7R	3,718,756
6.8	3,718,757
	3,718,758
	3,718,759
7.2	3,718,760
7.6	3,718,761
68	3,718,762
CLASS 179	
1N	3,718,763
1.5M	3,718,765
2DP	3,718,764
15BA	3,718,768
15BM	3,718,766
	3,718,767
18BC	3,718,770
18J	3,718,769
	3,718,782
90R	3,718,771
100.1TD	3,718,773
100.2B	3,718,772
100.2C	3,718,776
100.2D	3,718,774
100.2R	3,718,777
100.2T	3,718,775
115.5R	3,718,779
170G	3,718,780
175.2A	3,718,778
175.3	3,718,781
CLASS 180	
9.2R	3,718,199
74	3,718,200
98	3,718,201
114	3,718,202
120	3,718,203
CLASS 181	
.5VM	3,718,206
.5H	3,718,205
	3,718,207
5BE	3,718,204
50	3,718,208
CLASS 184	
5	3,718,209
CLASS 188	
218XL	3,718,210
CLASS 192	
12D	3,718,211
45	3,718,212
67R	3,718,213
105CD	3,718,214
141	3,718,215
CLASS 195	
28R	3,718,541
51E	3,718,542
99	3,718,543
CLASS 197	
16	3,718,243
127R	3,718,244
127	3,718,245
CLASS 198	
34	3,718,246
127	3,718,247
	3,718,248
181	3,718,249
208	3,718,250
CLASS 200	
1R	3,718,783
61.27	3,718,784
61.41	3,718,785
63	3,718,786
80	3,718,787
81.9R	3,718,788
83R	3,718,789
83V	3,718,790
85A	3,718,791
85R	3,718,792
160	3,718,793
166BB	3,718,794
168R	3,718,795
CLASS 202	
190	3,718,544
CLASS 203	
15	3,718,545
CLASS 204	
1T	3,718,546
28	3,718,547
35N	3,718,548
49	3,718,549
67	3,718,550
98	3,718,551
105R	3,718,552
129.75	3,718,555
147	3,718,554
149	3,718,556
157.1	3,718,557
180G	3,718,559
180P	3,718,560
180R	3,718,561
181	3,718,564
192	3,718,565
195G	3,718,569
195P	3,718,562
	3,718,563
	3,718,566
	3,718,567
	3,718,568
196	3,718,570
197	3,718,571
272	3,718,540
297R	3,718,573
298	3,718,572
CLASS 205	
159.2	3,718,558
CLASS 206	
47R	3,718,251
56DF	3,718,252
57A	3,718,253
65S	3,718,254
CLASS 208	
44	3,718,574
59	3,718,575
93	3,718,576
108	3,718,577
120	3,718,553
139	3,718,578
143	3,718,579
310	3,718,580
340	3,718,581
CLASS 209	
80.5	3,718,255
CLASS 210	
6	3,718,582
22	3,718,583
56	3,718,797
71	3,718,256
73	3,718,257
98	3,718,258
109	3,718,259
CLASS 211	
13	3,718,260
69.1	3,718,261
CLASS 212	
110	3,718,262
128	3,718,263
CLASS 213	
50.5	3,718,264
CLASS 214	
1BC	3,718,216
1D	3,718,265
2.5	3,718,266
6FA	3,718,267
8.5A	3,718,217
10.5R	3,718,218
17DB	3,718,220
38D	3,718,219
77R	3,718,221
145	3,718,222
152	3,718,223
302	3,718,224
450	3,718,225
451	3,718,226
512	3,718,227
620	3,718,228
CLASS 215	
1C	3,718,229
CLASS 219	
10.41	3,718,796
60A	3,718,798
77	3,718,799
85	3,718,800
99	3,718,801
131WR	3,718,802
158	3,718,803
301	3,718,804
305	3,718,805
550	3,718,806
CLASS 220	
22.3	3,718,232
41	3,718,231
60A	3,718,230
CLASS 222	
70	3,718,233
135	3,718,234
145	3,718,235
386.5	3,718,236
505	3,718,237
536	3,718,238
548	3,718,239
CLASS 224	
2B	3,718,240
5A	3,718,241
45S	3,718,242
CLASS 225	
2	3,718,268
CLASS 226	
33	3,718,269
97	3,718,270
CLASS 227	
10	3,718,271
CLASS 228	
3	3,718,272
15	3,718,273
CLASS 229	
2.5	3,718,274
14C	3,718,275
72	3,718,276
73	3,718,277
CLASS 233	
19A	3,718,278
CLASS 235	
30R	3,718,811
92PD	3,718,807
92T	3,718,808
151.12	3,718,809
156	3,718,810
168	3,718,812
181	3,718,813
200WB	3,718,279
CLASS 236	
44R	3,718,280
CLASS 237	
2A	3,718,281
CLASS 239	
33	3,718,282
533	3,718,283
CLASS 240	
1.3	3,718,815
8.16	3,718,814
52R	3,718,816
CLASS 241	
23	3,718,284
28	3,718,285
30	3,718,286
CLASS 242	
35.5R	3,718,296
55.19A	3,718,297
58.6	3,718,298
	3,718,299
66	3,718,300
71.1	3,718,301
75	3,718,354
81	3,718,302
	3,718,303
118.11	3,718,287
178	3,718,288
190	3,718,289
199	3,718,290
219	3,718,291
CLASS 244	
3.11	3,718,292
3.16	3,718,293
46	3,718,294
119	3,718,295
CLASS 248	
9	3,718,304
54CS	3,718,305
188.8	3,718,306
205R	3,718,307
460	3,718,308
CLASS 249	
90	3,718,309
165	3,718,310
CLASS 250	
43.5FL	3,718,817
43.5D	3,718,819
71.5R	3,718,818
83.3H	3,718,820
202	3,718,821
210	3,718,822
223R	3,718,823
CLASS 251	
77	3,718,311
149.4	3,718,312
290	3,718,313
329	3,718,314
CLASS 252	
8.1	3,718,584
8.5C	3,718,585
8.55B	3,718,586
8.6	3,718,587
32.5	3,718,588
33.4	3,718,589
46.7	3,718,590
49.8	3,718,591
62	3,718,592
62.1	3,718,593
	3,718,594
62.9	3,718,595
78	3,718,596
102	3,718,597
187R	3,718,598
188.3	3,718,599
301.2R	3,718,602
301.4F	3,718,600
301.4R	3,718,601
389A	3,718,603
391	3,718,604
408	3,718,605
	3,718,606
439	3,718,607
514	3,718,608
545	3,718,609
CLASS 254	
164	3,718,315
172	3,718,316
186HC	3,718,317
CLASS 259	
1	3,718,318
4	3,718,319
CLASS 260	
2N	3,718,610
2.5BD	3,718,612
	3,718,613
2.5BE	3,718,611
28	3,718,615
28.5B	3,718,616
29.2M	Re.27,587
30.4EP	3,718,617
30.8R	3,718,620
31.8R	3,718,614
47CB	3,718,619
47EN	3,718,618
67FP	3,718,630
75NP	3,718,622
	3,718,623
75M	3,718,621
77.5AM	3,718,624
78TF	3,718,625
78.3	3,718,626
79.3MU	3,718,627
79.5B	3,718,628
80.72	3,718,631
80.78	3,718,632
82.1	3,718,633
91.1M	3,718,634
93.7	3,718,635
94.2T	3,718,637
	3,718,638
94.9D	3,718,636
124A	3,718,639
157	3,718,640
162	3,718,641
165	3,718,642
239.3B	3,718,645
239.3D	3,718,646
243B	3,718,643
243C	3,718,644
247.1	3,718,647
247.2A	3,718,648
251R	3,718,649
268DK	3,718,651
268R	3,718,650
282	3,718,652
283S	3,718,653
294.8H	3,718,655
294.8R	3,718,654
295F	3,718,656
296A	3,718,657
302R	3,718,659
307D	3,718,660
308C	3,718,661
309.2	3,718,662
326.3	3,718,663
327A	3,718,664
327B	3,718,665
340.3	3,718,666
345.2	3,718,668
345.8	3,718,667
367	3,718,669
397.1	3,718,674
397.3	3,718,670
	3,718,671
	3,718,673
397.6	3,718,672
408	3,718,675
413	3,718,676
429.1	3,718,677
430	3,718,679
	3,718,680
448.2P	3,718,682
448.2R	3,718,681
456A	3,718,683
465D	3,718,678
465.7	3,718,684
473F	3,718,685
473R	3,718,686
479S	3,718,687
482R	3,718,688
494	3,718,689
501.12	3,718,658
515P	3,718,690
542	3,718,691
561A	3,718,693
562A	3,718,692
570.5C	3,718,694
583D	3,718,695
586A	3,718,696
	3,718,697
587	3,718,698
608	3,718,699
609R	3,718,700
611R	3,718,701
621G	3,718,629
665R	3,718,702
	3,718,703
671M	3,718,704
676R	3,718,705
	3,718,706
678	3,718,707
683R	3,718,708
	3,718,709
683.67	3,718,710
823	3,718,711
858	3,718,712
	3,718,713
862	3,718,714
873	3,718,715
898	3,718,716
	3,718,717
948	3,718,718
CLASS 263	
8R	3,718,320
19A	3,718,321
33R	3,718,322
40R	3,718,323
CLASS 264	
3B	3,718,719
29	3,718,720
40	3,718,721
41	3,718,722
61	3,718,723
98	3,718,724
163	3,718,725
219	3,718,726
289	3,718,727
346	3,718,728
CLASS 266	
5R	3,718,324
CLASS 267	
74	3,718,325
140	3,718,326
CLASS 269	
37	3,718,327
CLASS 271	
20	3,718,328
CLASS 273	
1R	3,718,329
119R	3,718,331
187R	3,718,330
192	3,718,333
CLASS 277	
26	3,718,335
27	3,718,334
40	3,718,336
165	3,718,338
CLASS 279	
51	3,718,339
57	3,718,340
CLASS 280	
28	3,718,341
47.26	3,718,337
87.01	3,718,342
116	3,718,343
150AB	3,718,332
261	3,718,344
289	3,718,345
415B	3,718,346
467	3,718,347
CLASS 283	
8	3,718,348
17	3,718,349
CLASS 285	
39	3,718,350
236	3,718,351
261	3,718,352
CLASS 287	
20.3	3,718,353
CLASS 292	
321	3,718,355
CLASS 293	
5	3,718,356
9	3,718,357
CLASS 294	
19R	3,718,358
26	3,718,359
27H	3,718,360
67E	3,718,361
112	3,718,362
CLASS 296	
14	3,718,363
28R	3,718,364
CLASS 297	
349	3,718,365
CLASS 299	
4	3,718,366
14	3,718,367
34	3,718,368
59	3,718,369
91	3,718,370
CLASS 302	
31	3,718,371
CLASS 303	
7	3,718,372
	3,718,373
21CG	3,718,376
	3,718,377
21A	3,718,374
21B	3,718,375
CLASS 307	
149	3,718,824
228	3,718,825
251	3,718,826
273	3,718,827
CLASS 308	
9	3,718,379
36.1	3,718,378
CLASS 310	
15	3,718,828
27	3,718,829
64	3,718,830
CLASS 313	
346R	3,718,831
CLASS 315	
18	3,718,832
	3,718,833
22	3,718,834
83	3,718,835
111	3,718,836
CLASS 317	
13R	3,718,837
31	3,718,839
93	3,718,838
99	3,718,840
100	3,718,841
101CC	3,718,842
235R	3,718,843
258	3,718,844
CLASS 318	
78	3,718,845
85	3,718,846
227	3,718,847
CLASS 320	
7	3,718,848
61	3,718,849
CLASS 321	
8C	3,718,850
12	3,718,851
	3,718,853
19	3,718,852
69R	3,718,854
CLASS 324	
37	3,718,855
57R	3,718,856
	3,718,857
60C	3,718,858
72.5	3,718,859
142	3,718,860
	3,718,861
CLASS 325	
111	3,718,862

CLASS 328	
37	3,718,863
115	3,718,864
234	3,718,865
CLASS 330	
4.9	3,718,866
CLASS 331	
91	3,718,867
94.5	3,718,868
96	3,718,869
116M	3,718,870
CLASS 332	
16T	3,718,871
51R	3,718,872
CLASS 333	
31R	3,718,873
73S	3,718,874
CLASS 335	
18	3,718,875
152	3,718,876
205	3,718,877
CLASS 337	
7	3,718,878
94	3,718,162
95	3,718,879
380	3,718,880
CLASS 338	
22	3,718,881
32H	3,718,882
322	3,718,883
CLASS 339	
14R	3,718,884
17LC	3,718,885
21R	3,718,886
92M	3,718,887
98	3,718,888
103R	3,718,889
107	3,718,890
116R	3,718,891
126R	3,718,892
176M	3,718,893
217PS	3,718,894
258R	3,718,895
CLASS 340	
1R	3,718,896
8R	3,718,897
10	3,718,898
17	3,718,900
	3,718,901
23	3,718,899
52E	3,718,902
146AQ	3,718,905
146.1AG	3,718,904
146.1AL	3,718,903
147R	3,718,906
	3,718,907
149A	3,718,908
167A	3,718,909
172.5	3,718,910
	3,718,911
	3,718,912
173CH	3,718,913
173CR	3,718,914
173R	3,718,915
	3,718,916
174TF	3,718,917
213R	3,718,918
237S	3,718,919
248E	3,718,920
279	3,718,921
280	3,718,922
347NT	3,718,923
413	3,718,925
417	3,718,924
CLASS 343	
6.8LC	3,718,926
7.4	3,718,927
17.2R	3,718,929
106R	3,718,928
112R	3,718,930
703	3,718,931
728	3,718,932
768	3,718,933
770	3,718,934
797	3,718,935
CLASS 346	
74ES	3,718,936
CLASS 350	
160LC	3,718,380
	3,718,381
	3,718,382
175GN	3,718,383
215	3,718,384
252	3,718,385
CLASS 351	
39	3,718,386
CLASS 352	
91	3,718,387
92	3,718,388
109	3,718,389
CLASS 353	
27	3,718,390
101	3,718,391
111	3,718,392
CLASS 355	
8	3,718,393
13	3,718,394
27	3,718,395
43	3,718,396
78	3,717,975
88	3,718,397
CLASS 356	
96	3,718,400
153	3,718,398
210	3,718,399
CLASS 401	
199	3,718,401
CLASS 402	
31	3,718,402
CLASS 404	
49	3,718,403
CLASS 408	
46	3,718,404
128	3,718,405
CLASS 415	
111	3,718,406
CLASS 417	
108	3,718,407
178	3,718,408
326	3,718,409
CLASS 418	
15	3,718,410
82	3,718,411
142	3,718,412
CLASS 423	
81	3,718,730
199	3,718,732
213	3,718,733
228	3,718,734
238	3,718,731
281	3,718,735
321	3,718,729
415	3,718,418
485	3,718,736
CLASS 424	
1	3,718,737
94	3,718,739
105	3,718,740
118	3,718,741
121	3,718,742
267	3,718,743
300	3,718,744
311	3,718,745
324	3,718,738
CLASS 425	
130	3,718,413
146	3,718,414
326	3,718,416
406	3,718,417
438	3,718,419
441	3,718,420
444	3,718,415
CLASS 431	
23	3,718,421
95	3,718,422
207	3,718,424
208	3,718,425
264	3,718,423
328	3,718,426

CLASSIFICATION OF DESIGNS

D 4—	20	226,362
D 6—	65	226,363
	198	226,364
D 8—	149	226,365
	210	226,366
		226,367
		226,368
	252	226,369
D 9—	1	226,370
	28	226,371
	89	226,372
	242	226,373
D13—	6	226,374
D14—	5	226,375
	30	226,376
D22—	25	226,377
D23—	62	226,378
	73	226,379
	88	226,380
	142	226,381
	147	226,382
D24—	1	226,383
D26—	13	226,384
	14	226,385
		226,386
	23	226,387
D34—	15	226,388
		226,389
		226,390
D40—	1	226,391
D42—	7	226,394
D44—	1	226,392
	10	226,393
D48—	16	226,395
D49—	24	226,396
	35	226,397
D55—	1	226,398
D57—		226,399
D59—	2	226,400
D61—	1	226,401
D71—		226,402
D74—	21	226,403
D83—	1	226,405
D84—	10	226,404
D86—	8	226,406
D87—	1	226,407
		226,408
	3	226,409
D95—		226,410

CLASSIFICATION OF PLANTS

P. —	68	3,312
P. —	80	3,311
P. —		3,313
P. —	88	3,310

GEOGRAPHICAL INDEX OF RESIDENCE OF INVENTORS

(U.S. States, Territories and Armed Forces, the Commonwealth of Puerto Rico, and the Canal Zone)

Alabama	1
Alaska	2
American Samoa	3
Arizona	4
Arkansas	5
California	6
Canal Zone	7
Colorado	8
Connecticut	9
Delaware	10
District of Columbia	11
Florida	12
Georgia	13
Guam	14
Hawaii	15
Idaho	16
Illinois	17
Indiana	18
Iowa	19
Kansas	20
Kentucky	21
Louisiana	22
Maine	23
Maryland	24
Massachusetts	25
Michigan	26
Minnesota	27
Mississippi	28
Missouri	29
Montana	30
Nebraska	31
Nevada	32
New Hampshire	33
New Jersey	34
New Mexico	35
New York	36
North Carolina	37
North Dakota	38
Ohio	39
Oklahoma	40
Oregon	41
Pennsylvania	42
Puerto Rico	43
Rhode Island	44
South Carolina	45
South Dakota	46
Tennessee	47
Texas	48
Utah	49
Vermont	50
Virginia	51
Virgin Islands	52
Washington	53
West Virginia	54
Wisconsin	55
Wyoming	56
U.S. Air Force	57
U.S. Army	58
U.S. Navy	59

(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

PATENTS

1 : 3,717,997
3,717,998
3,717,999
3,718,041
3,718,095
3,718,104
3,718,292
3,718,293
3,718,633
3,718,898
2 : 3,718,585
4 : 3,718,148
3,718,327
3,718,435
3,718,915
5 : 3,718,118
6 : Re.27,589
3,717,892
3,717,894
3,717,897
3,717,899
3,717,932
3,717,933
3,717,956
3,718,000
3,718,007
3,718,014
3,718,015
3,718,017
3,718,043
3,718,046
3,718,082
3,718,106
3,718,129
3,718,131
3,718,141
3,718,145
3,718,170
3,718,183
3,718,218
3,718,223
3,718,235
3,718,248
3,718,249
3,718,289
3,718,312
3,718,316
3,718,338
3,718,345
3,718,371
3,718,389

3,718,395
3,718,406
3,718,407
3,718,441
3,718,446
3,718,455
3,718,456
3,718,481
3,718,485
3,718,502
3,718,504
3,718,519
3,718,524
3,718,535
3,718,544
3,718,556
3,718,557
3,718,563
3,718,569
3,718,572
3,718,576
3,718,578
3,718,605
3,718,615
3,718,688
3,718,705
3,718,706
3,718,733
3,718,734
3,718,737
3,718,738
3,718,751
3,718,755
3,718,761
3,718,770
3,718,772
3,718,792
3,718,806
3,718,822
3,718,845
3,718,846
3,718,855
3,718,863
3,718,891
3,718,897
3,718,911
3,718,912
3,718,930
3,718,936
7 : 3,718,899
8 : 3,717,907

3,717,984
3,718,317
3,718,342
3,718,677
3,718,701
3,718,776
3,718,866
3,718,925
9 : 3,717,936
3,718,214
3,718,239
3,718,268
3,718,274
3,718,287
3,718,306
3,718,339
3,718,370
3,718,399
3,718,419
3,718,442
3,718,539
3,718,598
3,718,599
3,718,614
3,718,692
3,718,767
3,718,786
3,718,832
3,718,833
10 : 3,717,904
3,718,229
3,718,429
3,718,488
3,718,491
3,718,494
3,718,584
3,718,628
3,718,629
3,718,658
3,718,673
3,718,715
3,718,731
12 : 3,717,949
3,717,964
3,717,965
3,717,994
3,718,003
3,718,130
3,718,136
3,718,190
3,718,340

3,718,348
3,718,360
3,718,433
3,718,436
3,718,529
3,718,812
3,718,906
13 : 3,717,924
3,717,957
3,718,051
3,718,079
3,718,463
3,718,764
3,718,813
17 : Re.27,588
3,717,882
3,717,886
3,717,906
3,717,927
3,717,944
3,717,955
3,717,971
3,717,980
3,717,982
3,718,001
3,718,013
3,718,061
3,718,065
3,718,066
3,718,107
3,718,119
3,718,127
3,718,179
3,718,180
3,718,212
3,718,228
3,718,234
3,718,242
3,718,244
3,718,277
3,718,296
3,718,301
3,718,321
3,718,330
3,718,334
3,718,336
3,718,357
3,718,397
3,718,411
3,718,416
3,718,418

3,718,484
3,718,499
3,718,525
3,718,526
3,718,552
3,718,575
3,718,579
3,718,580
3,718,619
3,718,624
3,718,643
3,718,653
3,718,663
3,718,749
3,718,759
3,718,789
3,718,793
3,718,828
3,718,829
3,718,893
3,718,908
18 : 3,717,914
3,717,954
3,718,023
3,718,100
3,718,258
3,718,272
3,718,322
3,718,356
3,718,363
3,718,417
3,718,423
3,718,750
3,718,795
3,718,796
3,718,835
3,718,838
3,718,889
19 : 3,717,903
3,718,089
3,718,198
3,718,225
3,718,261
3,718,766
3,718,928
20 : 3,717,937
3,717,995
3,718,191
3,718,192
3,718,253
3,718,256

3,718,347
3,718,452
3,718,687
21 : 3,718,135
3,718,237
3,718,408
3,718,554
3,718,704
22 : 3,718,219
3,718,222
3,718,309
23 : 3,718,250
24 : 3,717,885
3,718,044
3,718,090
3,718,093
3,718,128
3,718,267
3,718,311
3,718,349
3,718,602
3,718,869
3,718,873
3,718,927
25 : 3,717,909
3,717,913
3,717,917
3,717,950
3,717,960
3,717,991
3,718,024
3,718,062
3,718,078
3,718,133
3,718,251
3,718,402
3,718,404
3,718,415
3,718,434
3,718,439
3,718,465
3,718,516
3,718,532
3,718,562
3,718,566
3,718,567
3,718,568
3,718,592
3,718,608
3,718,617
3,718,649

3,718,693
3,718,703
3,718,773
3,718,831
3,718,856
3,718,867
3,718,879
3,718,887
3,718,913
26 : 3,717,893
3,717,900
3,717,919
3,717,987
3,718,018
3,718,035
3,718,054
3,718,069
3,718,097
3,718,124
3,718,172
3,718,200
3,718,221
3,718,308
3,718,326
3,718,332
3,718,364
3,718,375
3,718,376
3,718,377
3,718,390
3,718,431
3,718,444
3,718,460
3,718,495
3,718,497
3,718,500
3,718,523
3,718,555
3,718,646
3,718,676
3,718,681
3,718,740
3,718,788
3,718,790
3,718,859
3,718,892
3,718,902
3,718,920
3,718,923
27 : 3,717,986
3,718,033
3,718,096
3,718,113
3,718,142
3,718,297
3,718,328
3,718,341
3,718,712
28 : 3,718,084
3,718,168
3,718,206
3,718,207
3,718,295
3,718,365
29 : 3,718,022
3,718,081
3,718,083
3,718,099
3,718,412
3,718,459
3,718,478
3,718,489
3,718,588
3,718,590
3,718,596
3,718,603
3,718,803

31 : 3,718,103
3,718,848
32 : 3,718,307
34 : 3,717,968
3,718,005
3,718,029
3,718,031
3,718,032
3,718,039
3,718,092
3,718,120
3,718,164
3,718,166
3,718,176
3,718,217
3,718,236
3,718,290
3,718,299
3,718,302
3,718,303
3,718,305
3,718,310
3,718,313
3,718,319
3,718,394
3,718,473
3,718,482
3,718,503
3,718,505
3,718,507
3,718,508
3,718,513
3,718,517
3,718,553
3,718,577
3,718,582
3,718,601
3,718,612
3,718,632
3,718,642
3,718,644
3,718,647
3,718,651
3,718,654
3,718,662
3,718,665
3,718,672
3,718,674
3,718,696
3,718,697
3,718,698
3,718,718
3,718,722
3,718,723
3,718,729
3,718,730
3,718,736
3,718,739
3,718,743
3,718,744
3,718,768
3,718,771
3,718,778
3,718,781
3,718,783
3,718,787
3,718,800
3,718,802
3,718,819
3,718,820
3,718,839
3,718,860
3,718,888
3,718,904
3,718,905
3,718,932
3,718,935

36 : Re.27,585
3,717,896
3,717,898
3,717,908
3,717,929
3,717,941
3,717,942
3,717,952
3,717,958
3,717,974
3,717,993
3,718,009
3,718,016
3,718,045
3,718,049
3,718,059
3,718,070
3,718,072
3,718,087
3,718,116
3,718,139
3,718,143
3,718,144
3,718,157
3,718,203
3,718,232
3,718,255
3,718,259
3,718,260
3,718,275
3,718,278
3,718,279
3,718,281
3,718,282
3,718,314
3,718,331
3,718,350
3,718,355
3,718,358
3,718,380
3,718,382
3,718,383
3,718,392
3,718,393
3,718,403
3,718,428
3,718,447
3,718,462
3,718,464
3,718,470
3,718,471
3,718,472
3,718,476
3,718,477
3,718,501
3,718,515
3,718,543
3,718,546
3,718,559
3,718,561
3,718,570
3,718,594
3,718,622
3,718,669
3,718,675
3,718,695
3,718,728
3,718,745
3,718,757
3,718,765
3,718,779
3,718,807
3,718,826
3,718,864
3,718,907
3,718,909
3,718,929

3,718,934
37 : 3,717,887
3,718,050
3,718,137
3,718,414
3,718,483
3,718,530
3,718,531
3,718,861
39 : Re.27,586
3,717,943
3,717,945
3,717,977
3,717,985
3,718,038
3,718,053
3,718,101
3,718,102
3,718,162
3,718,174
3,718,185
3,718,187
3,718,199
3,718,208
3,718,209
3,718,210
3,718,211
3,718,304
3,718,318
3,718,323
3,718,333
3,718,388
3,718,398
3,718,405
3,718,409
3,718,422
3,718,466
3,718,496
3,718,509
3,718,549
3,718,551
3,718,571
3,718,573
3,718,587
3,718,611
3,718,613
3,718,621
3,718,626
3,718,637
3,718,638
3,718,685
3,718,702
3,718,711
3,718,747
3,718,748
3,718,791
3,718,798
3,718,814
3,718,868
3,718,876
3,718,881
40 : 3,718,034
3,718,088
3,718,186
3,718,205
3,718,266
3,718,581
3,718,589
3,718,609
3,718,874
41 : 3,717,888
3,718,213
3,718,346
3,718,487
42 : 3,717,883
3,717,895
3,717,922

3,717,930
3,717,973
3,717,975
3,717,979
3,718,019
3,718,048
3,718,057
3,718,064
3,718,068
3,718,117
3,718,173
3,718,177
3,718,181
3,718,216
3,718,227
3,718,247
3,718,252
3,718,280
3,718,315
3,718,325
3,718,329
3,718,337
3,718,344
3,718,367
3,718,440
3,718,448
3,718,449
3,718,510
3,718,514
3,718,565
3,718,618
3,718,627
3,718,634
3,718,667
3,718,679
3,718,680
3,718,690
3,718,691
3,718,815
3,718,830
3,718,834
3,718,841
3,718,847
3,718,851
3,718,852
3,718,853
3,718,854
3,718,875
3,718,878
3,718,883
3,718,895
3,718,922
44 : 3,718,111
3,718,238
3,718,324
3,718,884
3,718,890
3,718,894
45 : Re.27,587
3,717,940
3,718,163
3,718,583
3,718,639
3,718,844
47 : 3,717,884
3,717,905
3,717,911
3,718,115
3,718,264
3,718,288
3,718,493
3,718,527
3,718,720
3,718,805
48 : 3,717,920
3,717,963
3,717,970

3,717,978
3,718,004
3,718,058
3,718,094
3,718,132
3,718,146
3,718,154
3,718,184
3,718,188
3,718,189
3,718,194
3,718,195
3,718,196
3,718,202
3,718,204
3,718,226
3,718,233
3,718,284
3,718,343
3,718,352
3,718,366
3,718,386
3,718,512
3,718,545
3,718,586
3,718,607
3,718,707
3,718,710
3,718,763
3,718,809
3,718,842
3,718,900
3,718,901
3,718,921
49 : 3,718,836
50 : 3,718,910
51 : 3,717,967
3,718,074
3,718,125
3,718,150
3,718,276
3,718,421
3,718,445
3,718,714
3,718,732
3,718,926
53 : 3,718,098
3,718,167
3,718,169
3,718,262
3,718,361
3,718,810
3,718,862
54 : 3,718,161
3,718,240
3,718,630
3,718,684
3,718,689
55 : 3,717,901
3,717,939
3,718,030
3,718,052
3,718,060
3,718,063
3,718,071
3,718,110
3,718,121
3,718,159
3,718,254
3,718,359
3,718,536
3,718,821
56 : 3,718,827

DESIGN PATENTS

6 : 226,390
226,401
226,405
9 : 226,404
17 : 226,371
226,382
226,383
226,394

226,397
226,406
226,408
18 : 226,384
20 : 226,402
25 : 226,386
26 : 226,376

226,381
34 : 226,370
36 : 226,362
226,364
226,366
226,367
226,368

226,385
226,388
226,393
226,395
226,399
226,403
37 : 226,377

39 : 226,375
226,387
226,391
226,398
226,410
40 : 226,389
42 : 226,365

45 : 226,373
49 : 226,380
51 : 226,409
55 : 226,378
226,396
226,400
226,407

PLANT PATENTS

12 : 3,310
17 : 3,312
39 : 3,311
3,313

U. S. GOVERNMENT PRINTING OFFICE : O - 1973

U. S.
OFFICIAL GAZETTE
UNITED STATES
PATENT OFFICE
VOL. 907
FEBRUARY
1973

MICRO PHOTO DIVISION

BELL & HOWELL

S
W